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Improved Cannon.

Fig. 1 represents a vertical longitudinal section.

Fig. 2 is a cross section through one accelerator.

Scale—Half an inch equals one foot.

If the gun is eighteen feet long and the bore is six inches diameter, it weighs 33,000 lbs.

Shot—300 lbs. Powder—100 to 120 lbs.

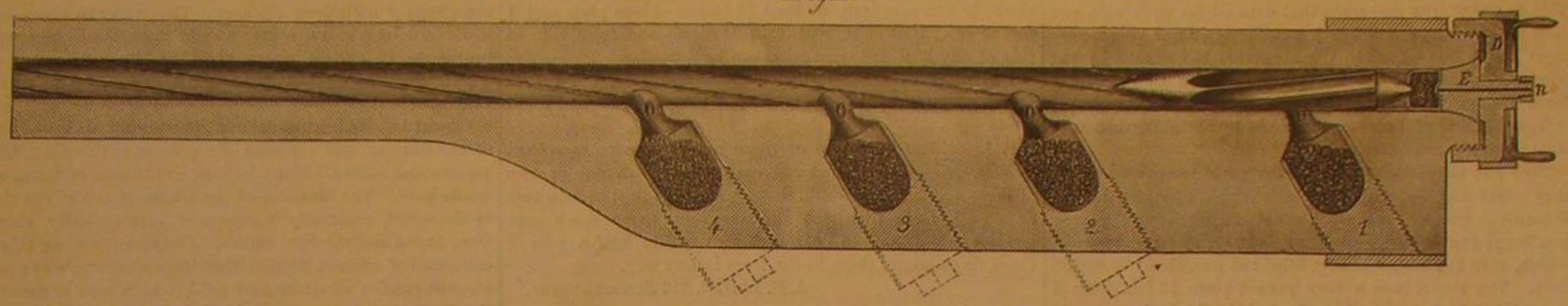
Initial or breech charge—5 lbs. very slow mammoth.

First accelerator—25 lbs. mammoth.

Second accelerator—25 or 30 lbs. No. 7.

Third accelerator—25 or 30 lbs. cannon or mortar.

Fig. 1.



A. S. LYMAN'S PATENT ACCELERATING CANNON.

Fourth accelerator—25 or 30 lbs. mortar or musket.

The accelerator plugs, 1, 2, 3, 4, may be made of soft cast steel fitting closely in and protecting the cast iron from the fire of the powder. Instead of these steel chambers, ordinary plugs only half the diameter of the powder chambers, as shown in Fig. 4, have heretofore been used, but though no cast-iron accelerating chamber has ever failed, it is believed that a protection of half an inch of soft steel, as shown—which will keep the fire out of any defect that may exist in the cast iron—will increase its durability.

The breech-loading arrangement consists of a cap, D, and is screwed on the outside of the breech like Whitworth's, but in front of this cap is the tapered plug, E, with its stem projecting back through the cap, and with the nut, *n*, on its end, so as to leave sufficient play, that when we open the breech the cap will make half a turn before it strikes this nut and lifts the plug from its seat, without necessarily revolving it at the same time. This greatly lessens the friction and the power required to open the breech.

Fig. 2.



Fig. 3.

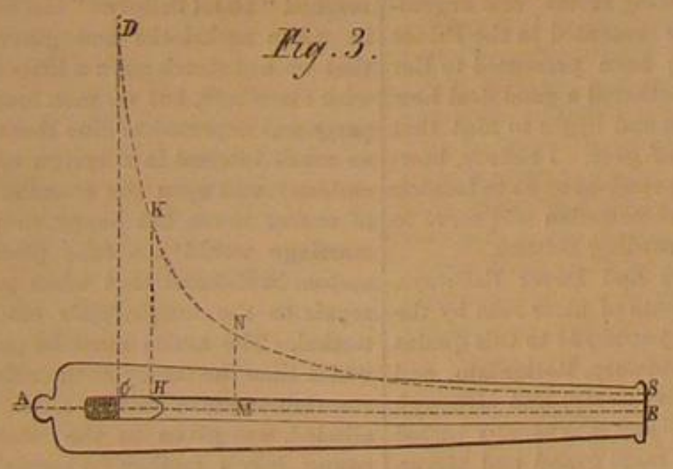
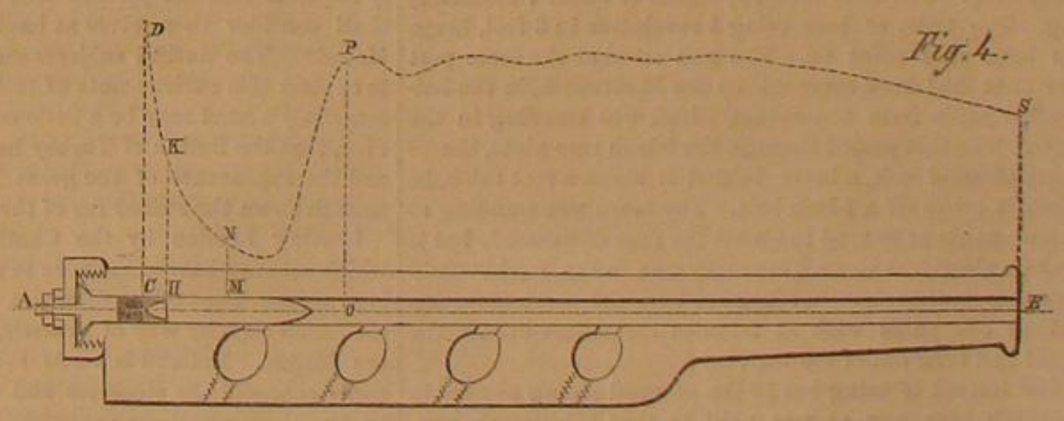


Fig. 4.



The initial charge is in a metallic cartridge made heavy around the back edges, so as to insure against the possibility of any leak around the plug. It will be perceived that though this plug is pushed back even the $\frac{1}{64}$ of an inch when the gun is fired, the space around the end of the plug next to the powder will not be perceptibly enlarged, while in the Whitworth cannon, if the cap is driven back the $\frac{1}{64}$ of an inch when the gun is fired there will be an opening the $\frac{1}{64}$ of an inch wide on all sides between the cap and the breech end of the gun. We have seen one of these cannon at the Washington Navy Yard with deep grooves cut across the end of the tube from this cause.

The sabot may be made of copper or sheet brass tube, filled with paper pulp and nearly as long as the tapered end of the shot. We have often with some forms of shot dispensed with the sabot. The valve openings—see Fig. 2—through which the accelerators are loaded, need not be over an inch in diameter for common cannon powder, but for the first accelerator, which is charged with mammoth powder, this valve should be about two inches in diameter. A copper cup on its end prevents windage. The valve stem projects up through the hollow screw with a cap nut on its end which keeps out water in case of rain, and like the breech plug is so arranged that when the screw has made about half a turn, it strikes the cap and lifts the valve from its seat, without revolving it, thus saving friction.

OPERATION.

When the gun is fired the shot is driven by the initial charge past the first accelerator, when the fire sets back down into and lights the mammoth powder in this accelerator. This raises the pressure perhaps nearly as high as it was raised by the small initial charge before the inertia of the shot was overcome. The action of each of the remaining accelerators is the same. It is found by experiment that every additional accelerator increases the force of the shot, and every addition to the charge in the last accelerator seems to increase the force of the shot as much as though it was added to the first accelerator or to the charge in the breech.

Though this breech-loading arrangement is somewhat similar to that of Mr. Whitworth's cannon, it is believed to be a much safer arrangement, for the following reasons:—

1st, When the gun is fired there is no pressure in the barrel within six inches of the end of the tube, and that six inches acts as a band to strengthen the tube.

2d, As we use not over one quarter as much powder in the breech, the pressure of the fire acts against not over one quarter as much of the length of the bore of the gun before the shot starts.

3d, The sabot in this accelerator prevents the fire of the powder from pressing around the shot, and the back nine inches of the shot is freed on its bearings, so that the strain from rotating the shot falls entirely on the bearings in front. The part of the gun that is strained by the pressure of the fire is thus separated a considerable distance from the part that is strained in rotating the shot. This separation of these two strains by nine inches of metal on which there is no strain, greatly lessens the danger of bursting the gun and removes the objection to the wedge action of the Whitworth shot, or any other shot that centers in the gun, as well as the objections to the large class of shot that are rotated by the sabot, or by a ring of softer metal.

It is believed that this breech will endure a greater pressure than the breech of a muzzle-loading gun. All the pressure on the breech pin is borne by the screw on the outside of the breech, where it is over forty inches in circumference, and free from the action of the fire, while in the muzzle-loader the strain acts first on the inside of the bore, where it is less than nineteen inches in circumference, and if any defect exists, the fire under heavy pressure enters it and increases the effect. It also enables us to use the metallic cartridge, which protects the powder chamber from the direct action of the fire.

The Whitworth bore is peculiarly adapted to the accelerator, as the shot is driven forward at the muzzle with very nearly as much force as at the breech, and is thus caused to center and be held very steadily in the gun as it leaves the muzzle. For this reason, though the shot is made smaller than the bore, so that it will enter freely without cleaning the gun, it is as accurate as the common form of grooves and jackets can be, even where they fit so closely as to necessitate very careful cleaning of the gun at each discharge. This fact has been thoroughly tested with small accelerating rifles.

RANGES OF CANNON.

	Diameter of Bore.	Elevation. 2°.	5°.	10°.
	Inches.	Yards.	Yards.	Yards.
Old 12-pounder, round ball	..	909	1,663	....
Old 42-pounder, round ball	..	1,010	1,666	....
Rodman's 400-pounder in use on monitors, with 40 lbs. of good powder	15	813	1,518	2,425
Parrott's 10-pounder	2·9	930	2,000	3,200
Parrott's 20-pounder	3·64	956	2,100	3,250
Parrott's 30-pounder	4·2	1,000	2,300	3,500
Common rifle with—				
James shot, 30-pounder	4·2	1,000	2,300	3,500
Sawyer's, 30-pounder	4·2	1,000	2,300	3,500
Hotchkiss shot, 30-pounder	4·2	1,000	2,300	3,500
Armstrong's rifle, 12-pounder	..	1,200	2,300	....
Whitworth's, 12-pounder	3·25	1,254	2,230	....
Accelerator, 12-pounder	3·55	1,500	3,584	....

The ranges of Parrott's rifles are copied from his Handbook. The range of the Accelerator is copied from the official records of the Navy Ordnance Bureau at Washington.

It will be seen by Benton's *Ordnance and Gunnery*, page 521, from which the above ranges of smooth bores are copied, that the 15-inch gun with 40 lbs. of good powder, not mammoth or rocket mixture, at 15° elevation, ranges but an average of 3,078 yards, which is 500 yards less than the 12-pounder Accelerator at 5°. With an elevation of 25°, it ranges 4,528 yards. Increasing the charge of powder to 50 lbs. increases the average range to only 4,680 yards—that is, but 152 yards, or 3½ per cent. If this 25 per cent addition of powder had been burned in an additional accelerating chamber, it would have increased its range several times as much. It is often proposed to apply the accelerator to smooth-bore cannon, but their inaccuracy is an insuperable objection. Exchanging the rifled accelerator for the smooth bore would be like the prairie deer hunter who should throw aside his good American hunting rifle for the old smooth bore musket with its round ball

COMPARISON OF THE POWER OF ACCELERATORS WITH THAT OF OTHER GUNS.

Fig. 3 is a diagram from Robbins' *Principles of Gunnery*, for showing the pressure applied to the ball in different parts of the bore of the gun. He supposed the powder to be in moderate quantity and of good quality, and all converted into an elastic fluid before the shot left its seat. Let A B represent the axis of the gun. Let the perpendicular, C D, represent the pressure of the fire on the shot at the moment it leaves its seat. Then when the shot is driven forward so that the gas from the powder has doubled its bulk, the pressure is reduced to one half (on account of the cooling of the gas by expansion, it would practically be reduced far below one half, but as there was probably some powder not consumed, we will represent it as one half), and its pressure will be represented by the perpendicular H K. When it has expanded into four times its original space the pressure will be represented by the perpendicular, M N, and the line, D K N S, drawn through the top of all the perpendiculars representing the pressures, would be a hyperbola. Now these perpendiculars representing the pressures at the points from which they are drawn, the area of the figure, D K N S B C, would represent the power applied to the ball.

It was reflecting on this diagram and its demonstration by Robbins that first suggested the idea of an accelerating gun. Practically, with common cannon it is found that while the

strain at the breech is enormous, the pressure before the shot leaves the muzzle is but little, and where the gun is long, even less than the resistance of the air which is packed before it. For this reason shortening the barrel often increases the force of the shot.

Fig. 4 shows the diagram described by an Accelerator. In this we must use a small quantity, and very slow powder, at the breech for the initial charge, because we use a long, heavy shot. Then when the curve has run down considerably and the shot is well under way, it passes over the first accelerator, containing perhaps ten times as much as the initial charge. The fire sets back, down into, and lights this, and raises the pressure or curve nearly as high as the perpendicular made by the initial charge.

When this accelerating charge is fired, instead of their being only three or four inches depth of elastic fluid in the breech to expand, there is over ten times as much, and the curve runs down less than one tenth as fast. When it passes over the second accelerator it fires another large quantity of powder, and the curve runs down still more slowly, and the area of the figure included between this curve, the perpendiculars, C D and B S, at each end, and the axis, A B, of the gun, which area represents the power applied to the ball, may be ten or twenty times as great as in the first case, while the pressure in the barrel of the Accelerator is not over one half or three fourths as great.

A good practical illustration of the difference between the Accelerator and one of the best cannon on the old principle (that is one of the best guns that does all its work with one blow or one charge of powder), was shown in our own experiment in the Navy Yard in Washington. It was said by the officer in charge that the most powerful gun they ever had there for penetration was the Whitworth muzzle-loader, 5¼ inches diameter of bore—a gun made by shrinking bands of steel upon a core of steel.

They had tested this gun upon the same plate upon which they tested the 2¼-inch bore Accelerator. The shot of this Whitworth gun was cast steel, about 12½ inches or 2¼ diameters long; the propelling power was 14 lbs. of powder (No. 7), which, with the cartridge bag, filled the gun about 20 inches deep. The target was a very perfect plate, 10 feet long, 3 feet wide, and 5 inches thick, backed by 18 inches of solid oak. The shot penetrated 3½ inches into this 5-inch plate. Next they fired a similar shot with 18 lbs. of powder (No. 7), which filled the gun over 2 feet deep. As the Whitworth gun uses a cake of beeswax and tallow for a wad, there was very little windage, but perhaps nearly the whole of that long column of strong powder was converted into an elastic fluid, as heavy as water and hotter than melted iron, before the inertia of the shot was overcome. Or it may be, as believed by some, that only a foot or so of the column was burned, while another foot next to the shot was rammed into a cake as hard as dry pressed brick, and not burned until it left the gun. This would make a very obstinate sabot, particularly if the bore was rough.

The shot penetrated but 3¾ inches, and that splendid Whitworth gun was ruined. It was cracked along its top several feet. There were no other shot marks on this plate except the two Whitworth, which were still sticking in it, and though it was a very perfect plate, it was supposed the solid oak backing only, prevented their passing through.

The Accelerator had but 4 inches depth, ¾ lb., of mammoth powder in the breech, but it had enough of the strongest cannon powder in the chambers to have filled the bore 30 inches deep. The shot was 17½ inches or about 7 diameters long. The twist of bore being 1 revolution in 3 feet, keeps this long shot point on. The gun stood at the same port hole that had been occupied by the Whitworth, in the battery 204 yards from the target, which was standing in the water. The shot passed through the 5-inch iron plate, the 18 inches of solid oak, a brace behind it about a foot thick, in which it broke off a 1-inch bolt. The brace was standing at such an angle as to tend to glance the shot downward, but it went on about 100 yards. No other gun in the world would have thrown that shot that distance with the same elevation—about 304 yards with 15 minutes elevation—even if the target had been out of the way.

Now instead of using but 18 lbs. of good strong powder in a 5½-inch bore gun, as was used in that Whitworth gun, which filled it 25 inches deep and spoiled it, we would use five or eight times 18 lbs. in the accelerators, which would be enough to fill the bore from 9 to 14 feet deep, if it was in the bore of the gun. That and the shot would more than fill the gun. But the powder being all in the accelerators except the 3 lbs. of very slow powder, it fills the bore but 4 inches deep, and though the pressure is not raised one fourth as high in the Accelerator, the power exerted is five or eight times as great as it was in the Whitworth cannon.

It was thought to be unsafe to fire this 12-pounder (2·55-inch bore) Accelerator at a higher elevation than 5° at the Navy Yard, and it was never fired excepting there. But from its comparative ranges at 2° and 5° we can approximate to its comparative range at higher elevations. While at 2° its range exceeds that of Armstrong's 12-pounder by but 32½ per cent, and Parrott's 2·9-inch bore gun but 70 per cent, at 5° it outranges the Armstrong 58·6 per cent, and the Parrott 79 per cent. The reason for this comparative increase of range for every increase of elevation, is the fact that our shot are more than twice as long and heavy as Armstrong's or Parrott's in proportion to their diameter, and therefore meet with much less resistance from the air in proportion to their momentum, notwithstanding their higher velocity.

With good rifles aimed by practiced gunners the principal cause of inaccurate shooting—when the exact distance is not known, as in hunting or in battle, and particularly when vessels are changing their distances—is misjudging the distance. While with the ordinary rifle cannon at a distance of 1,500 yards, the shot falls 1 foot in 7 or 8 feet, it is found that with the 12-pounder Accelerator the shot falls but 1 foot in 46 feet; that is, the common rifle shot falls as much (30 feet) in 70 or 80 yards as the Accelerator rifle shot falls in 460 yards, and a practiced gunner would misjudge his distance as much as 70 or 80 yards in 1,500 yards, probably a hundred times where he would misjudge it once by as much as 460 yards, and therefore throw his shot 30 feet over or under the point aimed at as many as one hundred times, when using the common rifle cannon, where he would once with the Accelerator.

Sir Howard Douglas, in his work on gunnery, page 532, remarks:—"In all cases of gunnery the great object is to have the path of the shot as nearly horizontal as possible;" and again, page 367:—"No law of gunnery is more clearly demonstrated and irrefutable than this, that elevation is inversely the exponent of accuracy;" "The gun that makes the greatest range with the least elevation, and consequently with the greatest horizontality in the flight of its shot, is assuredly the most accurate in its practice and the most destructive in its effects."

If this 6-inch shot, propelled by 120 lbs. of powder, of which 90 lbs. is quick and strong, averages 1,666 feet per second with 5° elevation (and it will more than that if properly modeled for overcoming the resistance of the air), it will range 5,000 yards; that is more than twice as far as any other gun, and more than three times as far as the 15 or 20-inch bore gun of the monitors. At 5° elevation, or 5,000 yards, it will penetrate at least 16 inches of iron plate and 4 feet of oak; that is, it will pass through and from side to side of any iron-clad vessel that can be floated.

The limit of the elevation of the 15 and 20-inch guns on the monitors is 6°, and their greatest range is less than 2,000 yards.

It is evident that two or three active wooden merchant vessels, properly prepared and each armed with one or two of these Accelerators, would destroy a whole fleet of monitors or slow iron-clads without allowing them to approach near enough to roll their 15 or 20 inch shot within half a mile of them, or endanger them in the least in any way.

A. S. Lyman, 212 Second avenue.

A TRIP FROM LONDON TO AMSTERDAM.

Amsterdam, June 30, 1867.

Before setting out upon my continental tour I passed a week in London, which was a most happy relief after the bustle and confusion of Paris. Aside, however, from this, the contrast between the two cities is very striking. Paris, the center of all that is brilliant and gay, the seat of art and fashion; London, dark and sombre, the center of the commercial world, where every one seems involved in trade and traffic. The Londoners are very unhappy just at this time, and are growling about the peculiar freak of the Royal mother. They read every day in the daily papers how Louis Napoleon is gathering emperors, kings, sultans, viceroys and princes at the Imperial Palace, bringing all the world to witness the festivities, while their own dear Queen in the hight of the London season, is away off at Balmoral, in Scotland, apparently as unconcerned as a peasant girl of all that is going on in the Great Metropolis.

To compensate, however, for what seems to be a strange anomaly in her conduct, the Royal mother orders her dutiful son, the Prince of Wales, to hold "drawing rooms" and urgently requests that all persons who are presented to the Prince shall consider themselves as having been presented to Her Majesty. The dutiful subjects are bothered a good deal how to explain this curious state of things and begin to hint that somebody's head may be a little out of gear. I believe, however, that the Sultan of Turkey has promised to go to London and the appearance of the great Mahommedan will serve to smooth down the ruffled fur of the growling Britons.

Leaving London by the Chatham and Dover Railways, which seem to have come near to a state of utter ruin by the bad management of its directors, I journeyed to this quaint old Dutch city, by way of Brussels, Antwerp, Rotterdam, and the Hague. Holland is a new country to me, and although easily accessible by steamers and railway it is usually passed by travelers, who seem to prefer the more grand and picturesque countries of Switzerland and the Rhine, where the eye is feasted by all that is sublime and beautiful in nature and of art made impressive by the lapse of centuries. Through all the western portion of Belgium, the country is very beautiful in its cultivation, not exceeded by that of any other country in Europe, and as regards its manufacturing and industrial interests Belgium is making great progress. Above Antwerp the soil in many places seems quite barren and unproductive, but the people appear to be happy and contented and prefer not to be swallowed up by their stranger neighbors. At Moerdyk, a steamer takes the railway passengers to Rotterdam by the river Meuse, which is one of the most agreeable trips in Europe, owing to the singular character of the scenery which lies stretched out on either side. It is generally known that a large part of Holland is formed of the alluvium deposited by the Rhine and its confluents. Hudibras describes Holland as a country that draws fifty feet of water, which is literally true, but by an almost superhuman amount of labor, and an expenditure of £300,000,000 sterling, these industrious Dutchmen have reclaimed the whole kingdom, and made it productive to the highest degree. Canals and ditches intersect and cut up the surface of the country in every direction even to the subdivision of farm lands into "polders," so that the milkmaid is often seen towing her boat load of polished milk cans to the pasture to obtain the daily supply of milk. I have also frequently noticed during their hay season that the farmers transport their hay in flat boats along their little farm canals. The whole country abounds in cattle and sheep, the cattle being uniformly black and white.

On the larger canals a great many sail vessels are employed, which, owing to the flat country, appear to be sailing on dry land, and still more singular it is to see them frequently floating along higher than the tops of the little cottages. Another singular feature of the country is the vast number of clumsy old windmills which are continually sweeping their long lazy-going arms through the air. These mills are used for grinding, sawing, and other mechanical purposes, but chiefly for draining the water from the low lands and pumping it into the canals, thereby preventing the inundation of the country. To the people of Holland, these old windmills must be looked upon with a veneration similar to that felt by the Egyptians for the sacred Ibis. I do not see why this same class of windmills could not be profitably employed upon our Western prairies where wind is plenty and cheap, and where it is not possible to obtain water power for grinding grain and other domestic uses.

The streets of the cities of Rotterdam, the Hague, and Amsterdam, have also the same system of canals running through them, and these latter are made very useful for transporting market produce and other merchandise from point to point. The Dutch being proverbial for their thrift and cleanliness, the traveler will look in vain for ruins or other evidences of decay which characterize some portions of Germany, and if the people were not very careful in the management of this net-work of canals, I am sure they would rapidly die off from the effects of malarious diseases. The water in these canals is covered by a green scum, which, upon close examination, proves to be a little water plant of the confervæ species which floats upon the surface and draws its life from the vegetable matter which accumulates in great abundance.

I spent two delightful days at the Hague. It is the capital of the country and contains the palaces of the King, Queen, princes and nobles. Many retired gentlemen of fortune also reside here. The Museum of the Hague is one of the richest in the world, especially in objects of rare curiosity obtained from Japan and the East Indies. Prominent among this rare collection of ancient things that interested me, was a small, elegant cannon of silver and gold, which was presented by the Society of Commerce of the Hague to Admiral De Ruyter. It is a rifled gun, which shows that the principle of rifling was applied to cannon nearly two hundred years ago. There is also a very old breech-loading cannon having a removable breech pin made on the same plan as the one illustrated in Bennett's work on ordnance. The art gallery contains fine pictures by Reubens, Vandyke, Jordaens, Teniers, Matsys, Gerard, Douw, Guido, Reni, Murillo, and other great masters. There are two pictures in this gallery which have made it famous the world over, the subjects being as unlike as it would be possible to make them. I refer to Paul Potter's *Bull*, and to Rembrant's *Lesson in Anatomy*. These wonderful pictures were painted upward of two hundred years ago, and to all appearance are as bright as when first finished. The Dutchmen think a great deal of Paul Potter's *Bull*, and it is said that the Dutch Government offered Napoleon a hundred thousand dollars rather than that the picture should be taken from them and carried to Paris. In these two great paintings, art appears to have done all that it is possible to do short of actual creation. This Museum and the palaces here bear evidence of the intimate trade which so long existed between these people and the Japanese. When our party reached "Hotel Bellevue" the waiters made their appearance in white neckcloths and gloves. It occurred to us at once that we had struck upon a little more style than we had met with elsewhere, but we soon found out that a large wedding party was expected to dine there that evening. An event of so much interest in a foreign country naturally excited our curiosity, and upon the assembling of the guests, expecting, of course to see the happy couple, I was informed that the marriage would not take place for several days. It is the custom in Holland that when parties engage to marry, they repair to the magistrate's office and sign a contract of betrothal. The notice must be published fifteen days, during which time the family of the affianced parties give a series of entertainments of various sorts. The dinner to which I have alluded, was given in the most sumptuous manner by the young lady's mother. I remarked to the landlady of the hotel, "supposing after all the fuss and expense, one of the parties should get sick of the bargain, and, as was sometimes the case in the United States, should fail to put in an appearance on the wedding day?" This idea struck her as exceedingly novel, and impossible in Holland, where the people appear to be very honest, happy, and industrious.

Amsterdam stands literally upon piles, and many of the buildings look as though they intended to tumble down. The greatest degree of skill in hydraulic engineering has been required to manage the water so as to prevent the city from being submerged, a calamity to which it is exposed at all times. It is not easy for its inhabitants to abolish old notions, so that occasionally one will see a very respectable coach-body mounted upon wooden runners, the driver holding in his hand, by a piece of bed cord, a greased rag, which he throws occasionally under the runners to lubricate them so as to pass easily over the pavements. I saw one of these vehicles this morning and cannot imagine anything more ridiculous.

I have also visited the famous town of Broek, which has the reputation of being the cleanest place in the world. Carriages are not permitted in the streets; smokers were once warned to put stoppers on their pipes, and from motives of cleanliness the cow's tails were tied up, when within doors. I think that some of these absurd notions must have gone out of fashion, but it is a remarkably neat little place, where good cheese, milk, butter, beer, and bad cigars can be had cheap for cash, but no trust.

S. H. W.

THE GREAT RXPOSITION COMPLETE.

Doctor Prime, under the *nomme de plume* of "Irenæus," has written to the New York *Observer* some of the best letters from Paris, descriptive of the Exposition, that have been published. We make the following extracts from his last letter.

At last it may be fairly and truthfully said the Exposition is complete. Every department is open and full. The sound of the hammer has ceased in the Palace of Industry and Art. No more doth the workman in his blouse, with his ladders and brushes, his car and his bars, jostle among the silks and the laces of the gay and the fair who throng the walks and niches of the grand bazaar. It is done. The world is here to see it. The kings of the earth, with their queens: the great men of the East with their wives and their concubines: princes and princesses, generals and captains, and ambassadors and commissioners, and men of high and low and no degree; deputations of the laboring classes from various countries; schools of young men and young women on excursions of pleasure; regiments of soldiers on a holiday, in picturesque uniform, from the mountains of the Tyrol; students from the German universities, a wild rollicking set of fellows who play as hard when they are abroad as some of them study when they are at home; Chinese and Japanese, and Turks and Greeks, and Russians, in great numbers, and Fins and Poles, and Swedes and Danes, and coal-black Africans and keen, sharp-set Yankees and Brazilians, and gay Italians and solemn Spaniards and Portuguese, and how many more I do not this moment remember; but assuredly all the civilized the semi-civilized and some of the uncivilized peoples of the earth have their representatives at this moment in the capital, the metropolis of art, the most beautiful, attractive, seductive, dangerous, destructive, delightful city in the world.

Around the central garden stands the great Exposition building itself, and over its several doors are the names of the streets that divide it into sections, and of the countries to which they lead. Standing in the garden we read the names of all the nations and select the one we wish first to explore. Now that I have taken you with me through the most of them separately, it is well to go through the walks, making successive voyages or travels around the world, passing constantly out of one land into another and making comparisons among them. It is thus that we get one grand impression of the whole. If at any time in the slow and imperfect development of the display, we have been tempted to regard it as a failure, now that all its proportions are revealed and the completed idea made a fixed and tangible fact, no one can call it a failure unless he had made such exaggerated previous conceptions that a city of pearls and gold would fail to satisfy his expectations. The outer circle is alive with the movements of useful art—the machinery by which the work, the hard work of the world is done. The inmost circle is the repository of the fine art—the paintings and statuary—of the several nations. Between these are many concentric circles, divided and sub-divided, into convenient compartments, in which all the results of human ingenuity and labor, whatever the wants, real or imaginary, of mankind demand, are assembled. It is not too much to say that so great a collection was probably never made before. Forty thousand persons are enrolled as exhibitors! Each of these has sent something, and many of them many things, which the Judges deemed of sufficient interest to be placed in competition with the rest. All together, the number of objects exceeds one million! Whatever, therefore, is admirable for its power to benefit or gratify the human race, whatever tends to exalt, improve, please and bless, distinguishing the human from the merely animal races, is therefore here, in its most elaborately finished form. We know somewhat of the games and fairs that brought kings and peoples into contact and competition in Greece and Italy, and Asia Minor in the days of old; we know that Damascus and Babylon, Bagdad and Cairo have had their streets and squares and bazaars thronged with millions of people to see and buy and sell: but never until railroads and steamers could be used to transport the productions of the earth from its most distant points to a common center, has it been possible to gather in one enclosure such a million of various fabrics as are now visible in one day, within this Park in Paris. The one chamber of diamonds exceeds description: a room full of precious stones, in every form of art, to adorn the women whose highest type of beauty is to need no other jewel. Yet it is not so much the brilliancy and excellence of one or another of these departments of art that gives the character to the Exhibition. True, you will not find in any shop or street such specimens of silks in piece and in dresses, such patterns of gold and silver ware, such porcelain in all the shapes that luxury and taste can devise or want require, such glass and crystal in every range of ornament and use, such wealth of wool and cotton wrought by hand and machinery into all the purposes of life, such instruments of music peculiar to certain lands and others common to all, but vieing with each other in splendor of finish and perfection of tone; such manifold productions of the earth, vegetable and mineral; such enginery to move the works that produced these various articles for man's use, and make man the master of the land, the air and the sea, the elements themselves being made subservient to his will. But you must take them all in at once in combining the results and effect of this Exhibition, and reflect that a sample of the best of everything is here under one roof, and may be seen for twenty cents! Such an Exposition was never made before, and it is quite doubtful whether another will be attempted during the present generation.

And outside of the building, in the Park itself, is a more picturesque and exciting show than that within. There by the erection and decoration of buildings representing forms of life at home, various nations have sought to show themselves, or some types of themselves, in Paris. If they are not more correct and true to facts than the ridiculous American farm house and school house, they are simply an imposition on the public. But we will hope that these Swedish and Russian and Swiss dwellings are somewhat like those in the countries they represent, while this United States farm-house is such a building as I never saw, and I have seen several. China has its pagoda and temple and theater and tea room. Egypt its palace, and Turkey its mosque, and Tunis its Royal residence.

Almost every nationality has a restaurant. The American offers buckwheat cakes, with sirup. We call for them—six leathery, burnt, heavy, sour, loathsome looking plaisters are laid before us, and some sugar dissolved in water, to imitate sirup. I called the manager, and, in terms of deep concern, addressed him: "Sir, do you expect American, Christian gentlemen to eat those vile things, and think them buckwheat cakes? For the honor of your country, I beseech you, as a patriot, to give them some other name, or suspend the business." He made many apologies, and promised to make better cakes. I have no confidence that he will succeed.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Cause of Guns Bursting.

MESSRS. EDITORS:—I observed in your issue of May 18th an article headed "The Bursting of Cannon," to which allow me to make a few remarks in addition to those already given by you, which I think will be admitted by all who have given the subject much thought and attention, to show the most direct cause for the bursting of all fire-arms regardless of size.

The true reason of upsetting of soft leaden bullets and the fracture of hard metal ones, arise from one and the same cause. That is, counter pressure upon the shot, and to illustrate my position I will place a conical bullet upon its side horizontally upon an anvil, and with a bat held with both hands will give it a blow upon its butt end, the force of which the bullet would receive amounting to 30 lbs. weight which would send the bullet from its state of inertia in its curved orbit, meeting with only unconfined atmospheric resistance until it would fall upon the earth. We will now find the leaden bullet and upon examination see its original form and contour but slightly if any changed. We will now take another bullet of the same size and form, cast in the same mold, and place it upon the anvil with its point downward, and measure a blow from the bat vertically, imparting again the force of impact upon the base of the bullet (30 lbs. as before) driving it against the anvil with such a force that we find on examination, a complete case of upsetting of the bullet, it being knocked out of shape, much shortened, possessing little or none of its original shape.

Precisely the case with the bullet in the gun. It lies between counter forces; the gas of the powder behind the bullet and the column of atmosphere in front of it trying to hold it in its place; and when we take in consideration the 15 lbs. of atmospheric pressure to the square inch, and the utter impossibility for two substances occupying one space at the same time, we will at once see the application of the bullet between the anvil and the bat. The bullet in the gun being placed between two antagonisms, the powder gas being the stronger of the two the bullet begins to move before the expansive power of the powder gas, the atmosphere gives way inch by inch, and as it is susceptible to compression, those particles nearest the bullet, press in those toward the muzzle of the piece until it becomes so much condensed that the whole column begins to move before the onward march of the bullet, and at this particular moment the upsetting or fracture of the shot takes place. And this particular time is when fracture or bursting of the gun occurs; therefore the fundamental law in gunnery is to have the piece as short as possible in proportion to the caliber, the object being to get the barrel only sufficiently long that a necessary charge of powder will burn before the shot passes from the muzzle of the gun; for the longer the gun the greater the atmospheric resistance in front of the shot and the chances much augmented for bursting of the piece. I have made many experiments satisfactory to myself and am forced to the belief that the frequent bursting of fire-arms regardless of size of caliber is to a great extent the result of counter pressure upon the shot.

To illustrate or demonstrate further the retarding effect of a column of atmosphere upon a bullet in a rifle barrel weighing 12 lbs., caliber, 70 to the pound, with 2½-inch gage of powder, shooting 69 feet, I drove a conical bullet 13½ inches in a solid block of pine wood; and with the same gun on the same day, giving it the same treatment, save exhausting the atmosphere in front of the bullet, I have found my bullet driven in the same block of wood 23¼ inches, with not more than one-fourth the recoil attending the first shot. In closing this article I will say that a goodly number of experiments that I have made all combine in affording me direct evidence that the range of fire-arms can be much increased, and that too by a less charge of powder, that their safety can be much augmented, if not wholly prevented from bursting, by exhausting the atmosphere in front of the bullet instantaneously with the discharge of the piece, so that the bullet travels in a vacuum until it passes from the gun and flies off in the open and unconfined air. E. H. PARDEE, M. D.

San Francisco, Cal.

The Use of Shot in Rifles.

MESSRS. EDITORS:—Some time since I noticed an inquiry under the head of "Answers to Correspondents," respecting the use of shot in rifles. Your correspondent appeared to be a western man, and I judged that being compelled to use a rifle on the prairies for defense against Indians, or for the destruction of large animals, he also desired to be able to obtain grouse, duck, etc., for food, when hard pushed, and when large game was not to be found. With this supposition, I give the results of my experience in the wilderness. I use a Spencer carbine when in pursuit of large game, and as one gun, with accouterments, etc., is quite sufficient for one person to carry, have been compelled to use shot in the rifle, when I desired or was compelled to live on small game. Still, I have never yet been compelled to use loose shot. I put the shot up in stiff paper cartridges, which fit very loosely in the gun, so as not to take the grooves of the rifle, the cartridge being kept from slipping in the barrel by a light wad. Eley's wire shot cartridges will not do. I have used a cartridge of peculiar construction, of stiff pasteboard, calculated to resist the centrifugal force given by the grooves, and which scatters the shot—it is of doubtful utility, and I shall not trouble you by describing it. It must not be understood that I advise the use of shot in a rifle, for I do not, but there are occasions when its use becomes absolutely necessary. The best method of extracting the bullet from the metallic cartridge shell is to place the cartridge upon a block of soft wood, on the surface of which is a "step" or elevation of about the thickness of the cartridge Rest the ball upon the "step," the edge of the "step" being as close to the edge of the cartridge shell as possible. Place over the shell of the cartridge a piece of board—press your foot upon it. The leverage thus obtained will force the ball from the shell in a moment. It is the most simple, easy, and least dangerous mode that I know of. T. R.

Albany, N. Y.

Breakage of an Engine.

MESSRS. EDITORS:—An occurrence took place with my engine, recently, resulting in a rather singular accident. The occasion of the accident is involved in so much mystery that I have concluded to lay the subject before your practical readers and have the cause suggested to my mind fully discussed, and if possible, determined.

We use a horizontal condensing engine of 200 horse-power, having double vertical poppet valves. We are now using about 100 horse power to drive a large new cotton mill in Paterson, N. J., known as the "Arkwright Manufacturing Company." We are running with 40 lbs. of steam having 27 to 28 inches vacuum. On the morning of the 4th of July the mill was started up as usual, everything working well for about an hour, when suddenly there came a general smash. The engineer shut off the steam and upon examining found the following breakages: the crosshead was split completely open through the key slot, and an arm about two feet long on the rocker shaft which drives the air pump, was also broken off near the hub.

I had the cylinder head and air chamber opened, expecting to find some solid substance within, as the cause of the accideat, but there was not a bolt or any other substance inside of either out of place. On further examination, however, I found that the seat of the lower forward poppet valve had broken off and dropped down, thus giving the steam free access to the cylinder. The breaking of the arm that drove the piston in the air chamber could not have caused it, for it was a slight arm not doing much at best, and in breaking simply dropped out of the way. There being no other apparent cause for the splitting of the crosshead the question arises could this have occurred from the sudden admission of steam in a vacuum against the piston, say when at a half stroke with the full momentum of the fly wheel, etc., upon it?

I would mention here that the fracture of the crosshead showed the metal to have been perfectly sound, the piston being fitted in the usual way with a taper and shoulder, but I never considered it a good job, as the shoulder was very slight, and the abrasion showed that the taper was never well fitted, the key having been driven so as to draw the rod into the crosshead one-eighth of an inch over the shoulder, thus forming a powerful circular wedge in the crosshead though the key had not been driven for three months.

The only solution I can give is that the piston met with some violent resistance, the weakest point yielding to the momentum, the piston rod being driven, as it were, through the crosshead.

Query. Has steam, if suddenly admitted into a cylinder when the piston is at its greatest speed, the effect of checking up the motion so quickly as to cause the momentum of the engine to produce the above-described accident?

PRESIDENT OF COMPANY.

Paterson, N. J.

[As no foreign substance was found in the cylinder we can account for this singular breakage under no other hypothesis than that water in the cylinder produced the accident. Undoubtedly the piston did meet with "violent resistance," and that resistance, if not of some foreign body accidentally introduced in the cylinder, was that of water "priming" over from the boiler. We cannot see how steam can be so suddenly admitted to the cylinder of an engine as to cause such a general smash. Water might do it.—EDS.

Middlesex Mechanics' Association.

The third exhibition of this Association will be held in Lowell, Mass., on Tuesday, Sept. 10, 1867. Those who propose to become exhibitors should address Hocum Hosford, the superintendent, stating the space required, the steam power, if necessary, etc., and their articles for exhibition should be delivered by the 2d of September. Those intending to exhibit should address Mr. Hosford, who will furnish all the information needed either by letter or the very explicit circular of the Association.

Improved Converting Motion.

Many attempts have been made to overcome the supposed imperfections of the crank by annihilating its "dead points;" or rather to produce a motion which should more readily convert a reciprocating into a rotary motion or *vice versa*. The inventor of the device shown in the engraving believes he has succeeded in producing a combination free from the objections of others devised for this purpose, and possessing some advantages peculiar to itself.

Its principal parts are a movable or sliding double-toothed rack in combination with a segmental pinion and rotating cam. The rack-frame, A, has secured to it at one end the piston rod of the cylinder, B, and slides in the ways, C. As the piston is sent forward and back of course the rack moves with it. Engaging with the rack, alternately at top and bottom, is the segment of a pinion, D, secured to the main shaft on which is the fly wheel, E. The outline of the pinion is denoted by the dotted lines. Secured to the pinion is a cam, F, which as either end of the frame, A, approaches the center, or the main shaft, comes in contact with the curved pieces, G, at the extremities of the rack-frame.

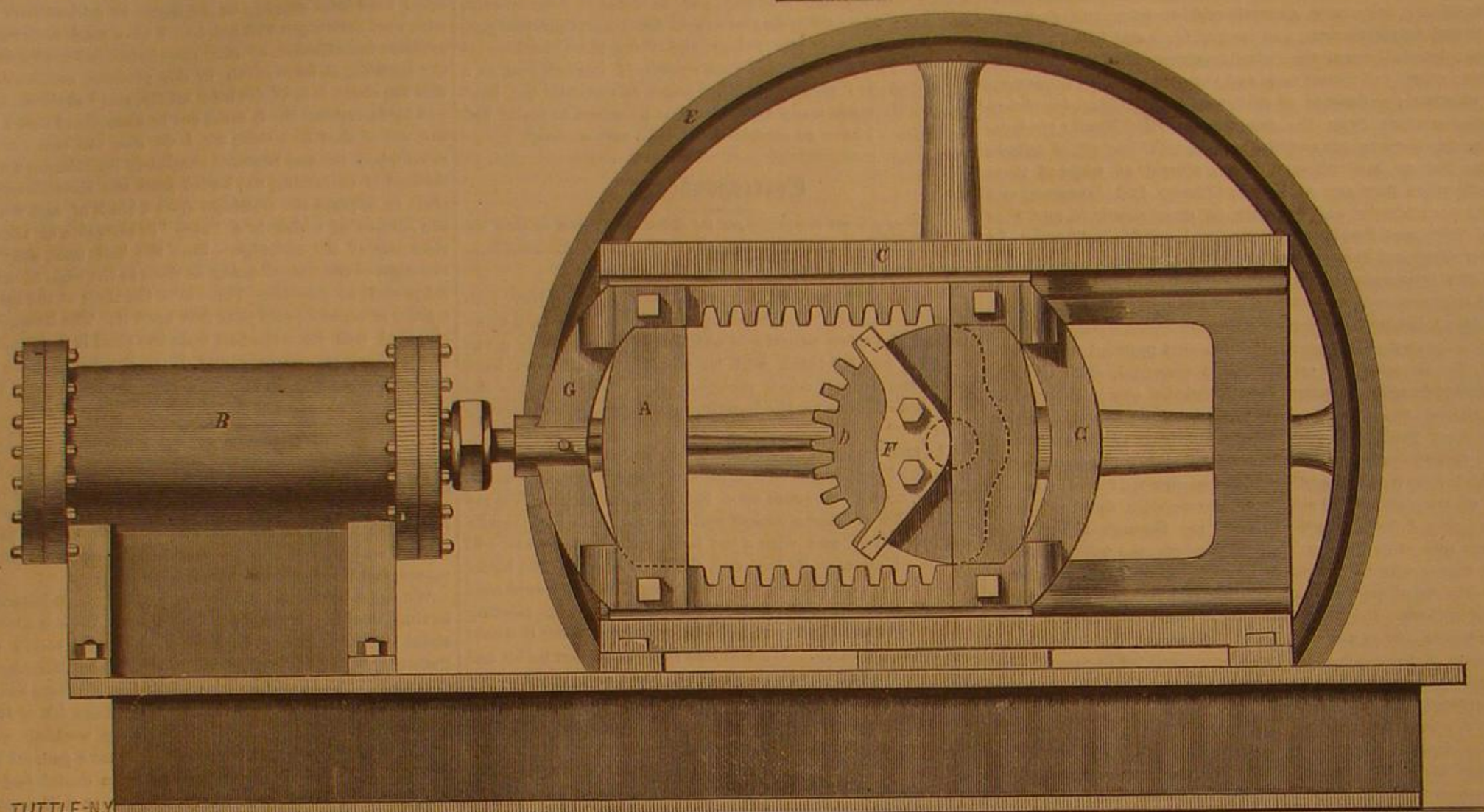
The operation of the engine is readily understood by reference to the foregoing explanation. The cylinder and steam chest is precisely like any ordinary engine, the other parts constituting the main differences. When the piston is moved by the force of steam in either direction, it carries with it the rack-frame, A, and the rack engaging with the segmental pinion, compels the shaft to make half a revolution. Part of this half revolution, however is made by the momentum of the balance wheel, as the pinion is toothed only about two-fifths of its circumference. As the rack reaches the end of the stroke the cam, F, rolls against the curved guides, G, and assists in throwing the rack in the other direction. We have seen a small engine work and found that its operation was very smooth, without jerking. How it will operate on a large engine remains yet to be seen. The object of the invention, and a most important one, is to dispense with the "dead points" of the crank and have a uniform leverage even to the end of the stroke. The inventor claims to have accomplished this end.

There is much disagreement among mechanics in relation tion to the loss of power in the crank. While some insist that this device for converting the reciprocating into the circular motion exerts its full force at only two points in an entire revolution, and that between these two points there is a constantly diminished force, others as strenuously assert that practically there is no actual loss of power. It must be admitted that theoretically the crank has a constantly varying power, and that its equable motion is due to the momentum of the fly wheel.

Mr. Page believes that a uniform leverage—that is a constant exertion of an equal amount of power at all points of the stroke—is better than the variable leverage of the crank, and that he has succeeded in developing a larger amount of power from a cylinder of a certain diameter with his improvement than is possible with the crank. He has experimented for years, and is satisfied he has greatly added to the power of the ordinary engine. For pumping purposes, especially, he claims a gain in actual performance of at least fifty per cent, and has demonstrated the fact to some of our best mechanics. The well known Woodward Steam Pump Manufacturing Company of New York have adopted Mr. Page's plan, and are about to apply it to their pumps. The President of the company in a note now before us says—"Thinking favorably of your patent engine, we have concluded to proceed as quickly as possible to apply the engine to our pumps."

We think the matter of sufficient interest to engage the attention of our engineers and mechanics, and suggest that they give the machine an examination. It is running near Mr. Page's office, No. 69 West street.

Patented in the United States, August 14, 1866. Applications pending for patents in England, France, and Belgium, through this office. For further information address John B. Page, 69 West street, New York City.



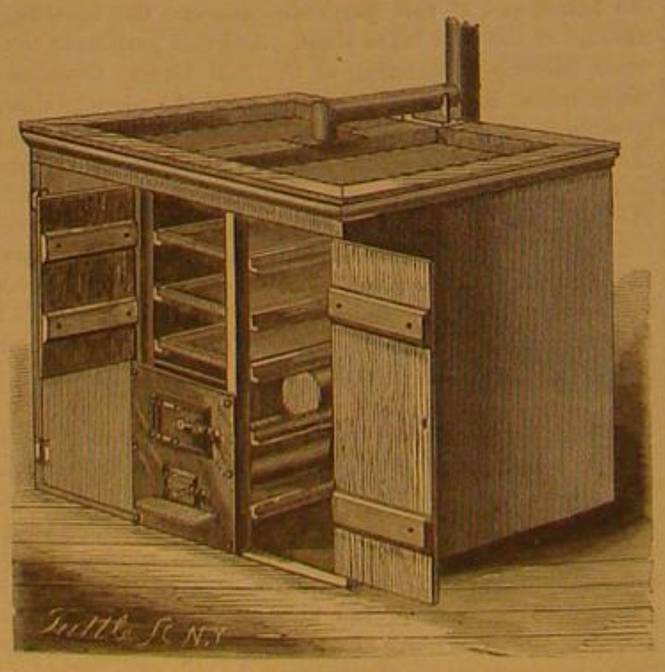
PAGE'S MOVEMENT FOR CONVERTING A RECIPROCATORY TO A ROTARY MOTION.

Rapidity of Thought in Dreaming.

A scientific writer says that a very remarkable circumstance and an important point of analogy, is to be found in the extreme rapidity with which the mental operations are performed, or rather with which the material changes on which the ideas depend, are excited in the brain. It would appear as if a whole series of acts that would really occupy a long lapse of time, pass ideally through the mind in one instant. We have in dreams no true perception of the lapse of time—a strange property of mind—for if such be also its property when entered into the eternal disembodied state, time will appear to us eternity.

LEAVITT'S FRUIT DRYER.

The consumption of fruits in a dried, dessicated, or preserved state has become an important element in our economics. Improvements in the preservation of fruits and vegetables from season to season have made the business one of considerable importance and compelled the general use of fruits beyond their proper season. Dried fruits, not being subject to decay so readily as those which are preserved in sirups or in hermetically sealed cans, have become a favorite article of commerce and use, and any means which will save part of the time and labor necessary to prepare them for the market and thus reduce their cost is a public benefit. Such is the object of the apparatus shown in the engraving.



It is a cupboard-shaped box, having in its lower part a furnace in which a fire is kindled, the smoke of which passes off to the chimney by a proper flue. On each side and over this furnace are shelves either of pans or slats, removable, on which the fruit to be dried is spread. Around the top are flues, the side flues being open on their lower sides and communicating throughout their whole length with the interior of the case. The end flues are closed except at their ends, where they communicate with the side flues and with a central flue at their middle. By this arrangement of the flues it will be evident that the remote upper corner of the dryer will be heated equally with the more central parts, as the excess of heat will be drawn thereto by the natural draft through the end flues which open into the dryer at those points and which are the only outlets. Thus, the excess of heat and the exhalations from the drying fruits escape through common outlets to the outside. Also, by thus causing the redundant heat and vapors to pass off around and over the top of the dryer, they add to the heating and drying capacity of the apparatus.

This device was patented May 14, 1867, by Charles Leavitt, Cleaveland, Ohio, who may be addressed for further facts in relation to the invention.

Self-Detaching Car Coupling.

A trial of a new car coupling was made at Elizabethport, N. J., July 10th, on the New Jersey Central Railroad. The correspondent of the *Journal of Commerce* reports:—The coupling pins are hinged to supporting rods, which are free to slide back and forth in suitable guides, and are held in position by springs. The coupling pins are provided with shoulders that catch underlips or stops in such a manner that the cars cannot become uncoupled as long as all the cars remain on the track, but will uncouple on a car that is so far off the track that it cannot be jumped back into its place again by the headway of the rest of the train. The committee stood near the track, on which an obstruction had been placed to strike the third car in the train of an engine and six cars. The train passed at the rate of twenty miles an hour; the third car was displaced by the obstruction, but jumped back again on the track, the coupling remaining firm in its place. The obstruction was then increased and the train approached at nearly thirty miles an hour. The third car met the obstruction, and was thrown out of the track too far to be jumped back, the front and rear coupling detached, the car rushed down the embankment, while the engine with the two leading cars, and the two cars that had been coupled behind the third, traveled safely along the track with hardly a perceptible decrease in their rate of speed. Several similar tests were made, resulting with the same unqualified success.

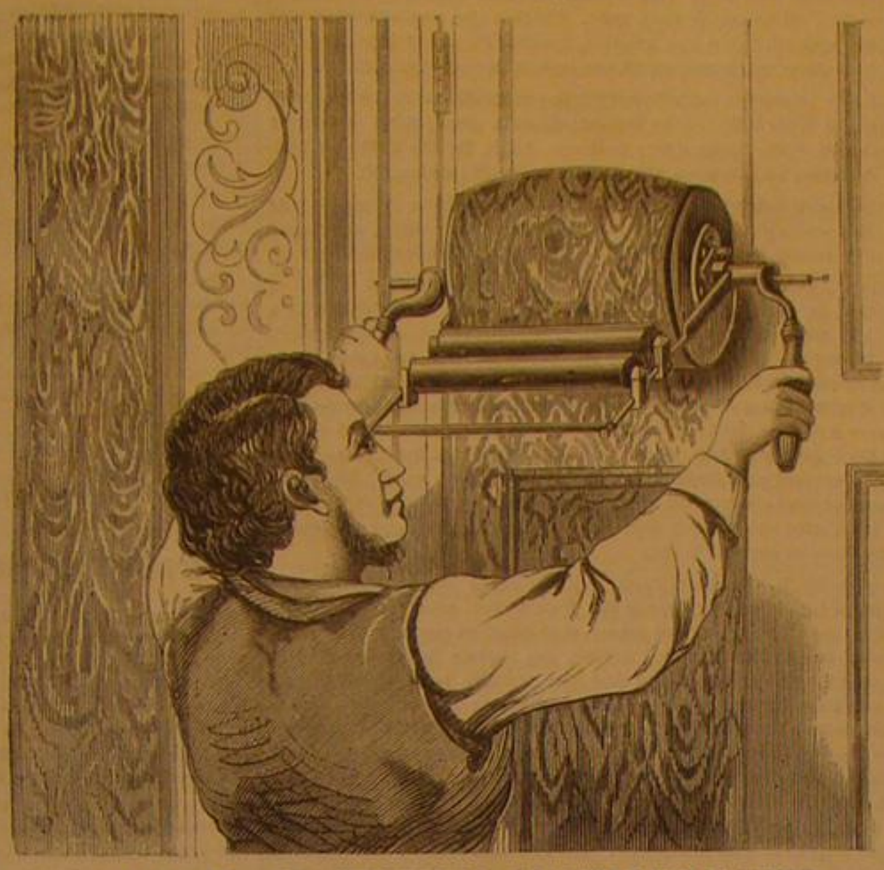
A Historic Gun.

In a private letter received at the Bureau of Ordnance dated Paris, June 14, 1867, appears the following scrap of information respecting a gun with a singular history:

One of the first items of interest that I found here was the old 3-inch bronze gun that we fired at the Washington Navy Yard in 1856 or 1857. The same gun was fired at the Washington Arsenal by Major Bell in 1855, and the same year it went to England and was fired at Shoeburyness by the Ordnance Select Committee. After that it went back to America, and in 1858 it was sold to the Mexican Liberal Government. It is now placed at the entrance to General LeBruff's office (Commander-in-Chief of Artillery), as captured by the French at Puebla, Mexico, by Maximilian, and presented by the Empress to the French government. It has our name engraved upon it. I thought this item might interest you as it was in this gun the first firing was made with our projectiles before government.

Improved Air Cylinder Graining Machine.

While every other trade has had the benefit of the inventor's skill, the painter has been left to plod along after the manner of his father of the last century, doing his work in the slowest and most expensive method. In the graining machine we have, however, something that while it will lessen the cost of work to the consumer, will facilitate the task of the workman and render the work more satisfactory to both. Finishing interiors in imitation of woods, grained in oil colors, is in good taste and in harmony with all the prevailing styles of building. It would also be more economical than any other style of finish, were it not for the tediousness and difficulty of getting even a tolerable resemblance by the present method of hand graining. To meet these wants, the Air Cylinder Graining Machine has been invented and after many years of extensive experiment has been successfully adapted to all the grainer's uses. The machine is simple in its operation, rapid in execution, and true to nature. It reverses the common mode of graining, which is to spread the color all over the work and then to rub out the lights, a plan which requires not only a skilled hand and a practiced eye to determine the pattern, but also a deal of labor to wipe it out clean, upon which latter the excellence of the work depends. The machine patterns are obtained directly from the fiber of the wood, so arranged that they take up the color, transfer it to the work and produce the dark shading of the wood, leaving the lights perfectly clean. The machine is constructed of a vulcanized rubber cylinder, in combination with an elastic belt in which the figure of wood is cast. It is supplied with a feeding apparatus, and is so arranged that different bands representing various woods may be employed at pleasure. The cylinder can also be regulated to different widths of panels.



ADAMS' AIR CYLINDER GRAINING MACHINE.

The ordinary graining colors are used. The machine will prove most useful and economical in many branches of manufacture. Owing to the elasticity of the air cylinder, convex, and even concave surfaces, when the depression is not too sharp, may be grained with as much facility as a flat surface. In many businesses where veneering is used solely for ornament and not for strength, the necessity for that tedious operation will disappear entirely, for as handsome exteriors can be produced by this machine on soft native woods as are now obtained by the costly process of overlaying with expensive imported woods.

Indeed there is hardly a practical limit to the use of the machine, for its advantages are many and obvious. First, it does many times more work than can be done by hand. Second, it does not require skilled labor. Third, it produces work true to nature and uniformly true.

The machine is manufactured by Heath, Smith & Co., 282 Pearl street, New York, under the superintendence of the patentee, Mr. Adams. Messrs. H. S. & Co. will be happy to show parties interested samples of work done with the machine at their office.

The Decline of British Skill.

The Philadelphia *Ledger* says that, under this heading, the London *Review* contains an article, the drift of which is not consolatory to British interests nor flattering to British vanity. Timely warning of shortcomings may, however, incite to proper efforts at amendment and arrest incipient decline. When, says the writer, we set the example in 1851, of those international competitions for the palm of excellence in works of art and industry, of which we have now an example in Paris, the last thing we should have feared was that the day would come when England would be beaten in a department which she had deemed especially her own. The superiority of her manufactures over those of all other nations was taken for granted as a thing that could not be be disputed. But too great confidence has relaxed efforts at home, while all other nations have been pressing ownward in the race with an energy not shown by England. Earl Grenville, at a distribution of prizes at the London University, quoted the president of the Civil Engineers in proof of the superior progress in machinery which has been made by foreigners. "He declared, on good authority, that greater improvements have been made in the manufacture of iron in France, Belgium, Germany, and Austria, than in England, and he assumed, upon general report, the fact that, except in the manufacture of furniture, glass, and china, we have made little advance in most departments of industry."

These statements find confirmation in the observation and inquiries of Dr. Lyon Playfair, who had just returned from Paris, where he had been acting as juror in one of the classes of the exhibition. There were many eminent men, of different nationalities, serving in a similar capacity, whose acquaintance he had made at the previous exhibitions of 1852 and 1862, whose opinions he tried to elicit on the present subject. With very few exceptions, he adds, there was a singular coincidence of opinion among these persons, that England had shown little inventiveness and made but little progress in the peaceful arts of industry since 1862. Mechanical and civil engineers lamented the want of progress in their own industries. Chemical and even textile manufacturers uttered the same complaint. Deserved stress is laid on the fact, and it is one which ought to serve as a lesson for our imitation in the United States, viz: that France, Prussia, Austria, Belgium, and Switzerland possess good systems of industrial education for the masters and managers of factories and workshops, while England possesses none. It was stated to Dr. Playfair that technical education had given a great impulse to the industry of France. In this very exhibition, it was found on inquiry, that whenever anything excellent in French manufacture attracted attention, in the great majority of cases, the manager of the establishment producing it had been a pupil of the Central School of Arts and Manufactures.

On the other hand, it is alleged that England has been imperfectly represented in the Paris Exhibition. Who invented puddling? ask the champions of British inventiveness. Who invented grooved rolls? who first succeeded in substituting coal for charcoal? who suggested the live blast? who invented the process of casting steel? have not mills been constructed in England which turn out sound armor plates of such enormous dimensions as even in 1860 would have been considered impossible? While admitting all this, the fact of the ascertained inferiority of British manufactures which have been exhibited, is still evident.

LOWE'S SPIRAL SPRING PACKING.

To utilize all the steam admitted to the cylinder of the engine and to equalize the wear of the piston, and diminish, or at least, distribute the friction, are the objects sought by a number of different devices for the improvement of piston packing. That represented in the accompaning engravings has the merit of novelty and differs in one important respect from any other which has come under our observation.

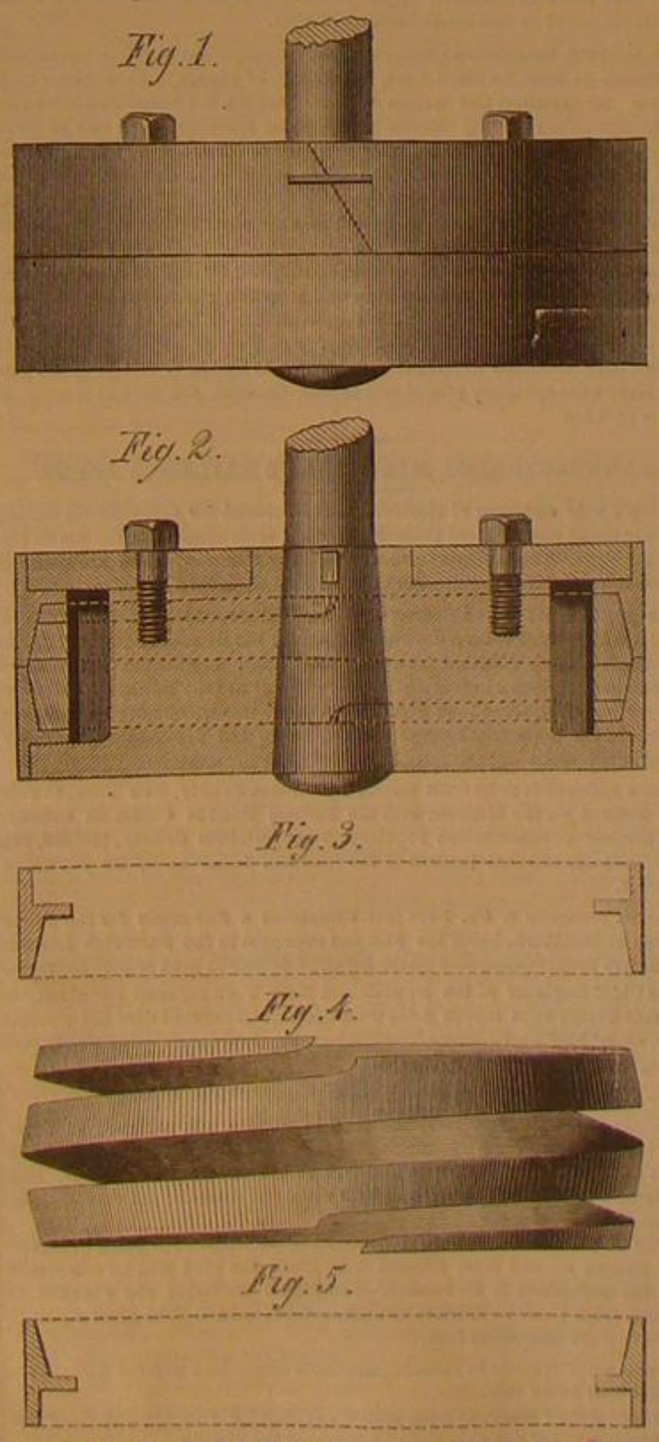


Fig. 1 is an outside view of the piston showing the two rings, which cover the edge surfaces of the piston head and follower. Fig. 2 is a sectional view of the piston, the dotted lines showing the spiral spring compressed between head, follower, and rings. Figs. 3 and 5 are sections of the two rings, having inward projecting flanges, surfaced to the inside of the head and follower, and overlapping their edges, Fig. 4 is the spiral spring expanded laterally and vertically. This spring, it will be seen, is beveled on its face from the center to both edges, so that it may be readily introduced into its place. It bears on the flanges of the rings, keeping them in close contact with the head and follower, and its diameter is enlarged by the compression of the head and follower, so that it bears outwardly against the rings all around, keeping them out against the inner surface of the cylinder.

The inventor claims for this piston a greater contact surface, the whole thickness of the piston having an equal bearing, while a narrow packing tends to wear the cylinder unevenly; greater ease of taking apart, and more regular and efficient automatic action of the spring. It is evident that the extension of the rings over the edges of the head and follower is an advantage.

This device was patented Dec. 11, 1866, by Barker Lowe, Fall River, Mass., by whom all communications relative thereto will receive prompt attention.

SMITH'S IMPROVED EXTENSION LADDER.

This useful ladder will commend itself at a glance. The engravings show it in two positions, one closed and one extended. It can be used in all situations where the ordinary step ladder is used, and thus the advantage of being easily adapted either to slight elevations or to a greater hight, while it may be folded together as compactly as any now in use.



It is a double ladder, both the step bars and uprights, and each of these parts are attached to their mates by straps through which one slides, both being held securely by pins passing through one into the other, holes being made at convenient distances for this purpose. It may be either a low ladder of three steps or a high one of six, or of any degree of elevation between the two extremes. The cross bars between the upright and the steps may be adjusted instantly, to give greater or less spread to the base. For libraries, for papering or painting rooms, hanging pictures, picking fruit, and many other purposes this contrivance will be found to answer all the uses of several ordinary step ladders, and will occupy no more space when not in use than one of half its capabilities.



It was patented through the Scientific American Patent Agency June 25, 1867, by Henry T. Smith. For further particulars address Smith & Schenk 183 Fulton street, Brooklyn, N. Y.

THE ACCELERATING GUN.

On our first page are engravings illustrating the description, by the inventor, of Lyman's Accelerating Cannon, which seems to promise considerable changes in the form and operation of rifled guns. From this account it will be seen that its performances are much superior to the ordinary rifle, while the destructive strain upon the barrel is much less. It has been thoroughly tested and has received the unqualified commendations of many of our best ordnance officers, the principal objection urged being that its use would render all present means of defense by armor almost valueless. However this may be, it would seem that its powers must greatly exceed those of the single charge piece.

We hope our government will extend facilities to Mr. Lyman for the further testing of the practicability of the invention.

Elastic Car Wheels.

Grigg's method of introducing wedges of wood between the rim and tire of locomotive driving wheels has been adapted by him to the wheels of passenger cars. The rims of the wheels have dovetailed recesses cast in them, the tires are then slipped on, and blocks of seasoned hard wood are driven into the recesses, firmly holding the tire and releasing its bearing from the iron. On locomotive driving wheels it prevents the stretching of the tires and the necessity of frequent "shimming" up, and is said to be much easier on the permanent way and the rolling stock than the ordinary method. This application of the improvement has been thoroughly tested with satisfactory results, and is believed to be equally beneficial when applied to car wheels.

A SILVER MEDAL was awarded at the Paris Exposition to J. R. Brown & Sharpe, of Providence, R. I. for a Revolving Head Screw Machine and a Universal Milling Machine, and another to Darling, Brown & Sharpe of the same place for Measures, Gages, etc.

Editorial Summary.

A MINIATURE VOLCANO.—Prof. Chontard, filling the chair of Natural Philosophy at Nancy, France, has devised the following experiment, showing the power of Ruhmkorff's induction coil. A quantity of the flowers of sulphur is mixed with a small proportion of iron filings, or, better still, with iron reduced by hydrogen, in which case it is in quite an impalpable state; zinc and copper filings may also be added in small quantities. The mixture, made as complete as possible, is placed on a pane of glass or a dry brick, so as to form a heap two or three centimeters high, and much longer than broad. The ends of the wires of a Ruhmkorff apparatus are inserted into the heap, so as to be two or three centimeters distant from each other. When ready, a current of electricity is sent through the coil, and instantly a violent explosion takes place. A sort of crater is formed, whence magnificent sheaves of fire are seen to issue, displaying colors like a boquet of fireworks. It is in reality a volcano on a very small scale, having its subterranean noises, as it were, and ejecting boiling lava.

BISMUTH.—A discovery has recently been made in South Australia of a lode of bismuth, and samples of the metal are now to be seen at the Melbourne Exchange, to which place they have been sent from the neighboring colony. This metal is very valuable if found in quantity, and it is stated that the lode discovered contains abundance of rich stuff, but being situated about 200 miles in the interior, some serious difficulties in the cost of carriage have been encountered. Trouble was also experienced in getting the metal smelted, but a quantity of it was sent to England in ingots some time ago, and it is expected the supply will be kept up.

THE City of Valparaiso is to be supplied with water through a canal to be cut from the Aconcagua River, flowing from the Andes Mountains. This canal, a portion of which has already been completed, is at the same time calculated to yield a revenue for supplying irrigation water to the lands throughout its course. With a view to effect these objects, a "Valparaiso Waterworks Company" is now being started in London, with a capital of $200,000, in shares of $20.

WALNUT SUGAR.—An Ohio editor has received a cake of sugar made from the sap of the black walnut tree. He pronounced it superior to maple sugar.

MUSTY GRAIN.—The musty smell which grain harvested in hot weather acquires, has been removed by Chalambel, by exposing it in the granaries to the influence of quicklime (which, however, should not be allowed to come in contact with it,) in the proportion of one part of lime to fifty of grain.

MILK QUOTATIONS.—At Berlin a milk market, with official quotations, has been established.

BENNINGTON, VT., boasts the possession of an artificial fountain which throws an inch jet to the hight of 154 feet. The celebrated fountain at Chatsworth, Eng., throws a jet ninety feet high.

ACTION OF CARBONIC ACID.—While workmen were engaged in re-opening and repairing the coal mines of Bow Buveur, at Jemeppe, they came upon a gallery communicating with the lower ladders, where they discovered seven bodies of the unfortunate workmen who, three months before, were imprisoned while making their way to the surface. The bodies were completely mummified, the shrivelled flesh adhering to the bones. This phenomenon is attributed to the abundant exhalations of carbonic acid gas collected in the gallery.

THE METRICAL SYSTEM.—The faculty of Yale College have decided on making a full knowledge of the metrical system one of the conditions for entering either its Academical or Scientific departments.

THE "UNLUCKY FRIDAY."—A very singular consequence of superstition is recorded in a recent Paris paper. It appears that the Paris Omnibus Company find their receipts sensibly diminished on Fridays, owing to the popular superstition of its being an unlucky day for traveling. The average difference between the numbers carried on other days and those on Fridays is no less than twenty-five thousand in favor of the lucky days.

AN AQUARIUM is about to be constructed at Berlin on the most extensive scale. Not less than $64,000 was subscribed during the first week after the idea was started. Dr. Alfred Brehm, a naturalist of note, has been placed at the head of the undertaking and is actively engaged in corresponding with every quarter of the globe for the acquisition of rare inhabitants for the new aquatic temple.

ASTRONOMICAL CLOCK.—A Methodist minister, of West Virginia, invented a clock attachment which calculates with scientific precision the rising and setting of the sun and moon, shows the changes of the moon, all eclipses, and other astronomical information relating to celestial phenomena. The calculations are made for one hundred years to come. The inventor has given to to his contrivance the above-mentioned name.

WATER SUPPLY.—New York is more wasteful of water than any other city in the world. In London, the quantity used is twenty gallons a day to each inhabitant, in Paris forty gallons, and in this City sixty.

LONDON REAL ESTATE.—As showing the wonderful increase in value of property in London, within three hundred years, it is stated that a plot of land containing about forty thousand feet, purchased in the year 1566, for 8s. 6d. per foot, is now valued at £20 per foot, or £800,000 for the whole, being an increase of £2,657 per year on an original outlay of £3,000.

HYDROPHOBIA.—A Detroit paper tells of an unfortunate resident of Pontiac, Mich., who, sixteen years ago, was bitten by a mad dog, and on a certain day each succeeding year, has been regularly seized with attacks of hydrophobia lasting but a short time. His last attack was on the 26th ult.

A MODEL Aerial Machine has been exhibited in France, which, by purely mechanical force, carries a mouse through the air. A sanguine and patriotic critic declares that France has solved the difficulty of aerial navigation, and that a machine proportionately large will raise an elephant much more easily than the model bears its tiny traveler.

SUGAR IN THE MUSCLES.—Dr. Ranke, of Munich, has by recent experiments confirmed the discovery made by Meissner, that a true, fermentable sugar exists in the muscle, which is increased by muscular action (tetanisation caused by strychnine or electricity), and further, that the liver has no effect in causing this increase, for the sugar is proved to arise in the muscle itself and not from muscular substance.

A VERY remunerative business has lately grown to pretty extensive protensive proportions in Melbourne in the exportation of leeches. The trade is principally carried on in connection with the operations of the Murray River Fishing Company, the fishermen there employed turning their attention at seasons unfavorable to the fishery to the collection of leeches. From 150,000 to 200,000 leeches are sometimes collected in one of the trips of the company's steamers. They are then packed and conveyed to Melbourne, where a large proportion of them are put up for transmission abroad, great numbers being sent to London and Paris, where it is stated they are preferred to leeches brought from any other place.

Exposition Notes.

THE immense spherical balloon nearly 70 feet in diameter, which makes hourly trips to the upper regions, is filled with hydrogen gas, made by decomposing steam by means of red-hot charcoal. By this process it is said the gas can be furnished at $2 75 per 1,000 cubic feet.

THE English exhibit one of their 12-inch guns, a muzzle loader, weighing 23 tuns, rifled with nine bands 2½ inches wide, and nine grooves 1½ inches wide, one-fifth of an inch deep, with increasing twist ending in one turn in thirty-seven feet. It has never been fired. There is also one of their 9-inch 12½-tun guns, with six bands and grooves, grooves 1½ inches wide, and one-fifth of an inch deep, increasing twist, one turn in twenty-four feet.

IN the number of articles contributed France naturally takes the lead with 11,645; England with 3,609, ranks second; Austria stands third with 3,072, Prussia exhibits 2,206; Spain, 2,071; Belgium, 1,447; Russia, 1,392; Switzerland, 966; America, 778; Sweden, 602; Netherlands, 504; China, 109.

AMONG the jewels exhibited is a very handsome beetle with diamond eyes and enamelled wings glittering with precious gems. On touching a spring he raises his wing sheath and discloses a watch possibly half an inch in diameter.

AN Austrian Engineer, Mr. Thomas Holt, exhibits drawings and models of a steam boiler, in which the tubes of ordinary boilers are replaced by a series of disks formed of plates, riveted or welded at the ends, through which the heated gases pass in the same manner as through the tubes. It is stated that by this means an immense increase of heating surface is obtained as compared with boilers of equal size constructed on the ordinary system directly over and near the fire; for example, a stationary boiler, 20 feet in length, on the ordinary system, would have 470 square feet heating surface; while one constructed with disks on Mr. Holt's plan would have 5,000 square feet. A more perfect combustion of the fuel and gases is obtained in this manner, evaporating about 40 per cent more water with the same amount of fuel than by those at present in use.

IN an annexe, Mr. F. Girard, of Paris, exhibits some improvements in the manufacture of tin plates. Ordinarily the iron plates, after being pickled and annealed, are dipped in melted grease, then plunged into a bath of melted tin which is covered with melted grease, the surface being imperfectly covered with tin. The plates are plunged into another bath of melted tin and left a sufficient time to make the alloy complete; they are then wiped on both sides with a hempen brush, and to remove the marks of the brush and to give a polish to the surface they are dipped again in a bath of melted tin, and finally dipped in a grease pot at a high temperature to remove any superfluous tin. By Mr. Girard's apparatus a uniform surface of tin is obtained by one dipping only, and the baths of melted grease and process of brushing are dispensed with altogether. The machine consists of a cast-iron bath divided into two compartments containing the melted metal, the temperature on one side being lower than that of the other, and in this compartment is placed a pair of revolving turned cast-iron rollers, 8 inches in diameter, and between these run the iron plates, coming out coated with tin at the rate of from 10 to 20 feet per minute. A little resin is thrown on the rollers as a flux.

IN the Wurtemberg Annexe is exhibited a machine for the manufacture of wood pulp for paper making. A clean white pulp suitable for paper making is produced at above half the cost of rags on this machine, and it is said that owing to the increased use of wood pulp, a rise in the price of rags has not taken place. In Germany there is hardly a newspaper printed, the paper of which does not contain more or less of wood pulp. Papers for printing purposes contain from 50 to 80 per cent of wood pulp; writing paper from 30 to 50 per cent; and some cardboard is exhibited made entirely from wood pulp. For printing purposes, paper containing a certain per cent of wood pulp is preferred to that made entirely of rags.

A NEAT little locomotive carriage by M. Larmanjet has been running about the Champ de Mars for some time, attracting, of course, a good deal of attention. Its cylinders and motion gear are beneath the boiler and boxed in. On the axle of the driving wheels are a pair of loose wheels of two or three inches smaller diameter, apparently intended to catch up the engine in case of its getting into soft ground, and there seems to be an arrangement for moving these wheels by powerful gearing if required. The engine is constantly in motion, runs at a good speed, and seems to be under very perfect control.

IN a magnificent display of timber exhibited by the Direction of the Austrian Imperial Forests there is an oak measuring 70 feet in length, 4 feet diameter at the base, and containing upward of 500 feet of timber, and a pine 3½ feet diameter and 150 feet long. For facility of transit it has, of course, been necessary to cut these trees into 14 feet or 15 feet lengths, but they have been carefully placed end to end, showing the tree as it grew, or rather as it fell.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

Sharp's rifle company of Hartford, manufactured for Government during the war about one-hundred thousand stand of arms adapted to the use of linen cartridges. The company are now making a new arm and are altering former manufactures so as to use their new metallic cartridges.

The petition before the Connecticut Legislature, of the Boston and New York Air line railroad for a draw-bridge across the Connecticut river at Middletown, has been defeated by a small majority. Permission was granted the company to throw across a suspension bridge at that point, but the carefully estimated expense is so great, that the project will be dropped for the present in the hope that next year's legislature will prove more accommodating.

A new railroad is to be built through Dutchess County, New York, to connect Fishkill on the Hudson, with the Harlem Road in Columbia County. The amount of subscription required from Dutchess County, $500,000, has been made up, and that portion of the road will immediately be put under contract.

Messrs. Simmons & Co. have just completed a fine organ for the Stone Church at Honolulu, being the first one ever sent to the Sandwich Islands. The native congregation sent fifteen hundred dollars in gold as part payment.

The Chief Engineer of the Newark and New York railroad has given notice that during next month a draw-bridge will be erected over the Passaic river, about half a mile above Newark bay, the two draws being ninety feet in length.

The Potosi mines in Missouri ship 10,000 pounds of lead weekly.

A letter envelope manufacturing firm in Buffalo, has received an order from the Western Union Telegraph Company for 3,000,000 envelopes, which is about three fifths of the amount required by the Company every year. The Merchant's Union Express Company are using envelopes at the rate of 6,000,000 annually.

Work on the western end of the Central Pacific Railroad is being energetically pushed on, and from present indications the road will be completed over the mountains in November. Over 16,000 workmen are engaged in grading, from Cisco to Trurpee summit, and the tunnel. The gross earnings for June were $123,000 in coin.

Carpets are now made in Philadelphia, from hemp and printed like calico, one side only being available.

The New Jersey Railroad have made provision for transporting 31,000 baskets of peaches per day over their road during the season.

The Marmora Iron mines in Canada, forty miles from Lake Ontario have been purchased by Philadelphia capitalists. The purchase covers 23,000 acres, also the Coburg and Peterboro railway. Ore from this mine has yielded from sixty to seventy per cent of fine iron.

A firm in Providence R. I., are making an article of stiffened or filled gold watch cases, the center material being a nickel composition. Such a case is strong, not liable to indentation, and quite elastic.

The U. S. Bunting Co., of Lowell, are making bunting which excels the English in texture and color, and we need depend no longer on foreign manufacturers for the materials for the Star Spangled Banner.

The Essex Glue manufactory of South Danvers consume about 1,000,000 lbs. of hide cuttings, in the annual production of half a million pounds of glue, which is principally used throughout this and to some extent in foreign countries, in sizing woolen goods, paper etc.

The "Sampson scale company" has been organized in New York, with a capital of $1,000,000. The scale was invented by Elnathan Sampson, and is said to be equally sensitive to the weight of two ounces and four tuns.

Hides of tanned leather which have been buried during the war, are now being brought to light, and sent northward, for "reconstruction."

The June business of the Erie Railroad showed a loss of $100,000—due to the high price of corn and the low rate of freight.

This company gives employment to 8,000 men and with their families makes a support to some 40,000 persons. Last year its payment to employees was a half million dollars per month.

The citizens of Terre Haute, Indiana have offered the use of $40,000 for a number of years as an inducement for a new firm to locate a proposed rolling mill and nail factory, in that place.

The old-fashioned stage coaches have been again resorted to by travelers in some parts of England, owing to the high fares and unaccommodating policy of the railroads.

The Germania Sugar Company of Chatsworth, Ill., have 600 acres of beets growing.

The Hartford and New Haven Railroad has just been compelled by the Connecticut Courts to pay to Benjamin Bright $3,700 for the destruction of his barn at Thompsonville, some three years ago, by a spark from one of their engines. Heretofore this Company has always settled such claims by gift, not admitting a legal obligation, but from a sense of justice. This is the first case of the kind ever tried in Connecticut, and establishes an important precedent.

A company with $520,000 capital paid up, has been formed in Richmond, Va. for the purpose of purchasing land in that State for the erection of manufactories, and developing its mineral resources.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

APPARATUS FOR DRIVING PILES, PRESSING HAY, ETC.—Stephen Mahuin, Liberty, Ill.—This invention relates to an arrangement whereby a heavy weight may be raised with comparatively little power, to any desired hight, and then detached and allowed to descend by the force of gravity; and the improvement consists in the use of a revolving drum having a continuous groove on its periphery, journaled on an arm of the operating lever, which has its bearing in the stationary standard or drum, to which is attached one end of the rope or chain whose other end is attached to the weight and which passes over two pulleys on the top of the derrick or frame.

ADJUSTABLE SULKY PLOW AND TOBACCO HILL ATTACHMENT.—James L. Spencer, Wellville, Va.—The main features of this invention are the making of the axle adjustable in length; the method employed in lifting the plows over obstructions, whereby any one plow may be lifted independently of the others, or all may be lifted together; and the attachment for tobacco hilling.

MACHINE FOR BREAKING AND CLEANING HEMP, FLAX, ETC.—Henry Zellner, Columbia, Tenn.—In this invention the endless apron is independent of the feed rollers, and revolves with a much greater speed. A beater is so arranged and operated that its slats strike between the slats of the endless apron and thoroughly reduce the hemp or flax.

NUTMEG GRATER.—Richard H. Chinn, Washington, D. C.—The object of the invention is to enable the operator to use up the entire nutmeg without bringing his fingers into contact with the rough face of the grea[illegible]ter and thereby wounding them.

COMBINED CLOVER THRASHER, HULLER, AND CLEANER.—Isa[illegible]c N. Young, Swann, Ind.—The object of this invention is to construct a ma[illegible]chine which shall thrash clover seed from the hay, separate the chaff from t[illegible]e seed, hull the seed, and clean the same, by the most simple, durable, and e[illegible]ffective machinery possible.

COMBINED LAND ROLLER AND SEED SOWER.—Henry Zellner [illegible], Columbia, Tenn.—The object of this invention is the construction of a simp[illegible]er, cheaper, and more effective arrangement of land roller and seed sower t[illegible]an any hitherto in use.

WASHING MACHINE.—Daniel Duncan and E. R. Ridgeley, Olne[illegible], Ill.—The concave which is partially submerged in the water of the suds box [illegible] has a corrugated surface and holes through it; it is supported upon spring[illegible] bearings, in such a manner that the vertical depression forces water in jets [illegible] upon the clothes, while the traveling roller above presses upon them.

PRUNING SHEARS.—Samuel W. Jones, Bluffton, Ind.—In this inven[illegible]tion the shears, fixed on the end of a staff, are operated by two levers conn[illegible]ected by rods with each other and with the movable blade of the shears.

CUTTING AND GUMMING APPARATUS OF ENVELOPE MACHINES.—E. [illegible]. Olmstead, Washington, D. C.—This invention is designed to effect the cutti[illegible]ng and gumming of single sheets of paper for envelopes in an envelope machi[illegible]ne, by a single instrument which performs both operations at the same stroke.

PACKING APPARATUS FOR ENVELOPE MACHINES.—E. B. Olmstead, W[illegible]ashington, D. C.—This improved apparatus receives the envelopes from the [illegible]carrier, folds the lappet, places the envelopes in packages of any desired n[illegible]umber, fastens a band around such packages, and delivers them into a box.

FOLDING AND PRINTING BED OF ENVELOPE MACHINES.—E. B. Olmst[illegible]ead, Washington, D. C.—This invention consists in adjusting the bed upon wh[illegible]ich the envelope is folded upon springs which permit it to be depressed till t[illegible]he envelope comes in contact with the printing form, and also in regulating t[illegible]he motion of the bed for the economical cutting of the paper and the proper d[illegible]elivery of the envelopes to a carrier.

COMBINED CORN PLANTER, CORN HILLER, AND CULTIVATOR.—S. J. Taylo[illegible], Rome, N. Y.—The object of this invention is the combination of a corn plan[illegible]er, corn hiller, and cultivator in one machine, so that it may easily be ad[illegible]justed for work in either capacity, and at the same time be neat, light, an[illegible] convenient to handle.

SAFETY BRIDLE.—D. M. Donehoo, Beaver, Pa. Patented July 2, 1867.—The driving reins are made hollow and carry a safety rein which is connected to rings on the gag rein just in the rear of the gag runners. Force applied to the safety rein shortens up the gag rein and draws the bit ring toward the ring on the check strap by drawing the forward ends of the rear portion through rings in the rear end of the forward portion, and giving an increased power on the bit as the rear portion of the rein is doubled on itself and each forward portion is carried around the bit ring and check ring before being attached to the bit ring.

DETERGENT MATERIAL.—J. Mitchell and W. C. Laird.—The application and use as a detergent material of the ley obtained by boiling rags, esparto, grass, straw, or other similar materials employed in manufacture of paper pulp, whether such ley be used in the state it comes from the boilers, or be concentrated either by itself or compounded with the hereinbefore mentioned materials, substantially as described. Second, the application and use to and in the cleansing of wool and other fibrous substances, and for other purposes where coarse soap has hitherto been employed of the peculiar detergent material described.

PRESERVING ANIMAL AND VEGETABLE SUBSTANCES.—N. S. Shaler, dated November 26, 1866.—For these purposes animal and vegetable substances to be preserved are introduced into and retained in a chamber or enclosed space pervaded by an atmosphere of carbonic acid gas, such atmosphere being constantly maintained at a temperature as near as may be at the freezing point, though where the substances are not intended to be kept for a great length of time somewhat higher temperatures may be used.

CONSTRUCTION AND ARRANGEMENT OF CHRONOMETERS, BAROMETERS, AND THERMOMETERS.—W. Weichert, Cardiff.—This invention relates to certain improvements in the construction and arrangement of chronometers, barometers, and thermometers, and consists, first, in causing the indication of marks of tenths of seconds, and in the beating of half seconds, and seconds: and second, in the combination with chronometers of a barometer and thermometer, forming one instrument. The face of the chronometer is furnished with an outer circular indicator beyond the periphery of the ordinary "seconds divisions;" this outer series is divided into six hundred parts, giving ten divisions to each second. The wheel work is also increased by extra pinions gearing into each other, in order to mark tenths, and beat half seconds and seconds. In the face of the chronometer below the center a space is cut in which a barometer dial is inserted, having the requisite indicators, and actuated by mercury as is well understood. The divisions on the scale may be made to any degree required, and the face of the barometer also contains a small thermometer divided into the scales of Reaumer Centigrade, and Fahrenheit. Now by these improved arrangements observations at sea may be taken with great accuracy, the time indicated by the chronometer being reduced to the tenth of a second, and, moreover, the indications of the thermometer and barometer are also shown, as it were, on one dial, thus forming a combination of all three movements in one.

BOOK-SEWING MACHINE.—Ferdinand Sims, Galveston, Texas.—This invention relates to a machine in which different sections of paper, each section containing one or more sheets, are sewed together previous to their being bound. With the aid of this machine the different sections of paper are sewed together, with the greatest ease and despatch, by one continuous thread, which is passed around needles, cords, or metal plates, forming loops around some of the said needles or cords, so that when all the sections are sewed together, the said needles, etc., are withdrawn, and cords or parchment bands are substituted in their place, when the book will be ready for binding.

MANUFACTURING CARMINE.—Gustav A. Siegle, Brooklyn, N. Y.—This invention relates to a new process of extracting carmine from cochineal. The invention consists in so treating the cochineal that it will yield coloring matter after the pure carmine has been extracted.

MACHINE FOR MAKING CENTERS FOR WATCH CASES.—Batiste Hilbert New York City.—This invention relates to an apparatus for casting, turning, and finishing the centers, rims, or rings of watch cases, to which the lids of ordinary watches are to be hinged.

OAR.—Abraham S. Jacobs, St. Louis, Mo.—This invention relates to such a construction of oars, that by their use the rowers will be enabled to sit with their faces toward the bow of the boat; the course of the boat can thereby be better regulated and easier controlled than by the ordinary oars.

KNIFE AND SCISSORS SHARPENER.—August Herthal, Bridgeport, Conn.—This invention relates to a device by which knives of any size as well as scythes, sickles, and other large, curved, or straight-cutting tools, and small knives and scissors, can be sharpened with great facility.

PEA RAKE.—Emery W. Rowley, Jr., Antwerp, N. Y.—This invention relates to a rake for raking peas, and consists in the attachment to an ordinary hand or other rake of a serrated or toothed cutter, the cutting edge of which projects below the head of the rake so as to cut the pea straw close to the ground when the rake is drawn over the same.

TREADLE AND CAM FOR LOOMS.—George S. Faulkner, Staffordville, Conn.—This invention relates to a device for operating the treadles on a loom, and consists in a novel construction of the cam, by which the required motion is imparted to the treadle; also in the arrangement of a block which is secured to the treadle, and which is worked by the flanges and sides of the cam.

HINGE FOR DOORS, GATES, ETC.—Alvah Wiswall, New York City.—This invention relates to the application of a spiral spring, lever, and friction roller, whereby the door, blind, or gate, to which the device is applied will be held in a closed or in an open state, and the use of fastenings for such purpose dispensed with, the device also serving as a hinge for the door, blind, or gate.

DROP PRESS.—L. H. Olmsted, Stamford, Conn.—This invention relates to a drop press for swaging, punching, and like purposes, and it consists of a novel automatic mechanism whereby the driving pulley of the machine may be operated continuously, and the rising and falling weight placed under the complete control of the operator.

PROCESS OF HOPPING BEER.—William S. Haight and Robert Green, Waterford, N. Y.—The object of this invention is to so treat the hops, and to so construct the vessel into which they are placed, that when the beer is added to the hops, the whole aroma of the hops will be extracted by the beer, and retained therein.

WEIGHING SCALES.—S. H. Franklin, Poland, N. Y.—This invention relates to an improvement in weighing scales of the steelyard class, and consists in a lever that is pivoted at one end, and at the other end is connected by a metal strap, with an eccentric forming part of a weighted pendulum or lever that carries a pointer to indicate the weight.

CLIP FOR CLOTHES LINES, ETC.—Julien S. Rowley, Chateaugay, N. Y.—This invention relates to an improved device for fastening clothes on lines to dry, and other similar purposes.

DOOR SPRING.—T. Van Kannel, Cincinnati, Ohio.—The object of this invention is to construct a door spring which will prevent the violent slamming o the door, and by which the door will be gently closed, power enough being obtained to overcome the pressure of the spring in the lock of the door upon the latch while the door is being closed.

CALL BELL.—W. H. Nichols, East Hampton, Conn.—This invention relates to a new construction of double-stroke call bells, whereby the same are made very simple and efficient, and whereby the cost for making the same is considerably reduced.

CHERRY STONER.—O. L. Robinson, Owassa, Mich.—This invention relates to an apparatus in which one horizontal receiving plate is employed, and is provided with concave depressions or countersinks, wherein the cherries are held. Each countersink is perforated with a hole large enough to allow the cherry stone to pass through. Above the receiving plate is arranged another plate of similar dimensions, also provided with countersinks, so that when it is placed upon the receiving plate the countersinks in both will form spherical chambers of sufficient dimensions that a cherry can lay in each chamber without being pressed. From the center of each countersink in the upper plate is suspended a punch, which, when the two plates are brought together, will pass through the cherry in the countersink of the receiving plate, and will force the stone through the hole in the countersink of the receiving plate, while the body of the cherry will remain in the chamber.

FARM GATE.—Isaac N. Young, Swann, Ind.—The object of this invention is to obtain a gate for use on farms which shall be simple in construction and not liable to get out of repair, which shall be easily opened and shut, and capable of being adjusted higher or lower as circumstances may require; which may be readily removed for repairs, and which shall be so adjustable as to permit the passing of the smaller animals about the farm, such as pigs, lambs, etc., while preventing the larger animals from escaping from one enclosure to another.

BREECH-LOADING FIRE-ARM.—D. C. Thrasher and B. F. Aikin, Freetown, Mass.—This invention relates to the class of guns known as breech-loaders, and to the manner in which access is had to the barrel for the introduction of the cartridge.

DROP PRESS.—John C. Rhodes, South Abington, Mass.—This invention relates to a drop press which is so arranged that the rebound of the drop will be caught and shut; the drop must be raised a certain height before it can be dropped.

STOP MOTION FOR WARPING MACHINES.—L. V. Richmond, Brainerd, N. Y.—This invention relates to the application of a stop motion to warping machines of that class, in which the yarn is wound around a vertical polygonal reel.

PRESERVING ANIMAL AND VEGETABLE SUBSTANCES.—Edwin D. Brainard, Albany, N. Y.—The object of this invention is to deprive the atmosphere in a close chamber of its moisture at a low temperature by means o condensation upon a cold surface, and the collection and conveyance of the water of condensation therefrom outside of said close chambers without the admission of air.

CORN PLANTER.—B. Wieland, Orangeville, Ill.—This invention consists in attaching a corn planting apparatus to an ordinary plow by which seed corn is dropped in any required number in the furrow made by the plow, and covered by shovels attached to the handles to any required length.

INSTRUMENT FOR WATCHMAKERS' USE.—Charles E. Collins, San Francisco Cal.—This invention is designed to furnish a convenient instrument for the use of practical watch makers by the combination of a bench key, a case opener and measuring gages for watch crystals, main springs and pinions, all conveniently arranged together in one article.

STITCHING HORSE FOR SADDLERS.—O. A. Dean, Champaign, Ill.—This invention relates to an improvement in a stitching horse employed by saddlers and harness makers and consists in averaging the clamp so that it may be adjusted by raising and lowering the jaws to suit the stature or convenience of the workman, instead of being stationary as ordinarily constructed.

STEAM AND WATER JOINT.—William Young, Easton, Pa.—This invention relates to the manner in which steam and water pipes are joined together so as to make a tight joint.

GATE.—Burton Greenside, Fort Dodge, Iowa.—This invention has for its object to improve the construction of gates that swing both ways so as to make them more satisfactory and reliable in operation.

PLOW CLEANER.—C. P. Devereaux, North Newburg, Mich.—This invention has for its object to improve the construction of Huntington's plow cleaner patented January 15, 1867, so as to give it more power and make it more efficient in operation.

COTTON AND CORN PLANTER.—M. L. Thornton and R. W. Thornton, Lumpkin, Ga.—This invention has for its object to furnish an improved machine by means of which corn, cotton, or other seeds may be dropped in connection with guano or plaster.

PLOW.—Benjamin F. Avery, Louisville, Ky.—This invention has for its object to improve the construction of wrought-iron, steel, and cast-iron plows so as to make them simpler in construction and more efficient in use.

FARM GATE.—Sylvester Goewey, Dormansville, N. Y.—This invention has for its object to furnish an improved self-closing gate, simple in construction, not liable to get out of order, and which when opened or lowered will be entirely out of the way.

FLOOD OR WASTE GATE.—William L. Clark, Cambria, Wis.—This invention relates to a new and improved self-acting flood or waste gate for the preservation of mill dams, canals, and all water courses where there are occasional freshets or an excess of water.

COTTON-SEED PLANTER.—Luther F. Wilcox and William G. Caldwell, Three Rivers, Mich.—This invention relates to a new and improved machine for planting cotton seed, and it consists of an improved seed-distributing device, arrangement of gearing for operating the same, and an improved means for preventing the choking or clogging of the hoppers, all being constructed and arranged in such a manner that cotton seed may be planted at suitable and equal distances apart and in one or more rows as may be required.

PASTRY ROLLER.—Albert L. Taylor, Springfield, Vt.—This invention relates to a new and improved device for rolling pastry, and is designed to supersede the ordinary single roller now employed for that purpose. The single roller requires to be passed over the paste or dough several times and in different directions in order to spread it evenly or form a sheet of even thickness throughout, whereas this improved device requires to be passed over the paste only once or twice in order to perform the work and it may be operated with far greater facility than the ordinary single roller.

WASHING MACHINE.—J. G. Bailey, Hillsdale, Mich.—This invention has for its object to furnish an improved machine by means of which the washing may be easily quickly, and thoroughly done.

PROPELLING VESSELS.—William A. Cobb, Orange, Mass.—This invention has for its object to furnish an improved propeller by means of which vessels may be propelled with greater speed and with much less bulk and weight of machinery than is possible with the devices now in use.

LAND ROLLER AND CORN MARKER.—A. Mains, Olena, Ill.—This invention has for its object to furnish an improved instrument by means of which the land may be rolled and marked for planting at the same time.

WAGON BOXES.—D. H. Peterson, Terre Haute, Ill.—This invention has for its object to improve the construction of wagon boxes, so that they may be put together and taken apart readily and quickly, and which will hold the parts of the box securely in place.

WASHING MACHINE.—William Goodman, Troy, Mich.—This invention has for its object to furnish an improved machine by the use of which the clothes may be easily, quickly and thoroughly washed and from which the water may be conveniently poured so that the clothes may be washed through several waters if desired without its being necessary to handle them.

WASHING MACHINE.—William L. Camp, Holden, Mass.—This invention has for its object to furnish an improved machine by means of which the clothes may be washed easier, quicker and more thoroughly than they could be with other machines.

GRAIN SEPARATOR.—A. W. Lockhart, Sacramento, Cal.—This invention has for its object to remedy the faulty construction of other separators and to furnish one in which the blast shall be delivered more evenly throughout the shoe and with better effect.

PISTON PACKING.—George Robinson, Detroit, Mich.—This invention relates to a method of packing the pistons of steam engines and it consists in employing three packing rings for that purpose, which are forced outward against the cylinder by the pressure of the steam.

APPARATUS FOR DISTILLING AND REFINING.—C. G. Howell, Corning, N. Y.—This invention relates to the manner in which the heat is applied in the distillation of petroleum and other liquids.

VENT FOR CASKS, BARRELS, ETC.—Oramel N. Wood, Windsor, Vt.—This invention relates to a vent designed to be inserted in casks or barrels containing liquids, to admit, when the liquid is to be drawn from a cask or barrel, of atmospheric air entering the latter, in order that the liquid may flow freely through the faucet. The object of the invention is to obtain a simple, cheap, and efficient vent which may be very readily applied and operated with the greatest facility.

FRUIT BOX.—Wm. R. Wilcox, St. Joseph, Mich.—This invention relates to that class of fruit boxes which are constructed of thin strips or veneers of wood, the sides of the box being composed of a single strip. It consists in a novel manner of inserting and securing the bottom of the box in the body thereof, and in an improved mode of securing the lapped end to one of the sides of the box.

MOP HEAD.—H. H. Mason and Joseph Messinger, Springfield, Vt.—This invention relates to that class of mop heads which have their movable jaws operated by a screw and nut, and consists in a novel way of attaching or connecting the ends of the wire or rod composing said jaw to the nut whereby a very cheap and durable connection of said parts is obtained.

COMBINED CORN PLANTER, HARROW, AND CULTIVATOR.—David D. Stelle, New Brunswick, N. J.—This invention consists in constructing a corn planter arranged with cut-offs, so that any required quantity of corn may be dropped at given distances, which is regulated by a cam on the axle. This machine has a revolving harrow, the teeth of which pass between a set of stationary teeth, and thus crush the clods which are too large to pass between them. A set of revolving hoes can also be used in place of the harrow. The teeth of the harrow and the hoes are set in spiral form.

COMBINED SCRUBBER AND MOP HOLDER.—J. J. Harlan, Cincinnati, Ohio.—This invention relates to an improved combined scrubber and mop holder in which the mop and scrubber can be used together. The mop cloth serves as a lubricator to keep the scrubber moist.

PITCHER.—William Bellamy, Newark, N. J.—This invention relates to certain new and useful improvements in that class of pitchers which are constructed with double walls in order to keep the contents of the pitcher cool, and which are commonly termed "ice pitchers." The invention consists, 1st, in constructing the pitcher with two lids, having their hinges at opposite points or sides, as hereinafter fully shown and described, whereby the top of the pitcher is rendered equally as capable of resisting atmospheric influences as the sides and bottom, and at the same time the lids are rendered capable of being fully opened so that the pitcher may be filled with ice and liquids, with equally as great facility as the ordinary single lid pitchers. The invention consists, 2d, in inserting a tube between the two walls of the pitcher, the lower part of the tube communicating with the lower part of the interior of the pitcher, and the upper end of said tube communicating with the nozzle or spout.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 50 cents a line, under the head of "Business and Personal."

J. S. M., of Me.—In heating an evaporating pan by steam, the steam being generated in an independent boiler, and brought into a steam jacket around the pan, the steam should be confined. The heating power increases with the pressure, and in a heating apparatus, only the small quantity of steam required to keep up the circulation should be allowed to escape. . . Pressure gages indicate the pressure above the atmosphere. The total internal pressure in the boiler is therefore 15 lbs more than that indicated by the dial of the gage.

J. B. W., of Ky.—An alloy composed of 90 silver and 10 platinum will probably answer your purpose. It is not tarnished by sulphur, and is of the same color as silver but harder. On boiling in sulphuric acid a part of the silver is dissolved from the surface and you have the peculiar effect sometimes, but improperly, called oxydation. The proportion of platinum may be varied within pretty wide limits. . . . Aluminium is not affected by dilute and cold sulphuric acid, but is very readily soluble in hydrochloric acid of any strength. It has as yet no established price and there are in this city only a few ounces. In quantities of ten pounds and upwards it ought to be furnished for about $4 per lb. In small quantities it will cost from two to five dollars per oz. A large demand would soon bring down the price.

R. C. C., of Mich.—For silvering lenses we recommend to you the processes in which silver is precipitated on the glass from a solution of nitrate of silver. The process known in Cimeg's is one of the best.

H. M. C., of Ala.—We are not aware that the laws of your state secure any peculiar protection or advantage to the discoverer of a mineral deposit. If the substance you have found is different in properties from any before known you may be secured by a patent.

R. H., of N. Y.—Pyrites is now largely used in the United States in the manufacture of sulphuric acid. The mineral is obtained in Canada, New York and other States. Copper pyrites is mined in Vermont. Kryolite is used in the manufacture of caustic soda in Western Pennsylvania.

P. F. M., of N. Y.—No satisfactory explanation of the light emitted by the lightning bug has yet been given. Probably it is a cause of muscular energy transformed into light. The light is of a phosphorescent character.

W. W. G., of N. Y.—You will find petroleum oil very useful in cleaning your rusty engine; it is very energetic in loosening iron rust.

W. E. B., of Pa.—"To indicate the time between 12 M. and 1 P. M. which abbreviation should we use." P. M. The abbreviation M is properly applied only to the instant of time when the sun is on the meridian.

A. J. S., of Mass.—Stucco ornaments are generally cast in molds of stucco, the molds being well oiled during use. Pitch, wax, and wood are also suitable materials and are sometimes used.

J. B. W., of Col., writes that he is quite *au fait* concerning the causes and cures of cholera; that he has made great discoveries, therein, etc.

G. B., of Ill.—Your arrangement of the magnets and armatures of a magneto-electric machine is ingenious, and probably novel The "magnet cylinder" armature as in Wilde's machine has, however peculiar advantages of compactness and simplicity, considerations of great importance in view of the rapid motion.

H. M. S., of O.—The vulcanizing process is generally understood by dentists, and some of your neighbors of that profession may give you the information you desire.

F. R., of N. Y.—Paraffin is a solid substance resembling wax and is obtained from coal oil and petroleum. * * The effect of sodium amalgam is to increase the affinity of mercury for other metals. * * * The essential oil of flowers is commonly extracted by exposing the flowers to the absorbing action of pure lard.

S. M. R., of Pa.—The copper amalgam is not used for filling teeth. The objections to it are that it is poisonous, and becomes loose in the cavity either from contraction, or from solution of its surface.

C. S. C., of N. Y.—It is probable that the masses of all the planets and the sun are increasing from the fall of interplanetary matter. The peculiar and precise effect of the increase is a very difficult mathematical problem, which we do not care at present to discuss.

P. N., of Pa.—A solution of bichloride of platinum is used for the bronzing of gas fixtures and other brass work. For a brilliant red lacker, try an aniline red dissolved in colorless spirit varnish.

G. E. W., of N. Y.—The difficulty of soldering aluminum and aluminum bronze is well known. It is said that a solder containing a considerable proportion of zinc is successful.

T. M. S., of R. I.—Ure says that cotton fiber can be distinguished from linen by immersing it for a minute in strong sulphuric acid. It is then withdrawn and washed with water containing a little alkali. when it will dissolve into a gummy mass. Linen thus treated will retain its fibrous texture. The microscopic test is however preferable.

A correspondent whose address we have lost is referred to "Weisbach's Mechanics" for information on the raising or back flow of water caused by dams.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Street Pavement Inquirers—I can reply only to those wishing to invest with me; all others see page 6, No. 1, this volume. A. Packham, Carrollton, Ky.

Makers of light open car wheels for hand cars, please communicate with Holske Machine Company, 538 Water street, New York City.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,571.—COMBINED SEEDER, CULTIVATOR, AND ROLLER.—James P. Long and Peter Low, Cherry Valley, N. Y. May 28, 1867.

1,657.—SPRING HOOK.—Samuel Lagwitz, New Jersey. June 5, 1867.

1,663.—ARTIFICIAL LIMBS.—Amasa A. Marks, New York City. June 6, 1867.

1,677.—SEWING MACHINE.—Nathan A. Baldwin, Milford, Ct. June 7, 1867.

1,679.—BRUSH, AND APPARATUS FOR MANUFACTURING THE SAME.—Barnard Lavery, New York City. June 7, 1867.

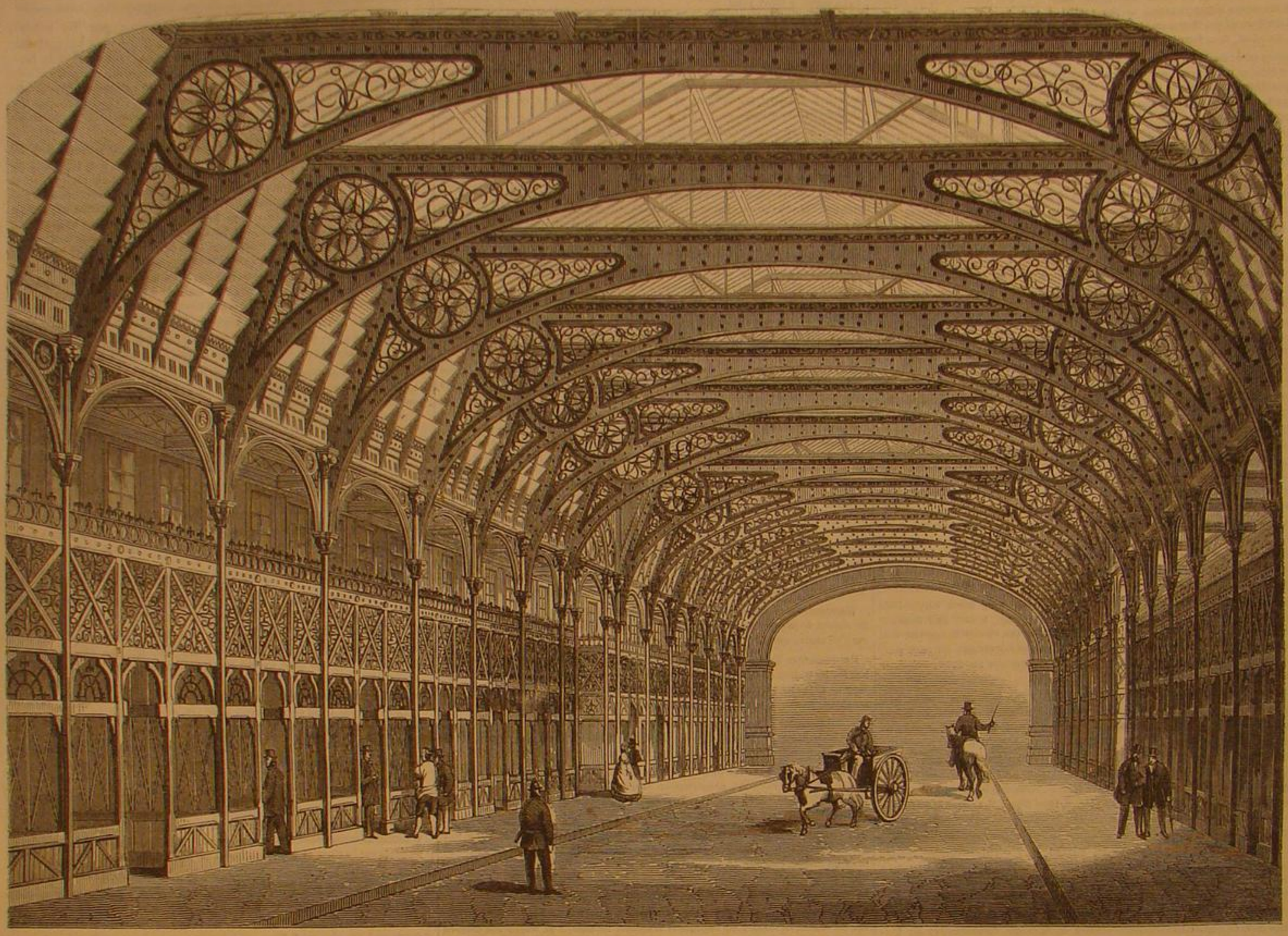
1,721.—STEP COVER AND WHEEL FENDER FOR CARRIAGES, ETC.—John W. Gosling, Cincinnati, Ohio. June 12, 1867.

1,725.—PONTOON BRIDGE, ALSO LIFE RAFT AND LIGHTER.—John Wright New York City. June 12, 1867.

New Market for London.

We copy from the London *Builder* a fine engraving of the interior of the new market just built in Smithfield for the supply of a portion of London. As will be seen from the illustration, which shows the central roadway through the building, the judicious combination of oak and iron produces a very fine effect.

The market is built over the joint depot of the Metropolitan and Great Western Railways, which are here subterranean. The roadway seen in the engraving is on a level with the street, and is 50 feet wide in the clear. The building is 631 feet long by 246 feet wide, inclosing a superficial area of 3¼ acres. The shops front on passages running at right angles to the main roadway. Each has a room above, for counting-room or offices, and between the ceiling of these rooms and the roof of the building is ample room for ventilation. Each shop is 30 by 15 feet. Stairs and dumb-waiters lead to the railway trains below the floor of the market. The building is lighted during the day by a louvre roof, and at night by gas in pendant glass globes in the central avenue, and scroll brackets in the passages.



THE SMITHFIELD (LONDON) NEW MARKET HOUSE.

It is to be hoped that such examples as this may not be lost upon the authorities of the commercial metropolis of this country. Without an exception, the New York markets are a disgrace to the city and discreditable to the enterprise of our people. It is surprising that such dirty, inconvenient, and disgraceful shams as our markets, are not supplanted by structures which would be creditable to American enterprise. Buildings might be erected in place of the tumble-down shanties now dignified with the name of markets, which would be not only objects of pride as architectural structures, but be made sources of revenue. Few public improvements are more needed in New York City than market-houses, which would not be as are the present, literally a stench in the nostrils of the people.

MISAPPLICATION OF TERMS---A SO-CALLED EXPLOSION.

All burstings of steam boilers are not explosions. An explosion is when a sudden generation of gas, whether of steam or of some other element, rends the material which before held it in place and under control, and tears it suddenly into pieces, or the reservoir, or boiler, is lifted from its place, and either hurled to work destruction outside the locality in which it was situated, or lifted from its seat, ruptured and torn, to scald and burn those in its immediate vicinity. These are properly explosions; but boilers are burst simply by the over pressure of steam caused by lowness of water or imperfections, as weakness of material, etc.

Such as the last we denominate a recent accident to a boiler which was one of a nest of three boilers each 60 feet long by 32 inches diameter and of ¼-inch iron. The explosion occurred on the 12th of July at the sugar refinery of Bertrand & Co., Water street, Brooklyn, L. I. Mr. F. W. Bacon, a well-known engineer, furnishes us with the following account of the results of his examination:—

The boilers were plain cylinders with a steam drum running across above, near the head, thus connecting them. They were set on an inclination of about 25°. Furnaces 8 feet by 3 feet each, under the higher end the heat passing on the under side part way down and then enveloping the whole boiler. The lower gage cock about 3 inches from bottom; two others 3 inches apart above. The right-hand outside boiler had a whole sheet torn almost completely out just in front of the bridge wall. It seemed to have swelled down until it gave way and then was torn off nearly around in the lines of rivets. Neither the boiler nor its mates were in the least moved from their position, The brickwork, of course, was pretty thoroughly demolished around the furnaces, and the shed over them, showing, however, no marks of an explosion, simply the effects due to the expansion of the steam and liberated hot water. There were two safety valves, apparently in good order and large enough, and said to be loaded at 50 lbs. per inch. It is said there was 45 to 47 lbs. pressure at the time of the rupture. It is claimed also by the engineer in charge that there was water sufficient. There were no glass water gages.

The rupture took place in the third sheet from the end. The second sheet was directly under the steam drum and a stay bolt went from the top of the drum and was made fast to the sheet. On either side of this bolt the sheet had settled down some two inches. The sheet in the middle boiler also had settled in the same way, and the next sheet beyond, corresponding with those that gave out, was also swelled as much. The sheets in the places mentioned were quite smooth and black, no red oxide, scale, or ashes that covered the other parts of the boilers visible. The rivet heads also had the same appearance. The fractures directly over the fire were black; those on the top were bright. The iron was completely disintegrated. On breaking it a few bright crystals could be seen; the remainder was black.

The swelling of the plates, the color of the exterior, the disintegration of the iron, all show most conclusively that when the sheets swelled down they were red hot; consequently could not have been covered with water. The mode of setting the boilers renders it almost impossible to keep the water at a reliable point in consequence of the great inclination leaving but a very small surface of water to evaporate from; to this add the rushing up of the steam made in the lower part of the boiler when it is entirely full of water and with hard firing the water must be very unsteady and uncertain.

A stroke of lightning at mid-day, from a perfectly clear sky, prostrated three inhabitants of South Killingly, Ct., on the 29th ult. It was accompanied by a heavy clap of thunder, and in half an hour afterwards there were a few drops of rain from a cloud that sprang up in the north-west.

Durability and Tenacity of Steel Rails.

The London *Railway News* says that at the Chalk Farm Station of the London and North Western Railway a Bessemer steel rail is now to be seen still in use, and in good order, which has outlasted twenty-five iron rails successively placed next to it on the same line. Judging by this example, the steel rails are at least twenty-five times as durable as iron ones. Steel rails are very tough, as some experiments made within the last few days at the works of Messrs. John Brown & Co., and Messrs. Cammell & Co., of Sheffield conclusively illustrate. These experiments were made chiefly for the satisfaction of the Hon. W. J. McAlpine, formerly engineer of the State of New York, and much connected with railways in America, who contemplates the more extended introduction of steel rails into that country. The result was to show the great toughness and powers of endurance of the steel rails. In one of the experiments a ram of a tun weight was suffered to fall upon a rail of 68 lbs. to the yard, supported on iron blocks 3 feet apart in the clear, from a hight of 20 feet, and the only effect was to bend the rail. The rail was then turned upside down and the blow was repeated, when the rail was bent straight, but without any cracking being visible. Finally the rail was exposed to the test of a tun ram falling through 30 feet, when the rail was very much bent and twisted, but not a crack was visible. By the mode of manufacture now adopted, perfect uniformity in the composition of every rail is insured.

Women Watchmakers.

Twenty thousand Swiss women earn a comfortable living by watch making. They make the movements, and even mostly put them together. A few women are finishers. The *English Woman's Review* says:—"Geneva has refused to employ women, and totally lost the watch trade. None of the so-called Geneva watches are made there, but in Neufchatel, where women have always been employed."

A traveler says:—"We see women at the head of some of the heaviest manufactories of Switzerland and France, in the watch and jewelry line." In England, women are employed in one London establishment, and in several principal towns. Five hundred women are employed at Christ Church in making interior chains for chronometers.

American watches are made by machinery, while those imported are made by hand. The Waltham Watch Company employs two hundred artisans, of whom seventy-five are women. Some Swiss women in Camden, N. J., make inside work for watches. In Boston, women cut the teeth of chronometer and watch wheels, earning from $4 to $6 a week. Delicacy of touch, practice, and great care are needed. A Waltham overseer says men earn double what women do, for they do more difficult work, are more thoughtful and contriving, more self-reliant and stronger; and besides it is the custom to pay women less for the same work.

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NEW YORK, SATURDAY, AUGUST 3, 1867.

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THE LINEN MANUFACTURE.

Probably the first textile spun and woven into cloth was wool, as it would evidently suggest itself in a raw state as well adapted to this purpose; but the manufacture of linen, dates from the earliest history; at least the earliest written records speak of it as well known. It was old in the time of Herodotus and the oldest Egyptian mummies are swathed in it. Among that singularly superstitious people it seems to have borne a sacred character, as their priests were forbidden to enter the temples clothed in any other than linen garments and their dead were always shrouded in it.

On account probably of the superior ease with which cotton can be prepared for the loom, the manufacture of linen, in this country, does not seem to have attained the proportions which its value and that of the plant from which it is derived entitles it to. The extensive application of machinery to its manufacture is of quite a recent date, and even now much of the Irish linen is manufactured, from the time it is pulled to its transformation into cloth, by hand.

Massachusetts seems to have led the way in the manufacture of linen. In 1632 it seems that the people of this colony had generally turned their attention to cattle raising, importing from England most of their clothing, and all of the finer sort. In 1640 the Assembly took the matter in hand and decreed that:

The Court taking into serious Consideration the absolute Necessity for the Raising of the Manufacture of Linnen cloths, doth declare that it is the Intent of this Court that there shall be an order settled about it, and therefore doth require the Magistrates and Deputies of the several Towns to acquaint the townsmen therewith, and to make Enquiry what seed is in every Town, what men and women are skillful in the braking, spinning, and weaving, what means for the providing of Wheels; and to consider with those skillful in that Manufacture, and what course may be taken for teaching the boys and girls in all Towns the spinning of the yarn, and to return to the next Court their several and joint advice about this Thing. The like consideration to be had for the spinning and weaving of Cotton Wool.

This description of cloth to which this order applies appears to have been a mixture of linen and cotton or linen and wool. In the same year an order of the Court offered a "bounty of three-pence on every shilling's-worth of linen, woollen, and cotton cloth, according to its valewation, for the incuragment of the Manifocture."

In 1662 the Assembly of Virginia enacted laws for the promotion of industry in the making of cloth and raising the materials. Flax seed was imported from England and distributed to each country and bounties offered for raising it. Two pounds of tobacco were offered for every pound of flax or hemp prepared for the spindle, three pounds for every yard of linen cloth a yard wide, and five pounds for every yard of woolen cloth. Every tithable person was required, under a penalty of fifty pounds of tobacco, (then the great staple of the colony) to produce yearly two pounds of dressed flax or hemp.

The industrious Dutch matrons and maids of New Netherland—New York—as early as 1670, are described by Denton as great manufacturers of linen. He says: "Every one make their own linen and a great part of their woolen cloth for their ordinary weaving." In New Jersey in 1677, or soon after, Quakers from Yorkshire and London made linen cloth, and in Pennsylvania in 1693 and Delaware at about the same time one of the principal employments of their women was the spinning and weaving of linen. Scotch-Irish carried on the business extensively in New Hampshire in 1719. The first linen factory was established in "Long-Acre"—Tremont street—Boston in 1737.

In Canada the culture of the flax has received more earnest attention than with us. There are at least three quite extensive manufactories of linen in that province, each employing over two hundred hands. There are also three linseed oil mills. It is said that the Canadian farmers realize almost as much from the seed, beside the value of the fiber, as from wheat. We cannot give the present condition of the manufacture in this country, but from the census of 1860 we find that it is confined mainly to the states of Massachusetts and New York, in which there are ten establishments with an aggregate capital of $639,795 and employing 528 hands. Probably this account would receive large additions if the present condition of the manufacture could be stated. The importance of this branch of industry may be inferred from the fact that in 1862 we imported linen to the value of $2,894,314 and other manufactures of flax to the value of $3,173,672.

THE PATENT OFFICE DELAYS.

For the last year and a half we have earnestly labored with the Commissioner of Patents to induce him to bring up the work of the Patent Office and put an end to the outrageous delays in the examination of the applications, which are so oppressive upon our inventors. But our labors have so far been in vain. The Commissioner has been profuse in promises, but almost the only thing he has really done to increase the force of the office is to fill one of the vacant examinerships by the appointment thereto of a mere politician, who has no knowledge or appreciation of the duties of the position. This appointee received and holds the office as a sinecure, and when we last heard from him, had not made a dozen examinations, although he had then been in office some three months. This is a fair sample of the manner in which the present Commissioner is helping along the affairs of the Patent Office.

We need not say that, when applications are so rapidly on the increase, and when so many thousands of poor inventors are waiting their turn for examination, it behooves the chief of the establishment to see to it that none but rapid and competent persons are appointed to the important positions of examiners. The obvious teaching of common sense would be to select from the corps of assistant examiners those who are most competent, most experienced, and quickest, and promptly advance them to the grade of full examiners. If the vacant posts cannot be filled within the Patent Office, then search outside for the right sort of individuals, and enjoin upon them the importance of expediting the work in every possible way. But it is too much to expect that an official who has no faculty for management, will adopt any such plain and simple method of relief.

In the meantime, is there nothing that inventors and solicitors can do by concert of action, to bring about a change at the Patent Office, and secure the prompt examination and decision of applications? We think there is. Let every applicant for a patent, and every solicitor who is suffering from delay, sit down and write letters of urgent complaint, one addressed to the President of the United States, another to the Secretary of the Interior, and a third to the member of Congress from the writer's district. Let the writer state the length of time that his application has been pending, and give some idea of the importance to him and his associates of a speedy examination by the Patent Office, and ask that something be immediately done for his relief. If each inventor and solicitor will take the trouble to write as we suggest, there will be poured into the ears of the President, Secretary and Congress an overwhelming stream of complaints which will impress upon them the importance and necessity of vigorous action.

All letters for the above officers will go through the post free of charge.

Inventors and solicitors, sit down and write!

THE UNION PACIFIC RAILROAD.

The building of this road and the probable results of its completion make the enterprise one of the most important of modern times. Its purpose is to connect the two portions of an empire separated by the breadth of a continent, and to plant settlements in what is now but a wilderness occupied by roving bands of savages. Other railway projects may be more noteworthy for their triumphs over greater engineering difficulties, but none can exceed this in grandeur of conception and magnitude of results. Already villages are springing up along the route as the work progresses and the receipts even now exceed, several fold, the operating expenses.

The United States Commissioners are now examining the section last completed, which carries the road a distance of 425 miles west of Omaha, and the work goes steadily forward two miles per day. Some interesting facts relative to the financial condition of the company will be found in their advertisement in another column. There can be no doubt but that the bonds of this road are perfectly safe as investment and their rate of interest is better than that on government bonds at present rates.

PROTECTION FOR PASSENGER CAR PLATFORMS.

In the State of Connecticut all railroad companies are by law required to protect the car platforms so that passengers cannot fall between them when in motion. On the Naugatuck railroad they use a board fastened at one end by a pin to one of the platforms, the other end resting upon the other platform without fastening. We witnessed a very narrow escape from accident on one of these cars the other evening, in the attempt of a passenger to pass the plank when the train was in motion, the brakeman having forgotten to insert the fastening pin.

We also observed a somewhat similar defect on the New Haven cars the other day, where the footway between the cars consists of a series of diagonal rods pivoted together like "lazy-tongs" so as to yield and contract under the variations of the buffer springs. In this instance one of the end staples of the footway had become wrenched out by the jerkings of the car, leaving passengers exposed to the danger of falling through.

The contrivances used on both of the above roads are unsafe and badly suited for the purpose. No sort of device should be employed which is liable to be deranged by the jolting of the car, or which depends for its safety upon the watchfulness of careless brakemen.

We hereby notify President Bishop of the insecurity of the said passage ways, and we warn passengers against stepping upon them without first making sure that the fastenings are in place.

One of the best devices that we have seen to fill the space between the platforms, is that used on the New Jersey Railroad, which consists of a spring frame extending entirely across each platform end. The frame is covered with leather or stout canvas and when the cars are coupled the frame of one car presses constantly against that of the opposite car, completely filling up the space between the platforms, and requiring the insertion of no fastening pins and no attention from brakemen. It is a self-acting arrangement.

FRANCE AS A POWER.

Napoleon said, some months ago, that "a nation's power depends on the number of men it can bring under arms." This is the opinion of a soldier, hardly that of a statesman, judging from his consequent action. To prove the correctness of his theory he musters into his standing army the flower of the male population of his empire, yet with a population considerably larger than ours he could not by any means bring the numbers into the field which we did during the five years of our recent struggle, and the status of the physical material of his armies would be immensely below that of ours. The statesman would greatly modify or qualify this assertion, if he did not contradict it. France is a nation of soldiers, but as a power either for defense or offense she is far below the United States, which was not, before our late war, and is not now, a military nation as the term is understood in Europe.

Le Fort in a paper in the *Revue des Deux Mondes* easily refutes the Emperor's logic, if there is logic in his bald statement. He says that, as compared only to the rest of Europe, the French population is almost stationary. Denmark and Sweden double their population in 63 years, Spain and Norway in 57, Russia in 66, Greece in 44, England in 52, Prussia in 54, France in 198. France has only 268 births yearly for every 10,000 inhabitants, while England has 347, Prussia 374, Austria 409, and Saxony 410. And the falling off has been rapid; for just before the revolution of July the proportion of births was quite 307 per 10,000. The percentage of infant mortality is much the same in France and in England. The difference is that in the former country the absolute number of births is so lamentably small. Nearly a quarter of a million of people of both sexes are kept by holy vows out of the reproductive class. The grand evil is late marriages, fostered to a great extent by the military law. In this way 80,000 young men are taken off every year for the seven best years of their lives. And when the soldier's term is over, he has very often got entirely out of domestic habits. If he marries, it is not till he has provided a home and secured a fixed income, so that the term of his celibacy fully averages ten instead of seven years.

The marrying age in France is just over 30 for men, just over 26 for women; in England it is 25 for men, 24 for women. At 27, you find in France 582 bachelors and 418 husbands out of 10,000; in England the proportion is nearly reversed. Further, these 80,000 men drawn for service in the army, are the pick of the whole population; and of these fully one-third is returned tainted with contagious diseases. As to the fallacy that the French pass more recruits per cent now than they used to pass, "that is just because we want more soldiers, and are therefore less particular. In the Crimean war we actually passed 69 and 70 per cent, instead of the usual 60—the hospitals and graveyards out in the East knew with what result. It stands to reason that if the vast force provided for by the new law is to be kept on foot, France must either be rapidly depopulated, or the term of service must be considerably shortened.

We cannot see why the militia system of this country or the volunteer system of England might not be as advantageous and as effective for France as for the United States and England.

THE TOMATO.

The vast improvement in means and methods of agriculture is often remarked; indeed, one must be blind not to recognize it; but it is seldom we notice the additions made to our edibles not only by improvement of species producing new varieties, but by the introduction of entirely new in-

dividuals. They come so gradually into use that they are familiar to us before we have remarked their novelty. Thirty years ago the varieties of garden esculents were very few. Green corn of the sweet variety was but little cultivated; pumpkins and the Canada crook-neck filled the places now usurped by many much superior squashes; the celery was merely a garden herb under the name of "lovesage;" cauliflower and kale were rare, and the tomato or "love apple" was almost entirely unknown.

Our first knowledge of this now deservedly esteemed vegetable was its advertisement as a medical plant. It is known to botanists as the *Lycopersicum esculentum* or the *Solanum lycopersicum*, and belongs to the order which includes the deadly nightshade. One of our exchanges says:

It is generally supposed, to be a native of South America, and to have been cultivated at an early period by the people of Peru and Mexico. It made its appearance in Europe in the 16th century, the first mention of it being by Rembert Dodoens, the famous Dutch herbalist, whose work, published in 1583, speaks of tomatoes as vegetables which may be eaten as a sort of salad with pepper, salt and oil. John Gerarde, an Englishman, whose "Herbal" was given to the world in 1597, tells us that in his time, several varieties were to be found in the gardens of his country. Half a century later, in 1656, John Parkinson, another English writer on plants, treats of them as garden curiosities, cultivated more for their beauty of appearance, than for utility. He styles them sometimes love apples, sometimes amorous apples.

It is noteworthy that the several species of *Solonacea* are called *tomatl* by the Mexicans, and we thus find an Aztec word current in southern Asia—an extraordinary philological phenomenon which would seem to establish some sort of connection, at a very remote age, between the old and the new worlds.

Notwithstanding the fact that the tomato was known to be used as an article of food by several semi-civilized races, it was long before the people of any enlightened nation ventured to introduce it on their tables. For more than 150 years after the death of Parkinson his description of its position in Europe continued to be the correct one. It was grown to a limited extent merely as an ornamental plant.

Its real name took the place of "love apple," by which the last generation of Americans knew it. This latter designation indicates that it was introduced into Europe through some of the Latin nations. The French style it *pomme d'amour* or "love apple." The Italians, by whom it is now cultivated, called it formerly *pomo d'or*, or "golden apple," but now universally designate it *pomo d'amore*, or "love apple." The German name is "paradise apple;" the Swedes and Danes have no title for it, it being unknown in the north of Europe. It is singular that the United States, where it had been known only a comparatively short time, should be the first to makes it a common article of diet. In Germany and France it is scarcely employed except in the manufacture of sauces, and to give a flavor to soups, and even in Italy, with a climate admirably adapted to its culture, it is far from holding the place which it does among us. In England, also, it is still regarded rather as a luxury than as an article of general consumption.

The large red tomato is the variety most commonly to be found in the market. But there are many others. These are the small red tomato, one kind of which is sometimes styled the cherry tomato, from its size and sprightly acid flavor, forming an excellent pickle; the pear tomato, very tender, but ripening very slowly; the large yellow tomato, which differs very little from the large red; the fig tomato, which, when dried, is prepared as a sweetmeat; and the perfected tomato, with a large juicy fruit, of either a scarlet color or a crimson tinted with violet. A species, denominated the Humboldt tomato, was brought to Europe some years ago from Peru, which is said to be a perennial, but which has not yet made its way to our gardens.

Important Archæological Discovery---Perhaps.

A member of the Copenhagen Royal Society writes to a Washington paper that he has found a wonderful Runic inscription on a rock near Georgetown, D. C. The inscription, a copy of which the professor furnishes, reads as follows:—

"Here rests Syasy, or Suasu, the fair-haired, a person from the East of Iceland, the widow of Kjoldr, and sister of Thorgr, children of the same father, twenty-five years of age. May God make glad her soul. 1051."

Just above this inscription is engraved on the rock the name "W. Langley, 1758."

On continuing his explorations the antiquarian came across some human teeth, two Roman coins, and several bronze trinkets.

From these discoveries the professor believes it to be proven beyond doubt, that the early voyagers, having left the New England shores—where their presence, centuries ago, is now generally admitted, the "round tower" at Newport having undoubtedly been built by them—they continued their journey Southward certainly as far as the mouth of the Potomac, which they ascended. In support of his conclusion, he refers to a manuscript lately dug out of some old ruins at Skahldt, Iceland, wherein the statement is made, that under the command of Herbardur, his countrymen sailed in a Southerly direction from Vineland (or Martha's Vineyard), where they wintered, and thence up a sea and various rivers, the ascent of one of which was stopped by a succession of falls, to which, from their shape and foamy appearance, the gave the name of Hvidsderk, or white shirt; and the manuscript further states that in this neighborhood the illegitimate daughter of Snorré was killed by a small spear (or arrow) and buried near the spot where she fell.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JULY 16, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Resident of Canada and Nova Scotia pay $500 on application.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

66,667.—Inhaling Fluid for Cure of Consumption and other Diseases.—N. W. Abbott (assignor to H. W. Persing), Centralia, Ill.

I claim the combination and use of the ingredients herein named, as and for the purpose set forth.

66,668.—Folding Gate.—C. N. Ackerson, Bath, N. Y., and W. D. Harrah, Davenport, Iowa, assignors to J. C. Delany, Philadelphia, Pa.

1st, We claim the construction and arrangement of the several parts of the within-described folding gate, all operating together as herein set forth.

2d, The combination of the slide, f, and latch, e, with a cord, g, arranged substantially as and for the purposes described.

3d, The slide, f, in combination with the spring catch, e, the said slide serving as a means whereby to force the spring, e, out of contact with the gate, substantially as described.

66,669.—Net for Fishing, etc.—Benjamin Arnold, East Greenwich, R. I. Antedated Jan. 17, 1867.

1st, I claim the use of the full-sized twine in connection with the strand or smaller twine, in making netting, substantially as herein set forth.

2d, I claim as a new article of manufacture, nets or netting, made as herein described.

66,670.—Steam Generator.—Henry Bevis (assignor to himself, Thomas H. Foulds, and W. D. Dalton), Cincinnati, Ohio.

I claim the steam chamber, C, and water chamber, B, connected by one or more annular series of ascending tubes or ducts, D, immediately surrounding the fire, and having downwardly-discharging terminations, G, above the crown sheet, and by one or more outer annular series of descending ducts, E, having their inlets flush with the top of the crown sheet, for the purpose set forth.

66,671.—Rotary Pump.—John P. Birch, Philadelphia, Pa., assignor to himself and George W. Paterson, Newburyport, Mass.

I claim the combination with the eccentric piston case and central pin or spindle, mounted in opposite ends of the pump case, of the pistons or buckets and their grooved and tongued supporting disks, mounted on said spindle, and within the piston case, substantially as shown and described.

66,672.—Upright Drill.—P. Blaisdell, Worcester, Mass.

1st, I claim the combination with the sliding head piece, G, and bearing, F, of the upright spindle, E, provided with the collars, d m, and nut, o, substantially as set forth.

2d, The combination with the adjustable frame, H, and spindle, E, of the sliding head piece, G, screw shaft, e, collars, m d, and nut, o, constructed and arranged substantially as and for the purposes set forth.

3d, The combination of the sliding head piece, G, and bearing, F, with the adjustable frame, H, and spindle, E, arranged as and for the purposes set forth.

66,673.—Sash Fastener.—Thomas H. Burridge (assignor to himself and G. C. Fablan), St. Louis, Mo.

I claim the combination of trapezoidal tongue, or series of tongues, d, with the spring, d', and the strip, D, the sash or blind, and the window stile, when acting substantially as and for the purpose set forth.

66,674.—Refrigerator, Cooler, and Filter.—William P. Burwell, Chicago, Ill.

1st, I claim one or more ventilators, O, for ventilating the filling of a refrigerator without communicating with the interior, substantially as and for the purposes specified.

2d, In combination with the ventilators, O, I claim the arrangement of the ice box, K, in one compartment, and the dripping pan, F, filter, E, and reservoir, G, provided with a draw cock, H, in the other compartment, substantially as specified.

66,675.—Nutmeg Grater.—Richard H. Chinn, Washington, D. C.

I claim the box, A, having a foraminous bottom, B, and below it a conducting tube, C, in combination with the nutmeg holder, E, fitted to slide within the box, A, handle, E', and sliding piston, K L, when arranged to operate in the manner and for the purpose specified.

66,676.—Apparatus for Manufacture of Gas.—John C. Clapp, Homer, N. Y.

I claim the employment of a retort within a common stove for the distillation of gas, substantially as set forth.

I also claim the special combination and arrangement of the retort, B, pipes, D E and F, and sliding joint, I, with the stove, A, whereby the retort may be elevated to the top of the stove when not required for use, substantially in the manner and for the purpose specified.

I also claim the arrangement of the purifying vessel or vessels, H, under the stove, in combination with the retort, B, and connecting pipes, substantially as and for the purpose described.

66,677.—Car Coupling.—A. H. Clark, Fond du Lac, Wis.

I claim the combination of the sliding block, a, the hinge flap, b, and the coupling pin, d, with a draw-head on a railroad car, constructed and operating substantially as and for the purposes herein described.

66,678.—Machine for Tenoning Blind Slats.—John J. and Thomas Clark, Elgin, Ill.

1st, We claim wheels, W and W", when used in combination with arch piece, P, constructed and operating substantially as and for the purpose described.

2d, Springs, H H", when used for holding the slat in slot, d, substantially as described.

3d, The combination of slide, R, and adjustable arms, x x", for the purpose substantially as set forth.

66,679.—Horse Rake.—John P. Hunter, Williamsport, Ind.

I claim, in combination with the rake head, A, and sled, E, the handle, F, standard, G, and elastic spring board, H, substantially as and for the purpose set forth.

66,680.—Beehive.—Edwin Cox, Monroe, Wis.

1st, I claim a beehive having its sides or panels composed of one or more layers of paper, with outer protecting panels of wood, whereby the dampness within the hive is absorbed, substantially as herein set forth for the purpose specified.

2d, The inclined strips or plates, I, in the bottom of the spare honey box, F', in combination with the troughs or gutters, m, in the upper parts of the comb frames, G, substantially as and for the purpose set forth.

3d, The entrance boxes, H I, provided respectively with the moth box, p, tube, t, and stoppers, u, constructed and arranged substantially as described.

66,681.—Churn.—John Cram (assignor to himself and James B. Thomas), Chicago, Ill.

1st, I claim the arrangement of springs, S S, or their equivalents, in combination with an oscillating churn box, A, substantially in the manner and for the purposes specified.

2d, I claim an oscillating churn box, A, provided with the springs, G G, or their equivalents, in combination with the stops, elastic or unelastic, substantially in the manner herein described.

3d, I claim the arrangement of the cream cutters, M, in combination with an oscillating churn, when provided with springs, G G, or elastic stops, S S, so as to operate in the manner herein specified.

4th, I claim, in combination with an oscillating churn, when provided with springs, G G, or elastic stops, S S, as specified, the arrangement of a butter gatherer or worker, L, or its equivalent, in the manner and for the purposes described.

5th, I claim the combination and arrangement of the oscillating churn, A, with the cream cutters, M, and the butter gatherer, L, substantially as and for the purposes herein specified.

66,682.—Loom.—George Crompton, Worcester, Mass.

I claim, in combination with the lifter and depresser levers, hung upon fulcra in line with the cloth-making point, as described, the evener levers, connected to and actuated by the lifter and depresser levers, when the eveners are hung upon fulcra, in line with the fulcrum of the respective lifter or depresser, to which each is connected, substantially as set forth.

Also, in combination with the mechanism of a loom, a cloth roll having provision for locking it, either in connection or out of connection, with the mechanism through which it is driven, substantially as set forth.

66,683.—Steam Generator.—Jeremiah Darling, Cincinnati, Ohio.

1st, I claim the steam and water columns, G, when constructed and arranged as and for the purposes set forth.

2d, I also claim the pipes, J, when arranged with reference to the columns, G, as herein described, and for the purposes set forth.

3d, I also claim the coil or incline pipes, K, when arranged and combined with the posts, G, and dome, C, as herein described and for the purposes set forth.

66,684.—Reciprocating Harrow.—Jay Densmore (assignor to L. A. Densmore and Justus Day), Holley, N. Y.

I claim a reciprocating harrow operated by cranks, or their equivalents.

Also, the carriage, A A, behind the reciprocating harrow, as described.

Also, the driver's seat, B, in combination with the carriage, A A, as described.

Also, the wrist pin, n, the draft pole, D, the sleeves l and h, the joint, o, or their equivalents, the brace, g, the chains, c c c c, or their equivalents, the guards, s s s s, all in combination with a reciprocating harrow, as and for the purposes set forth and described.

66,685.—Ice Cream Freezer.—Joshua W. Dougherty and F. W. Gerecke, Newburgh, N. Y.

We claim the cylindrical center freezer, C, with the manhole, O, upper center step, E', center pin, d, on the bottom, in combination with the beater arms, U1 U2, and the outer cream vessels, B B, by the square step, M, substantially and for the purpose as specified.

66,686.—Washing Machine.—Charles Draeger, Ladoga, Ind.

1st, I claim the employment of the weighted rollers, F, hung in slotted bearings in the oscillating frame, G, and arranged to operate substantially in the manner set forth.

2d, The semicircular washboard, in combination with the weighted rollers and oscillating frame, arranged and operating substantially as described.

66,687.—Churn.—Noah Drew, Howell, Mich.

1st, I claim the employment of two dashers, B C, having chamfered and perforated wings, c, constructed and arranged relatively with each other on one staff, substantially in the manner herein described.

2d, The employment of revolving shield hooks, H, in combination with loop bearings, m, and recessed handles, E, substantially as and for the purpose herein specified.

3d, Hanging the lever, L, by the use of slotted straps, M, in combination with a fast pivot, l, projecting from each side of the arm, D, substantially as and for the uses set forth.

66,688.—Equalizing the Draft of Horse-power.—Wm. P. Dunlap, Maquoketa, Iowa.

I claim the arrangement and combination of the segment, C, having the radius, D, with rods, J, spring, I, and arms, A, substantially as and for the purpose set forth.

66,689.—Nutmeg Grater.—C. A. Durgin, New York City.

I claim, as a new article of manufacture, a grooved or concave grater, substantially as described and specified.

66,690.—Hand Saw.—A. W. Elmer (assignor to himself and Christian Ensminger), Springfield, Mass.

I claim, as my invention, the combination of the nut, C, in the end and forming a part of the handle, D, with the slit socket, A, the round hole to receive the shank, B, and the shank, B, with the end split to receive and hold the saw, substantially as set forth and described.

66,691.—Plow.—Charles A. Elton, Hillsboro', Ohio.

I claim connecting the rear end of the beam, A, to the handle, B, of my improved plow, by means of the slotted and angular-shaped holder, d, and the bolts, c and e, as described, when the slots in said holder are of such a size and shape that by operating the bolt, c, the forward end of said plough beam can be varied and secured in any desired lateral position, and by operating both of said bolts, c and e, the forward end of said plow beam can be varied and secured in any desired vertical position, substantially as herein set forth.

66,692.—Saw.—James E. Emerson, Trenton, N. J.

I claim the provision in a saw of apertures, d, for facilitating, dressing, or sharpening, substantially as described.

66,693.—Saw Gummer.—James E. Emerson, Trenton, N. J.

I claim the adjustable and reversible bearings, F F, constructed and applied to the curved stock, A A', in the manner and for the purpose set forth.

66,694.—Water Indicator for Boilers.—William R. England, Milwaukee, Wis.

I claim, 1st, The arrangement of the whistle lever, L, connecting rod, K, index hand, H, lever, F, and float, E, substantially as herein set forth.

2d, I claim the arrangement with reference to the first clause of claim of the glass tube, O, and whistle, M, substantially as herein set forth.

3d, I claim the arrangement of the adjustable collars, m and n, with the whistle lever, L, substantially as herein set forth.

66,695.—Plumb Level.—C. Ensminger and A. W. Elmer, Springfield, Mass.

We claim the parallel-sided hand, a, in combination with a semicircular graduated scale, o, as and for the purpose specified.

66,696.—Horse Rake.—Henry V. Farris, Richmond, Ind.

I claim the draw bar, e, posts, c c, and sliding pins, u u u, when operating and constructed substantially as herein set forth.

66,697.—Propelling Hoop.—James Faye, Philadelphia, Pa. Antedated July 11, 1867.

I claim the combination with the hoop of the guide, b, rollers, c d and e and stay, f, or their equivalents, the whole being substantially as above described and for the purpose herein stated.

66,698.—Safety Pocket.—Robert W. Fisk, Olney, Ill.

I claim a watch safe, consisting essentially of the plate, D, hook, e, prong, m and m', when combined and arranged to operate in the manner and for the purpose specified.

66,699.—Hay Loader.—C. W. Gage, Homer, N. Y.

I claim the adjustable arm, E, upon the end of shaft, D, tongue, K, and spike m, sliding brake bar, L, in front of the rear wheels, B B, and rope, G, passing to the rear of the wagon, when combined, arranged, and operating in the manner and for the purposes specified.

66,700.—Brick Machine.—Alois Gans (assignor to himself and John Moos), Lincoln, Ill.

I claim, 1st, The hopper, A', the molds, B B', and the carriage, B2, when combined with the actuating devices, a2 C C1 C2 and C3, substantially as described and set forth.

2d, The combination and arrangement of the plungers, D', and the molds, B B', as described and shown.

3d, The plungers, D', when arranged as described in combination with the operating devices, a2 d d1 d2 d3 d4 d5 d6 d7.

4th, I claim the clutches, E, in combination with the molds, B B', as and for the purpose described and shown.

5th, I claim the clutches, E, when arranged as described, in combination with the operating devices, a2 e e1 e2 e3 e4.

66,701.—Cask for Fermenting Wine.—John Glenert, Washington, Mo.

1st, I claim the combination and arrangement of the cask, A, pipes, B b, and tub, B', as and for the purpose set forth and described.

2d, The cask, A, and the filling device, C C' c c', when combined in the manner and for the purpose set forth.

66,702.—Elliptic Spring.—Robert Gray, Litchfield, Ill.

I claim projecting a rib, a', from the convex side of a leaf of the spring, so as to form a rounded parabolic curve or elliptical curve, as shown in fig. and substantially for the purpose set forth.

66,703.—Smoke Conductor for Railroad Locomotives.—John Greacen, Jr., New York City. Antedated July 5, 1867.

I claim a smoke chamber, with an opening running longitudinally of the track, in combination with flues or chimneys as set forth, so that the smoke from the chimney of a locomotive while in motion may be received by said chamber and conveyed away, as specified.

66,704.—Potato Digger.—I. M. Green, West Bloomfield, N. Y.

I claim, 1st, The hand potato digger consisting of the sliding and self-clearing fork, G, lever, D, main frame, B, wheels, A, and spring tread arm, H, the whole arranged, combined, and operating in the manner and for the purpose specified.

2d, The special combination of the clearing bars, g g, with the sliding fork, G, in potato diggers, as herein described.

3d, The combination of the spring tread arm, H, with the hand-wheel potato-digger, A B, operating as and for the purpose herein specified.

66,705.—Portable Field Fence.—C. S. S. Grifling, Astabula County, Ohio.

I claim the mode of attaching the panels together by lapping over the ends of the boards, A, on each side of the slats, B, so as to brace the ends and also adjust them to the inequalities of the ground, as herein described.

66,706.—Air Bed.—J. R. Hamilton, Portland, Oregon.

1st, I claim the button-headed screw and cap-nut stay fastening, as constructed and combined with the air-tight or waterproof fabrics, for the purpose herein specified.

2d, I claim the self-closing puppet valve and tube with the screw and plates when constructed as described and used in combination with air beds, substantially as and for the purpose herein set forth.

66,707.—Coal Stove.—John L. Hanson, Boston, Mass.

1st, I claim the combination as well as the arrangement of the fire chamber, A, the two chambers, B C, the descending pipes, F F', the flue space, G, the ascending pipes, H H, their chambers, Z, and the oven flue space or chamber I, and its escape flue or passage.

2d, I also claim the combination and arrangement of the flanges, k l m n, with the dished oven or with the same, the flue space, I, the series of pipes, H, the flue space, G, the pipes, F F', the chambers, B C, and the fire chamber A.

3d, I also claim the combination as well as the arrangement of the series of holes, t t, and their covers, as set forth, with the flue space, I, the pipes, H F F', the flue space, G, and the chambers, A B C.

4th, I also claim the combination as well as the arrangement of the passages, y y, the flue space, G, the chambers, A B C, the pipes, H F F', the flue space, I, and the chamber, Z, the whole being substantially as hereinbefore explained.

5th, I also claim the combination as well as the arrangement of the flange, g, and the lining guard, b, with the grate-holding partition, c, made with a hole through it to receive a grate as specified.

66,708.—Sorghum Evaporator.—W. H. Henderson, Litchfield, Ill.

I claim, 1st, The combination and arrangement of the chimneys, B B', and their connecting trough, D, with reference to the boilers, A A1 A2, as described and set forth.

2d, The arrangement of the dampers, C C1 C2 C3, as described and set forth.

66,709.—Breech-loading Fire-arm.—A. J. H. Hilton, Boston, Mass., assignor to Joseph A. Robbins and Wm. L. Thompson.

I claim, 1st, The breech block, f h i, constructed as described, and moving obliquely to the axis of the barrel, so as to simultaneously close the breech and explode the cartridge, substantially in the manner set forth.

2d, I claim the lever, o o', operated by the forward or returning movement of the trigger guard, E, for the purpose of ejecting the empty cartridge case, substantially as described.

3d, I claim the combination of the sere spring, G, with the trigger, L L', and trigger guard, E, as and for the purpose specified.

66,710.—Window-shutter Holder.—William F. Hofman, Philadelphia, Pa.

I claim an improved shutter holder formed by the combination of the bar, F, and pieces, E and G, when said bar is formed with notches or strait parts, the plains of which are at an angle with each other, substantially as herein shown and described and for the purpose set forth.

66,711.—Railroad Chair Sleeper.—Robert M. Holland, Philadelphia, Pa.

1st, I claim a sleeper consisting of a cast-iron beam or girder, to which are connected the above-described devices or their equivalents for securing the rails to the top of the girder, and permitting their withdrawal therefrom.

2d, The girder, A, with their recesses, h, in combination with the blocks, B, and links, C, the whole being constructed and arranged substantially as described for the purpose specified.

66,712.—Vise.—A. Jameson, Trenton, N. J.

I claim the combination of the jaw, A', its hollow shank or arm, C, and screw, D, and the slotted jaw, A, and nut, E, when the latter is arranged within the slot or opening in the jaw and connected to the same as described

66,713.—COMBINED COTTON SEED PLANTER AND FERTILIZER DISTRIBUTOR.—James Johnson, Northampton County, N. C.

1st, The combination of the teeth, G, and plows, H, with the adjustable drag bars, E, and rollers, R, as herein described and for the purposes set forth.

2d, I also claim the arrangement and combination of the hoppers, C, with their adjustable slides, D, and operated by the lever, J, as herein described and for the purposes set forth.

3d, I also claim the vibrating apron, S, with its diverging grooves, for the purpose of sowing broadcast.

66,714.—ROUNDABOUT TOY.—F. H. Keeney, Newport, Ky.

I claim a "Roundabout" or Flying Dutchman, substantially as described, and adopted to be propelled by the rider or riders by means of one or more cranks and pinions.

66,715.—BROOM HEAD.—Elisha Kelley, Locust Grove, Ohio.

I claim the construction of wire racks in combination with hinged or permanently fixed casings or sides, substantially in the manner and for the purpose as herein set forth.

2d, The combination of the stay with the wire racks, substantially in the manner and for the purpose as herein set forth.

66,716.—MACHINE FOR DRESSING STONE.—Francis L. King, Worcester, Mass.

1st, I claim the self-adjusting spindles, K, and their holders, H, for rotating the upper stone, in combination with the reciprocating bed, C, for carrying the lower stone, when constructed, arranged and operating substantially as set forth.

2d, The combination of the boxes, N, and rotating collars, L, with the sliding spindles, K, constructed and operating essentially as and for the purpose specified.

3d, The self-adjusting frame, S, carrying the lower journal box, N L, in combination with the spindle, K, and holders, H, operating substantially as and for the purpose described.

66,717.—CORN CULTIVATOR AND POTATO PLOW.—John Kurtz, Clinton Township, Pa.

I claim, 1st, The slotted side pieces, B B, with their top and bottom bars or plates, C C, and adjustable uprights, E E, as arranged and combined with the reversible plows, H H, as herein described and for the purposes set forth.

2d, I also claim the slotted side pieces, B B, with their bars, C C, for the purposes set forth.

66,718.—APPARATUS FOR SIFTING COAL.—Samuel Langmaid, Lawrence, Mass. Antedated June 28, 1867.

I claim the pivoted tilting box, A, constructed substantially as shown and described, in combination with the gate, E, crank shaft, F, cams, G, and inclined screen, H, with or without the springs, h, the whole arranged to operate substantially as and for the purpose set forth.

66,719.—CUTTER HEAD FOR PLANING MACHINES.—Henry A. Lee, Worcester, Mass.

I claim a matcher head constructed in the peculiar manner above described and as shown in the drawings, so that it may be used equally well in lieu of either a closed or an open matcher head, as and for the purposes set set forth.

66,720.—MOP WRINGER.—Augustus S. Lesner (assignor to himself and A. L. Noyes), Boston, Mass.

I claim the arrangement in connection with a pail or bucket placed upon a platform, as shown, of levers, e, carrying rolls, f f', and attached to treadle, C, by links, d, all operating together with each other and in combination with the reaction spring, h, as and for the purpose described.

66,721.—STEAM ENGINE.—Henry O. Lothrop, Milford, Mass.

1st, I claim the combination or mechanism whereby the two rods, F F, of the engine pistons are enabled to effect rotary motion of the crank, N, or its shaft, O, as set forth, such combination consisting of the cross head, c, the slide or carriage, R, the connecting rods, G H, and shaft, K, the lever, I, the arm, L, and the connecting rod, M, the whole being arranged and applied together, substantially as specified.

2d, I also claim the mechanism or combination by which the piston is kept stationary for a period during the passage by and beyond the dead point of the crank, such being for the purpose hereinbefore described, consisting in the stationary cam plate, S', and the sliding and studded crank, N, constructed and applied together, and to the standard, Q, and the shaft, O, substantially in the manner and to operate as specified.

3d, I also claim the combination of such mechanism or its equivalent with one or more cylinders, their piston or pistons, and a crank so connected with the piston or pistons as to be capable of being revolved thereby.

4th, I also claim the combination or mechanism for supplying steam to and discharging it from the cylinder and its three pistons, as specified, the said mechanism consisting of the two rotary valves, U U', their cases, T T', and inlet and exhaust chambers, i g, and ports, constructed and arranged together, and with the pistons and cylinder, substantially in manner and so as to operate as specified.

66,722.—PLATFORM SCALES.—C. C. Lyman, Edinboro', Pa.

I claim, 1st, The rack, F, inclined planes, E, and cog wheel, K, as arranged in combination with the platform, B, for the purpose and in the manner as set forth.

2d, The grooved pulley, J, and rope, L, or its equivalent, as arranged and operating the pulley, J, in the manner and for the purpose described.

3d, I claim the use of inclined planes or their equivalents, for the purpose of raising and lowering the platform, substantially as specified.

66,723.—BRICK MACHINE.—Gaylord Martin, (assignor to himself and George Burham,) Milwaukee, Wis.

1st, I claim revolving grate F', cutters G', and rollers H, in combination substantially as and for the purpose described.

2d, Adjusting nut H, screw M, slide G, pitman F, yoke I, slide L, and follower K, in combination substantially as described.

3d, Followers K, when made with pipes K', substantially as described.

4th, Jointed lever Q, shaft R, lever S, cams T, and weights X, in combination for the purpose of holding the stove door shut against any ordinary pressure, and when the stove door is opened by extraordinary pressure to lower the platform at the same time, and to shut the door and raise the platform simultaneously when the extraordinary pressure is relieved.

5th, Lowering platform U, simultaneously with opening stove door P, and closing said door and raising the platform automatically substantially as described.

6th, Slide C', jointed lever D', rocker shaft B', slotted lever A', pitman Z, and roller E', in combination with crank and crank shaft Y, substantially as and for the purpose described.

66,724.—GLOBE VALVE FOR STEAM ENGINES.—E. C. Mayer, and Jacob Ruppenthal, St. Louis, Mo.

We claim the valve case B, and the valve D, when combined with the globe A, in the manner and for the purpose set forth.

66,725.—COMPOUND FOR DESTROYING INSECTS.—A. McDougall, (assignor to McDougall Brothers,) Manchester, Eng.

I claim the employment of and use of the oil obtained (after the naptha or spirit has been removed) in the distillation of tar resulting from the destructive distillation of carbonaceous substances or of any of the constituents of this oil, in combination with an alkali or an alkaline earth, and with fatty or other saponifiable substances, and with an acid hereinbefore described as a dressing for sheep or other animals to destroy or to protect them from vermin or insects, or as a soap for disinfecting or clearing purposes, and as a protection to the skin from the attack of insects and when such oil or any of its constituents after treatment with an acid, is combined with an alkali or alkaline earth. I employ the same as a material for the disinfection of foecal sewage or other matters and the destruction of entozie paracites contained therein or for the destruction of entozie paracites or vermin in soils.

66,726.—PRINTING PHOTOGRAPHS.—Carl Meinerth, Newburyport, Mass.

I claim the interposition of any transparent medium, or a mat between the negative film and the printing surface, for the purpose of producing the effect as shown in the enclosed specimens.

66,727.—WEATHER STRIP.—Joseph Miller, Alliance, O.

I claim supporting the weather strip C, to the door in the groove by means of the brackets D, provided with the lip a, combined in the manner and for the purpose substantially as set forth.

66,728.—LACER FOR KNEE BRACES, ETC.—Joshua Monroe, (assignor to himself and Gardner,) New York City.

I claim a lacer for knee braces, artificial limbs and splints which is made in two parts connected by lacing strings or other suitable adjustable fastenings in front and in the rear to operate in combination with the joint C, and socket B, substantially as and for the purpose described.

66,729.—HINGES.—George R. Nebinger, Lewisburg, Pa. Antedated July 5, 1867.

1st, I claim a hinge consisting of the wings A and B, in combination with the plates C, constructed and arranged as shown and described.

2d, The arm a attached to the pin that unites the wings and having the shoulder e, thereon, as and for the purpose set forth.

66,730.—HORSE HAY FORK.—D. F. Neikirk, Republic, O.

I claim the hay fork with curved or angular tines, a central support D, a bail which affords end supports and to which the hoisting rope is attached and a pivoted connection which passes through the fork at a point near the curve or at the angle of its tines when such fork has its spring catch arranged on its central support D, and also has a loop E, attached to or formed on the bail, all of the said parts being arranged and operated substantially in the manner and for the purpose herein described.

66,731.—WASHING MACHINE.—Ingwer P. Nissen, Davenport, Iowa. Antedated March 12, 1867.

I claim the combination of the sides B, the zinc bottom C, with the braces D, and triangular ribs K, when the same is pivoted and hung upon the standards A, as and for the purpose specified.

66,732.—ARTICLE OF FOOD FROM OYSTER JUICE.—Butler G. Noble, New York City.

I claim the extract of oyster as a new article of manufacture, the same being the natural juice or liquor of the oyster, concentrated by evaporation to a state of dryness, substantially as and for the purposes herein set forth.

66,733.—CAR COUPLING.—A. V. B. Orr, Steeleville, Pa.

I claim in an automatic car coupling the combination of the stop D, with the spring S, and the link supporting device a, with its spring g, all constructed, arranged and operating as described for the purpose set forth.

66,734.—STOP MOTION FOR LOOMS.—W. Pilkington, Frankford, Pa., D. Pilkington, Chester, Pa.

1st, We claim the combination of the fork f, lever s, finger b, and stand a, constructed and operating as and for the described purpose.

2d, We claim the combination of the swell c, lever e, and lever s, as and for the above described purpose.

66,735.—WATER WHEEL.—Frederick Post, Plano, Ill.

I claim the cap E, in combination with wheel g, having buckets h, and I, the latter being curved downward at the bottom, the whole being arranged substantially as and for the purposes set forth.

66,736.—GOLD WASHER.—I. F. Quimby, Rochester, N. Y.

1st, I claim passing the gold bearing sand or other material to be washed through an upward or counter current of water for the purposes herein shown and described.

2d, The employment of the agitator, constructed, arranged and operating in combination with the tubes E, C, and G, substantially in the manner and for the purposes set forth.

3d, The water box B, when constructed arranged and operating conjointly with the deposit chamber A, and the supply or induction tube T, and the vertical discharge pipe, G, for the purposes set forth.

4th, The general construction and arrangement of all the parts, substantially in the manner and for the purposes herein shown and described.

66,737.—BARREL STAVE JOINTER.—M. Randolph, St. Louis, Mo., assignor to himself and J. S. Todd.

1st, I claim the automatic feeding grippers, F', f f1 f2 and f3, for the purpose of conveying staves to and from the jointing knives, substantially as described.

2d, I claim the jointing knives, G and G', when arranged in combination with the table, A', and the feeding grippers so as to allow two staves to be jointed on opposite edges simultaneously and at one stroke or revolution of the machine.

66,738.—CHARCOAL FURNACE.—A. J. Redway, Cincinnati, O.

I claim the combination with the shell or body, A, having interior flues or channels, a a, and air inlets, I I', at its opposite sides of the detachable grate or fire basket, E e, having a crenulated edge, f f, perforations or calliducts, F, and air openings, G G, all as herein described and for the purpose set forth.

66,739.—IMPLEMENT FOR WAGONERS.—John Richards, Washington, D. C.

I claim the improved implement for wagoners constructed and arranged substantially as herein described and for the purposes set forth.

66,740.—WASHING MACHINE.—Milo A. Richardson, (assignor to himself and Alva F. Jennings,) Sherman, N. Y.

1st, I claim in combination with the wash tub, A, the washing apparatus, constructed substantially as described, centrally attached to the bottom thereof when in use, and readily removable when not required, substantially as set forth.

2d, I claim the series of bed rollers, D D, spirally grooved in alternating directions in combination with the driving rollers, C, arranged and operating substantially as set forth.

3d, I claim a convex surfaced roller, C, provided with serrate grooves as described the bed of which are parallel, and not with the surface thereof, substantially as and for the purposes set forth.

4th, I claim the hook headed spring connections of the heads, e, shanks, I, and coiled springs, h, for holding the working roller adjustably in its bearings and permitting ready disconnection therefrom substantially as set forth.

5th, In combination with the washing machine as described, I also claim the device for clamping the frame, B, to the tub, consisting of the bent bolt P, clutch block, Q, and thumb screw, t, arranged and operating substantially as set forth.

66,741.—HAY RAKE AND LOADER.—F. M. Robinson, and T. G. Springer, Conneautville, Pa.

1st, We claim the hooked or bent spring teeth, d, applied to the revolving drum D, guided by means of bars C, and acted upon at proper times so as to leave the hay upon the endless carrier G, by means of rods, g, and cams or inclined bars, E', substantially as described.

2d, The hooked or bent spring teeth, d, applied to a revolving drum D, guided by means of bars, c, and acted upon at proper times so as to leave the hay upon the endless carrier G, by means of rods, g, and cams or inclined bars, E, substantially as described in combination with the spring rake, E, the teeth of which are arranged so as to rake up the hay and also serve as guards for the spring teeth, d, in elevating hay, substantially as herein specified.

3d, The hooked or bent spring teeth, d, applied to revolving drum, D, guided by means of bars, c, and acted upon at proper times so as to leave the hay upon the endless carriers, G, by means, substantially as described, of communicating a rapid rotary motion to said drum, D, so that the speed of this drum shall be greater than that of the driving wheels substantially as specified.

66,742.—PROPELLER.—Henry Rolle, Boston, Mass.

I claim the combination with the blades, c, and bars, b, of the long and short armed double cranks, D D', and cranks, F F', the whole being arranged for operation and for the purposes set forth.

66,743.—GRATE FOR STOVES.—J. J. Savage, Troy, N. Y.

1st, I claim a fire grate for stoves composed of a curved or angular formed lifting and hold back a grate part, D, having side or end pieces, G G, and suspended within the fire box by journals, F F, or their equivalents in such manner that it may swing upward for the purpose herein set forth, and having arranged to operate in combination therewith a horizontal grate part, C, which jointly with said grate part, D, constitutes said fire grate in manner substantially as herein described and operating for the purpose set forth.

2d, I claim the arrangement in combination with the fuel reservoir of stoves and front fire grate part C, thereof, of a lifting and hold back grate part, D, constructed substantially as described and arranged in such position thereto respectively as to operate for the purpose and in manner as herein set forth.

3d, In combination with a fuel reservoir of stoves and fire box thereof, I claim a lifting and hold back grate part, D, arranged in connection with a dumping or tilting grate part, C, in such manner as to be operated simultaneously by and with the same, as and for the purpose herein set forth, said grate parts respectively being constructed substantially as described.

4th, I claim the combination of a lifting and hold back grate part D, with a dumping or tilting fire grate part, C, constructed and arranged to operate by and in connection with each other in manner substantially as shown.

5th, In combination with a lifting and hold back grate or plate, D, and a fire grate, C, I claim a lifter arm, L, arranged substantially in manner as herein described and for the purpose set forth.

66,744.—ARTIFICIAL LEG.—F. Schmitt, Springfield, Ill.

1st, I claim constructing the upper and lower portions of an artificial leg, A and B, or either of them, of alternate strips of thin wood and cloth, substantially as and for the purposes specified.

2d, The pivot, 5, of the ankle joint, when located centrally as respects the length of the foot, and constructed and operating substantially as described.

3d, The combination and arrangement of the tenon, D, plate, 6, hinge rod, 5, and springs, 2 and 3, with the foot, C, and lower portion of the leg, B, forming the ankle joint, when constructed and operating substantially as specified.

4th, The combination and arrangement of the spring strap, 1, knee opening, f, calf opening, h, rule joint, 7, and cords or lacing, 9, with the upper portion, A, and lower portion, B, of the leg, forming the knee joint, when constructed and operating substantially as and for the purposes specified.

66,745.—TRENCHING AND HOISTING APPARATUS.—Albert G. Smith, Cleveland, Ohio.

1st, I claim the buckets, H, provided with the tilting straps, c, when arranged and operated conjointly by the pulleys, I, ropes, J and N, cranes, D E F, and windlass, L, as and for the purpose set forth.

2d, The pulleys, a a', paws, M, as arranged and operating conjointly and in combination with the cranes, D E F, and buckets, H, in the manner and for the purpose described.

3d, The cranes, D E F, in combination with the frames, A B, and rollers, Q, for the purpose and in the manner set forth.

4th, The combination of a movable frame with one or more cranes and hoisting apparatus, so arranged over the ditch or channel being excavated that the cranes and hoisting apparatus will be self sustaining with said frame, when operating conjointly in the manner and for the purpose set forth.

66,746.—SHIFTING TOP FOR CARRIAGES.—Antoine Soursin, St. Louis, Mo.

I claim the combination and arrangement of the seat, A, its loops, a, and the knobs, a', the shifting rail, B, substantially as set forth.

66,747.—MACHINE FOR ADJUSTING CARRIAGE TOP BOWS.—Antoine Soursin, St. Louis, Mo.

1st, I claim an adjustable frame work, E E', when applied to a carriage body or seat in such a manner as to form a false work or frame on which to place and adjust the carriage bows or hoops preparatory to fixing the said hoops on the vehicle, substantially as herein described and set forth.

2d, I claim the bed plates, A A1 A2, when combined and arranged substantially as herein set forth, for the purpose of adjusting the machine laterally and longitudinally on the vehicle to which it is applied.

3d, I claim the posts, D, when combined with the pendulous posts, D1, and the adjusting arms, D3, as herein described and set forth.

4th, I claim the graduated beams, E, in combination with the beams, E1 and D, and the screws, E2 and e, as and for the purpose set forth.

5th, I claim the sliding stick I I' when constructed and employed as and for the purpose set forth.

66,748.—SULKEY PLOW AND TOBACCO HILLER ATTACHMENT.—James L. Spencer, Wellville, Va.

1st, I claim the combination and arrangement of the plows, G G1 G2 G3, with the arms, M M1, the rods, m1 m1, and the arms, I I, substantially as and for the purpose specified.

2d, The roller, L, having the short arms, l l, adjustable in position, and having the handle, H, substantially as and for the purpose described.

3d, The pole, T, having the shovel, t, and the blunt arm, t1, substantially as and for the purpose specified.

4th, The combination of the gear wheel, P, the pinion, g, the lever, R, the shaft, Q, bearing the wheel, S, and the pivoted pole, T, bearing the shovel, t, and the blunt arm, t1, substantially as and for the purpose described.

66,749.—APPARATTS FOR CARBURETING AIR.—J. H. Springer and John C. McDonald (assignors to themselves, Richard G. Howell and George Stiles), Philadelphia, Pa.

1st, We claim the perforated air tubes constructed, arranged, and operating as described.

2d, The combination of two carbureting chambers separated by a diaphragm traversed by air tubes, substantially in the manner described.

3d, The combination of the oil chambers and tank with the perforations, e, and shield, F, arranged and operating as and for the purpose described.

66,750.—EVAPORATING PAN.—Enoch E. Stubbs and Thos. C. Davis, West Elkton, Ohio.

1st, We claim the skimming apparatus consisting of the trough, v, and tube, x, in combination with trough, w, and strainer, z, arranged at the elevated end of the pan, K, for draining the syrup from the extraneous matter, in the manner and for the purpose described.

2d, The spring catches, l l, arranged in the manner described upon the pan, B, to act in connection with the projecting edge of turntable, a, for holding the granulator and cooler, D, in position, in the manner and for the purpose specified.

66,751.—MAGAZINE FIRE-ARM.—E. L. Sturtevant, Boston, Mass.

1st, I claim the combination with a sliding breech or recoil block of a cartridge carrier, held in and actuated by but not forming part of said breech block, under such an arrangement that the breech block in its sliding movement shall cause the raising and lowering of the carrier, as herein specified.

2d, I also claim the carrier, c, in combination with the sliding block, C, and its groove or recess, s, for raising the cartridge into line with the barrel, as well as for expelling the empty shell, essentially in manner and to operate as explained.

3d, I also claim the employment of the carrier, c, and its spring, for the combined purpose of raising the cartridge and at the same time keeping back the supply of cartridges within the magazine, substantially as described.

4th, I also claim the peculiar mode of connecting the guard lever, D, to the sliding block, C, viz., by the dovetailed groove, l, and studs upon the lever, in manner and for the purpose as explained.

5th, I also claim the peculiar formation of the grooves, l l, whereby the cartridge carrier, c, is caused to rise and elevate the cartridge, and substantially to guide the carrier and cartridge forward in a line with the bore of the barrel, essentially as explained.

66,752.—APPARATUS FOR WARMING WATER BY PETROLEUM LAMP.—Charles C. Tainter, Springfield, Ill. Antedated June 26, 1867.

I claim the lamp, I, in combination with the air pipes, D D, and eduction pipes, C C C, when arranged to operate in vessel, A, in combination with boiler, H, as shown.

66,753.—MILK STRAINER.—Sidney Van Auken and James H. Graham, Binghamton, N. Y.

We claim the frame, A, and the mode of attaching it to the pail, in combination with the detachable strainer, G, and the spring, H, all constructed substantially as herein described and represented, for the purpose set forth.

66,754.—CLAMP FOR FILING SAWS.—E. E. Van Etten, Mount Morris, N. Y.

I claim the arrangement of the swiveled clamps, C D, the set screws, h g, key hole socket, r, and the groove, q, constructed and operating in the manner and for the purpose specified.

66,755.—HOOKS FOR WATCH CHAINS.—Antony Wallach (assignor to himself and Adolph Wallach), New York City.

I claim the hooks, a and b, united by the joint pin, c, in combination with the saddle, d, and swivel, as specified.

66,756.—ROCK DRILL.—Wm. Weaver, Phœnixville, Pa.

1st, I claim the drill rod, D, nut, N, and spring, k, bearing on the nut, in combination with the within-described devices or their equivalents, for first turning the nut on the drill rod and then elevating and turning both together, the whole being constructed and operating substantially as and for purpose specified.

2d, The drill rod, D, nut, N, with its projections, l, in combination with the shaft, L, and its peculiarly bent arms, s s, the whole being arranged and operating substantially as and for the purpose described.

3d, The tube, d, arranged in respect to the rod, D, and nut, N, substantially as and for the purpose set forth.

4th, The nut, N, consisting of two adjustable disks, l l', an intervening elastic washer, e, and set screw, 3, or its equivalent.

5th, The adjustable plate, l, or its equivalent, in combination with the spring, k, for the purpose as described.

6th, The combination of the frame, C, platform, A, legs, B, and bars, a2, the whole being constructed and arranged for adjustment substantially as set forth.

7th, The grove, e, in the rod, D, and set screw, 3, combined and operating substantially as set forth.

66,757.—STEAM GLOBE VALVE.—Joseph H. Webster (assignor to himself and John Kupferle), St. Louis, Mo.

I claim the bonnet, E, constructed with a blank end on the shank, H, and arranged in relation to the valve, valve stem, and seat, substantially as described, for the purpose specified.

66,758.—METALLIC PACKING FOR PISTON RODS.—Joseph H. Webster (assignor to himself and John Kupferle), St. Louis, Mo.

I claim in combination with the stuffing box, the solid alloy packing, c, when made of an oblong form and and arranged in relation to the stuffing box, rod, and gland, so that the screwing down of the latter will contract the two ends of the packing around the rod, as shown and described.

66,759.—DEVICE FOR CLEANING GRAIN.—P. G. B. Westmacott, Elswick, Newcastle upon Tyne, Eng. Patented in England Nov. 21, 1866.

I claim arranging machinery for conveying and treating corn, grain, or other articles in bulk, substantially as hereinbefore described, and especially with a rapidly traveling band on to which the grain is delivered down an incline or shoot, in such manner that the material when it comes upon the band may be traveling approximately in the same direction and at the same speed as the band.

I also claim the bending up the band into a tray-like form, at the point where the grain or material is fed on to it, substantially as herein described.

I also claim the arranging the said machinery in such manner that the carrying band may be deflected at any point where it is desired to remove the grain or material from it in such manner as to cause the grain or material to leave it and shoot forward into a guide trough or shoot by which it is led away, substantially as herein described.

I also claim the cleansing of corn, grain, or other articles by throwing it off at such a velocity from the band that the lighter particles and dust are by the resistance of the air separated from the bulk, substantially as herein described.

I also claim the arranging the said machinery in such manner that by deflecting the carrying band it may be caused, where desired, to give motion to a transverse band, or to distributing and conditioning apparatus, substantially as herein described.

I also claim the distributing and conditioning corn, grain, or other article by causing it to descend on to the cone or instrument with radial arms rotating on a vertical axis, substantially as herein described.

66,760.—CARRIAGE CURTAIN BUTTONHOLE.—Edwin L. Yancey, Utica, N. Y.

I claim the plates, A B, arms, G, and slide, D, as arranged in combination with the curtain, I, for the purpose and in the manner as set forth.

66,761.—CARRIAGE CURTAIN BUTTONHOLE.—Edwin L. Yancey, Utica, N. Y.

I claim the plate, C, provided with the arms, D E, and cap, H, as arranged in combination with the curtain, G, for the purpose and in the manner as set forth.

66,762.—BRUSH.—Albert A. Young (assignor to himself and George T. Dalton), Boston, Mass.

I claim the combination and arrangement of the handle, C, the shank, a, and its groove, b, with the metallic plates, d d, the set screw, e, and the pivot, e, whereby the handle is reversed with reference to the body of the brush, substantially as described.

66,763.—MACHINE FOR CUTTING DOVETAILS.—Calvin Young, Auburn, N. Y.

I claim, 1st, The combination of a hollow chisel two of the sides of which are parallel but of unequal length, and the remaining two sides of which are not parallel but are of equal length, and one or more augers working in or through said hollow chisel, for the purpose of cutting dovetails, substantially in the manner described.

I also claim in combination with two chisels whose cutting edges are held together by a spring or yielding attachment, the studs or pins which when moved into the path of the chisels cause them to spread laterally for the purpose of cutting down the back wall of a dovetail and cleaning out the corners or underneath portions, substantially as described.

66,764.—FARM GATE.—Isaac N. Young, Swann, Ind.

I claim the gate above described, having the movable bars, c c', the slotted uprights, D D D, the bolt and nut, e, the flanged balance bar, F, the three rollers, g g g, and the pin, p, all constructed and arranged substantially as and for the purpose specified.

66,765.—CLOVER THRASHER, HULLER, AND CLEANER.—Isaac N. Young, Swann, Ind.

1st, I claim the adjustable pick, G, working in the movable bearings, y y, substantially as and for the purpose described.

2d, The drums, g g', connecting or disconnecting with each other when in motion by the ratchet and pawl, substantially as and for the purpose specified.

3d, The combination and arrangement of the thrasher, B, the beater, F, the apron, E, the pick, G, the straw carrier, H, the table, W, the huller, I, the fan, K, the cleaning selves, L L, and the elevator, O, all constructed and arranged substantially as and for the purpose specified.

66,766.—WOOD SCREW.—Solomon W. Young (assignor to himself and J. W. Hoard), Providence, R. I.

As a new article of manufacture, I claim a gimlet-pointed screw having one or more grooves or indentations in the shank and thread thereof in the plane of, but obliquely to the axis of the said shank, that is to say, having the grooves formed between the point and cylindrical part of the shank, substantially in the manner and for the purposes set forth.

66,767.—BREAKING AND CLEANING HEMP.—Henry Zellner, Columbia, Tenn.

1st, I claim the combination of the beater, G, having the slats, g g, with the endless apron, F, having the slats, i i, substantially as and for the purpose described.

2d, The combination of the beater, G, pitmans, K K, crank shaft, I, idle wheel, O, cog wheel, P, shaft or roller, f,' and apron, F, for the purpose of adjusting the motion of the apron, F, to that of the beater, G.

3d, The arrangement of the rapidly moving apron, F, in combination with the slowly revolving feed rollers, d', F, substantially as and for the purpose specified.

66,768.—COMBINED SEED SOWER AND ROLLER.—Henry Zellner, Columbia, Tenn.

I claim the combination and arrangement of the roller, C, arms, D D, roller, G, pitmans, H H, and the vibrating agitator or slider, I, of a seed box, B, substantially as and for the purpose described.

66,769.—SOAP DISH.—Calvin Adams, Pittsburg, Pa. Antedated July 9, 1867.

1st, I claim a soap dish with two or more lugs or pins projecting from the bottom or edge of the dish in the manner, substantially and for the purpose shown and described.

2d, As an article of manufacture a cast iron soap dish in the manner substantially as shown and described.

66,770.—MATCH LIGHTER.—William Adamson, Philadelphia, Pa.

1st, I claim a match lighter consisting of a strip of paper or other material part of which is sanded or otherwise roughened, and part left plain for the purpose specified.

2d, The combination described of the sand paper, the advertising cord and strip of glass or mica.

66,771.—HARNESS SHAFT LOOP.—B. J. Aurand, Mount Gilead, Ohio.

I claim as a new article of manufacture a harness shaft loop constructed as described, consisting of the wooden or metallic ring, B, having raised flanges, a, upon its outer and inner sides between which are fitted flush with the periphery and inner circumference the continuous leather band and lining, as herein described, for the purpose specified.

66,772.—THILL COUPLING.—James Auten, Chile, N. Y.

I claim the combination and arrangement of the rubber blocks, b b, and the packing, f, with the clip made in two parts, c d, connected by bolt, E, as shown and described, and for the purpose set forth.

66,773.—PAINT COMPOUND.—D. R. Averill, Newburg, Ohio.

I claim a paint composed of the ingredients herein named and prepared and compounded substantially in the manner specified.

66,774.—PLOWS.—B. F. Avery, Louisvill, Ky.

1st, I claim the cast standard skeleton, D, constructed substantially in the manner herein shown and described, and for the purpose set forth.

2d, The point, F, and arm, f', constructed and attached to the skeleton, D substantially in the manner herein shown and described.

3d, the brace bar, G, constructed with lugs, g' and g2, and secured to the mold board, E, handle, C, and landside of the skeleton, D, substantially in the manner herein shown and described and for the purpose set forth.

66,775.—WASHING MACHINE.—J. G. Bailey, Hillsdale, Mich

1st, I claim the combination of the small roller, I, and apron, J, with the fluted cylinders, B and D, and with the box, A, substantially as herein shown and for the purpose set forth.

2d, The combination of the springs, E, and levers, F, with each other and with the journals of the roller, D, and box, A, substantially as herein shown and described and for the purpose set forth.

66,776.—PRINTERS GALLEY.—J. W. Baker, Warsaw, Ind.

I claim a printers galley having the detachable end piece, A, in combina-

tion with the adjustable side stick, c, operated substantially as shown and described.

66,777.—Apparatus for Carbureting Air and Gas.—J. F Barker and C. N. Gilbert, Springfield, Mass.

1st, We claim the heating of the fluid of any carburetor used for the purpose of carbureting air or gas, by means of a heated fluid, the same being circulated in pipes and radiators through the carburetor and heater, substantially as herein described and set forth.

2d, The heater, B, having a case, B', filled with a non-conducting substance, and the coil, n', when used in combination with radiators placed inside a carburetor, substantially as herein described and for the purpose set forth.

3d, We claim in combination with a carbureting apparatus, a condenser, substantially as herein described, so as to cool the gas after being carbureted and before it passes into the distributing pipes for the purpose hereinbefore specified.

4th, We claim the use of the condenser, C, in combination with the carburetor, A, the radiators, c and T, and the heater, B, when constructed substantially as described and for the purposes herein specified.

5th, The valve, H h, in combination with the pipe, s, radiators, c and T, and carburetor, A, all constructed substantially as described and for the purpose herein specified.

6th, The heater, B2, having the space, O, between the two cylinders, l and l' with the inverted cone, n, having its base open and attached to the upper part of said cylinder, l, so that the interior of said inverted cone, n, shall communicate with the space, O, all constructed and operating substantially as herein described and set forth.

66,778.—Gate.—U. N. Bardsley, Goshen, Ind.

1st, I claim pivoting the large gate, F, at its middle part to the forward end of the small gate, A, the rear end of which is hinged to a gate post in the ordinary manner substantially as herein shown and described and for the purpose set forth.

2d, The combination of the arms, B, and rod, C, with the gates A and E, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the rod, K, with the rear ends of the gates, A and E, substantially as herein shown and described and for the purpose set forth.

4th, Securing the bottom board, e', of the gate, E, removably in place by the bolts, N and O, substantially as herein shown and described and for the purpose set forth.

66,779.—Ice Pitcher.—William Bellamy, Newark, N. J.

1st, I claim an ice or double walled pitcher provided with two lids hinged to the top of the pitcher at opposite or different points, substantially as and for the purpose specified.

2d, The spout, G, placed between the two walls and communicating with the bottom of the pitcher and the nozzle or spout thereof, substantially as and for the purpose set forth.

66,780.—Mode of Attaching Calks to Horse Shoes.—W. J. Berne, Cincinnati, Ohio,

I claim adjustable calks which may be applied to ordinary horse shoes without removing the latter, by means of the socket, A, toe piece, B, cross piece, D, and straps, C, substantially as described.

66,781.—Hammer Head.—Robert Black, Holyoke, Mass., assignor to himself Martin Devinny and John Murphy, Chicopee, Mass. Antedated July 7, 1867.

I claim as a new article of manufacture a hammer head constructed of the parts, A and B, the part, B, being cast and attached to the part, A, substantially in the manner and for the purpose described.

66,782.—Joint for Iron Pipes.—E. G. Blakslee, Sing Sing, N. Y.

1st, What I claim is the joint for cast iron pipes formed by a socket with two enlargements at one end of a length of pipe receiving the end of the next length of pipe and made tight by the packing, d, as set forth.

2d, I also claim forming the packing for the joints of cast iron pipes of a ring of soft metal cast in a separate mold and calked or driven into the joint as set forth.

66,783.—Flour Bolt.—S. H. Blossom, Buffalo, N. Y., and J. E. Huston, Hillsdale, Mich.

1st, We claim the bolts, C and E, constructed, arranged and operating as described to separate the feed from the meal, and the flour from the midlings consecutively.

2d, The secondary chamber, p, employed in combination with the chamber, p', as and for the purposes set forth.

66,784.—Attaching Thills.—Charles Boyton, Lyons City, Iowa.

I claim the spring or rigid piece of metal, C, the packing, H, and the adjustable bolt, F, when constructed, arranged and operating substantially as and for the purposes above set forth.

66,785.—Converting Iron into Steel.—J. F. Boynton, Syracuse, N. Y.

1st, I claim in carrying the above described method into effect, the use of hydrocarbon gas surcharged with carbon by passing it through a carbonizing vessel and mixing or combining it with hydro-carbon vapors by any known means of producing that result.

2d, I also claim in carrying the above described method into effect, the use of other gases hereinbefore mentioned, when charged with hydro-carbon vapors.

3d, I also claim in carrying the above described method into effect, the use of atmospheric air charged with hydro-carbon vapors by any know means of producing that result.

4th, I also claim in carrying the above described method into effect, the heating of heavy hydro-carbons to cause their vapors more readily to mix or combine with the gases or air, and be carried forward therewith.

5th, I also claim melting iron or the nitro-carbonized compound after it has been converted into steel by the above described method and thereby converting it into cast steel as described.

6th, I also claim in carrying the above described method into effect, the use of hydro-carbon vapors without admixture with gas or air, as and for the purpose set forth.

7th, In carrying into effect the method herein described, of converting iron into steel, I claim coating a portion of any piece of iron with a wash as described, to prevent the portion so coated from being converted into steel.

8th, I also claim converting the oxides of iron directly into steel by one heating, by passing carbureted or carbonized hydrogen gas over and through the same when in a highly heated state according to the method or process therein described.

66,786.—Mode of Drying and Purifying Air for Preserving Animal and Vegetable Substances.—Edwin D. Brainard, Albany, N. Y.

1st, I claim the improved method of drying and purifying the air in a close chamber at a low temperature for preserving animal and vegetable substances, substantially as herein described.

2d, The condenser, C, the collecting vessel, D, the pipes, a b, and the overflow box, c, or the equivalents of them or either of them in combination with a close chamber, A, when arranged to operate substantially as and for the purposes herein described.

66,787.—Plow.—T. E. C. Brinley (assignor to himself and J. G. Dodge, Louisville, Ky.

1st, I claim the standard and landside cast in a single piece and provided with the flange, C, constructed as described.

2d, A plow consisting of the flanged standards as above described in combination with a separate mold board and point of cast iron as set forth.

3d, A plow consisting of the flanged standard as described in combinotion with a mold board and point made separately of steel as described.

66,788.—Shaving Cup.—G. P. Brooks and James McGrady, Boston, Mass.

We claim the within described shaving mug, A, with its soap receptacle, B, substantially as described.

66,789.—Attaching Thills to Vehicles.—J. D. Brunner, Doylestown, Pa.

I claim the bar, A, provided with the slot, o, as herein described when used with the head, D, and bolt, E, in the manner and for the purposes specified.

66,790.—Fire-proof Safe.—H H. Bryant, Boston, Mass.

1st, I claim a safe or similar structure provided with chambers or vessels for holding water or other suitable liquid and inclosed within an outer chamber or jacket for receiving the steam and vapor discharged from said chambers or vessels, as herein shown and set forth.

2d, The combination with one or more water chambers or vessels of an exterior steam air chamber or chambers, under the arrangement herein described so that the steam generated within the said water chambers shall be discharged through suitable vents or valves into the exterior steam chambers and thence into the open air, substantially as and for the purposes specified.

3d, Forming the walls of a safe or other similar structure of an inner water or other liquid compartment and an outer air or steam chamber communicating with each other and with the exterior of the structure as and for the purposes herein shown and set forth.

4th, In a safe or other suitable structure I claim the combination with a water chamber of suitable construction of a flexible tube and float or buoy, for conducting the steam from said chambers, as herein shown and described.

5th, The combination and arrangement with the steam and water chambers of the vents or valves for the eduction of steam from said chambers and for the introduction of the liquid into the water chamber, substantially as shown and set forth.

6th, The combination with the body of a safe or similar structure of ordinary or suitable construction of a door in which air or steam and water compartments are arranged as herein specified, the said compartments being provided with vents or valves arranged to discharge the steam generated in the water chamber, in the manner described.

66,791.—Tellurian.—S. P. Campbell, Buffalo, N. Y., assignor to himself and Francis M. Loring, Gloucester, Mass.

1st, I claim the elliptical guide way, Q, in combination with the stud, L, and operative mechanism of the instrument for the purpose of illustrating the ellipticity of the earth's orbit.

2d, The horizontal circle, p, constructed in two parts and graduated as described in combination with the globe of a tellurian.

3d, The traveler, D, and plate, K, having the connection and movements described in combination with the stud, L, grand wheel, G, guide way, Q, and cup, Y, or its equivalent, for the purpose of giving an orbital movement to the globe without changing the direction of its pole,

4th, In combination with the globe of a tellurian the elliptic plane or dial a u, constructed with an elliptical channel, as shown and described.

5th, The transparent zodiacal ring, v, as set forth and described.

6th, The dial, P, of a tellurian marked with the line of apsides, the equinoxial and solstitial lines, the months, the table of the equation of time, the signs and constellations of the zodiac, and the effect of the precession of the equinoxes, as set forth and described.

7th, The traveler, D, provided with the shaft, H, pinion, J J, and racks, B B, or their equivalents, in combination with the plate, K, stud, L, and guide way, the whole operating as set forth to produce an illustration of the orbital movement of the earth,

8th, The grand wheel, G, and elliptical rack, E, in combination with the barrel, V, with its lower pinion and the wheel, W, at its upper end, for the purpose set forth.

9th, The grand wheel, G, elliptical rack, E, in combination with the barrel, V, with its lower pinion and the wheel, W, secured at its upper end the train, I, and moon wheel, X, for the purpose set forth.

10th, The wheel, X, with the arm, l, in combination with the arm, t, and inclined flange, w.

11th, The plate, U, provided with the index, y, in combination with the plate, s, and grand wheel, G, as set forth and described,

66,792.—Washing Machine.—W. L. Camp, Holden, Mass.

I claim the combination of the revolving disk, D, having grooved floats, E, attached to it, each float being at a different distance from the center with the tub, A, having capped wings, F G, attached to it, substantially as herein shown and described and for the purpose set forth.

66,793.—Hop Press.—Newel Carpenter and James Hutchinson, White Creek, Wis.

We claim a novel arrangement for applying lever power to press hops or similar substances consisting of the blocks, F, provided with the dogs, e, and the hinged lever, G, provided with the flanged rollers, d, in combination with the ratchet plates, D, beams, C, and pawls, a, when arranged to operate as described.

66,794.—Corset.—M. L. Changeur, Paris, France.

I claim the corset or boddice provided with bands, A, made detachable at their one end and adjustable at the other end, arranged and operating substantially as shown and described.

66,795.—Flood or Waste Gate.—W. L. Clark, Cambria, Wis.

I claim the combination of the three gates, B B C, arranged within a flume or box, A, and connected together, to operate in the manner substantially as and for the purpose herein set forth.

66,796.—Instrument for Laying out Stair Railings.—Alexander Clow (assignor to himself and John Hendry), Erie, Pa.

I claim the herein described apparatus consisting of the standard, A, tracing arm, C, pattern, E, adjustable support, F, and foot clamp, G, arranged and operating substantially as and for the purposes herein set forth.

I also claim the combination of a trammel with the above claimed apparatus, arranged and operating substantially as and for the purposes set forth.

66,797.—Propeller.—William A. Cobb, Orange, Mass.

I claim the propeller constructed as described consisting of the frame, D, having the series of vertical paddles, E, and hung at each end upon the crank shafts, C, between the sills, A, said crank shafts connected by the crank wheels, F, and shackle bars, G, all operated directly from the engine by the driving bars, H, as herein shown and described for the purpose specified.

66,798.—Combined Instrument for Watchmakers' Use.—Charles E. Collins, San Francisco, Cal

I claim an improved instrument for watch makers' use formed by the combination of measuring gages for watch crystals, main springs, and wheel pinions, a revolving bench key and a case opener, all united and connected with one handle, substantially in the manner as herein described.

66,799.—Bridge.—G. W. Corey, Port Jervis, N. Y.

I claim the braces, a, shoe, f, and keys, g, all constructed and arranged as described and for the purpose set forth.

66,800.—Brick Machine.—F. F. Cornell, Jr., New York City.

1st, I claim a mold for forming bricks or blocks open on two of its contiguous sides,

2d, The movable mold block, M, with its outer side, f, tapered inward in a direction opposite to its motion when discharging a finished brick and retained in position by the fixed block, K, having a corresponding taper at f', and by ribs, j j, attached to the fixed blocks, K K,

3d, The gate, P, or its equivalents, provided with the dovetail slip, p, moving in the dovetail groove, p', in the side of the fixed block, K, as and for the purposes hereinbefore described.

4th, The bed plate, A, standards, T T, spindle, C, supporting roller, B, cross head, D, bolts, m m, groove, h, to receive the index bar, H, and groove c, to receive the flange, l, as and for the purposes hereinbefore described.

5th, The index bar, H, with a suitably beveled end moving in proper guides to engage with the notch, v, in the flange, l, or with any other mechanical device in combination with a movable table or nest of molds, as and for the purposes hereinbefore described.

6th, The swinging jaw, E, having lugs to which may be attached rods or frame furnishing resistance to the power used for moving the plunger forward when pressing a brick, as and for the purposes hereinbefore described.

7th, Bevelling the upper faces of the fixed blocks, K, as and for the purposes hereinbefore described.

8th, The bed plate, A, plunger, L, index bar, H, mold table, I, flange, l, notch, v, supporting roller, B, cross head, D, and bolts, m m, standards, T T, and head bolt, F, all arranged as and for the purposes hereinbefore described.

66,801.—Construction of Bell Pulls and Trips.—Silas L. Covell, Troy, N. Y.

I claim the combination of the arm, A, with the trip, B, spring, C, and catch, D, constructed and operating substantially in the manner and for the purpose herein described.

66,802.—Revolving Plow.—M. A. and I. M. Cravath, Bloomington, Ill.

We claim, 1st, The plow, A, combined with the axle, a, constructed as herein mentioned, as a new article of manufacture.

2d, The arms, e t g h, of different shapes and lengths as shown for the purpose of combining and operating two or more plows.

3d, The combination of the slides, F F, the bent levers, G G, the swivels H H, the curved straps, I I, or any equivalent device, to operate the wheels, E E, in the manner set forth for the purpose herein mentioned.

66,803.—Fanning Mill.—A. B. Culver, Westfield, N. Y.

I claim combining in one machine the two motions for chaffing and separating by means arranged and operating substantially as herein described.

66,804.—Hose and other Couplings.—M. S. Curtis and W. D. Tewksbury, New York City.

1st, We claim the combination with the bevel rings or formations, b and c, on the male and female butts of the bevel-edged sliding block, E, when said sliding block is prevented from revolving and operated by means of a screw restrained from longitudinal play, substantially as specified.

2d, The combination of the swivel cap, F, screw, e, and sliding block, E, for operation in connection with the butts and their beveled rings or formations, all constructed and arranged essentially as herein set forth.

66,805.—Mariner's Compass.—Samuel Custer, Salem, Va. Antedated July 12, 1867.

1st, I claim the combination of the lower battery magnet with the correcting battery above it, substantially as and for the purpose described.

2d, The combination of the correcting battery with the upper or main directive needle as well as the arrangement of adjustment position of magnets, as and for the purpose described.

3d, The combination of the main directive needle with the correcting battery below it, under its arrangement of two or more magnets, as and for the purpose herein described.

66,806.—Magnetizing Compass Needle.—Samuel Custer, Salem, Va.

I claim the combination of a pair of magnets under the arrangement for opening and closing after the needle to be magnetized has been introduced, substantially as and for the purpose described.

I also claim the adjustment of the hinges by any mechanical arrangement which will produce the intended effect, substantially as and for the purpose described.

66,807.—Fruit Gatherer.—M. Darling, Blodgett's Mills, N. Y.

1st, I claim a cloth table and frame divided in two parts, A C A' C', to facilitate its application and removal from the body of the tree, as herein described and for the purpose set forth.

2d, A cloth table and frame constructed in two parts, A C A' C', and each part made to fold up by joints or hinges, i i, substantially as herein shown and for the purpose described.

3d, Also the extension legs, g' G, in combination with the fruit gathering table, A, substantially in the manner and for the purpose set forth.

66,808.—Stitching Horse.—O. A. Dean, Champaign, Ill.

I claim the adjustable clamp, B, of a saddlers stitching horse arranged and operating as and for the purpose herein described.

66,809.—Plow Cleaner.—C. P. Devereaux, North Newbury, Mich.

1st, I claim forming a wing or extension, d4, upon or attaching it to the rear side of the lower part, d3, of the cleaner, D, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the lever, F, with the connecting rod, E, and handle, C, substantialal as herein shown and described and for the purpose set forth.

66,810.—Banjo.—H. C. Dobson, New York City.

I claim so securing the frame for holding the parchmenu head of a banjo or other similar musical instrument to its rim or cylinder having the soundboard upon the back or under side as to leave an open space around and between the said parchment head frame and rim substantially as herein described and for the purpose specified.

66,811.—Washing Machine.—J. G. Dodge, Louisville, Ky.

1st, I claim providing the rubbing frame with the additional hinged rod, l, located in the narrow space as described.

2d, Securing the series of slats in place by means of the rod, p, plate, d, and piece, m, arranged as shown and described.

66,812.—Scrubbing Brush.—A. J. Doolittle, Hamden, Ct.

1st, I claim the brush provided on its back with the slotted boxes, F F, as and for the purpose set forth.

2d, The handle, C, provided with the spring prongs, D, when used in combination with the brush and its boxes as and for the purpose specified.

66,813.—Folding Table.—D. Doty, Detroit, Mich.

I claim the combination of the bolt, C, notches, a and b, and the hinged top when made for joint action substantially as herein described and for the purposes herein set forth.

66,814.—Milk Pail and Strainer.—J. L. Drake, Boston, Mass.

I claim the utensil herein described consisting of the closed vessel, A, hinged cover, C, adjustable and removable funnel, f, and strainer, g, constructed and operating substantially as and for the purpose set forth.

I also claim the combination therewith the elastic ring, i, on the joint of tubes, D and E, arranged and operating in the manner specified.

66,815.—Washing Machine.—D. Duncan, and E. R. Ridgley, Olney, Ill.

I claim the arrangement of the perforated and corrugated spring concave with the vibrating roller journaled in bearings in the lid operating substantially as described and represented.

66,816.—Drill Jar.—James C. Eastman, Titusville, Pa.

I claim a pair of jars applied to drilling tools and other similar uses constructed of wrought iron and steel, combined and applied substantially as represented, and for the objects herein set forth.

66,817.—Attaching Thills to Sleighs Etc.—H. F. Edwards and W. C. Whiting, Worcester, Mass. Antedated July 8, 1867.

We claim the combination of the connecting rod, a, with a key, s, or its equivalent attached with any number of slotted eyes, c c c c, through which the rod, d, may pass and in which it may turn, the key, s, and the slots in the eyes, c c c c, being at such relative position as may be desirable or convenient in the manner and for the purposes set forth.

66,818.—Can for Looms.—G. S. Faulkner, Staffordville, Ct.

I claim the double faced cam, C, when arranged on a shaft, B, and when provided with flanges, d e and f, in combination with the inclined blocks, D, on the treadle, the latter being provided with a pin, g, as set forth.

66,819.—Rosette Engine.—C. H. Field, Providence, R. I.

1st, I claim combining the rocking frame, C, with the mechanism which operates the graver, substantially as described.

2d, Combining the rosette wheel or pattern with the spindle which gives motion to the holding block by the toothed wheels, F and F', of different dimensions substantially as described for the purposes specified.

3d Combining the carriage which carries the graver with a pattern block, L', substantially as described for the purposes specified.

66,820.—Pipe Coupling.—Benaiah Fitts, Newark, N. J.

I claim a pipe coupling constructed substantially as herein described.

66,821.—Water Wheel.—Seth Fletcher, Skowhegan, Me.

What I claim as my invention is the curb as made with the inclined scroll deflector, as specified, in combination with the wheel as made with the conical bottom, and having its buckets arranged as specified.

66,822.—Whitewash Brush.—Adam Foss, Wayne Co., Ohio.

I claim the leather strips, C, inserted in band, A, in the manner and for the purpose substantially as set forth.

66,823.—Farm Gate.—Geo. W. Fox, St. Joseph Co., Mich.

I claim a gate having a post, b, hinge bar, c, rest, d, hinges, e el. ring, f, and set screw, g, arranged, combined, and operating for the purposes and in the manner substantially as herein described.

66,824.—Wool-packing Table.—A. Franklin, Galena, Ohio.

1st, I claim the concave bed, D, applied at one end of the apron bed, B', and extending below the plane of this bed, substantially as described.

2d, Attaching one end of the slitted apron, F, to an adjustable bar, F', applied to the concave bed, D, substantially as and for the purposes described.

3d, The elastic strap, i, as applied over the baling cords, c, substantially as and for the purpose described.

4th, The combination of the three-pronged cord holders, E, with the concave bed, D, substantially as described.

5th, The application of spring latches, b', to the sides of the elevated portion of the concave bed, D, substantially as described.

6th, The combination of the lever, G, swinging arm, h, hook, g, and apron, F, substantially as described.

66,825.—Weighing Scale.—L. H. Franklin, Poland, N. Y.

I claim the swing case, A, with indexes, in combination with the eccentric, b, the strap, a, and the lever, B, arranged and operating for weighing, substantially as herein described.

66,826.—Fence.—George L. Gavett, Sandstone, Mich.

I claim the employment of diagonal tie braces, F, in combination with sills, C, and posts, D, for bracing and tying the panel rails of a farm fence, either with or without the pins, p, substantially in the manner herein specified.

66,827.—Harness Motion for Looms.—John F. Gebhart, New Albany, N. Y.

I claim, 1st, The frame, F, with sheaves, G G G, for carrying the straps from the end of the loom to the heddle frames, when said frames are connected to the under part of the looms by the straps and pulleys, J J J, for the purpose specified.

2d, The combined worm cam, M, placed under the heddle frame, H, into which are placed the pins on the bars, P, for shifting the shafts, g g, with clutches, e e' in the manner and for the purpose set forth.

3d, The arrangement of the shaft, b, provided with sliding cams, D D, cog K, with the driving shaft, X, and its gear, and the treadles, E, for the purposes specified.

4th, The combination and arrangement of the frame, B, upon the end of the loom frame, A, for supporting the cam shaft and cam to operate the treadles, when said treadles are secured upon the stand, C, and connected to the straps which pass over the frame, F, and connect the heddle frames, H, with straps and pullies, J, in the manner and for the purposes set forth.

66,828.—Harness Motion for Looms.—John T. Gebhart, New Albany, Ind.

I claim, 1st, The arrangement of the slides, F F F, and dogs, G, as constructed and used in combination with the levers, H H, and cam, D, for the purposes specified.

2d, The wheel, E, with lugs, g g, shaft, I spur wheel, n, cylinder, K, with pins, z z z, for operating the dogs, G, and giving motion to the slides, F, when constructed and operating in the manner and for the purposes set forth.

3d, The arrangement of the slides, F, sheaves, d d1 d2, and cords, e e, with the frames, A A', and bows, a a, as herein set forth.

66,829.—Farm Gate.—S. Goewey, Dormansville, N. Y.

I claim the combination of the horizontal bars, A connecting chains, D, or their equivalents, slotted posts, B, ropes or chains, G, and weights, I, with each other, substantially as herein shown and described and for the purpose set forth.

66,830.—Machinery for Propelling Vessels.—Stephen J. Gold, Cornwall, Ct.

1st, Applying the power, to turn the paddle wheels, directly to the paddle wheels, at or near their peripheries, by means of gear cogs on said paddle wheels, which mesh into the cogs of a suitable pinion, which pinion is driven by the engine, substantially as herein above set forth.

2d, Separating the rim of the pinion, I, from the inner portion, M, to which it is secured, and with which it turns by interposing between them india-rubber, or some other elastic non-resonant body, substantially as and for the purpose set forth.

3d, The combination with the gearing on the paddle wheels of the pipes, Q, substantially as and for the purpose specified.

4th, The combination with the pipes, Q and S, of the openings through the shaft, U, for supplying the said pipes, Q, with steam, substantially as and to the effect set forth.

5th, The combination of paddle wheels turned by means of cog gear on said paddle wheels at or near their peripheries, and suitable pinions operated by steam machinery, substantially in the manner set forth, with the hull of a vessel constructed with numerous transverse walls or bulkheads connected near the top thereof by a web, in such a manner that the said walls will sufficiently stiffen and strengthen the vessel without the use of ribs, substantially as herein above described.

66,831.—Washing Machine.—Wm. Goodman, Troy, Mich.

1st, I claim the combination of the exterior and interior semi-cylindrical tubs, B and D, with each other and with the frame, A, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the cylindrical rubber, E, and frame, F, with the interior tub, D, substantially as herein shown and described, and for the purpose set forth.

3d, Pivoting the exterior tub, B, the interior tub, D, and the rubber frame, F, to the frame, A, by the same pivoting rod, C, substantially as herein shown and described.

66,832.—Gate.—Burton Greenside, Fort Dodge, Iowa.

1st, I claim the combination and arrangement of the cogged or toothed plates, e1 e2, and the cap or plate, e3, having two curved grooves, e6, formed in the lower side to receive and guide the two guard pins, e5, attached to the plate, e1, with each other, substantially as herein shown and described and for the purpose set forth.

2d, The combination and arrangement of the adjustable latch, F, and weighted operating lever, G, with each other and with the front vertical bar of the gate, substantially as herein shown and described and for the purpose set forth.

3d, The combination of lever, H, with the weighted lever, G, and latch, F, and with the upper part of the gate, substantially as herein shown and described and for the purpose set forth.

4th, The combination of the adjusting screw, I, and nut, J, with the lower part of the weighted lever, G, and with the front vertical bar of the grate, substantially as herein shown and described, and for the purpose set forth.

5th, The combination of one or more movable latches, K, and pivoted drops L, with each other and with the post, B, substantially as herein shown and described and for the purpose set forth.

66,833.—Process of "Hopping" Beer, Ale, etc.—Wm. S. Haight, Waterford, N. Y.

1st, I claim the process, herein specified, of extracting hops by placing the same into an air-tight vessel and applying the beer, substantially in the manner herein specified.

2d, Applying steam to the hops when the same are contained in an air-tight vessel, preparatory to the application of the beer, substantially as set forth.

3d, The process, herein set forth, of removing the beer from the hops from which the extract has been taken by the application of water, as set forth.

66,834.—Scrubber and Mop Holder.—John J. Harlan, Cincinnati, Ohio.

1st, I claim the holder, A, furnished with the T-slots, c c', substantially as described, in combination with the rod, B, and mop, M, in manner and for the purposes as herein set forth and described.

2d, The holder, A, furnished with the U-shaped groove, and the slots, f f', substantially as described, in combination with the rod, E, in manner and for the purposes herein set forth and described,

3d, Attaching the mop cloth, M, and scrubber, R, to the same holder at the same time, by the means and in manner and for the purposes, substantially as herein set forth and described.

66,835.—Clothes Wringer.—Joshua Harrison, Brooklyn, N. Y., and Geo. H. Harris, Munson, N. Y.

1st, We claim the combination, in a clothes wringer, of a cork roll and a rubber roll, substantially as and for the purpose set forth.

2d, The combination with the cork roll, D, and rubber roll, C, in a clothe wringer, of the spring, F, and bar, E, substantially as set forth.

3d, The combination with the end pieces, A and B, forked at their lower ends, the rolls, C and D, and the spring, F, of the bent levers, H and I, the said bent levers being so constructed and arranged as to accomplish the result set forth, substantially as herein above specified.

66,836.—Clothes Wringer.—J. Harrison, Brooklyn, N. Y., and G. H. Harris, New York City, assignors to themselves and Chas. W. Hudson, New York City.

I claim, 1st, The combination with the end pieces, D and E, and rolls, A and B, of the bar, F, and spring, G, substantially as set forth.

2d, The combination, in a clothes wringer with the bar, F, and spring, G, of a teat or projection, C, upon one which fits into a depression in the other, to hold said spring in its place, substantially as herein above specified.

66,837.—Knife and Scissors Sharpener.—Augustus Herthal, Bridgeport, Ct.

I claim, 1st, The plates, B B, constructed as described, and adjusted by means of the set screws, a, between the jaws of the spring plate, A, provided with screw, d, as herein set forth for the purpose specified.

2d, The double plates, B B, in combination with the rollers, c c, set screw, a, and support, A, all made and operating substantially as and for the purposes herein specified and described.

66,838.—Device for Making Centers for Watch Cases.—B. Hilbert, New York City.

I claim, 1st, The mold for casting the "centers" of watch cases, when formed of the hinged jaws, A, in combination with the sectional ring, B, and case, C, all made and operating substantially as herein shown and described.

2d, The device for finishing and smoothing the outside of the centers consisting of the sliding and revolving shaft, D, in combination with the eccentric shaft, H, and cutters, I, all made and operating substantially as herein shown and described.

3d, The device for smoothing and finishing the inside of the centers con-

sisting of the revolving cylinder, J, in combination with the eccentric sliding shaft, L, and cutters, N, all made and operating substantially as herein shown and described.

4th, The revolving shell or cylinder, J, made of two pieces hinged together and provided with grooves, l, around its inside and otherwise constructed, substantially as set forth.

66,839.—WASHING AND WRINGING MACHINE.—Israel Hogeland, Lafayette, Ind.

I claim the combination of the rollers, b b b, etc., and b' b' b', etc., with the endless apron, h, the gearing of the cog wheels, C* C' of the springs, d and thumb screws, c, together with the perforated or slotted pipes, l l l, etc. the apron, h, and rollers, g g, all operating substantially as set forth and described for the purpose.

66,840.—DEVICE FOR PREVENTING HORSES FROM BITING AND CRIB-BITING.—B. D. Howe, Hanover, N. H.

I claim a muzzle of suitable material constructed with bands of metal with an opening, a a' b b' c c', used in the manner and for the purpose set forth.

66,841.—APPARATUS FOR DISTILLING AND REFINING PETROLEUM.—C. G. Howell, Corning, N. H.

I claim distilling, refining and producing petroleum and other liquids by the direct action of heat to the heating vessel, D, and by the action of steam on a retort in a steam boiler, substantially as shown and described.

66,842.—DISH HOLDER.—F. H. Hubbard, Ripon, Wis.

1st, I claim the combination and arrangement of the handle, I, and lever, P, provided with jaws, B B, enveloped with rubber bands, S S, and spiral spring, S, for keeping the jaws in position to secure the dish when used in the manner and for the purposes specified.

66,843.—DOOR SPRING.—Hugh Hughs, Utica, N. Y.

I claim the construction and arrangement of the door spring above set forth and described.

66,844.—LOOMS.—F. W. Hupelsburg, New York City.

1st, I claim the conical or taper take-up rollers, J K, constructed and arranged substantially as shown.

2d, I also claim the horizontal warp spool frame, A, in combination with the conical take-up rollers, J K, substantially as shown.

66,845.—MACHINE FOR PRESSING AND CUTTING THE FILLINGS FOR CIGARS.—W. H. Huse, Brooklyn, N. Y.

I claim, 1st, The treatment of the filling for cigars and plug tobacco by passing it through a steam jacket on its way to be compressed and cut substantially as described and for the purpose set forth.

2d, The combination of the steam jacket and endless apron with the compressing wheels and V-shaped cutters, substantially as described.

3d, The combination of the steam jacket and endless apron with the cutting and compressing wheels and straight cutters, substantially as described and for the purposes set forth.

4th, The combination of the steam jet with the cutting and compressing wheels as and for the purpose described.

5th, Cutting the compressed filling into the proper lengths for cigars and giving to one end of each length so cut the proper taper to form the tip when wrapped by means of the revolving V-shaped cutters, arranged substantially as herein described.

66,846.—HOPPLE.—G. W. Hyatt, Auburn, N. Y.

I claim, 1st, The combination of the bow, A, hook, C, and hasp, D, when all are arranged and operated substantially in the manner and for the purposes above set forth.

2d, The combination of the swivel joint, F, with the link, E, having one of its sides bended as and for the purpose substantially as above specified.

66,847.—OAR.—A. S. Jacobs, St. Louis, Mo.

I claim the construction and arrangement of the oar, A, pivoted at a, to the gunwale of the boat its inner end provided with ferrule, b, pivoted to the connecting rod, C, extended diagonally across said gunwale whose outer end is pivoted to the ferrule, d, at the outer end of the short lever, B, which is pivoted to the row locks, c, as herein set forth all operating independently of the oar on the opposite side of the boat as herein set forth for the purpose specified.

66,848.—RUBBER-COATED RUBBER BELTING.—Pliny Jewell, Jr. (assignor to P. Jewell & Sons, Hartford), Ct.

I claim a new article of manufacture a gum coated leather belt, substantially as and for the purpose described.

66,849.—SPRING FOR BED BOTTOMS.—James Johnson, Northampton Co., N. C.

I claim the arrangement and combination of the circular top, A, links, K, braces, B and C, with the vertical rod, D, and spring, E, operating in the tube, F, as herein described and for the purposes set forth.

66,850.—PRUNING SHEARS.—S. W. Jones, Bluffton, Ind.

I claim, 1st, The pruning shears above described having the fixed blade, A, attached to the staff, C, and operating in combination with the movable blade, A', the connecting rods e e, and the levers, D and H, substantially as and for the purpose described.

2d, The movable lever, D, pivoting in a sliding thimble, F, on the staff, C, and having the holes, m m m, by which its power may be adjusted substantially as and for the purpose specified.

66,851.—EXTENSION SLIDE FOR TABLES.—Charles Kean, Hollidaysburg, Pa.

I claim the grooved centers, caps and bases put together in the manner and form set forth for the purpose specified.

66,852.—GATE.—Elijah Kemper, Thornville, O.

I claim the combination with a sliding gate of the tilting latch, I, constructed and operating as herein above set forth.

66,853.—MACHINE FOR GRINDING THE RUNNER OF SKATES.—Abraham Kipp, Jr. Sing Sing, N. Y.

1st, The combination with a grinding wheel or stone and loose holder to the work having a level bearing surface as described, a bed or table on which said holder rests and over which it is moved hinged or made adjustable to vary its angle relatively to a horizontal position, essentially as herein set forth.

2d, The loose or free holder, D, forming a base or bearing plane provided with adjustable clamps, E, and rests, H, for securing and supporting the work, all constructed and arranged substantially as specified.

66,854.—CORRUGATED LIGHTNING RODS.—J. A. Kissell and N. Blickensderfer, Chicago, Ill.

We claim a lightning conductor consisting of a continuous flat strip, corrugated longitudinally as herein shown and described.

66,855.—EGG BEATER.—P. Klepper, Centralia, Ill.

I claim the arrangement of the beater, A, in combination with the stand, C, supported by legs, d, substantially as and for the purpose described.

66,856.—SCRUBBING UTENSIL.—B. I. Lane, Framington, Mass.

I claim a scrubbing brush or utensil the friction surface of which is composed of a caoutchouc or equivalent elastic material and abrasive powder combined together substantially as set forth.

I also claim forming the friction surface of a scrubbing brush or utensil of alternate rows of bars and teats or points of caoutchouc or equivalent elastic material or compound, substantially as shown and described.

I also claim forming the rubbing surfaces as projections from a rubber block, c, into which the handle block, a, is inserted substantially as shown and described.

66,857.—GLOBE VALVES FOR STEAM ENGINES.—Daniel Lee, Boston, Mass.

I claim the arrangement of the valve and the screw which moves it with relation to the diaphragm, stuffing box, and plug, l, substantially as and for the purpose described.

66,858.—BOX FOR INDELIBLE INK.—C. L. Lochman, Carlisle, Pa.

1st, I claim as a new article of manufacture a pasteboard box with wooden top and bottom constructed substantially as set forth.

2d, The use of an elastic band or stretcher made of any suitable material in connection with said box for the purpose specified.

66,859.—GRAIN SEPARATOR.—A. W. Lochhart, Sacramento, Cal.

1st, I claim adjustably attaching the fans to the fan shaft so that they may be set at any desired angle, substantially as herein shown and described.

2d, The combination of the fan boards, D, jointed arms, C C, and curved arms, E, or equivalent with each other and with the fan shaft, B, substantially as herein shown and described.

3d, The combination of the curved adjustable blast boards, I and J, with the air chamber, A, blast chamber, K, and with the shoe of the machine, substantially as herein shown and described and for the purpose set forth.

66,860.—DROP PRESS FOR PRESSING HAY AND OTHER PURPOSES.—Stephen Mahwin, Liberty, Ill.

I claim the revolving drum, K, provided on its periphery with a continuous groove, k, in combination with the stationary drum, H, lever, I, rope, G, pulleys, e e' weight, B, and frames, A E F, substantially as and for the purpose described.

66,861.—LAND ROLLER AND MARKER.—A. Mains, Alena, Ill.

I claim the levers, E, pivoted to the side of the frame, A, and having the rollers, F, pivoted to their lower ends constructed and arranged as described in such a manner that the roller, C, may be raised above or rest upon the surface of the ground as shown and for the purpose specified.

66,862.—GAS STOVE.—M. S. Marshall, Melrose, Mass.

I claim, 1st, The combination of the furnace, A, pins, B3, and gas stove, B, when said parts are respectively constructed and arranged to operate substantially as and for the purpose set forth.

2d, The vertical pipe, D, when constructed with gratings, D2, formed by outwardly projecting rods and filled by pieces of soapstone or other suitable conducting and refracting material, substantially as and for the purposes set forth.

3d, The pipe, G, when constructed with internal pipes opening and projecting into the chamber of the stove, substantially as and for the purpose set forth.

4th, In combination with the vertical pipes, D E F G, all or any of them, I claim the double top-plate, K and L, arranged substantially as and for the purpose set forth.

5th, In combination with the stove plates B, I claim the gas pipe and burner, C, and flue plate, H, when arranged substantially as and for the purpose set forth.

66,863.—MOP HEAD.—H. H. Mason, and Joseph Messinger, Springfield, Vt.

We claim a mop head of the kind specified, having the ends of the wire or rod which constitute the movable jaw E, secured to the lugs or ears of the nut D, by inserting the ends of said wire or rod in the mold in which the nut is cast so that the lugs or ears will be cast around the ends of the wire or rod substantially as shown and described.

66,864.—DEVICE FOR CRIMPING BOOTS AND SHOES.—J. W. Maxfield, Potsdam, N. Y.

I claim the arrangement of the knife, d, and awl, e, with clamp, a, attached to the lower part of pincers for the purpose specified.

66,865.—HORSE RAKE.—Wm. H. McPherson, Danby, N. Y.

1st, I claim the oval revolving head, A, provided with the groove or grooves, O, the rod for holding the teeth and the pressure staples, Q, as described.

2d, The combination of the lever, F, made as described, the spring, R, and the stop plate, L, substantially as and for the purposes described.

3d, The wheels, B C D, and lever, E, all constructed and arranged substantially as described.

66,866.—WAGON BRAKE.—B. B. Monroe, Jackson, Mich.

I claim the slotted blocks, F F, connected to the bars, E, by the bails, a a, when arranged with the bar, H, and rod, G, and operating in the manner substantially as and for the purposes specified.

66,867.—FLOUR BOX.—Frederick Monroe, Charlestown, Mass.

I claim a flour box having its cover made substantially as and for the purposes described.

66,868.—MUCILAGE STAND.—E. Morgan, Springfield, Mass.

I claim a reservoir mucilage stand having a fountain which connects with and supplies the well, substantially as herein described, in combination with a brush.

66,869.—HARROW.—John E. Morgan, Deerfield, N. Y.

I claim the construction and use of the sectional harrow with inclined coupling links as described, and for the purposes described.

66,870.—GATE.—Theodore Munger, Cedar Falls, Iowa.

1st, I claim supporting the gate by its longitudinal rails upon two flanged rollers, C C, the said rails having their contact edges chamfered or beveled whereby the gate is made capable of being adjusted in hight as described.

2d, The self-closing catch in combination with the oblique ended slat.

66,871.—CULTIVATOR.—John Murphy, Albany, Ga.

1st, I claim the construction of the frame, A B and C, in combination with the plow beams, F, secured thereto substantially as and for the purpose described.

2d, I also claim the plow, S, with its arm, Q, substantially as and for the purpose specified.

66,872.—COCKLE AND GARLIC SEPARATOR.—J. W. Neal, Big Lick, Va.

1st, I claim the spindle, C, with the perforated metal plate, t, and corrugated bar I, when constructed and used substantially as herein specified.

2d, The combination and arrangement of the frame A, and hopper B, cylinder, C, as constructed, brush, D, board, E, and drawer F, all operating in the manner and for the purposes specified.

66,873.—DOOR SPRING.—J. W. Newton, Norwich, Conn.

I claim the combination of the curved bed piece, B, shaft, F, rod, I, spiral or other suitable spring, Q, and arm, P, attached to the door when all combined and arranged together substantially in the manner and for the purpose described.

66,874.—CALL BELL.—W. H. Nichols, (assignor to J. H. Abell,) East Hampton, Conn.

I claim the application to gong or call bells of a twisted rod, b, for the purpose of revolving the clapper, D, substantially as herein shown as described.

The combination with each other of the tube, B, bell, C, clapper, D, twisted rod, b, and spring, e, all made and operating substantially as and for the purposes herein shown and described.

66,875.—WHEEL-WRIGHT'S MACHINE FOR TENONING SPOKES.—G. H. Ober, Newbury, Ohio.

I claim arranging two cutters upon a frame in such manner that they can be adjusted to cut tenons of different thicknesses when used in combination with an adjustable table, G, and clamp, P, all constructed to operate substantially as described.

66,876.—APPARATUS FOR ENVELOPE MACHINES.—E. B. Olmsted, Washington, D. C.

1st, I claim the vertical box, D, containing the inclined shelf, N, and the gumming box, E, and roller, e, and supporting and guiding the plunging plate, O, substantially as and for the purpose described.

2d, The horizontal box, B, containing the plunger, C, the stops, b b, the springs, b" b", and the hinged plates, M and M', substantially as and for the purpose specified.

3d, The sliding box, L, moving on the end of the box, B, and having the arms, l" l", the slot, l', and the interior barbed arms, t t, substantially as and for the purpose described.

4th, The apparatus for moving, cutting and gumming the binding tape, consisting of the shaft, G, with the drum, g', and ratchet wheel, g, the tube, H, the knife, I, and the ratchet wheel K, bearing the cam, k, all arranged and combined substantially as and for the purpose described.

5th, The plunger, C, consisting of two parts, C' and C", and the spring c, and having a face composed of two vertical plates and a wide space between them, substantially as and for the purpose specified.

6th, The rod R, having the clutch at its extremity in combination with the guide, I, and the slot, l', in the wall of the box, L, substantially as and for the purpose described.

66,877.—CUTTING AND GUMMING APPARATUS FOR ENVELOPE MACHINES.—E. B. Olmsted, Washington, D. C.

1st, I claim the channel, B, having cutting edges acting in combination with the knife, I, substantially as and for the purpose specified.

2d, The cutting and gumming instrument, D, having the movable plates, L L, with gumming beds, l' l', the knife, I, and the metallic paper-holding strip, K, substantially as and for the purpose specified.

3d, The combination of the plunger, E, the cutting and gumming instrument, D, and the table, A, substantially as and for the purpose described.

66,878.—FOLDING AND PRINTING BED FOR ENVELOPE MACHINES.—E. B. Olmsted, Washington, D. C.

I claim a triple bed, H, composed of the plates, h h' h", connected as shown supported and guided by the shaft, B, and actuated by the arm, G', substantially as and for the purpose described.

66,879.—DROP HAMMER.—L. H. Olmsted, Stamford, Conn.

I claim the combination of the friction driving pulley, I, and shaft, D, with the devices for engaging and disengaging the one from the other, consisting of the weight, F, the upright shaft, J, provided with the arms, L L', the bar, K, attached to an arm, n, on the upper end of said shaft and the sliding collar, m, on the shaft, D, all arranged to operate in connection with a friction clutch pulley substantially as set forth.

I further claim the ratchet, G, and pawl, H, in combination with the mechanism set forth in the first clause of claim, substantially as and for the purpose described.

66,880.—HAT BOX.—Charles W. Packer, Philadelphia, Pa.

1st, I claim a box, A, having a vertical opening, x, and a leaf, b, a central standard, C, and lid, B, all being constructed and arranged substantially as and for the purpose herein set forth.

2d, The combination of a box constructed as above described and a standard or pillar, C, made hollow and furnished with a cover as and for the purpose described.

66,881.—FOLDING LUNCH BOX.—Franklin B. Parks, Cambridgeport, Mass.

I claim the arrangement of the flanges of the box, bottom, sides and ends with such bottom, sides and ends connected in manner and so as to be capable of being folded together, as explained, each end plate under such an arrangement being hinged on one of the side plates.

I also claim the arrangement of the flanges of the box top, with the said top, and with the bottom, sides and ends connected together in manner, as so as to be capable of being folded together as described.

I also claim the arrangement of the hooks, and their receiving holes with the top, the bottom, sides and ends of the box, connected in manner and so as to be capable of being folded together as set forth.

I also claim the combination of the recesses of the sides with the bottom sides and ends, connected substantially in manner and so as to be capable of being folded together as explained.

66,882.—WAGON BOX.—D. H. Peterson, Terre Haute, Ill.

I claim the grooved and flanged irons, G and H, in combination with the end and side boards C and B, of the wagon box, substantially as herein shown and described and for the purpose set forth.

2d, The irons, F and E, constructed substantially as herein shown and described, in combination with the side boards, B, and bottom bars, D, of the wagon box, as and for the purpose set forth.

66,883.—BED LOUNGE.—James D. Pratt, Cleveland, Ohio.

1st, I claim the hollow safe or drum-head receptacle, D, provided with the sunk depression or recess, C, and lid, F', inclined folding head, G, provided with the sunk depression or recess, H', drop leg, L, and flap, N, all combined, arranged, and operating in combination with the permanent head and folding seat of the lounge, substantially as and for the purposes herein set forth

2d, The employment and use of the springs, C1 and C2, located over the openings, B B1, of the frames, A and A', and operating as and for the purpose specified.

66,884.—DROP PRESS.—J C. Rhodes, South Abington, Mass.

I claim the drop, C, provided with a ratchet bar, a, and with a projecting stud, b, in combination with the double-armed pawl, c, and spring, d, all made and operating substantially as herein shown and described.

66,885.—WOOD-TURNING LATHES.—John Richards (assignor to J. A. Fay & Co.), Cincinnati, Ohio.

1st, I claim the combination of a tubular tail stock with a rack and pinion for moving the same, arranged and operating in the manner and for the purposes specified.

2d, I claim the recess or rectangular extension of the bow in the tail stock shown at a, formed in the manner and for the purposes explained.

66,886.—STOP MOTION FOR WARPING MACHINES.—L. V. Richmond, Brainard, N. Y.

1st, I claim the construction and arrangement in the sliding box, G, of the cylinder, H, with flanges, h', upon which the hooks, i, rest in such a manner that their eyes shall be above the upper plate of the said box whereby the threads are easily adjusted, as herein shown and described.

2d, I claim the sliding box, G, provided with the flanged shaft, H, having the fixed clutch, K, and sliding cogged clutch, l l', in combination with the pinion, m, horizontal shaft, m', and pulley, o', arranged and operated by means of the band, o, from the shaft, B, substantially as and for the purpose herein shown and described.

3d, I claim the stationary box, G', with its appendages consisting of the flanged cylinder, H, sliding clutch, l, having arm, z*, sliding plate, z', springs, z" and r, latch, s, horizontal sliding bar, t having staple, w, and spring, n, operated from shaft, X, by means of the cord, o, substantially as herein set forth.

4th, I claim the plate, R, for sustaining the drop wires, i, and operating substantially as herein shown and described.

5th, I claim the cord, n, for the purposes of transferring the motion from the forked sliding bar, m", to the spring, r, substantially as herein shown and described.

6th, I claim the combination of the forked bar, m", with the pins, q q, and cord, n, substantially as and for the purpose herein shown and described.

66,887.—WELL TUBING.—Lewis F. Rider and John W. Ferry, Hornellsville, N. Y.

We claim the point, A, as constructed with its projecting cutting edges, a a a, on the underside combined with the lower end of the tube, C, with its steel pin, d, to hold the barrel or shield, D, on the outside of the pipe while being driven, substantially as herein described for the purposes set forth.

66,888.—PISTON PACKING.—George Robinson, Detroit, Mich.

I claim the packing ring, D, constructed as described in combination with the rings, E and F, arranged so as to close the holes, a a', alternately to the steam passing beneath the ring, D, pressing it out, as herein set forth for the purpose specified.

66,889.—CHERRY STONER.—O. L. Robinson, Owasso, Mich.

1st, I claim driving the stones at once out of a number of cherries by means of a series of punches, m, which are made to pass through the cherries, the latter being placed upon a plate, D, which is provided with perforated countersinks, substantially as and for the purpose herein shown and described.

2d, The plates, D and E, when made as described in combination with the frame, A, and lever, C, all made and operating substantially as herein shown and described.

66,890.—WATCH.—Henry Rothfelder, New York City. Antedated June 11, 1867.

I claim fitting a watch key in the handle of a watch case and retaining it therein by a suitable catch or fastening, substantially as described so that said key is not liable to drop out spontaneously but can be taken out and used like an ordinary watch key.

2d, The sleeve, d, in combination with the key, C, handle, B, and spring, f, substantially as and for the purpose set forth.

66,891.—PEA RAKE.—Emery W. Rowley, Jr., Antwerp, N. Y.

I claim providing a pea rake with a serrated or toothed cutter, D, substantially in the manner and for the purpose herein shown and described.

66,892.—CLIP FOR CLOTHES LINES AND OTHER PURPOSES.—Julian S. Rowley, Chateaugay, N. Y.

I claim the improved clip for clothes lines formed of the side clamps, B B, riveted to the center piece, A, arranged and operating as herein described.

66,893.—HINGE.—Samuel Selden and W. J. F. Liddell (assignors to John C. Selden), Erie, Pa.

We claim the stop in the band of the loose jointed reversible door hinge constructed as specified and for the purposes set forth.

66,894.—HORSE RAKE.—D. P. Sharp, Ithaca, N. Y.

1st, I claim the spurs, e, arranged upon the bar, C, in combination with the rake teeth, B', and clearing spurs, I, on the bar, F, operating substantially as herein set forth for the purpose specified.

2d, The lever, D, rod, g, and spurred bar, C, arranged in relation with each other and with the spurred bars, F, bars, E', and standards, E, substantially as herein set forth for the purpose specified.

66,895.—COTTON PLOW OR CULTIVATOR.—F. Marion Shields, Macon, Miss.

1st, I claim the hoes, D d d', when constructed in the manner and for the purpose herein described and represented.

2d, The combination of the hoes, D D D, beam, A, shanks or stocks, E E, draft tongue or beam, B, and handles, C C, all arranged substantially in the manner and for the purpose set forth.

3d, In combination with the above the fenders, F F, applied in the manner and for the purpose set forth.

66,896.—WIRE-TWISTING MACHINES.—C. Shortan (assignor to T. W. Bracker), New York City.

I claim the construction and arrangement of the slotted standards, D, and standards G upon the bed piece, B, slotted pinions, H, sector-shaped gear wheels, I, attached to the rock shaft, J, hung in bearings, K, crank arms, L P spring, O, wire, M, and treadle, N, substantially as described for the purpose specified.

66,897.—METHOD OF MANUFACTURING CARMINE.—Gustav A. Siegle, Brooklyn, N. Y.

I claim, 1st, Treating cochineal with water, bicarbonate of ammonia, alum, cream of tartar, acetic acid, egg and spirits of wine for the purpose of extracting pure carmine, substantially as herein set forth.

2d, Treating cochineal with water, crystallized soda, alum, cream of tartar and spirits of wine, substantially in the manner herein set forth for the purpose of extracting pure carmine.

3d, Treating the carmine contained in the liquor which is drawn off, the pure carmine, with tartaric acid, substantially as and for the purposes herein shown and described.

4th, Treating the refuse cochineal from the first and second process above described with soda and boiling it, substantially as set forth for the purpose of producing liquid lake.

5th, Heating the refuse cochineal from the fourth process and treating it with soda and prussian blue, for the purpose of producing a violet color.

6th, Heating the refuse cochineal from the fourth process and treating it with soda, starch and alum, for the purpose of producing a purple color.

7th, Treating the refuse cochineal from the fifth and sixth processes by placing it below the surface of the earth in a well-covered box, substantially as and for the purpose herein specified.

66,898.—TICKET HOLDER.—Samuel A. Simison, Earlville, Ill.

I claim a ticket holder, made substantially as described for the purpose specified.

66,899.—BOOK-SEWING MACHINE.—Ferdinand Sims, Galveston, Texas.

1st, I claim a machine for sewing books, made and operating substantially as herein shown and described.

2d, I claim the manner of preparing the sections of paper with notches, slots and slits at the ends, etc., substantially in the manner and for the purpose herein shown and described and the use of sections prepared.

3d, I claim the combination of the cross head, b2, screw, b', and board, b, with the tablet, B, for the purpose of forming a press or clamp, operating substantially as herein shown and described.

4th, I claim the needle bar, D, and its combination with the eccentric, d2, plate, d3, and needle holders, f, all made and operating substantially as herein shown and described.

5th, I claim the slotted needle holders, f, and springs, f2, constructed and operating substantially as herein shown and described.

6th, I claim the pedal arrangement, E, when combined with the levers, e, and needle bar, D, substantially in the manner and for the purpose herein shown and described.

7th, I claim the slotted guide plates, h, made and operating substantially as herein shown and described.

8th, I claim the application of the cords, i, and the manner of holding the same in place, substantially as and for the purpose herein shown and described.

9th, I claim the slotted key plate, l, made and operating substantially as herein shown and described.

10th, I claim the needles, G g g1 and g2, made and employed and operating substantially in the manner herein shown and described.

11th, I claim the needles, g3 and g4, when applied for the purpose herein shown and described.

66,900.—BRIDGE.—R. W. Smith, Tippecanoe, Ohio.

1st, I claim a bridge constructed with inclined posts, C C, in combination with the braces, D D, resting squarely against the sides of the posts and arranged in relation to the sills and chords substantially as described.

2d, In combination with the inclined posts and braces as described, I claim the vertical central posts, C2, and braces, D1, substantially as described.

66,901.—CHURN.—Myron H. Spaulding, Morrisville, Vt.

I claim the construction of the plates, C and E, forming a metallic box containing changeable gearing, G and K, when arranged and combined with double beaters, as herein described and for the purposes set forth.

66,902.—LANTERN.—Charles F. Spencer, Rochester, N. Y., assignor to himself and Charles W. Barker, Irondequoit, N. Y.

I claim the arrangement herein described for fastening the cap to the guards, consisting of the bearings, b, formed by bending projections of the guard wires concentric with the guard ring, in combination with the eyes, g, on the under side of the cap for sliding over the bearings, and the flange, i, or equivalent, for centering the cap, the whole operating substantially in the manner and for the purpose herein set forth.

66,903.—STAIR ROD.—Charles E. Stearns, Boston, Mass.

I claim the combination and arrangement of the hook and eye and the double tapering spring bar provided with shoulders and studs, as set forth.

66,904.—COMBINED PLANTER, HARROW, AND CULTIVATOR.—D. D. Steele (assignor to himself and T. E. McDonald), New Brunswick, N. J.

1st, I claim the corn dropper and mode of cutting off the required amount of grain to be dropped, substantially as described.

2d, I claim the revolving harrow made and operating in combination with the stationary harrow, in the manner and for the purpose substantially as described.

3d, I also claim the revolving hoes, set in similar manner, to be used in place of the harrow when required as a cultivator.

66,905.—MACHINE FOR ROLLING HOES.—Wm. T. Stillman, Ilion, N. Y.

1st, I claim a stand or frame with horizontal ways for the carriage that carries the rollers, and perpendicular ways for the anvil block, and a bed for the screw that raises the anvil block, the whole being constructed and arranged substantially as described.

2d, In combination with the subject matter of the first claim, I claim, the carriage, J, with one or more rollers and the vertical adjustable anvil, E, substantially as and for the purposes set forth.

66,906.—MACHINE FOR MAKING SPIKES.—Antoine St. Louis, Keeseville, N. Y.

1st, I claim the arrangement of the moving anvils, K and L, the slide hammers, H H', with its hammers, E and F, the latter being provided with a roller face, as and for the purpose set forth.

2d, the combination of the slide, W', and gripper, W, with the ways, V V, lever, U, and cam wheel, S, substantially as and for the purpose set forth.

3d, The combination of the knife or cutter, a, with the anvil, K, and hammers, E and H, substantially as represented.

66,907.—COAL STOVE.—John H. Stone, Philadelphia, Pa.

I claim the extended flange, c', of the fuel pot, E, in combination with the tubes, L L L L, retort, K, and air spaces, G and H, communicating with the external air through the base, A B, the said parts being arranged to operate together as described for the purpose of supplying and heating fresh air for the combustion of the inflammable gases arising from the burning fuel in the fuel pot, E.

I also claim, in combination with the retort, K, having tubes, L, connecting with hot-air space, G, around the fire pot, the cylinder, M, and the escape pipe, o, arranged within the upper part of the body, C D, of the stove, substantially in the manner described, for the purpose of diffusing the heat more effectually over the said body of the stove, and also for increasing the draft of the latter, as specified.

66,908.—SCREW PLATE.—George C. Sweet (assignor to himself and Frank Douglas), Norwich, Conn.

I claim a screw plate made in two parts, and pivoted together by pivots, A A, for the purpose of tilting one half of the plate down for the removal or reception of dies, as herein specified.

66,909.—PASTRY ROLLER.—Albert L. Taylor, Springfield, Vt.

I claim an implement for rolling pastry, composed of a plurality of rollers fitted in suitable end pieces or bearings, or any proper stock, substantially as shown and described.

66,910.—COMBINED CORN PLANTER AND CULTIVATOR.—S. J. Taylor, Rome, N. Y.

1st, I claim the vertical slide, K, operated by the spring, L, substantially as and for the purpose specified.

2d, The covering teeth, d d, having faces inclined inward and backward, and attached to the cross beam, D, substantially as and for the purpose described.

3d, The hinge by which the wings, C C', and the cultivator bars, O O', are jointed to the plow, A, composed of the jaws, m m, clasping the bolts, n n, substantially as and for the purpose specified.

4th, The combination and arrangement of the plow, A, the draw beam, B, the seed box, P, together with the wheel, G, for operating it, the wings, C C', the cross beam, D, having its covering teeth, d d, the adjusting bars, E E', and the cultivator bars, O O', all constructed and operated substantially as and for the purpose specified.

66,911.—Steak Broiler.—D. C. Teller, Terre Haute, Ind.

I claim the vertical position in which the steaks are placed over the fire, and the arrangement of the vertical rods, E E, all substantially inclosed with the can, C, as specified, for the purposes in the specification.

66,912.—Corn and Cotton Seed Planter.—M. L. and R. W. Thornton, Lumpkin, Ga.

1st, We claim the combination of the corn and guano hoppers, J and L, dropping cylinders, I and K, shaft, G, guide spout, O, gear wheels, E and F, drive wheel, C, and shaft, D, with each other and with the frame, A, of the machine, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the cotton-seed hopper, M, and stirrer, N, with the guano or plaster hopper, J, dropping cylinder, I, shaft, G, spout, O, gear wheels, E and F, drive wheel, C, shaft, D, and frame, A, of the machine, substantially as herein shown and described and for the purpose set forth.

66,913.—Breech-loading Fire-Arm.—D. C. Thrasher and B. F. Aiken, Freetown, Mass.

We claim the bar, D, the tube, E (with its slot), and the guide wing, a, the spring catch, F, and the steady pin, H, in combination with the breech piece and barrel of a breech-loading gun, substantially as herein shown and described.

66,914.—Locomotive Truck.—J. E. and Wm. P. Tynan, Paterson, N. J.

We claim the elliptical-winged rollers, E F, the beam, A, the socket plate, B, the pivot plate, C, and bolt, D, when combined together as and for the purposes shown and specified.

66,915.—Window Shade.—Michael Vetter (assignor to himself and Simon Kahn), Muscatine, Iowa.

I claim a window shade which is composed of straws woven together, in the manner described, as a new and improved article of manufacture.

66,916.—Meat Chopper.—W. H. H. Walker, Bangor, Me.

1st, I claim the chopping knife as constructed with frame or bone, B, crank, c, wheels, d and f, pitman, D, and knife, E, and arranged to connect with the table by means of clamp, A, or its equivalent, all constructed and arranged as and for the purposes specified.

2d, Pivoting the frame or bow, B, whereby a swinging motion may be imparted to the cutting blade, as described.

3d, The adjustable raising and lowering of the cutting blade by means and in manner substantially as described and shown.

66,917.—Wagon Brake.—Seth Warren, Hollis, Me.

1st, I claim the combination, as described, arrangement of the sliding frame, i i i, with the rocker, c, the pieces, i i, working through the holes in the cross bar, e, and having the brakes with the crank shaft, o, all operating as and for the specified purposes.

2d, The combination and arrangement of the two cross pieces, e and f, united by the rods, h h, upon which moves the rocker, c, as and for the purposes set forth.

3d, The brake when so arranged by means of the crank, o, as to press against the wheel when the carriage has a forward motion and to be thrown up, and thus relieve the wheels in backing, in the manner and for the purposes herein set forth and described.

66,918.—Drying Boxes, etc., of Pulp.—Seth Wheeler and Edgar Jerome, Albany, N. Y.

We claim drying the hollow articles made directly from the paper pulp or other analogous substance, upon or within a frame which is rigid vertically but expansible horizontally, such frame being the one upon or within which the articles are made.

66,919.—Finishing Boxes, etc., of Pulp.—Seth Wheeler and Edgar Jerome, Albany, N. Y.

We claim pressing or finishing the article upon or within a removable permeable rigid frame, such frame being the one upon or within which the article is made.

Sustaining the hollow article by a permeable rigid frame during the pressing or finishing process.

66,920.—Making Blanks for Paper Boxes.—Seth Wheeler and Edgar Jerome, Albany, N. Y.

1st, We claim creasing the paper blanks in their manufacture for the purpose described.

2d, Forming paper or paper board during the process of manufacture from pulp direct, with spaces at those points where, in the manufacture of many-sided hollow articles, no material is required, substantially as described and shown.

3d, As a new article of manufacture, paper or paper board made direct from pulp with creases on its surface and with spaces left in it at the points where, in the formation of many-sided hollow articles, no material is required, substantially as described and shown.

66,921.—Dust Room in Cleaning Cotton.—James Whitehill, Newburgh, N. Y.

1st, I claim the combination with a screen to the dust room of a brush operating in its one stroke or action to abruptly and rapidly travel over or sweep the face of said screen while in its opposite or further action it moves at a slower velocity over the same, substantially as and for the purposes specified.

2d, The winding pulley, G, with its tripping formation, c, in combination with the brush and rope or chain, operating essentially as herein set forth for the purpose specified.

3d, In combination with the screen and brush, operating as described, a cushion or springs to arrest the brush in its descent, substantially as specified.

4th, The attachment to the rope, F, when tripped, as described, of a swivel thereto, for operation in an intermediate manner between the winding pulley and brush, essentially as and for the purpose described.

66,922.—Car Coupling.—O. J. Whitney, Clifton Springs, N. Y.

I claim constructing the draw head of a railway car with a recess, E, in front of the hole through which the pin passes, and with an elevation, C, to sustain the pin, B, in an inclined position above the chamber into which the link enters, said draw-head being arranged to operate in connection with the ordinary pin, B, substantially as set forth.

66,923.—Corn Planter.—B. Wieland, Orangeville, Ill.

I claim the combination of the movable hopper, D, provided with the rotary disk, c, the guide bars, r r, the brushes, t, and the wire guides, m, the marking wheel, E, the discharge tube, G, and the covering wings, n n, arranged and operating substantially as and for the purpose herein described.

66,924.—Cotton Seed Planter.—Luther F. Wilcox and William G. Caldwell, Three Rivers, Mich.

1st, I claim the adjustable or extension teeth, J, arranged within the case, J, and operated by means of the inclines, J, on the adjustable box, K, and the springs, K, within the case, all arranged substantially as and for the purpose set forth.

2d, The rotating arm, M, within the seed hopper, I, arranged substantially as and for the purpose specified.

66,925.—Fruit Box.—William R. Wilcox (assignor to himself and William W. Wilcox), St. Joseph, Mich.

1st, I claim securing and supporting the cords of the box by means of the bent end, b, fitting into the slot, c, and the tenon, d, fitting into the slot in the corner of the box, substantially as herein shown and described for the purpose specified.

2d, In combination with the above, I claim the bottom, C, substantially as herein shown and described.

66,926.—Snow Plow.—Daniel L. Winsor, Cambridge, Mass.

1st, I claim the combination of the gage runners, B B, with the plow body, provided with the cutting and plowing nose, as specified.

2d, I also claim the arrangement of the bottom of the nose of the plow body with respect to the rest of the bottom surface of the body, and with the two guide runners, in manner substantially as specified.

3d, I also claim the arrangement of the cavity, d, and the seat, e, within the body of the plow, as explained.

66,927.—Door Spring and Hinge.—A. Wiswall, N. Y. City.

I claim the spiral spring, b, fitted on the upright rod, g, of the part, C, of the device, in combination with the oblique bar, b, of the part, B, of the device, pivoted to the bar, d, of the part, C, and provided at its outer end with a friction roller, E, against which the lower end, j, of the spring, b, bears, while the upper end, i, of said spring bears against the bar, c, of the part, C, substantially as and for the purpose set forth.

66,928.—Composition Finger Keys for Pianofortes.—Leopold Wolf (assignor to himself, K. S. Hathaway, and James Hamilton), West Meriden, Conn.

1st, I claim, as a new article of manufacture, composition finger keys for pianofortes.

2d, I claim the process of forming finger keys for pianofortes in metallic molds.

3d, I claim a composition for finger keys for pianofortes, substantially as described.

66,929.—Vent Plug.—Oramel N. Wood, Windsor, Vt., assignor to D. M. Smith, H. H. Mason, and A. C. Mason, Springfield, Vt.

I claim the tube, A, provided with the external screw threads, a a, and the cap, B, provided with a packing, f, and an internal screw thread to fit on the upper screw thread, c, and having grooves or air passages, e, made in it, all arranged substantially as and for the purpose set forth.

66,930.—Railway Chair.—L. M. Woodcock, Auburn, N. Y.

I claim the main chair, b, in combination with the auxiliary chair, c, constructed and used substantially as and for the purpose set forth and described.

66,931.—Tool for Threading Screws.—S. W. Young, and J. W. Hoard, Providence, R. I.

We claim a longitudinally-ribbed cutting tool of cylindrical or other suitable form, the end of which is beveled or recessed, so as to form the extremities of the said longitudinal rib or blades into cutting points, in the manner herein shown and specified.

66,932.—Steam and Water Joints.—Wm. Young, Easton, Pa.

1st, I claim the cavity or recess, E, between the fitting and the nut, D, substantially as and for the purpose set forth, in combination with the pipe, A B.

2d, I claim the nut, D, in combination with the socket or fitting, C, and the recess, E, substantially as shown and described for the purposes specified.

66,933.—Automatic Life-preserving Boat.—And. Carson, Memphis, Tenn.

1st, I claim constructing vessels with cabins, etc., constructed separate from the hull or framework of the vessel, and made detachable by devices operated automatically by the ingress of water into the body of the vessel, substantially as specified.

2d, In combination with the float, A, the arms, D, and latches, H, or their equivalents for the purpose set forth.

REISSUES.

2,679.—Mode of Cleaning and Purifying Bone Black.—Charles N. Brock, Philadelphia, Pa. Patented July 2, 1861.

1st, I claim cleaning and purifying bone black by the application of a current of air, substantially as herein described.

2d, The combination of the perforated receiving vessel A, and diaphragm or screen E, with the supply pipe or vessel D, the air pipe B, and fan C, substantially in the manner and for the purpose herein shown and described.

3d, The screen F, in combination with the receiving vessel A, for separating and removing the fine dust from bone black by means of a current of air, substantially as herein described.

2,680.—Locomotive Head Light.—J. Carton, Utica, N. Y., assignee of John Stuber. Patented May 20, 1856.

1st, I claim in a lamp having a cylindrical wick the outer cylinder M, in combination with the button P.

2d, In a lamp having a cylindrical wick the outer cylinder M, and button P, in combination with the can or deflector N.

3d, In a lamp having a cylindrical wick the outer cylinder M, and deflector N, in combination with the chimney gallery O.

2,681.—Corn and Cotton Seed Planter.—C. C. Garrett, Dayton, Ala. Patented March 12, 1867.

1st, I claim the stirrup lever, R, connected to the side plates, A*, so that they may be raised and lowered, substantially as and for the purposes herein described.

2d, I claim the stirrup lever, R, and its connections with the side plates, A*, in combination with the lever, O, for the purposes and substantially as described.

3d, I also claim the harrow, C2, and its means of attachment to the springs, D2 D2, in connections with the seed planter, when constructed in the manner and for the purposes substantially as described.

4th, The box, K, provided with the slide valve, L, operated by the pintles, I, in the gear wheel, E, and the levers, M N, all arranged substantially as set forth.

5th, The seed hopper, c, and cylinder, b, when applied to and used in connection with a cotton seed planter, substantially as and for the purpose specified.

6th, The attaching of the bearer springs, D2, to the frame of the device, in the manner described, or in any equivalent way to admit of the adjustment of said springs, substantially as and for the purpose set forth.

2,682.—Spoons and Forks.—Florain Grosjean, New York City. Patented Jan. 28, 1862. Reissued July 7, 1863. Again reissued July 12, 1864.

I claim a sheet-metal handle, having a central corrugation or hollow ridge which extends along the narrow part of the said handle and vanishes into the broad portion or palm thereof by tapering sidewise and flatwise, substantially as before set forth.

I also claim a sheet-metal handle having a central corrugation or hollow ridge which extends along the narrow part of the handle and vanishes into the bowl (or its substitute) by tapering sidewise and flatwise, substantially as before set forth.

I also claim a sheet-metal handle having two lateral hollow beads or corrugations which extend with a space between them longitudinally along the narrow part of the handle into the palm thereof, substantially as before set forth.

I also claim a sheet-metal handle having the central hollow ridge combined with the lateral hollow beads, substantially as before set forth.

2,683.—Cultivator.—D. J. Noble, New Boston, Ill. Patented March 20, 1866.

1st, I claim the combination of the adjustable plow beams, E, with a stationary frame, A, and a device whereby said beams may be locked rigidly at any desired hight, substantially as and for the purposes specified.

2d, I claim the levers, H H, pivoted to the frame, A, and arranged relatively with the plow frame, E, as herein specified, in combination with the notched plates, I I when all are constructed and operate substantially as and for the purposes set forth.

2,684.—Composition for Roofing and for other Purposes.—William L. Potter, Newark, N. J. Patented Feb. 21, 1865.

I claim the use of the above-described rock, as and for the purposes specified.

2,685.—Creasing, Slicking and Skiving Leather.—C. C. Bellows, New Ipswich, N. H. Patented Oct. 23, 1866.

1st, I claim the combination of the slotted standards, B, slotted triple-armed lever, E, springs, I, and rods, G, arranged to operate with the roller, D, when constructed and applied in the manner and for the purpose specified.

2d, The plate, J, having skiving knives, d, attached to or formed on it and applied to the upper roller, C, by means of the bars or clamp frame, substantially as and for the purpose described.

3d, The lateral adjustable creasing wheel, F, on the upper roller shaft operating with the flanged roller, G, substantially for the purposes specified.

4th, The combination and arrangement of two rollers of equal or unequal diameter and connected by gears of equal or unequal diameter with the creasing wheel, F, and flanged roller, G, substantially as and for the purposes set forth.

2,686.—Oiler.—John Broughton, New York City. Patented March 6, 1866.

1st, I claim an oiler having a rigid exterior inclosing or containing an auxiliary yielding or spring bottom, which is compressed or operated through a suitable opening in the said rigid exterior, substantially as set forth.

2d, Combining with the yielding or spring bottom of an oiler a rigid or inflexible exterior whose lower part is rounded or made to approximate in shape to a semi-sphere to form a rolling surface and is provided with an opening through which the yielding or spring bottom can be operated, substantially as set forth.

3d, The combination in an oiler of a rigid exterior, an internal yielding or spring bottom, and a compressing thumb piece, substantially as set forth.

4th, Combining with the yielding or spring bottom of an oiler, a stop applied in such a manner that such yielding part cannot be compressed beyond the limits of its elasticity, when said stop is applied and operated externally thereto, substantially as set forth.

5th, In oilers, provided with yielding or spring bottoms forming the sides of the reservoir and such yielding or spring bottom of one piece, substantially as set forth.

6th, Combining with the tube or nozzle and cover of an oiler, a reservoir the sides and yielding or spring bottom of which are formed in one piece, without joint or seam, substantially as set forth.

7th, Combining with the reservoir of an oiler the yielding or spring bottom and the sides of which are formed of one piece a rigid exterior or shell provided with a suitable opening through which the yielding part can be compressed and operated, substantially as set forth.

2,687.—Steam Cock.—Albert Hallowell and H. R. Barker, Lowell, Mass. Patented Nov. 28, 1865.

1st, We claim in a stop cock in which the valve stem is operated by a valve key connected with a hand wheel, the arrangement of a ground joint, e f, the male part, e, being constructed upon the key, E, and the seat or female part in the cap, F, of the valve case, G, substantially as set forth.

2d, We claim the construction of the key piece, E, with its valvelike portion, c, with reference to the seat, f, in the cap, F, and the combination of the valve stem, b, and key piece, E, with a male and female screw thread whereby to operate the valve, A, substantially as set forth.

3d, We claim the arrangement of the hand wheel, I, tube, H, the screw, h nut, l, key, E, and cap, F, applied to the case, G, in combination with the ground joint, e f, substantially as described.

4th, We claim the arrangement of the annular groove, K, with the ground joint and key, E, and cap, F, combined with the valve and its case, substantially as described.

2,688.—Cooking Stove.—Daniel E. Paris, Troy, N. Y. assignee of J. R. Hyde. Patented March 24, 1863.

1st, I claim attaching or supporting a reservoir situated in rear of a diving flue cooking stove, to or by the rear part or end of the top plate of the stoves as and for the purposes herein set forth.

2d, So attaching the reservoir to the rear end of the top plate of the stove that its cover, or pieces that form its cover, shall be nearly level with the top surface of the stove thus practically forming an extension thereof, as and for the purposes herein set forth.

3d, The hot-air chamber between the front of the reservoir and the back plate of the stove closely covered by the top of the reservoir or the top plate of the stove or both together.

2,689.—Puddling Furnace.—Philip Keenan, and Edward O. Connor, Brownstown, Pa. Patented Nov. 14, 1865. Antedated Aug. 26, 1865. Reissued July 23, 1866.

We claim the use of pulverized ore and water in combination with fire clay when used for "fix" in the preparation of furnaces used for puddling or boiling in the manufacture of iron as herein described and set forth.

2,690.—Fix for Puddling Furnaces.—Hugh McDonald, Pittsburgh, Pa. Patented Oct. 17, 1865. Reissued January 23, 1866.

I claim the use of pulverized iron ore as a fix for puddling or boiling furnaces when mixed into a pasty mass with water or other suitable liquid.

Also pulverized iron ore combined with carbonaceous matter and made into a pasty or adhesive mass, and used as a fixing for puddling or boiling furnaces.

2,691.—Embalming Dead Bodies and Carcasses.—G. W. Scollay, St. Louis, Mo. Patented Jan. 22, 1867. Antedated Jan. 19, 1867.

1st, I claim embalming dead bodies and carcasses and preserving them from putrefaction by introducing antiseptic gas or gases into the arterial or vasular system, substantially as described.

2d, Embalming dead bodies and carcasses or preserving them from putrefaction by the introduction of antiseptic gas or gases into the bowels, stomach, or lungs, substantially as set forth.

3d, Embalming dead bodies or carcasses or preserving them from putrefaction by combining the internal and external application of the gases thereto, substantially in the manner described.

DESIGNS.

2,705.—Oilcloth.—J. T. Webster, New York City, assignor to Deborah Powers, A. E. Powers, and N. B. Powers, Lansingburg, N. Y.

2,706.—Eyelet.—James C. Merritt (assignor to himself and Oscar J. Merritt), New York City.

2,707.—Trade Mark.—James S. Waters (assignor to the St. Louis Lead and Oil Company), St. Louis, Mo.

2,708.—Buttonhole for Cuffs, etc.—Jarvis R. Wood, Fitchburg, Mass.

Note.—Fifty-one patents in the above list were obtained through the office of the Scientific American Patent Agency.—Eds.

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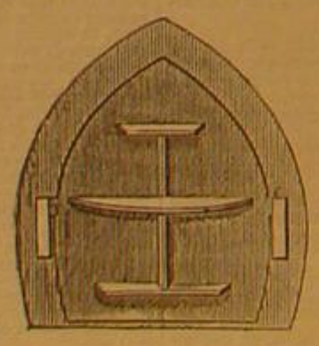
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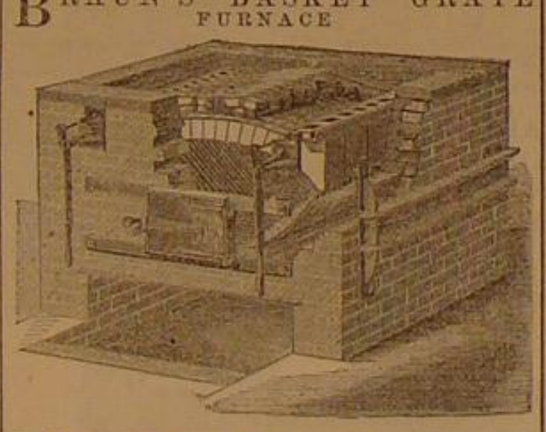
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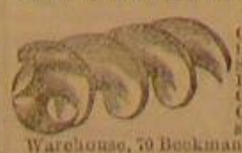
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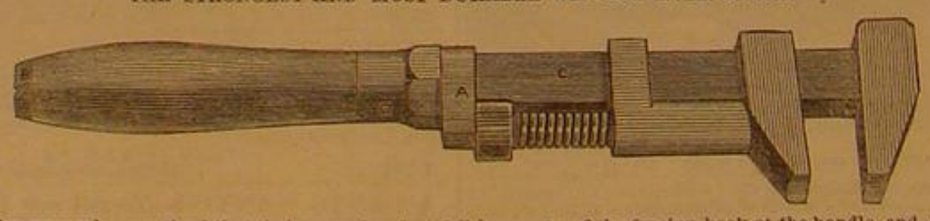
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8th. Although it is not claimed that there can be any better securities than Governments, there are parties who consider a first mortgage upon such a property as this the very best security in the world, and who sell their Governments to re-invest in these bonds—thus securing a greater interest.

9th. As the Union Pacific Railroad bonds are offered for the present at 90 cents on the dollar and accrued interest, they are the cheapest security in the market, being 15 per cent less than U. S. Stocks.

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[Communicated.]

Improvement in Steam Generators.

C. H. Gould's improved steam boiler, patented April 30, 1867, combines all the good qualities of the best boilers in use, occupying but very little room, and can be safely located upon the working floor of any store, warehouse, or manufactory.

In the illustration the boiler is shown divided in the plane of its axis into two equal parts, of which Fig. 1 is an interior and Fig. 2 an exterior view.

A, is a cylindrical vessel open at the top and closed below by bottom, B, supported a short distance above which bottom is a grate, C, so as to form an ash pit, D, and a fire chamber. E. F is a vessel larger than, but of similar shape to the vessel, A, which it surrounds concentrically, so as to form a water jacket, F', between them; and the two heads, B and G. H is an annular plate which joins the upper edges of A and F, so as to close at the top the annular space or jacket, F' between them. J, is a drum-shaped chamber which is supported a short distance above and connected with the water jacket, F', by means of a series of short pipes, K. The bottom, M, of the drum, J, constitutes the crown of the fire chamber, E, while the top or head, L, of the drum constitutes the crown of the steam space. The flat plates, B G L M, are suitably stayed by bolts, such as are represented at N. All its parts being cylindrical in form, can be easily made to resist any desired pressure.

The bottom, M, is joined to the cylindrical vessel, P, at the top, which vessel is joined at the bottom by ring, O, to cylindrical vessel, R (or outside shell of boiler), the two forming water jacket, I. The water jackets, I and F', are securely stay-bolted as represented.

The pipes, *m m*, connect the inner and outer water jackets at the bottom, as the short pipes, K, connect them at the top. X is a manhole into the steam chamber, and W is a hand-hole into the lower water chamber.

The parts above described constitute the boiler proper, which rests at O O on iron bed plate, S, which in turn rests on masonry, T.

The outside water jacket between cylindrical vessels, R and P, and the inner water jacket between cylindrical vessels, A and F, form the descending flue, Q, which, in connection with the opening, U, through the center bed plate, S, communicating with horizontal flue, V, makes the entire smoke circuit, and thus obliges all the flame and heat to converge at a point immediately under the center of the boiler, completely enveloping the inner water jacket before their final exit. The central aperture through bed plate, S, is occupied by an open-ended cylindrical damper, 3, which serves to restrict the draft or shut it off altogether, and by its operation compels the heat in passing to hug the bottom of the boiler. The feed-water pipe, which enters the boiler at G, passing up through the smoke flue, serves as a guide for the damper.

It will be readily seen that a very large plain vertical generating surface is obtained in this form of boiler; also that the bottom of the steam chamber (the water line being some inches over it) affords a large surface for the direct action of the fire; that the most intense heat is where it is wanted, and that as it diminishes, passing off downward, it approaches in its final exit the bottom of the boiler where the water is thrown in; that it has no confined or horizontal smoke passages, and therefore any kind of fuel can be used and the generating surface kept clean; that the direction of the flues is such as to form an inverted air chamber for the heated air and gases, which can only pass off as they are forced by the draft; that the hottest part of the smoke and gases is thrown in contact with the hottest part of the generating surface, and that the generating surface will at no point return or give back heat to the smoke.

More than a year's use of this form of boiler proves that all the dust or sediments in the water settle on the bottom, G, except a small portion in the water jacket, I, at O, both of these parts being the furthest removed from the fire, and not liable to be burned that it is a very rapid generator of steam, and will make as much steam from the fuel as any form of boiler that has water space enough to be safe.

Y, in Fig. 2, is an outer shell or case of "galvanized" iron, having between it and the outer shell of the boiler a narrow air space for the purpose of controlling the radiation, making it doubly secure as to fire, besides giving a neat outside finish. This engraving also shows the outside appearance of C. H. Gould's patent water regulator, with the conducting pipe from reservoir to stop, *g*, and pipe, *f*, leading to the forcing pump. An ash spout, *h*, leads to the ash chamber formed by the foundation walls of the boiler A boiler of this construction 52 inches in diameter and 6 feet high is found amply sufficient for ten horse-power. For further information address C. H. Gould, patentee, 84 West Second street, Cincinnati, Ohio.

Fig. 1

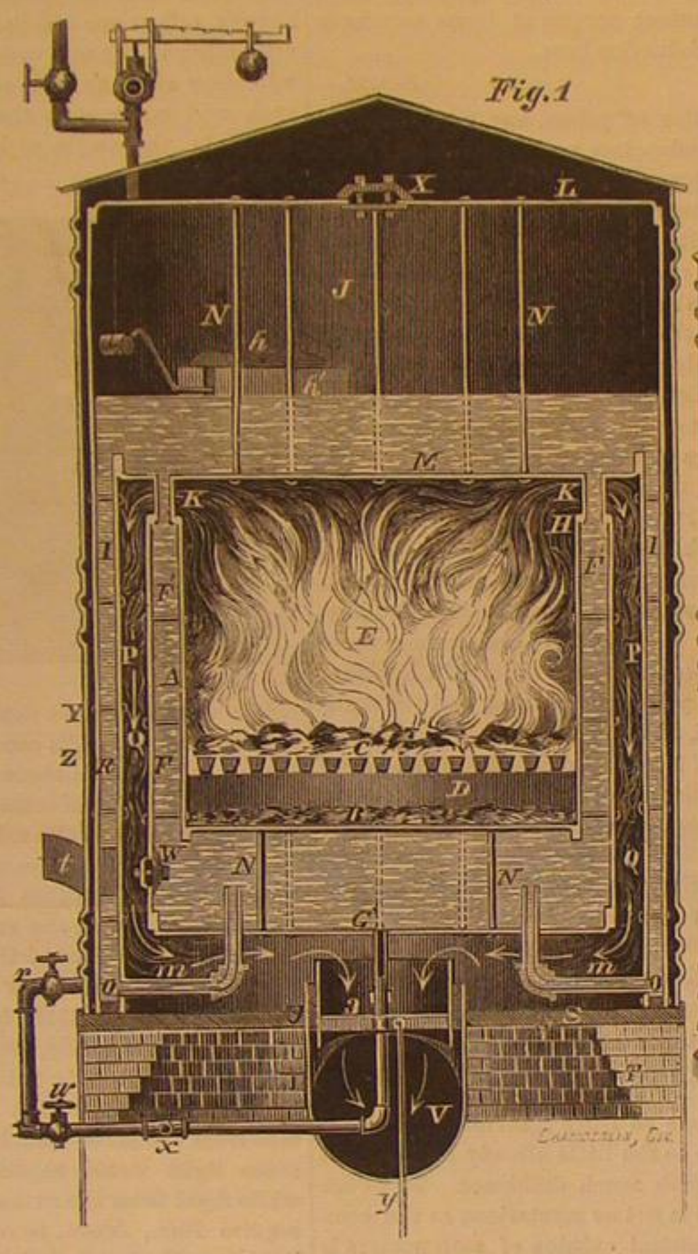
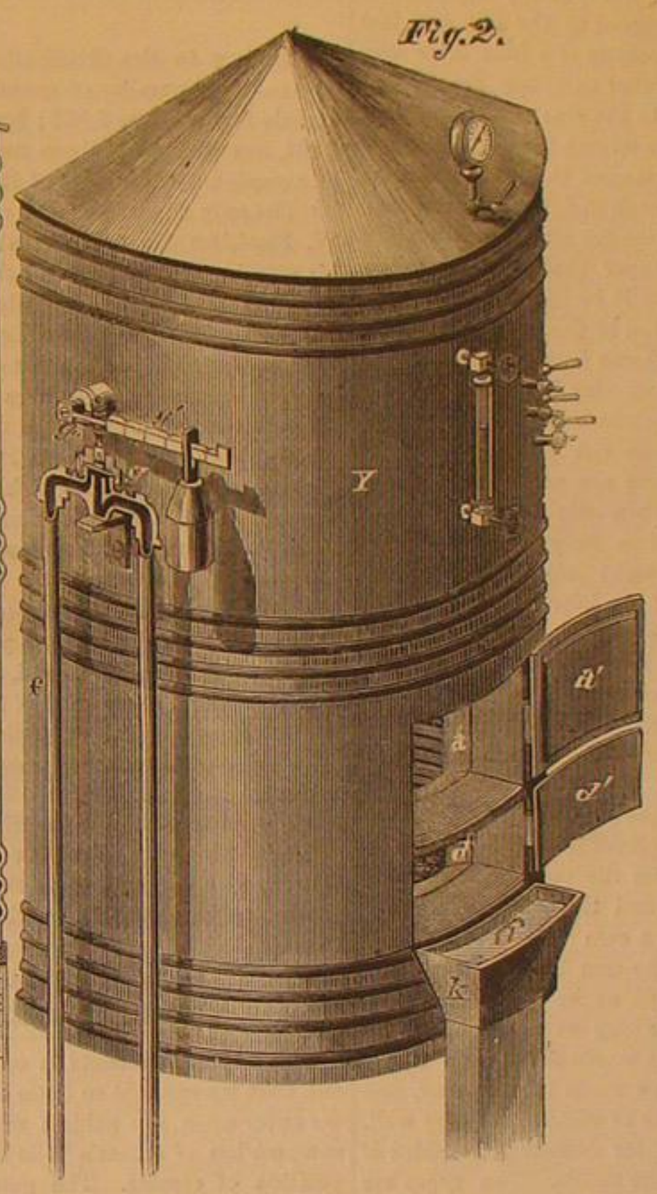


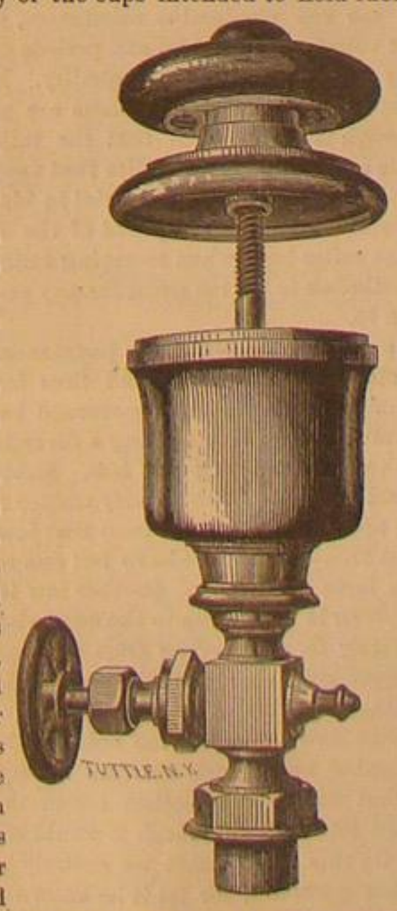
Fig. 2.



C. H. GOULD'S IMPROVED STEAM BOILER.

LUNKENHEIMER'S TALLOW LUBRICATOR.

The fault with many of the cups intended to hold lubricating material for machinery is that they leak more or less, and that the threads cut on the covers and cups get worn, and after long usage refuse to 'take.' The one shown in the engraving is in this respect entirely different. The cup proper is of the ordinary form and has seated in the center of its bottom a steel spindle, which projects above the top of the rim and engages with a thread cut in the center of the top knob, which is of wood and has a core of brass to which it is secured. The cover is attached to this knob or rather to its shank, and turns freely upon it. The edge of the cup's rim has an annular recess filled with Babbitt or other soft metal, and when the cover is screwed down it seats itself air-tight on this soft bed and prevents all waste of material. The knob or handle being of wood is never too warm for the hand.



This cup is intended especially for tallow, which is greatly preferred to oils for lubricating engine cylinders. When oil is subjected to the heat of "live" steam it is frequently decomposed into its components of glycerin and acids, and loses its value as a lubricator, while tallow, requiring a greater heat for its decomposition, gradually melts and passes into the steam chest and cylinder in the form of a liquid lubricator. The bottom of the cup is pierced with a number of small holes, surrounding the steel spindle, which open into the passage through the gate.

The whole device is very simple in its parts and does not appear liable to get out of order. It is also ornamental in form and finish and seems to be well adapted to its uses as a steam cylinder lubricator.

Patented by F. Lunkenheimer who can be addressed at the Cincinnati Brass Works, Nos. 10 and 16 East Seventh street, Cincinnati, O.

A Novel Propeller.

A few days ago we examined the construction and observed the operation of a small working model of a propeller on a plan quite unique. It consists of three vertical blades placed equi-distant around an upright shaft at the stern of the vessel, the lower end of the shaft working in a step on the prolongation of the keel. The shaft by which the blades are driven works inside a hollow shaft, on which is secured a horizontal eccentric, which connects by arms with the blades, and feathers them as they rotate. No rudder is used with this propeller, the set of the eccentric and blades, by means of a lever, determining the line of the vessel's progress. Further description without the aid of engravings, could not be understood.

The performances of the model are quite surprising. The vessel was made to turn exactly on its center repeatedly, without going ahead, and a slight turn of the adjusting lever would send it either back or forward in a direct line, or in any circle desired, all without reversing the driving machinery and without the aid of a rudder. It is a remarkable contrivance, and is worthy the attention of our mechanics and engineers. It may be seen in operation at the Corn Exchange, Whitehall street, New York city. Foreign patents are now pending through this office. Mr. F. G. Fowler, of Springfield, Ill., is the patentee.

Special correspondence of the Scientific American.

AMERICAN MACHINES AT THE PARIS EXPOSITION.

PARIS, July 2d, 1867.

There are several machines in the American department which are interesting from their ingenuity and efficiency, and accordingly attract considerable attention. First, may be mentioned the Hicks engine, now well known in America, of which several different sizes are exhibited. Our people seem to have a great fondness for endeavoring to produce a steam engine which shall be the most compact, cheap in first cost, and appear, at least, very simple in construction. As evidence of this, witness the host of rotary engines we have brought forward, (and, by the way, as good an example of these as I have ever seen is to be found among our machines in the Exposition,) of which, however, it would hardly be too sweeping an assertion to say, that none are of any value. The reason that so few of such engines have come permanently into use is, that users of power have not been long in discovering that where compactness, or cheapness, or the absence of moving parts from view were obtained by an utter disregard of the amount of steam to be consumed or wasted, and the cost of repairs after wear, the price paid for the former qualities was altogether too dear, and they have concluded that it was more agreeable to see a good-sized coal pile than a mysteriously simple engine. The Hicks engine, however, is a complete exception to these remarks, for though compact, cheap, and invisible as to its moving parts, yet these quali

ties have not been obtained by a sacrifice of economy in the distribution of steam, or the multiplication of rattling packing pieces, or still worse, the total absence of any piston packing at all. This engine may fairly claim to compete with the ordinary form of steam engine, which is more than can be said of most machines of this class. A really good machine is Root's blower for cupola furnaces and similar purposes. The volume and pressure of blast delivered from the one which he has on exhibition is really astonishing when we observe how slow, comparatively, is the speed with which it is run. Blowers of this class, in which the air is forced out by the regular displacement, are far preferable to the fan in point of economy, and apparantly Root's is very free from the objections that exist, with some forms, in respect of excessive friction and consumption of oil or tallow. Blowers of this kind are unknown in England, but engineers can hardly be long in appreciating their advantages and introducing them.

Next we find an excellent nail machine, cutting a perfect shower of nails out of a plate at one operation. The simplicity of the machine is partly due to the particular form of nail which it produces, and this, therfore, should be described first. In one direction its sides are parallel throughout, and its thickness equal to that of the plate from which it was cut. In the other it tapers from one end to the other, and then has a short bevel on each side, forming a point. This bevel, at the point, is exactly the counterpart of that under the head, so that when two nails are placed point to head, they exactly fit together, and it is in this way that they are cut. This peculiarity enables the nails to be cut without any waste metal whatever except that which is produced at the first and last cut on each sheet. The machine consists of a feed table over which is placed a stout rocking lever carrying the cutters, eight or ten in number, according to the size of the machine. At each stroke of this lever it chops off one less nail than the number of cutters. The feed is so arranged that at each stroke the sheet is moved sideways and back and forth alternately the length of one nail, and the cutters are alternately beveled in opposite directions so that the taper that is given to one side of the nail, under one cutter, shall be in the opposite direction from that which will be given to the other side by its neighbor at the next stroke. The sheets from which the nails are cut are about 20 inches wide, and may be of any convenient length within the limits of the width to which they can be rolled, the grain running across the plate so as to be lengthways in the nail. The cutters are made very strong, are planed to the proper form, and then only require grinding across the end as they wear. The only difficulty that would suggest itself at first thought would be whether the lip, which undercuts one side of the head, would not often become broken and require a large amount to be ground off to bring it again to an edge; but this, it is stated, does not occur in practice. The machine is capable of producing 5,000 lbs of nails per day. The nails are not of a form to cause splitting, and it is stated that they are preferred by those who have used them to any other form.

Near this machine we have another, ingeniously designed for molding matrices for stereotype plates by a process of composing, instead of setting up type for the purpose. The matrix is formed of soft, thick paper, and the impressions in it are made by steel dies moved by a cam by power coming from a foot treadle, the action of the cam being determined by touching the keys of a keyboard as in type-setting machines. The paper matrix is fed along at the proper rate after each impression to produce the words and lines. Specimens are shown of stereotype plates made in this way, and also of printing from the plates, both of which look very well.

Again, we have a neat machine for dressing the sides of type after they have come from the molds. The types are placed in rows, and between each row a brass space; a number of rows thus making up a block of any size. Each row in succession is passed sideways between a set of inclined cutters which remove all inequalities, and the finished type are received at the other side of the cutters and re-formed into a block, the brass spaces, however, having been left behind. The motions of the parts of the machine are so arranged as to avoid the possibility of the rows becoming broken or the type getting displaced.

In wood-working machinery there are a few good things, but any one familiar with the subject can see that it would be easy to go into any good shop, where tools are abundant, and select a far more interesting stock than that which professes to represent the whole nation.

There is one tool, however, that is a novelty, and well deserving of praise. It is a machine for turning banisters or other ornamental turned work. The only operation required in running it, is to start the machine once for all, and then, without stopping, put in the square sticks and let down the cutter on it; it then finishes itself and is ready for another stick. The construction is as follows:—An iron frame, sliding vertically in guards, carries an inclined finishing cutter. The vertical side of this cutter is planed to the pattern which it is desired to turn, and as it wears, it is only necessary to grind the end. This cutter has a vertical direction coinciding with the frame, and as the latter descends it comes in contact with the work at one side and passes partly by it. Its inclined position causes it to commence its work at one end and continue along to the other as it descends. To prepare the way for the finishing tool two other cutters go before, the first roughing off the corners of the stick and the second traveling over the edge of a former, begins the finished pattern. These cutters are made to move along by an inclined groove in the moving vertical frame which carries the finishing cutter. The working of the tool is beautifully simple, and it turns out a well-finished piece of work. The end of the spindle is made with a central point projecting beyond the griping edges, so that the work may be caught on this without stopping until the tail stock is screwed up, when the teeth catch it and set it in motion.

A set of cask-making machines are shown for flour barrels and other dry work. The main features are not new, though the precise application of principles may be. They are of exceedingly rough workmanship.

A very neatly arranged sawing table is among the best tools. It has a fixed countershaft, for driving, placed beneath the floor, and the belt from this passes around a frame in which are fixed two arbors, the one carrying a rip saw and the other a cross-cut. By means of a worm gearing, either of these may be turned up so as to project above the table, and when it does of course its arbor and pulley alone take the strain of the belt, the other being down below it. The table is also provided with gage guides by which any angle may be given, either in ripping or cross-cutting, and it appears to be a tool that would be very handy in a shop.

Quite a number of Pickering's governors, of various sizes, are also exhibited, some of them being placed on the engines which are at work. This is quite new in England, but it is probably not equal in efficiency to Porter's, which is well known there, though it is vastly preferable to the old, slow-moving form.

Justice's "dead stroke" hammer is another novelty which appears to deserve well the attention which it attracts. Its capabilities for light or heavy work are exhibited at intervals by hammering out ingots of lead and drawing them down to a small bar. Its present success at home may have no little influence in its introduction here.

Ssade.

Alluding to the distribution of prizes, our correspondent says:—"The number of grand prizes awarded was 64; gold medals 883; silver 3,653; bronze 6,565; honorable mention 5,801, not including those for groups 8 and 9, which will not be awarded till the close of the Exposition.

"The only Americans who received grand prizes were Cyrus W. Field, for the Atlantic cable; Hughes, of New York, for his printing telegraph; and the Sanitary Commission, for the fine display of articles intended for the relief and comfort of soldiers during war. The Emperor awards the order of the Legion of Honor to the most eminent competitors in the Exposition, and, after the names of some of the members of the Commission and Jury, from the United States, are those of Mr. Goodwin and Mr. Eliss Howe, for sewing machines, Mr. Mulat, engineer, and Chickering, of Boston, for Pianos. There was also a class of extra prizes for those establishments in which systems tending most toward the elevation and happiness of working men were in operation; and among these are some American names, such as the mills of Chapin, of Lawrence, Mass., to whom a prize was granted, and the Agricultural Colony, of Vineland, N. J., of which honorable mention was made. No award of this kind appeared to have been made to any English establishment, though it would seem that some of these are deserving of credit for the interest taken in their employees. The complete lists of those who have been rewarded with silver and bronze medals are of course too lengthy to be reproduced in a letter, but our countrymen will be found well represented among them in proportion to the number of articles exhibited by them."

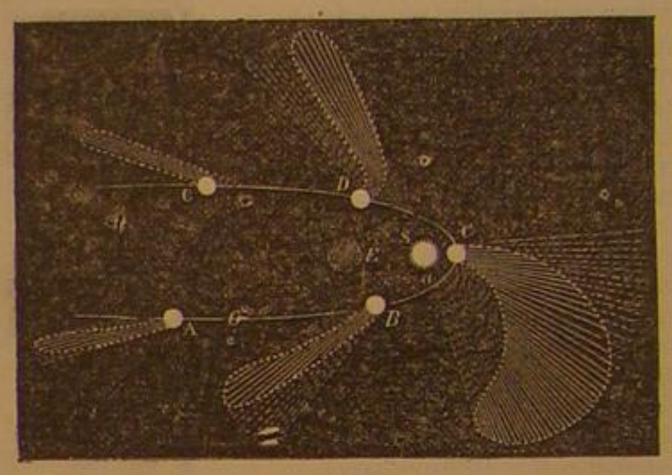
[For the Scientific American.]

WHAT ARE THE TAILS OF COMETS MADE OF?

The subject of comets is one so little understood, and we feel that we can add so little to the little already known that we enter upon the subject with much diffidence. To us the composition of comet's tails is not so mysterious as the composition of comets. The general opinion of astronomers is that comets are composed of ponderable matter and are subject to the law of gravity same as planets, but unlike planets are only a gaseous film. And yet comets have been seen as a dark body upon the face of the sun when in transit across the disk of that bright luminary. The orbits and motions and periods of some comets so much resemble the orbits and motions and periods of planets that it would indeed seem that they too are ponderable substances, while the small size, great velocity, vast orbits and periods of others is strong evidence of their imponderable quality. But is is not generally claimed that the tails of comets are ponderable substances. Although it would seem that the tails of comets, like the caudle appendage of all bodies that are so equipped, should be composed of the same material in kind as their bodies, but the enormous velocity required of the extremity of a tail 150 million miles long when sweeping around the sun in passing its perihelion is far too great for any ponderable substance to attain to.

In order to understand any phenomenon of Nature we must first study her language and thus learn her laws. Every phenomenon of Nature is governed by some one law that controlls all, notwithstanding a diversity of phenomena may seem to flow from that one law. Having once learned the general law it becomes an easy matter to interpret the cause of all apparent departures from that law. One law of comets is that they—as a rule—have but one tail, although as many as six have been seen. Anothor law is that the tail is—as a rule—seen in opposition to the sun, whether the comet is approaching to, or receding from the sun. This is their most distinguishing characteristic, and is what has so bewildered the master minds of all ages and all countries. The great Sir Isaac Newton was of the opinion that comets' tails were ponderable, but of such extreme tensity, that if the largest one that was ever stretched across the heavens were compressed into one cubic inch it would still be less dense than air. On this latter point we entirely agree with the great English geometer, for let it be known to all people that the tails of comets are only the reflection of light, simply the rays of the sun coming in contact with the substance of the comet and thereby becoming intensified (electrified). When like rays from the same sun strike the surface of a planet they are reflected greatly modified. Comets cast a brightness which diverges, planets cast a shadow which converges, clearly proving that the substance of the two are not the same.

All are familiar with the streaming rays reflected from a calcium light as they are seen to pierce through deep darkness, expanding and also becoming more dim as they lengthen, presenting the appearance of a solid body for a great distance and gradually vanishing from sight. These are in fact artificial comet tails, governed by the same law as proved by their expansion and diminishing in brightness as they lengthen. The tails of comets continue to expand as they lengthen and contract as their length decreases, thus proving that they are governed by the same law as the reflection of light. Again, the tail increases in length and breadth as the comet approaches the sun and decreases in length and breadth as it recedes from the sun, further evidence that it is governed by the law that governs the reflection of light. But how are we to explain the phenomena of two or more tails? Well, if the tails of comets are but the reflection of the electrified rays of the sun, it follows that the rays must strike a surface capable of reflection, and no light can be reflected when the ray strikes a surface perpendicularly. Now then, comets of a true spherical form reflect one tail, comets of an irregular spheroidal form reflect more than one. A perfect sphere will always reflect one tail in opposition to the sun, while those presenting to the sun various surfaces with various angles will show as many tails as angles presented; the direction of each will conform to the law governing the reflection of light, viz., the angle of insidence and reflection will be the same.



We next propose a demonstration in confirmation of the idea that comets' tails are simply a reflection of the electrified rays of the sun. In stating our premises we remark first, that the velocity of comets may be computed at one million miles an hour, and the velocity of light twelve million miles a minute, while the length of a tail may be reckoned at 150 million miles. Suppose in the plate above we represent a vertical view of S, the sun, E, the earth, and O, orbit of a comet sweeping around the sun with the velocity of one million miles an hour. Now then, when the comet is seen from the earth at A and B the tail is seen in the rear of the comet; when at c, at the side, and when at D and e, it is in advance of the comet, but in all cases it is seen in opposition to the sun. Now, suppose that the comet when at B and D is distant from the earth one hundred million miles; at that distance light would require 8m., 20 sec., to reach the earth, while light from the extreme verge of the illumination would require 20m., 50sec., to reach the earth; but by the time light from the head of the comet reaches the earth the comet will have swept along its path nearly two hundred thousand miles, and by the time the light from the extremity of the tail reaches the earth the comet will have traveled more than three hundred and twenty-five thousand miles. As the comet speeds along its path the light in the rear of the comet begins to fade out in 8 m. 20 sec., beginning at the path, and in 12 m. 30 sec., a ray will have vanished out the entire length of the tail, while at the same instant the rays of light shooting out from the head of the comet are speeding their flight to the extremity and will arrive there in 12 m. 30 sec.;

The dotted portions indicate the fading-out rays in the rear of the comet and the rays not yet filled out in advance of the comet. Now as light requires 12 m. 30 sec. to travel the length of the tail and as the comet will have traveled two hundred thousand miles in the same time, it follows that the extremity of the tail must fall behind the apparent position of the comet as seen from the sun two hundred thousand miles, and more than three hundred and twenty five thousand miles as seen from the earth, when the comet is at B. The curvature of the tail is wholly dependent upon the curve of the path the comet is moving in at the time.

The singular phenomenon of the tail preceding the comet when the comet is receding from the sun is all owing to the velocity of light being much greater than the velocity of a comet. Light travels as far in five minutes as a comet does in sixty minutes. The short and beautiful curve of the tail, always seen near its root, when the comet is receding from the sun, is owing to the fact, that the rays shot out from the comet and the course the comet is traveling at the time, are in the same general direction, which enables the comet to double up, as it were, a portion of its own tail; that is, the speed of the comet is superadded to the speed of light, whereas, when the comet is approaching the sun the cometric rays simply fall behind, producing a curve in the tail equal to the curve of the path in which it is traveling.

G. M. Ramsay, M. D.

New York City, July, 12, 1867

GREAT GUNS AND BREECH-LOADING FIRE-ARMS.

So far as actual trial can demonstrate a fact, it would seem that this country is still ahead in the production of the most powerful cannon. Our fifteen-inch smooth bores have been tested in actual conflict, and have proved the most effective weapons of modern warfare. There is no adequate reason for supposing the twenty-inch would prove a failure under similar circumstances. The English government have lately been experimenting with a fifteen-inch Rodman, cast by Cyrus Alger, at South Boston, and its performances appear to have awakened considerable interest. The gun weighs 19½ tuns, and with it was sent a quantity of our mammoth cannon powder and a number of the spherical shells. From the London *Standard* we condense a report of the trials:—"The programme of Thursday's trials was with the object of testing the range, accuracy, and general working of the piece, and the velocity of the missiles when propelled by 35 pounds, 50 pounds, and 60 pounds of the American powder, and corresponding charges of English large-grained rifle powder, such as is used in our 7½-inch and 9-inch rifled guns. Fifteen rounds altogether were fired, and sufficed to give a valuable character to the weapon. The practice on such occasions as the present is to train the gun upon some definite object, such as a target, in a nearly horizontal direction—in this case two degrees of elevation taken with a spirit-level quadrant—and then to fire with various charges of powder, noting the spots at which the shots first graze, and the time, in seconds, from the discharge in which they do so. The rest of the flight of the missiles in their ricochets, is only incidentally noted. The object is not to hit the target, but to find out the distances certain charges will project shots of the same weight, and the amount of deflection those shots experience, and the velocities they attain in their flight.

"The first seven rounds were with the American mammoth powder, a very coarse but strong powder, the individual grains being as large as horse-beans, and roughly angular like the coarser flint gravel met with just below our sea beaches. The velocity in all the following cases was taken at 50 yards from the gun:

"Round No. 1:—Charge, 35 pounds; weight of shot 452 pounds 12 ounces; recoil of gun carriage, 5 feet; time of flight to first graze, 2·7 seconds; distance of range to first graze, 696 yards; deflection of shot to the right, 1·6 yards.

"Frame of screen cut by shot, and velocity consequently not obtained.

"Round No. 2:—Charge 35 pounds; shot, 451 pounds; recoil, 4 feet 11 inches; flight, 2·5 seconds; range, 740 yards; deflection, right, 0·6 yards; velocity, 917 feet per second.

"Round No. 3:—Charge, 35 pounds; shot, 455 pounds; recoil, 5 feet; flight, 2·7 seconds; range, 737 yards; deflection, right, 0.6 yards; velocity, 926 feet per second.

"Round No. 4:—Charge, 50 pounds; shot, 453 pounds 4 ounces; recoil, 8 feet 5 inches; flight, 3 seconds; range, 963 yards; deflection, right, 2·8 yards; velocity, 1,110 feet per second.

"Round No. 5:—Charge, 50 pounds; shot, 454 pounds; recoil, 8 feet 7 inches; flight, 3 seconds; range, 1,003 yards; deflection, right, 2 yards; velocity, 1,120 feet per second.

"Round No. 6:—Charge, 50 pounds; shot, 453 pounds 8 ounces; recoil, 8 feet 9 inches; flight, 3 seconds; range, 987 yards; deflection, right, 3·2 yards; velocity, 1,133 feet per second.

"Round No. 7:—Charge, 60 pounds; shot, 453 pounds 4 ounces; recoil, 10 feet; flight, 3·3 seconds; range, 1,138 yards; deflection, right, 1·4 yards; velocity, 1,210 feet per second.

"The next six rounds were fired with the English service large-grained rifle powder, the grains of which are far smaller than the American, and in appearance much like very fine coal dust. The combustion is also much more sensitive, and the powder stronger: roughly, probably, in the proportion of 40 pounds to 50 pounds.

"Round No. 8:—Charge, 35 pounds; shot, 450 pounds 12 ounces; recoil, 6 feet 4 inches; flight, 3 seconds; range, 879 yards; deflection, 1·6 yards; velocity, 1,037 feet per second.

"Round No. 9:—Charge 35 pounds; shot, 452 pounds 8 ounces; recoil, 6 feet 7 inches; flight, 2·8 seconds; range, 880 yards; in line true; velocity, 1,044 feet per second.

"Round No. 10:—Charge 35 pounds; shot, 450 pounds; recoil, 6 feet 5 inches; flight, 2·9 seconds; range, 873 yards; deflection, 1 yard left; velocity, 1,010 feet per second.

"Round No. 11:—Charge, 50 pounds; shot, 453 pounds; recoil, 9 feet 4 inches; flight, 3·1 seconds; range, 1,023 yards; in line, hit the target near the center; velocity, 1,191 feet per second.

"Round No. 12:—Charge, 50 pounds; shot, 451 pounds 8 ounces; recoil, 9 feet 9 inches; flight, 3·2 seconds; range, 1,073 yards; deflection 2·2 left; velocity, 1,211 feet per second.

"Round No. 13:—Charge, 50 pounds; shot, 451 pounds 8 ounces; recoil, 9 feet 10 inches; flight, 3·2 seconds; range, 1,140 yards; deflection, 2·4 yards left; velocity, 1,214 feet per second.

"The two concluding rounds were fired with American mammoth powder.

"Round No. 14:—Charge, 60 pounds; shot, 451 pounds 8 ounces; recoil, 9 feet 10 inches; flight, 3·1 seconds; range, 1,012 yards; in line, true; velocity, 1,194 feet per second.

"Round No. 15;—Charge, 60 pounds; shot, 452 pounds 8 ounces; recoil, 9 feet 9 inches; flight, 3·1 seconds; range, 1,032 yards; deflection, 2·6 left; velocity, 1,210 feet per second.

"The alteration from right to left deflection was possibly caused by a change in the direction of the wind.

"We cannot in this notice enter into detailed comparisons between the performances of our own heavy rifled guns and this American cannon; but we may briefly add that the battering charge of our 9-inch Woolwich muzzle-loader is 43 lbs. L. G. R. powder, and the ordinary service charge, 35 lbs. The weight of the 9-inch rifle shot, 250 lbs.

"The American Rodman has thrown its shot very true and a very long distance. It was a pretty sight to see the dark ball rebounding from the mirror-like sea, dashing up a round cloud of spray at each ricochet, until, at last, in the far distance, out among the gray, hazy ships, a faint, continuous white mist streaked for many seconds the surface of the water, and the thud, thud of the rebounds of the shot died away in a pulsating noise like the distant puffling of a railway train."

By reference to our reports of the trials of the fifteen-inch gun, against iron-faced granite targets, at Fortress Monroe, in September last, published in Vol. XV., Nos. 15 and 16, it will be seen that this piece tested at Shoeburyness maintained its character for initial velocity. In the former case, with a charge of 55 lbs. of mammoth powder, and a shot of 432 lbs., its velocity was 1,155 feet per second: in the latter case, with 60 lbs. of the same powder and a shot weighing, in three trials 453 lbs. 4 oz., 451 lbs. 8 oz., and 452 lbs. 8 oz., the velocity was respectively 1,210, 1,194, and 1,210 feet per second. From these trials, compared with those of the English guns, it is evident that the English wrought-iron rifled guns are not only inferior in weight to our fifteen-inch smooth-bore, but inferior in initial velocity, and consequently in range; that they do not equal them in penetration or perforation we believe can be proved to the satisfaction, even of the English, by competitive trials of both at Shoeburyness against the same targets.

The English authorities have been unwilling to believe our statements as to the efficiency of our fifteen inch guns, although they were tested repeatedly, in our late war, against the sides of powerful iron-clads, and as for the twenty-inch gun they merely regard it with either well-assumed contempt or insincere ridicule. Possibly it has not yet been subjected to a sufficiently satisfactory test, even for us, but we have as much faith in its endurance and its power of penetration and range as we have in those qualities of its lesser cousin, which have been repeatedly tested. Indeed, we are ready to join with the *Army and Navy Journal* in not only believing in the possibility, but urging the practicability of casting guns on the Rodman principle, which shall throw shot and shell of twenty-five inches diameter. Such a gun, if constructed, would smash the heaviest wall of masonry of any existing forts, and destroy any iron clad that ever floated. We doubt if any floating battery in existence could withstand the inertia even of our twenty inch shot.

Nor does it seem we lag behind in the perfection of fire-arms for the infantry and cavalry arms of the service. Of course the intention of all improvement and all invention in this direction, is to construct a perfect breech-loader. Although during the late war, regiments of cavalry and infantry were armed with improved pieces loading at the breech, as the Burnside, Sharps, Spencer, etc., the Government was employing private establishments, in various parts of the country, in the manufacture of muzzle-loading rifles, up to the close, or nearly so, of the war. It was known, that in the first engagement of any magnitude—the first Bull Run—Burnside's division was greatly assisted by the Sharps' rifles of eight companies of the Second Connecticut Infantry, yet two years after that, if not later, the Colt's Company, in Hartford, and other contractors, were busy in filling government orders for the Springfield muzzle-loading rifle. In consequence, there is now in the country not less than one million of muzzle-loading muskets and rifles. Of course, the grand object at present is to "convert" these comparatively inefficient arms into superior weapons. New York State has about forty thousand Springfield muskets which it is proposed to convert. A State Ordnance Board is holding sessions in New York City for the purpose of examining and testing the various plans which may be laid before them. Quite a number of different plans have already been submitted, many of them quite ingenious and apparently promising. We forbear any detailed report at present.

The United States Government has already adopted a plan for converting, which has not only the approval of the Secretary of War and eminent ordnance officers, but has been examined by commissions or individual officers of various European governments, who, without an exception, agree that the converted piece excels the Prussian needle gun, the French Chassepot rifle, or any other with which they are acquainted.

It is known as the "Allin Patent," and a large number of workmen are now employed at the Springfield Armory in converting our muzzle-loaders into this breech-loading piece. A correspondent of the *World* thus describes the transformation:—

"The object is to reduce the calibre of the old muskets in order to admit of the use of a smaller cartridge, and thus secure greater range and force; that important point has been accomplished by reinforcing the barrel, that is putting in a thin lining or sleeve, which delicate operation is effected with admirable precision and rapidity. The old rifling is first reamed out, leaving a perfectly smooth bore. The lining is then inserted and brazed so as to become practically a part of the original. This new interior is then rifled with a shorter twist than before, being reduced to one turn in forty inches, while the calibre is reduced by the lining from 58·100 to 50·100 of an inch.

"The breech-loading apparatus of the Allin gun is almost as simple as an ordinary muzzle-loading musket. It consists merely of a slot cut into the top of the barrel, serving as a cartridge chamber, which is covered by a breech-block, swinging on a hinge at the lower end. The same block and hammer are used. There is nothing complicated or puzzling about the weapon. The clumsiest soldier can handle it easily. It has been fired twenty times a minute, and one has been discharged several thousand times without perceptibly affecting its efficiency, even after having been exposed for weeks at a time to the snow and rain of last winter. Its weight, complete, is about nine and a half pounds; owing to the improved rifling and reduced calibre obtained by the reinforcement above described, it has a surprising range and accuracy: and, to conclude, it is "finished up" to the highest degree of perfection, every part (of which, by the way, there are only nineteen all told,) bearing the minutest inspection for its beauty and strength of construction and the admirable finish of the minutest particular. Some thousands of these burnished breech-loaders, ranged in their racks, are a sight to captivate the heart of any expert in gun science. These guns are now being used in our Indian war in the far West, and the soldiers speak in the highest terms of them. The Cranston central-fire copper cartridge, on a new principle, (the "anvil" of the cartridge being loaded,) is now being tested at the armory for the new breech-loader. Hitherto the Martin cartridge has been used, but the Cranston proves a formidable if not fatal rival."

A Mountain Railway.

When the British government determined to construct a net-work of railways throughout India, considerable discussion took place as to the best means of connecting Bombay with Calcutta and Madras, for, as there was no break in the Western Ghauts, the idea of constructing a railway across them seemed utterly impossible. However, surveys were made, and at length it was determined to build the railway as it now exists; that is, run from Bombay to Callian, a distance of thirty miles inland, and there it forks into two branches, one going north-east to Agra, where it joins the East Indian railway leading from Agra to Calcutta, and the other going in a south-easterly direction towards Poona and Madras. The first of these crosses the Thell Ghaut—a mountain rising 1,912 feet above the level of the sea—and the latter crosses another mountain called the Bhore Ghaut, which rises to the height of 2,037 feet above the sea. The difficulties which the engineers encountered in the construction of this work were something stupendous; but as most of the ground over which the line passes is now cleared of jungle and leveled, and the all-but inaccessible mountain scarps, along which the track has been laid, have been well nigh obliterated, the obstacles in many places are scarcely apparent.

The Bhore Ghaut incline, which is the larger of the two mountain ways, is fifteen miles and sixty-eight chains long

The level of its base is 196 feet above high water mark at Bombay, and of its summit 2,027 feet; so that the total elevation of the incline is 1,831 feet. Its average gradient is one in forty-eight; its least one in three hundred and thirty, and its steepest, one in thirty-seven Throughout its length are twenty-six tunnels, ranging fron,forty-nine to 437 yards long, and forming a total length of 3,985 yards, or two and a half miles. There are eight viaducts, most of which consist of arches of 50 feet span, varying in length from 52 yards to 168 yards, and from 45 feet to 139 feet high; so that the total length amounts to fully half a mile.

The total quantity of cuttings amount to 1,623,102 cubic yards, and the embankments to 1,849,834 cubic yards, the greatest depth of cutting being 80 feet, and the maximum hight of the largest embankment being 74 feet. Besides this there are eighteen bridges of various spans, from seven to thirty feet, and fifty-eight culverts, of from two to six feet span, the cost of the incline was £597,223, or £41,188 a mile; or in other words about $3,000,000. The works were commenced in 1855, and were finished about five years afterwards.

It is obvious that to make a train laden with freight or full of human beings, ascend a gradient of upward of eighteen hundred feet must require extraordinary locomotive power. Accordingly, when an ordinary passenger train approaches a station at the foot of the Ghauts, it is divided into two sections, and generally two exceedingly powerful engines are attached to pull, and a third to push each section up the ascent. Powerful brake vans are also attached, so that in case of accidents the train may be stopped and prevented from receding down the slope. In descending the Ghauts, similar precautions are taken to prevent the trains from going too fast, and fewer locomotives and more brakes are dispatched with each train. Even then it requires the utmost caution to prevent the trains getting too much headway, lest it run off the rails and be dashed to pieces over some of the yawning chasms with which the mountains abound.

A terrible accident of this kind occurred in 1865. A heavy goods-train started from the top of the incline early one morning. It went on all right until it got to a steep portion of the line, where the guards and brakemen should have applied the breaks. They neglected to do so: the train acquired accelerated speed with every foot of space it traversed; the driver shut off steam and reversed his engine; the brakesman applied the brakes with all their might, and some of the men at the risk of their lives actually jumped off and tried to put lumps of wood between the spokes of the wheels. But all efforts were unavailing. The momentum increased. The train rushed down the descent with terrific velocity. It dashed past the reversing station with a whirl and a rush, and plunged over the precipice beyond. Its motion was so swift that, enveloped in the dense cloud of dust which it raised, it was not seen by the inmates of the solitary station past which it swept; and but for the remarkable noise which it made, the accident would have remained unknown. Search was made, and the train and its freight were found smashed to pieces at the bottom of the precipice, and the poor men who had charge of it crushed to death beneath its ruins. —*Cin. Com. Journal.*

Improved Device for Regulating Funnel Drafts.

The object of this invention is to furnish a much needed improvement in an article of general utility: the regulating and adjusting the draft in stoves without—as is the case with close fitting dampers when closed, forcing the gases and smoke from the stove into the room—and for a greater economy in the combustion of fuel, as it will save from 20 to 25 per cent of coal and from 30 to 40 per cent of wood. It not only prevents the leaking of gases from the stove, but provides a means of escape for them, and for all impure air from rooms. The engravings represent the advantages of this invention.

Fig. 1, section of pipe, A, with dial box, B, attached; Fig. 2, sectional view of pipe and box. Attached to damper spindle, G, is a hand or pointer, H, with knob, and pointed stud on under side, to hold the damper at any graduation from 0 to 5 by indentations, b, in the face opposite the figures, graduating the draft in the stove accordingly. When the hand points to 0 the damper is at right angles with pipe or closed; when it points to 5 it is open. See dotted lines, M, Fig. 1. E in Fig. 2 is the damper, which is simply a thin disk of cast iron, oval in form, parallel with spindle G. Openings J, J, in dial face below, with corresponding openings in pipe above the damper, are for the purpose of admitting air from the room into the pipe, (arrows in Fig. 2 indicate air,) operating with the damper to increase or decrease the ascent of gases in the pipe, affecting the combustion of fuel in the stove. These openings also provide a means of ventilation. Inside dial box, B, is a revolving disk, L, with duplicate slots, J. J., by which the air passage may be opened or closed as desired. D, in Fig. 2, is the space between inside of the pipe and damper when closed, for the escape of gases and smoke, as a total interception should never be allowed. All draft obtained consequent upon this space can be controlled by the admission of cold air through the openings, J, J.

Fig. 1

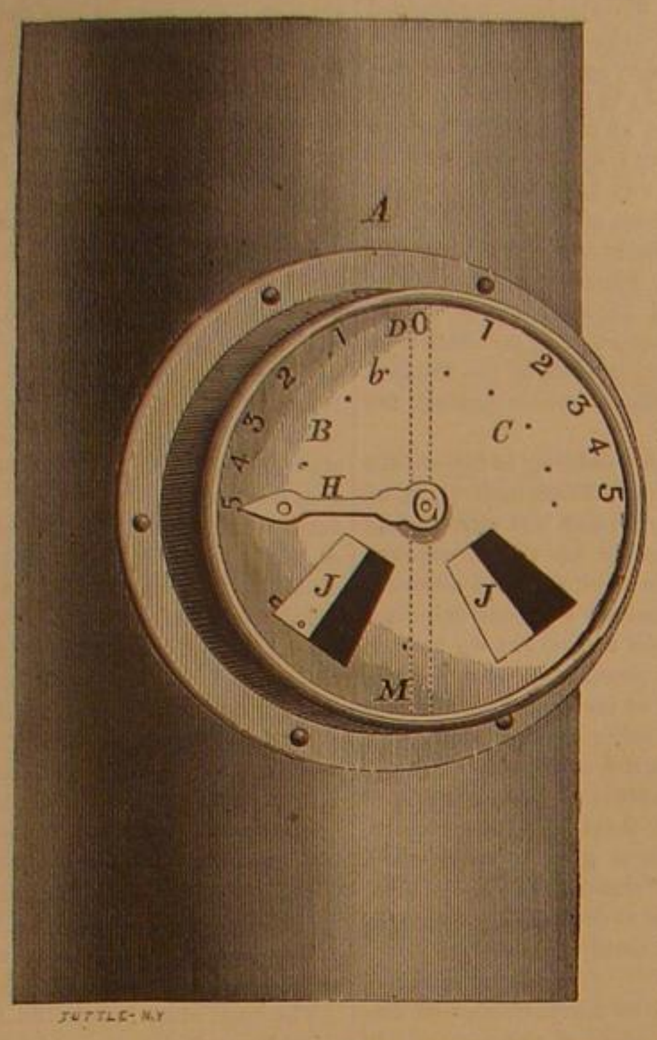
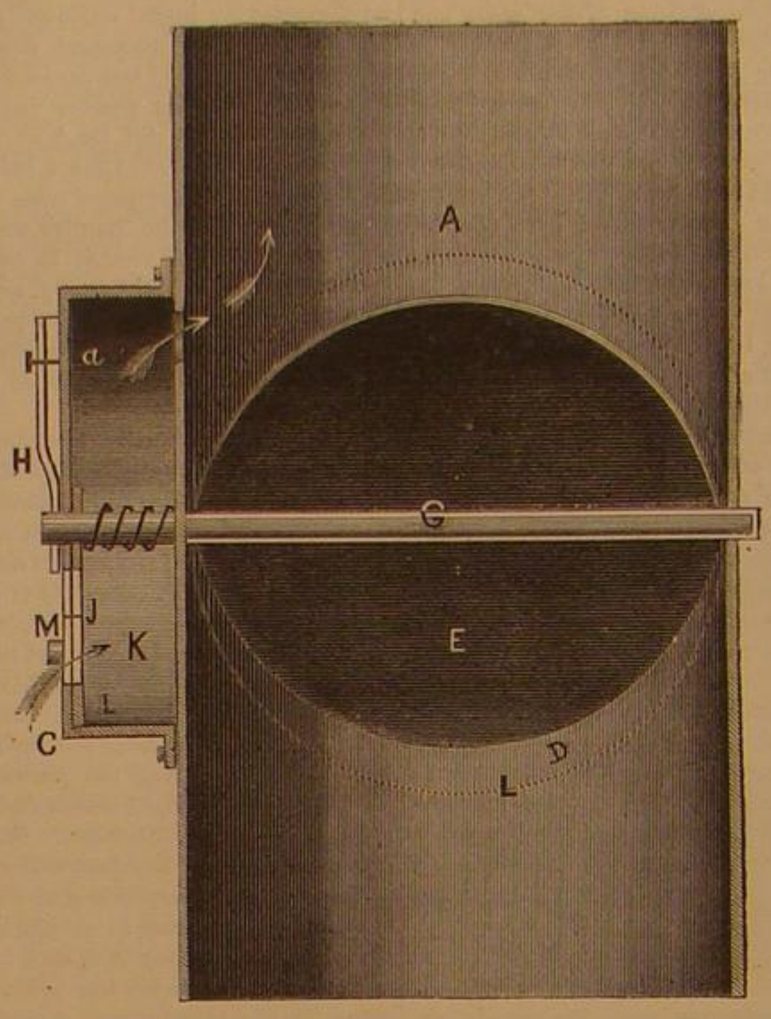


Fig. 2.



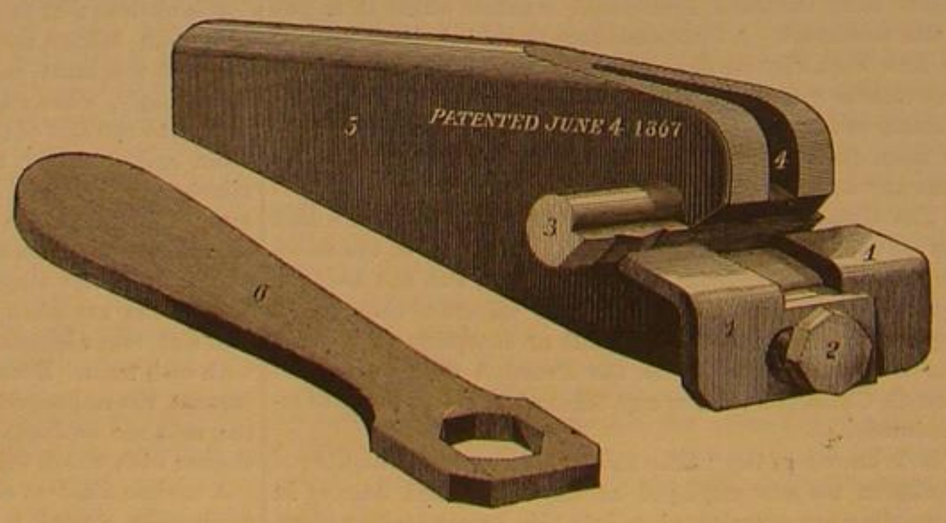
BULLARD'S DIAL ATTACHMENT FOR STOVEPIPES.

It is simple and can be attached to any pipe. Patented through the Scientific American Patent Agency, April 16, 1867. Further particulars and information regarding rights, etc, can be obtained by addressing Bullard & Co. Geneva, Ontario Co., N. Y. Circular of information furnished on application.

Improved Swage for Saw Teeth.

The setting of circular saw teeth has almost entirely gone into disuse and the swaging or spreading of the edge succeeded it. The result is very much favorable to the action of the saw, as each tooth is wider on its point than back, and thus chisels a kerf to admit the passage of the saw without that alternate strain unavoidable when the teeth are set.

The engraving represents a late improvement upon the swage patented last year by the inventor. The object accomplished by this tool is the spreading and sharpening the teeth of circular and upright saws, and giving them the most perfect shape for cutting lumber. The movable lips, 1, 1, are so made as to form the tooth widest at the extreme point and on the under side. They are secured by the screw, 2, after being adjusted to allow the saw tooth to spread to the desired width. The pin, 3, fits tightly in the body of the swage, 5, but can be driven by a slight blow of the hammer, so that either the V-die or the flat part of the pin can be brought between the movable lips. The groove, 4, is made to admit of the swage being used on a fine-toothed saw. 6 is the wrench for screw, 2.



EMERSON'S ADJUSTABLE SWAGE.

In using this tool the top of the tooth is placed between the movable lips, and a few light blows are given with the hammer on the end of the swage. The face of the pin and the inside face of the swage being tempered very hard, together form the edge of the tooth, while the movable lips, also tempered hard, form the corners of the tooth and determine its width. The V-die is first used on a new tooth, as the spread is more easily started with it, but the tooth is finished with the flat part of the pin between the lips. The head of the swage is tempered to prevent its being battered with the hammer. Two sizes are manufactured, the smaller for very fine toothed saws exclusively.

For further information address American Saw Company No. 2 Jacob street, New York City.

How to Sleep.

Dr. Joseph Wait, of Natick, R. I., has written a very sensible article on the above subject which we transfer to these columns from the *California Farmer*:—Sleep is the natural restorative of the wasted energies of the human system. It is during sleep that the processes of assimilating the food and nutrifying the tissues are thoroughly carried on and perfected, and that the nervous system is built up and invigorated. He who is a good sleeper, habitually enjoying quiet, refreshing, and unbroken sleep of seven or eight hours every night, can scarcely fail to have good health; while he whose sleep is disturbed and broken from any cause, who is restless and unquiet, and who fails to find himself in the morning refreshed and reinstated in tone and energy,—however favorable his other conditions may be,—cannot be a well person; or if he has health he is in a sure state to lose it. So potent is sleep as a means of restoring strength to the nervous and muscular systems, that the judicious physician—of whatever school,—values it above all other physical agencies as a curative in disease. However much the doctor may think of his medicines, he will suffer his patient to pass them all by so long as he can sleep!

Healthful, refreshing, sleep therefore, should be duly valued by all who wish to have sound health. We cannot afford to be indifferent whether "tired nature's sweet restorer" visits our pillows favorably or not. We must be very hospitable to her; we should be at great pains to entertain her; we should woo her favors; we should be careful to make all the circumstances and surroundings agreeable to her requirements; then she will not show herself a moody, fickle or unreliable guest, but will make herself at home with us, and wrap us nightly in her soft embrace, till fresh life and vigor are infused into us.

There are other ways of "murdering sleep" than by guilty conscience, like Macbeth. One of the most effectual is practiced alike by men and women—which is the habit of carying their business, whatever it may be, to bed with them. The merchant is absorbed in his mercantile affairs from morning till evening, and, when he closes his store at night, he does not close his business, shutting the affairs of the day out of his mind and occupying it with other thoughts which shall prove a diversion and relief, but he allows himself to study, and plan, and calculate about the special matters which have occupied him during the day. He goes to bed with his head full of business: when he sleeps his brain is burdened with it; he wakes, and turns, and dozes, and turns again. Business haunts him like a night-mare. He awakes in the morning unrefreshed and enervated, having performed as much business by night as by day.

The lawyer suffers his business to occupy his mind clear up to the time of retiring; and then when he would put it away he cannot, but it flits about his bed-head, whispering first in this ear, then in that; startling sleep from him whenever she would settle upon him with her downy pinions.

The minister studies his sermon far into the night, and then goes to bed and sermonizes during the remainder of the night, and rises in the morning weary and worn,

The student pores over his lessons till midnight, then goes to his couch with a brain excited and active; and so can get no continuous, undisturbed repose.

Women who have husbands and children and houses to care for, work, and calculate, and plan till the management of their households and servants comes to absorb all their thoughts and life, till they keep house at night between the intervals of fitful sleep, as well as during the day. Teachers carry their schools to bed with them and expend their sleeping as well as their waking energies upon them.

In order to secure such repose of the mind and the body as shall reinvigorate them, it is essential that the thoughts be turned out of the channel in which they have run during the day. They must be effectually diverted from their course. Thus the action of the nervous system is modified, the circulation of the blood is changed, and a sedative condition is secured.

There is a real philosophy in the practice of devoting the evening to amusements. Legitimately regulated and intelligently appropriated, they would for the time absorb the attention, thoroughly breaking up the action of the mental faculties, and so be the most fitting preparation for healthful sleep.

By amusements and recreations, by social intercourse, or by conversation, pleasant or gay; by reading something which shall not task the mind, while at the same time it diverts it with new thought; by light and pleasant physical exercise in the open air—not in gymnasiums—or by some other means should all persons, whose minds are burdened with cares or study, relieve the pressure before retiring at night.

The housekeeper may walk in the fields, and listen to the birds and pluck flowers, or cultivate and train flowers in her garden, or have a romp with her children; being sure for the time to become herself a child, and forget the duties of the day. She may seek to divert her thought by chatting with her neighbor; only let her be sure not to chat upon household affairs, and not to allude to her trials in the management of her children, nor to her difficulties with her servants, nor to her hardships in her labor.

One of the greatest mistakes which people make, so far as cultivation and expansion of the mind are concerned, not mentioning sleep, is always to make their conversation relate to their particular work or profession. Mothers are prone to be continually talking about their children, or domestic affairs; teachers about teaching; farmers about their farming business; lawyers about the law, etc. Every person, however much necessity may cause him to be devoted to business during the day, should so command his resources and surrounding, that before going to his couch at night, he shall be emptied of his farm, store, office, study, household work, teaching, and be simply a human being, lovingly related to God and to all men. Then, if his stomach has not work on hand, his sleep will be sweet and refreshing, and one of the surest preventives of sickness he can possibly have.

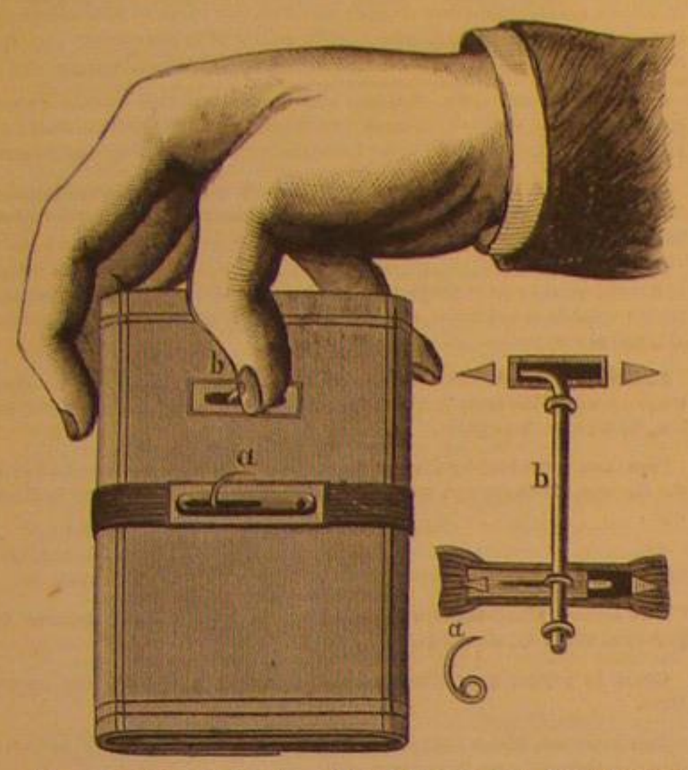
American Oils at the Paris Exposition.

Notwithstanding the many flings at the slimness of the American department at the great Exposition, our countrymen have succeeded in bearing away a goodly share of the first prizes. Among the most deserving is the award of a silver medal—the highest in the class—to Mr. F. S. Pease of Buffalo, N. Y., for engine, signal, lard, and petroleum oils. Mr. Pease has long been well known in this country as a manufacturer of superior oils, and it is gratifying to learn that his products are being introduced into France and England, and so far have given perfect satisfaction. Mr. Pease's oils took two prize medals, also, at the World's Fair in London, 1861. These facts sufficiently attest their superiority. He exhibits in Paris about forty different kinds and qualities of oils adapted to every purpose for which oils are used.

A Sensible Strike was made by some coal miners in England recently. They refused to work until certain precautions were taken against accident, which were acknowledged by the proprietors to be essential, but which they did not want to attend to just then.

WEBER'S SAFETY POCKETBOOK.

Not only visitors to our large cities, but the regular inhabitants have frequent cause to deplore the skillfulness of the professional pickpocket, who so adroitly relieves them of their pocket-books, generally without alarm or detection. The engraving, however, shows a very simple means of balking their skill and protecting the citizen's money. Under the clasp, which retains the elastic strap in place, is a curved needle, seen at *a*, which is secured to a wire bar, *b*, in the smaller figure, inside the wallet cover. The other end of the bar is bent at right angles and terminates on the outside of the porte-monnaie in a small knob, which works in a slotted guard, b, in the large figure. The point of the curved needle projects through the central guard at *a*.



The operation is simple. When the pocket book is to be placed in the pocket the thumb presses against the knob, b, and the neeble is turned back until its point is below the surface of its guard; the thumb is then withdrawn, and a spring on the inside of the book cover throws the curved needle forward, engaging with some portion of the pocket or clothing and securing it in a loop. Now, unless the knob is pressed back, the book cannot be removed from the pocket, at least, without alarming its possessor.

This ingenious device was patented April 2, 1867, by Theodore A. Weber, who can be addressed care U. Herrmann & Bro. 159 Pearl street near Wall, New York city.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

"Running Down" the "Dunderberg."

MESSRS. EDITORS:—When the English journal *Engineering* by error assigned to Captain Ericsson the design of the *Dunderberg*, it was made an occasion to declare this vessel a "weak monstrosity;" when she was sold to France this was made an occasion to impeach her prowess and ridicule her purchasers. The last paper ball fired at this persistently abused vessel was by the *Army and Navy Journal* in its issue of June 29, 1867. If there is then, anything in the tone of the present article seemingly harsh, let it be viewed in the light of those persistent misrepresentations; let it be viewed in the knowledge of persistent efforts to glorify Mr. Ericsson's monitors and defame any ship of any other man. Then to the subject. The *Army and Navy Journal* tells us: "The broadside vessel is a style of iron-clad which we have uniformly pronounced inferior to the turreted monitor. . . . The 9-inch Woolwich rifled gun, a very common gun in England, at moderate range, would certainly penetrate the 3½-inch armor of the *Dunderberg's* casemate, and probably go through both sides into the sea." Now the SCIENTIFIC AMERICAN says, page 173: "The *Dunderberg's* casemate sides and ends are inclined inward for the purpose of 'shedding' the shot fired against it, and plated with armor plates 28 inches wide and 4½ inches thick, extending in one section the entire hight of the casemate." So there seems one inch more of solid iron than the *Journal* gives credit for. Then the *Journal* gets 7 feet of soft timber into the *Dunderberg's* casemate, in order to afford its shells chance for "maximum destruction," when other accounts put the 7 feet of timber as well as the 3½ inches on the vessel's sides proper. Is the *Journal* merely innocently "in error" or "wilfully misrepresenting?"

Further on we quote: "The *Tennessee's* armor was not only much thicker than the *Dunderberg's*, but was backed by more solid timber," etc. The report of Captain Jenkins and others on "Survey of the rebel ram *Tennessee*," of August 13, 1864, says: "The plating at the casemate sides is 5 inches thick, consisting of two 2-inch and one 1-inch plates, about 6 inches wide. The backing was yellow pine, 13 inches, placed vertically; outside planking of yellow pine, 5½ inches thick, placed horizontally, and outside of this a layer of oak 4 inches thick, bolted on vertically, upon which the plating is secured." In all say 22½ inches mixed timber and 5 inches laminated armor in plates only 6 inches wide.

The *Dunderberg's* casemate has 4½ inches solid hammered plates 28 inches wide (which are certainly equal to the laminated armor of the *Tennessee*), and three courses of timber each one foot thick, say 36 inches of timber (which are certainly a little more than equal to the backing of the *Tennessee*)—so this assertion is "curiously the reverse of the fact."

Then the *Journal* tells of the "15-inch shot fired at the *Tennessee*, instead of being fired at point blank range, was fired at a considerable elevation, and struck not fair and square, but at an acute angle with the casemate, and even at an acute angle with the length of the vessel." Official reports do show that a certain Captain Nicholson, of the *Manhattan*, claimed all sorts of havoc committed by his 15-inch shot, but the survey of Captain Jenkins rectified some of this "fearful" havoc. In 2 hours and 52 minutes the *Manhattan* fired just 11 times, whereas the *Winnebago* fired 56 times in 2 hours and 30 minutes, the *Chicasaw* in about the same time fired 12 times, and the survey aforesaid showed more "fearful havoc" by the 11-inch balls of the *Winnebago* and *Chicasaw* than by the 15-inch balls of the *Manhattan*. Only two 15-inch balls are claimed as effective; one went through the armor, the other indented it (as per Captain Nicholson's report) so that Captain Jenkins and others did not find the indentation, for they do not mention it. Now does not the *Journal* get the two 15-inch balls "mixed"—did not the one that was fired at considerable elevation, at an angle, etc., as stated above, only graze the armor, and was not the ball that went through really fired "fair and square?" It looks too much so to be otherwise.

Then the *Journal* persists: "A single well directed shot, even if it took an hour to fire it, would pierce the *Dunderberg* * * *, while the latter might be firing her guns once a minute, if she liked, for an hour, without being able to enter such monitors as the *Puritan* or *Kalamazoo*." It is proposed to accept these odds. The *Dunderberg* fires for an hour, the *Puritan's* turret has an hour to get jammed (and certain official reports show that it does not take an hour to so get them), the pilot house has an hour to be pounded out of true, and its supporting spindle to be strained so as again to jam the turret; then there is the hour to jam a port stopper—in short, an hour in which any one of the numerously authenticated ills may befall the "rotating turret" which disable the ship. But even at the risk of imputation of cruelty, it is proposed to pour a single well-directed shot into the *Puritan* in the following manner. Aim to strike square about 2½ feet below load water line, if the swell of the sea only once in an hour favorably exposes the side armor of the *Puritan*, then the *Dunderberg's* single well-directed shot meets two 1-inch plates of iron and four feet of wood, and just beyond the boilers! It is not proposed to send the ball entirely through.

The *Dunderberg* carries an armor of 3½ to 4½ inches solid iron on the entire side to a depth of six feet below the water line, placed at an inclination, backed by seven feet of timber; the *Puritan* has laminated iron—six one-inch plates—extending but one foot below the water line, and then receding at the rate of one plate for every six inches of depth, backed by four feet of timber. Which is the better, or to put in other words, which isn't a swindle?

The English *Bellerophon* carries her solid 6-inch plates six feet below load water line, and here is the boasted, puffed monitor fitted with a sham protection that does not need a Woolwich 9-inch gun to "certainly penetrate it." To hold the *Puritan* or any other monitor to be an immaculate conception is an Ericssonian assumption. The interests of John Ericsson, Esq., are not always those of the nation—the *Puritan's* side armor shows it. To boast of the monitors as our accepted "war vessel," is to remain in the past. Happily, republics are ungrateful enough to keep on regardless of individual interests. In our infancy we may have petted these things over much; in our riper day it becomes us to consider that nothing, even nothing is perfect, save the illustrious vanity of certain inventors.

When the little *Monitor* drove back the *Merrimac* we felt gratitude to the great engineer; she was a good ship to fight in. When she buried herself and part of her gallant crew, we buried a part of our gratitude; she was a bad ship to sink in. Every blow that jammed a turret, or strained a spindle, or broke the turning gear, undermined a great Ericssonianism—the rotating principle—and the first design that gives us a vessel strengthened by her turret, not subject to derangement in her battery, not endangered by that ever awkward turret deck joint, the first such design that gives equal offensive prowess of battery, will apply the principle of rotation in office to the rotating principle of the Ericsson turret.

Progress never sleeps, and this country will progress, and in spite of the *Army and Navy Journal* or any of its pet notions.

G. P. HERTHEL, JR.

To Prevent the Ravages of Bolt Eaters.

MESSRS. EDITEURS:—I notice in your valuable paper an answer to inquiry in No. 23, Vol. XVI., of E. W., of Pa,, by J. Allen, of Grafton, Ill., how to prevent the bug from destroying his bolting cloths. I have had quite a good deal of trouble from the same cause in my own mill. I first tried to prevent the ravages of the bug by giving light to the chest by putting glass around it and muslin doors; their deeds being evil, I thought they would require darkness. The result was profitable, but not radical. I next procured wire cloth, so fine that those bugs could not get through the meshes, covered a reel, and bolted the chop through this bolt just before entering the silk cloth reel. Thus the bug never gets into the reel; it also prevents any hard substance from injuring the silk cloth. I have a smoothly made barrel at the end of my wire bolt, where I can catch hundreds of them, as they can not crawl out of the barrel. Mr. Allen's plan of running bolts rapidly when empty may be a partial remedy, but when the bug once gets into the reel it is certainly difficult to bolt him out, as he holds tenaciously to the cloth in the vicinity of the rib, and at that point bores through to release himself from prison. I hold to the doctrine most emphatically that an ounce of prevention is worth more than a pound of cure.

If E. W. will come to Miamisburg he can see my arrangement, which I know is effectual, in an old mill where any quantity of bugs are hatched, besides seeing one of the prettiest countries in the United States, with a harvest unsurpassed in quality and good in quantity in wheat, rye, oats, and flax, abundance of all kinds of fruit, with a good prospect for corn and tobacco.

JACOB SHUEY.

Miamisburg, Ohio.

The Mechanical Question.

MESSRS. EDITORS:—In reading the "mechanical question" of your correspondent H. H., page 50, I am at a loss which most to marvel at, the complacency of your contributor, who seems to be both imperfectly acquainted with the rules of simple arithmetic and profoundly ignorant of the nature of the mechanical laws he professes to manifest such contempt for under the name of "theory," or the superficial nature of your reply. His statement is briefly this:—Take an inclined plane having a length of 4 feet and a hight of 4½ inches (or else a base of 4 feet and same altitude; it is difficult to make out which he means, but the result would not be materially different), then 100 pounds resting on the plane can be balanced by 8¾ pounds power. He speaks of "occular demonstration." The thing is simply absurd. The testimony of individuals, or crude and careless experiments, can have no weight with any intelligent mind against that of absolute laws. He may indeed place his inclined plane upon a rickety table not beveled up, and imagine he has a rise of 4½ inches when the actual lift may be perhaps 2 or 3 inches. But accuracy is as necessary in conducting "practical experiments" as in working problems, and he who fails in the latter and treats arithmetic with contempt may well be suspected in his attempts at the former. I give the problem, (l being length; h, hight of plane; P, power, and W, weight). $\frac{P}{W}=\frac{h}{l}$. $\therefore P=\frac{Wh}{l}=\frac{100\times4.5}{48}=9\frac{3}{8}$ pounds (or in case 4 feet represents the base of his plane, $\frac{100\times4.5}{48.21}=9.334$ pounds). To move the weight would require considerably more, of course—experiments to the contrary notwithstanding. Let me add that the laws of mechanics were first deduced from multitudes of careful and accurate experiments—not from theories, which on the contrary were against them, as Galileo found to his cost while verifying this very principle of the inclined plane.

Washington, D. C. H. H.

Siberian Marmots.

MESSRS. EDITORS.—In your Scientific Magazine of the 27th April there was a rceipe to destroy rats by injecting into their haunts sulphuret of carbon in vapor. We have here an immense quantity of little animals about the size of rats which live in the ground, they lie dormant all winter very deep in their holes and in the summer they are destructive to the grain crops, particularly wheat, they are called "siberian marmots." Would some of your correspondents be kind enough to tell us how they can be destroyed? If by vapor from what the vapor is produced, and by what means it can be injected into the ground as their runs are very extensive running out of one into another for a great distance and for about three feet from the surface perpendicularly.

WM. COWLEY.

$\frac{6}{18}$ June, 1867. Nicholas Plain, Kharkoff, Little Russia.

[The marmot belongs to the squirrel family; the American wood chuck and gopher are varieties which closely resemble in their habits the European marmot. If the outlets of the holes are guarded, it seems very likely that a good dose of bi-sulphide of carbon would destroy the pest. Bi-sulphide of carbon is a very volatile liquid, and if it were poured into the marmot holes, its heavy vapor would immediately penetrate into all their ramifications.

Our readers will observe the peculiar method of expressing the date of the letter. The Russians still adhering to the unreformed calender or old style are twelve days in advance of our reckoning. Our 6th of June was their 18th. Little Russia is one of the departments of Russia in Europe and Kharkoff is a province.—EDS.

Mysterious Boiler Explosions.

MESSRS. EDITORS:—There have been three mysterious boiler explosions in this city within two or three years, all in the same mill. First, that of a four-flued boiler, which had been in use two or three years, when one of the owners passed through the engine room a few minutes before the explosion, and noticed the water running out of a leaky gage, and believed there was plenty of water in the boilers.

They then put in two double-flued boilers, with glass water gage in addition to the usual gages; water connection in the form of a large mud receiver, with large pipes from the boilers down to the mud receiver. It ran about a year and blew up, killing the engineer, so there was no evidence in regard to the state of the water, but it is supposed that with the glass water gage he could not very well be deceived.

The mill was rebuilt, with two more boilers, water connections the same as before. The steam connection was the pipe for conveying steam to the engine. In both the last explosions the boilers next the brick smoke stack were blown to pieces, while those next the engine remained whole, except the damage caused by being thrown out of the building. The engineer says that by the indicator he had between 45 and 50 pounds. It had been higher but it was working down. He tried the water and found it well up; stepped out to get a drink and away it all went.

Many suppose that some peculiarity of the water causes it, there being indications of oil or something of the sort near by, where they are boring for oil. But if this is so, why should not other boilers in the vicinity be troubled in the same way?

There were no water gages in the boiler next to the chimney; the breeching that conveyed the smoke from the flues to the stack, running into the chimney not very high above the boilers. If the breeching was not very large, would not the boiler nearest the chimney have the strongest draft through its flues, consequently make steam the fastest, while the engine, through a small pipe, was drawing off steam as fast from the boiler nearest to it as from the other? Would not the boiler with the best draft make most steam and push the the water down through the large water pipes up into the the other boiler faster than a small steam pipe connection could equalize the pressure, at a time when the engine was drawing its steam through this pipe, thereby causing the boiler nearest the engine to show water at its gages, while but little water remained in the boiler nearest the chimney? If this is so, would not large steam connections (steam drum for instance), remedy it? Or running the breeching perpendicular for a distance before turning into the chimney so as to equalize the draft, be a remedy? C. G.

Beardstown, Ill.

[This may be a series of "mysterious" explosions, but we are inclined to think otherwise. The only mystery is that the explosions did not follow one another more rapidly. It seems strange that any competent engineer should arrange boilers in the way described. If we had full data, such as the size of the boilers, amount of grate surface, area of breeching, and area and hight of chimney, size and length of steam pipe, size and speed of piston, we think we could show conclusively the cause to have been the water leaving one boiler for the other; at least such is our present opinion. An expert examining the exploded boilers could have determined, probably whether there had been a lack of water or not.

The boiler next the engine would naturally have the greatest draft of steam from it, especially if the common pipe was small. The boiler next the chimney would have the best draft unless the breeching was large; hence, a greater pressure upon it. It would require but half a pound difference in pressure to change the level of the water nearly one foot, which would leave the flues bare.

Water connections should always be arranged with checks, so that the water could enter but not leave the boiler; this is a cardinal point. No boiler should be without gage cocks, glass gages, and low water indicator and reporter. Had there been a good low water reporter attached to these boilers these accidents would not, in all probability, have occurred. The mud receptacles should have been independent, having each no connection with the neighboring boiler. It would be well to run partitions in the breech or conveyer to the chimney from one boiler to another to equalize the force of the draft. —Eds.]

A Question.

Messrs. Editors:—Suppose a chain composed of three links, the whole outside-to-outside measure of which is twenty inches, the links being made of 1¼-inch-diameter round iron, and a single link made of the same size iron and having the same length as the chain made of three links. Would the single link be as strong to resist the strain of a train of cars stretching up as the three links? If not, why?

If there is any difference in favor of the three links then I think it would have to be the result of the six ends each springing a little or being more elastic than the two ends of the single link. But again, unless very carefully made, there are more chances of tearing or breaking one in three welds than a single weld. If the single link is not as strong, made of the same iron, how much heavier ought it to be made to be as strong? Wm. Weiles.

New York City.

An Invention Wanted.

Messrs. Editors:—One article which is of more importance to the laboring people of the United States than any other, would be a neat wooden shoe with a flexible sole. It ought, it can be invented. It now costs from ten to twelve dollars per year for each laborer's shoes; two pairs of wooden shoes, or $2½ per year ought to shoe our laborers. H. E. L.

New Jersey.

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Editorial Summary.

Effect of Lightning on Wires.—When the electric fluid is passed through a wire, undulations of the latter are produced, and the wire is momentarily shortened. This shortening was first observed by Nairne, but no satisfactory explanation of the phenomenon has ever been given. In a paper addressed to the Academy of Sciences by M. F. P. Leroux the subject is examined anew. Operating on wires left entirely free at their nether extremities, the undulations were quite apparent, but their order was so irregular, and they assumed such a variety of shapes that no rule could be laid down regarding them, but M. Leroux observed that the temperature caused by successive electrical discharges was not without influence upon them, and he concluded that the phenomenon alluded to involves in its explanation no new principle, and is simply a question of temperature. As the heat engendered by the discharges increases, the wire tends to expand in length by dilation, but simultaneously and from the same cause there is a tendency to increase in diameter, and it is to this double molecular action the undulations must be ascribed.

Encouraging, Very.—J. R. Glover writes to the New York Farmer's Club, that he has been so engaged in his experiments in hatching eggs artificially that he has not had his clothes off more than two and a half hours in any of the twenty-four for the last three months. The results of his persevering labors he sums up as follows: "I have used about 1,600 eggs, and I have now on hand, in good condition, sixteen chickens—just one chicken to one hundred eggs." Still he believes the thing can be done, if we only knew how.

The female skull, according to Weckler, is smaller than that of man, both as regards horizontal circumference and internal capacity, and the weight of the brain is correspondingly less. It may be said that the type of the female skull approaches in many respects that of the infant, and in a still greater degree that of the lower races. With this is connected the remarkable fact that the difference between the sexes, as regards the cavity of the skull, increases with the development of the race, so that the male European excels the female much more than the negro does the negress.

Miners' Lamps.—Notwithstanding that every English miner who is detected in unlocking his safety lamp is liable by law to three months imprisonment, the offence is committed with impunity by means of false keys. A simple plan has been invented by a manufacturer of these lamps for sealing them without using any lock. When the staple has been put down over the eye a small leaden pin is inserted in the latter, then being placed under a horizontal press fitted with two dies, the shank of the plug is formed into a head and both heads are impressed by the dies with any lettering or device.

Life and Death.—It has been estimated that the number of deaths per year throughout the world is about thirty-two millions. Assuming this to be correct, the deaths each day would be about 88,000; 3,600 per hour, 60 per minute, and thus every second carries one human being into eternity. A calculation of the annual births on the globe shows that whereas 60 persons die per minute, 70 children are born, and thus the increase of the population is kept up.

A Huge Laundry is established in the suburbs of Paris at which is washed the soiled clothing of the guests of the principal hotels, at the rate of 40,000 pieces a day. The clothing is boiled with soap and soda, and then washed in hollow wheels, rinsed, partially dried by centrifugal machines, and for the rest in hot air ovens, which carry off nearly three pounds of moisture per pound of coal burned, and is finally ironed between polished rollers, and then packed ready for return to Paris.

A Mammoth Cave in southern Illinois is reported to rival the famous Kentucky cave and to exceed in length any others yet discovered. It has been partially explored a distance of three miles, but a thorough search through it has never been instituted. Some years since two men got lost in its pas, sages, and after three days of unceasing travel emerged into the open air thirteen miles distant from the place where they entered.

The American Poultry Association recently organized in this city is instituted to encourage the raising of poultry on a larger scale than has heretofore been attempted in the United States. They propose by statistics and by the practice of individual members, to show that poultry is a source of wealth, and that the raising of poultry may be combined with many other branches of farming industry. This will encourage at some future time the formation of large poultry establishments, such as have been erected at Bromley (Kent, England), and in the environs of Paris.

New Zealand Flax.—Interesting samples of paper made from this fiber have been forwarded to England. While rather highly colored, the flax paper has a singularity of texture and a strength which suggests an excellent paper for bank notes. The coloring matter has been removed by chemical means, leaving the pulp as white as that of ordinary cotton rags.

Walrussian Wealth.—Reports of gold deposits in our new Russian Possessions are still coming in. The latest is contained in a letter to Secretary Seward from Mr. Berry, of Oregon, who relates that a party of prospectors found in the Stickteen River, three hundred miles from its mouth, gold and silver deposits of great wealth, also rubies and agates, and on Bristol River, copper and coal indications.

Novel Method of Manufacturing Gas.—According to a Swiss journal a means has been discovered of utilizing cockchafers, or, as they are more commonly called, "June bugs." The *Estafette* of Lausanne states that between four and five millions of these insects were recently sent to Friburg for the manufacture of gas, and the residue forms an excellent carriage grease.

A Novel Speculation of the Accidental Insurance character has been started in Buenos Ayres. A joint-stock hospital has been opened to which subscribers who pay $1 20 in silver monthly are to be admitted free, and attended with the best medical skill, in case of sickness or accident.

Philadelphia Schools.—Of the total number of 142,517 children between the ages of six and eighteen within the city limits, 53·5 per cent are in her public schools; 17·4 per cent in private and parochial schools; 14·6 per cent at work, and 14·5 per cent in idleness. The children between six and eighteen are usually estimated at 18 per cent of the whole, which would give for Philadelphia a total population of 784,000.

For testing the different lubricating properties of oils and other lubricants an English inventor has contrived an apparatus whose principle depends on the amount of frictional motion necessary to produce a given temperature.

Flexible Glue.—A German chemist has discovered that if glue or gelatine be mixed with about one-quarter its weight of glycerin, it loses its brittleness and becomes useful for many purposes for which it is otherwise unfit, such as dressing leather, giving elasticity to porcelain, parchment or enamelled paper, and for book binding.

A Heavy Blast.—Two tuns of gunpowder was fired in a mine of the Salt Lime Works Company, Clitheroe, England, and the explosion which followed the lighting of the train resulted in the displacement of about 20,000 tuns of stone.

Power of the Human Voice.—It is stated that the human voice, when speaking with clear articulation and supplied from good lungs will fill 400,000 cubic feet of air. The same voice singing, under like circumstances, can fill with equal facility 600,000 cubic feet.

The Imperial Commissioners of the Exposition are proposing to give a grand entertainment to the members of the juries, the great prize holders, and other notables, while the exhibitors are about preparing a banquet for the Emperor himself, who, it is said, has given a conditional acceptance.

Remarkably Accurate.—A full examination of the United States Treasury Department shows that since 1861 $14,500,000,000 have passed through the hands of the Treasurer, in many thousand receipts and payments, but such has been the accuracy with which all these monetary affairs have been transacted, that the vaults contained the requisite cash indicated by the books, to the fraction of a dollar.

A New Alloy consisting of 65 parts tin, 8 parts copper, 10 parts lead, and 17 parts antimony, has been patented in England. The composition is particularly designed by the inventor for facing or forming calico printing rollers. In this country these rollers have been always made of composition, brass or bronze, or preferably of copper, cast, drawn and rolled directly from the ingot.

Explosion of a Letter.—While one of the employés of the New York Post Office was stamping a letter a few days since, he was much perturbed by a mysterious explosion that blew part of the letter away, and scorched his hands and face. The letter contained percussion caps upon which the stamp unfortunately descended.

A French Chemist says that thirty pounds of flesh, thirty-two pounds of blood, and sixty-two pounds of bone, contain as much nitrogen as one thousand pounds of farm manure; and hence that the carcass of a dead horse is worth more than a tun of the best farm-yard manure for the purpose of vegetation.

Graphite.—A gas pipe in the lower part of this city that had lain undisturbed for several years, was recently taken up and found to be so completely coated with graphite that pieces were sawed off in convenient size and served admirably as lead pencils.

Consumption of Paper.—England uses about 220 million pounds of paper annually, France yearly consumes 195 millions, while the United States demands more paper than both these countries combined—440 million pounds.

There are 362 journals of various kinds now published in Paris, against 416 only in 1854. The Exhibition has been the cause of eleven publications being added to the usual list.

Dirt Eaters.—An analysis of the earth eaten by the natives of the Island of Borneo shows that in 100 parts there was 15·4 of pit-coal, resin (organic matter volatile at red heat), of pure carbon, 14·9, of silica, 33·3, of alumina 27·7, and of iron pyrites, 3·7 parts.

Prolific.—In San Bernardino county, California, the farmers raise three crops a year off the same field: first oats or barley, next Indian corn, and last, turnips, beets or grass.

Bismarck was a healthy man till he achieved greatness, and now he has all the diseases which foreign correspondents attached last summer to Napoleon.

The great tabernacle of the Saints at Salt Lake City is now finished. It is 250 feet wide, and furnishes comfortable sitting room for 10,000 people.

Two century plants are now in full bloom in New Orleans, and, say the papers of that city, attract great attention.

Gold, in paying quantities, is found near Bellville, Richmond county, Ohio.

The American Watch Company now finish a watch every two and a half minutes during the working hours of the day.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The plans for the new bridge across the Mississippi river at St. Louis have been accepted, and it is to be commenced without delay. The new bridge will be an immense structure, accommodating two double tracks of rails for street cars, beside sidewalks for foot passengers, and will consist of three arches, the central arch having a span of 515 feet, and the two side arches 497 feet. The central piers will be nearly 200 feet in hight from the bed of the river. The estimated cost of this great bridge is $5,000,000.

The Dismal Swamp canal, now in a very dilapidated condition, is to be repaired by a company composed chiefly of North Carolina speculators. It is estimated that more than a half million dollars will be needed to restore the canal to a working condition.

The Union Pacific Railroad will locate its locomotive, machine and car shops at Cheyenne, a new city just laid out at the foot of the Black Hills. Coal, iron, minerals and water power are found in proximity. At present it is a bare prairie, but within four months it will be the terminus of the railroad.

Ohio has just now two mining excitements; one is a gold mine discovered in Richland county, the other a silver discovery in Washington county. The former locality has been visited by a Cincinnatti scientist who reports extensive deposits of gold ore, the best specimens being found near Bellville on the borders of West Virginia.

In the United States there are 81 square miles of territory to each mile of railroad, and one mile of road to each one thousand of population. In Great Britain the proportion is nine miles area to one of railroad, and one mile of road to each 2,819 of population; in France the ratio is twenty-four miles to one of railroad, and one mile of road to 4,172 inhabitants. Belgium with one mile of railroad to every seven miles of territory, has a more thorough network of railroads than any other country, while Russia, with a territory twelve times the extent of the British Isles, has only one fifth the length of road.

In San Francisco, the North Pacific Fur company, capital $1,000,000, has been formed for trading in our new northern possession. The trade of this latter country in skins and furs, last year amounted to $1,500,000. These furs consisted of sea-otter, seals, blue and white foxes, mink, muskrat, beaver and bears.

The citizens of Schuylkill county, Pa., have under consideration the erection of Bessemer steel works in that county. At a meeting in furtherance of the project held in Schuylkill Haven, it was stated that $160,000 had already been subscribed. There are now only two Bessemer steel works in the country.

The directors of the New York Central Railroad Company, at their late session resolved to issue stock of the company to the holders of the stock of the Athens and Schenectady line, so as to absorb that line in the Central. This will add two millions to the capital stock of the Central Company.

The largest blast furnace in the world is at the Norton Iron works, Cleveland district, England. Its capacity is 2,600 cubic feet. Although its productive powers have not yet been tested, it has already made 431 tuns of pig iron in one week.

The total consumption of roofing slates in the United States was, in 1866, 250,000 squares,—a square being ten square feet. Beside this the trade in finer slate qualities used for mantle-pieces table and billiard plates, is annually increasing in importance. There are twelve slate quarries in Pennsylvania whose combined productions in 1865 was 60,000 squares, in 1866, 90,000 squares, and this year it will reach a much higher figure, while the demand exceeds five times the present power of supply.

The Pacific Asphaltum company have an apparently inexhaustable mine of this substance convenient to San Francisco. The Asphaltum, which has the solidity of coal—powder being used to blast it—and differing entirely from that heretofore used, is found at a depth of six to ten feet from the surface, continuing in solid masses about 15 feet deep when soft and liquid matter is met with, which the company do not yet know how to employ, or dispose of.

The originator of a railroad route from Cordalia to Salta, S. A., a distance of seven hundred miles, is William Wheelwright, a native of Newburyport, Mass. The road is being built by an English company, and 120 miles of it are already completed.

EXTENSION NOTICES.

Norman Millington, of Shaftsbury, Vt., for himself and S. M. George, executrix with Abraham B. Gardner and Leland J. Mattison, executors of the estate of Davies J. George, deceased, having petitioned for the extension of a patent granted to the said Millington and George the 18th day of October, 1853, for an improvement in machines for figuring carpenters' squares, for seven years from the expiration of said patent, which takes place on the 18th day of October, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 30th day of September next.

Harry Whittaker, of Buffalo, N. Y., having petitioned for the extension of

patent granted to him the 18th day of October, 1853, for an improvement in the application of high-pressure engines to screw propellers, for seven years from the expiration of said patent, which takes place on the 18th day of October, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 30th day of September next.

Samuel Pratt, of Hammonton, N. J., having petitioned for the extension of a patent granted to him the 25th day of October, 1853, for an improvement in screw nails, for seven years from the expiration of said patent, which takes place on the 25th day of October, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 7th day of October next.

David M. Smith, of Springfield, Vt., having petitioned for the extension of a patent granted to him the 25th day of October, 1853, for an improvement in spring clamp for clothes lines, for seven years from the expiration of said patent, which takes place on the 25th day of October, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 7th day of October next.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

RAILROAD SPIKE.—Lewis Postawka, Boston, Mass.—This invention consists in constructing a spike, designed more especially for securing rails and their chairs to the ties or sleepers, with a longitudinal slit extending from its point upward a certain distance, and having the ends of the slit or slitted portion beveled at their inner sides, so that, when the spike is driven into the tie or sleeper, the resistance which the latter offers to the penetration of the former, will cause the two parts of the spike, formed by the slit, to spread out or diverge, so as to effectually clinch the spike.

RUDDER.—Thomas W. Murray, New York City.—This invention consists in constructing the rudder with a cast-iron post, and securing the blade of the rudder, which is of wood, to the post in a novel way, and also in a novel way of securing the rudder post to the stem post of the vessel. The object of the invention is two-fold; to wit: to prevent the unshipping of the rudder, and to obviate the contingency of the bending and twisting-off of the rudder post.

CLEANING HARNESS AND OTHER LEATHER.—George H. McCleary, Hollidaysburg, Pa.—This invention has for its object to furnish an improved process by the use of which old harness and other dry and hard leather may be renovated, or made soft, pliable and tough.

RAILROAD CAR WHEEL.—David Forrest, Eastport, Me.—This invention has for its object to furnish an improved car wheel, so constructed that the parts most subject to wear or liable to be broken may be replaced when worn or broken, and which shall be very compact.

CHURN.—Wm. Weddington, Winterset, Iowa.—This invention has for its object to furnish an improved churn, so constructed and arranged that the churning may be done by air introduced into the churn.

GATE.—E R. Wolfe, Plymouth, Pa.—This invention has for its object to furnish an improved attachment for closing gates, which shall be simple, cheap, efficient, easily constructed, symmetrical in appearance, and which shall have no projecting parts to catch upon passing objects.

MACHINE FOR WASHING AND DRYING DISHES.—A. W. Ward, Fishkill, N. Y.—This invention has for its object to furnish an improved machine by means of which dishes may be washed and dried quickly, thoroughly, and conveniently.

POTATO DIGGER.—Henry P. Smith, Denton, Mich.—This invention has for its object to furnish an improved machine by means of which the potatoes may be easily and rapidly dug and separated from the dirt that may adhere to them.

WASHING MACHINE.—Butler R. Platt and Joseph A. Gray, Holland, Mich.—This invention has for its object to furnish an improved machine by means of which the clothes may be washed quickly and thoroughly, and which may be easily adjusted to wash coarse or fine clothes.

HORSE RAKE.—John B. Hoag, Oxford, Ill.—This invention relates to a new and useful device for holding a horse rake when working and releasing it when loaded, to enable it to revolve and dump the hay.

COMBINED WRITING DESK AND TABLE.—Albert A. McMore, Brooklyn, N. Y.—This invention relates to a new and improved arrangement whereby two indispensable pieces of furniture are combined in one, and the invention consists in attaching the top of a table to the frame in such a manner that the table is transformed into a writing desk in one second of time, and altered to a table with equal facility.

OFFICE CHAIR.—Robert Fitts, Fitchburg, Mass.—This invention relates to improvements in the construction of arm chairs designed for use in offices and for other purposes.

EXTENSION BEDSTEAD.—Jacob Holzmann, New York City.—This invention relates to a new bedstead which can be extended in length and width, so that it can be used for children or as a double bedstead for adults, as may be desired. The invention consists in making each of the side bars as well as the end bars or heads of two pieces, so that the ends as well as the sides can be made longer or shorter at will.

CARTRIDGE BOX.—William H. Morris, Cold Spring, N. Y.—This invention consists in constructing a cartridge box with a series of blocks or cartridge receivers constructed and arranged in such a manner that a greater number of cartridges than usual may be contained in a case of a given size, and the cartridges extracted from the blocks or receivers with the greatest facility.

CULTIVATOR.—William E. Smith, Oquawka, Ill.—This invention relates to a new and improved cultivator of that class which have their plows or shares attached or arranged in such a manner as to be capable of being moved or adjusted both vertically and latterally by a person walking at the rear of the machine.

TETHERING ANIMALS.—Warren Johnson, Fisherville, N. H.—This invention relates to a new and improved device for tethering animals and is an improvement on that class of tethers which are composed of a weighted pole connected by a swivel to an upright or stake. The invention consists in an improved swivel by which the pole is connected to the upright or stake.

WASHING MACHINE.—W. W. Adams, West Derby, Vt.—This invention has for its object to furnish an improved washing machine so constructed and arranged that the washing may be done quickly and easily, which will not tear the clothes, and with which the labor of handling the clothes shall be greatly diminished.

MAKING BUNGS, PLUGS, TAPS, ETC.—Wm. L. Standish, Pittsburg, Pa.—This invention consists in constructing and combining mechanical devices for making bungs, plugs, taps, etc., for barrels and other purposes.

SASH FASTENER.—George King, John Gomber and Lindhurst Shope, Frederick, Md.—This invention relates to a new and improved device for fastening window sashes.

STEAM CUT-OFF.—L. Griswold, Portland, Wis., and G. Caul, York, Wis.—This invention consists in providing a steam chest with cylinders and pistons or valves and apertures and arranging them in such a manner that the valves or pistons which admit and cut off the steam shall not be subject to undue friction in consequence of the pressure of the steam and also so that the steam is made to operate upon the main shaft when the crank is on the center.

BROAD-CAST SEEDERS.—Jacob Slauder, Osborn, Ohio.—In this invention the seed board is made reversible, so as to throw the seed in front of or behind the plows at pleasure. Secondly—the plows can be removed and drill teeth substituted, hose being attached for the purpose of conveying the seed from the seed-board to the conducting tubes. Thirdly—the seed box can readily be adjusted to sow oats as well as wheat and other grains.

DEAD BODIES.—Colin Cree St. Clair, Washington, D. C.—In this invention a liquid composition or cement is poured around the body in a suitable mold, which, drying and hardening, effectually preserves the body and at the same time serves the purpose of a coffin or sarcophagus.

CHURN.—L. M. Cook, Owatonna, Minn.—In this invention the churn is provided with two stationary and two movable dashboards.

HEDGE PRUNER.—Frederick Bender, Baltimore, Md.—In this invention the cutting blade is made with a perfectly straight edge, and when closed enters a longitudinal slot in the opposite blade, which is also straight.

CORN PLANTER AND FERTILIZER.—John B. Gemmill, Strawbridge, Pa.—The object of this invention is to combine in one machine a corn dropping mechanism and mechanism for depositing a phosphate or other fertilizing material, together with a novel and simple arrangement of devices for operating the slides which regulate the flow of the material from the hoppers.

MACHINE FOR DIGGING AND GATHERING POTATOES.—Christian G. Grabo, Detroit, Mich.—This invention has for its object to furnish an improved machine by means of which potatoes may be dug and gathered thoroughly and cleanly.

SNOW PLOW.—R. S. Harris, Dubuque, Iowa.—This invention has for its object to furnish an improved apparatus by means of which the snow may be readily removed from the track and thrown to a sufficient distance at one or both sides of said track, to be wholly out of the way.

WINDOW-BLIND FASTENER.—Jackson R. Baker, Jersey City, N. J.—This invention has for its object to furnish an improved fastening, by the use of which the blind will be held securely when open, and which can be operated to close the blind without its being necessary to reach so far out of the window as is the case when the ordinary fastening is used.

LOCK.—Robert M. Webb, New York City.—This lock is of that class of locks employed for articles having hinged or rising and falling lids, covers, or tops, such, for instance, as pianofortes, sewing-machine cases, etc.

LATH FRAME.—Albert Reed, Mankato, Minn.—This invention relates to a frame so constructed as to facilitate the nailing and securing of laths to the side of a room and at regular and equal distances apart, so as to leave spaces or openings of a uniform size or width between the several rows or series of laths.

CULTIVATOR.—Jacob Wilson, Somerford, Iowa.—This invention relates to a new and improved two-horse cultivator for cultivating those crops which are grown in hills or drills, such as corn, cotton, etc. The invention consists in a novel and improved construction of the parts, whereby the rider or operator has full control over the plows, being enabled to raise and lower and move the same laterally with the greatest facility, and the draft mechanism also improved and rendered more favorable for the horses than hitherto.

COMPOSITION PLATE FOR ARTIFICIAL TEETH.—G. F. J. Colburn, Newark, N. J.—This invention relates to a new and improved composition for the plates in which artificial teeth, or teeth and gums, are set. The object of the invention is to obtain a composition for the purpose specified, which will admit of being manufactured or molded into the desired form, and the teeth, or teeth and gums set into it with far greater facility than hitherto, and which will also possess the advantage of admitting of repairs being made (broken teeth replaced), with far less difficulty than with either the metallic (gold) plate or with the hard rubber or vulcanite plate.

BASE FOR ARTIFICIAL TEETH.—G. F. J. Colburn, Newark, N. J.—This invention consists in combining a peculiar composition with a metal plate, whereby a very superior base for artificial teeth is obtained, one which will be strong and durable, possess the advantage of being readily and economically repaired when necessary, as, for instance, the replacing of a broken tooth, and which may be worn by any person with the greatest convenience and comfort, even those to whom the hard rubber or vulcanite bases are repulsive.

SAW MILL.—Alfred Gifford and Robert L. Felts, Milroy, Ind.—This invention relates to a new and improved reciprocating saw mill, and has for its object portability, to admit of the whole machine being drawn from place to place by yokes of cattle, and also admit of being driven or run by a small engine and to operate rapidly.

PAPER NECKTIE.—Hiram Whitney, Watertown, Mass.—This invention relates to the manufacture of neckties from paper, and consists, first, in providing a necktie made from paper, with an extension piece along its upper edge, and a folded piece upon its lower edge, having a buttonhole in the same, by means of which two pieces the necktie can be secured upon the front button of the shirt.

STOVE-PIPE SHELF RACK.—John Turner, Marshalltown, Iowa.—This invention relates to a new device for utilizing the strength as well as the heat of stove-pipes, and consists in arranging shoulders firmly around the stove-pipes, and placing thereon revolving shelves upon which plates and other kitchen utensils can be placed.

BUTTON.—Victor Charlet, Hoboken, N. J.—This invention relates to a revolving button fastening which is so arranged that the said fastening projects from one side of the shank of the button when being applied, and can be made to project from opposite side of the same after being applied.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 50 cents a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

A. H. G., of Mo., and also J. K. of the same state ask: "Why do the notches of the quadrant on a locomotive vary in distance when the steam is admitted and cut off in a regular ratio?" The graduation of the quadrant on the locomotive is not done by an unvarying rule. It is determined by turning the engine and noting the movement of the valves. The motion of the link is compound, owing to the setting of the eccentrics, which are not set exactly opposite each other. It is also varied by the length of the eccentric ends. Scarcely any two engines have their quadrants slotted precisely the same. Without elaborate diagrams it is impossible, on account of the above facts to demonstrate the subject.

W. J. B., of Mich., wants to know what proportion of a horse power five square inches of water, operating on a wheel 65-9 inches diameter, under a head of four feet, provided the water transmits its whole power, will develop. The actual weight of a column of water, not in motion, of the dimensions of five square inches sectional area and four feet high, is 42.60 lbs. The velocity of the water and the description of wheel are essential data to a categorical reply.

A. H., of N. Y., asks us to publish engravings and descriptions of the condensing steam engine. It can be found in the "Guide to Inventors," published by Munn & Co. Price 25 cents.

R. S. S., of Ga., says he has three elbows in a pipe conveying wind from a fan to a cupola, and that the fan gives much less blast than when it was run with a straight pipe. The trouble is probably in the elbows. The remedy is to make the elbows larger than the straight pipe. Where elbows are used they should have four times the sectional area of the straight pipe. Usually the pipes of fan blowers are too small.

C. F. S., of Mass.—Iron and zinc castings may be bronzed by precipitating on the surface by the battery or otherwise, a coating of copper.

D. B., of N. Y.—We have had practical experience in the manufacture of grape sugar from starch, using sulphuric acid and lime, and have fermented the sirup without encountering the difficulty you allude to. We suspect that you have mismanaged the process in some way.

J. B., of N. Y., thinks that the gases from a gun which is fired, cleave the air and leave behind them a vacuum; the concussion on filling up the vacuum produces the sound. The theory is bad; the vacuum is mostly imaginary. The gases of burning gunpowder tend to expand equally in all directions, and to produce condensation rather than rarefaction. After the bullet has left the gun there is a vacuum in its path.

M. S. D., of N. Y.—Some of the most useful cements for water joints, are white lead and oil, india-rubber, rosin and lard, shellac, sealing wax and pitch. The choice among them would be determined by the materials used in the construction of the apparatus, its size, etc.

E. H. R., of Mass.—If you still find metal unsuitable for the molds in which you cast your Babbitt or other alloy we suggest that you try soapstone. Soapstone is easily brought into form and will give a good surface to the casting.

J. B., of Ill.—The utility of sand to the blacksmith in welding iron, arises from the fact that it makes a flux with the superficial oxide which protects the iron from burning and keeps its surface clean.

J. S. McC. of Ohio.—We do not think that plaster of Paris would answer for "small and delicate cores for cast iron."

A. T. S., of Conn.—The weight of the earth has been determined with great accuracy. The elements for the calculation are the mean density (5.6604 greater than water) and the cubical contents.

G. H., of N. J.—Pine wood yields less acetic acid on distillation than almost any other kind of wood, and it is doubtful if you can separate the acid with profit in the circumstances you mention. There is nothing cheaper than lime to neutralize the acid.

J. N., of O.—We are not aware that the philosophy concerned in the renovation of feathers by steam is fully understood. There can be no doubt that feathers are often injured by parasites, and that steam will destroy them as you suggest.

R. G., of Ill.—Borax is found in California and we are told in quantity sufficient to supply the whole American market.

J. E. H., of W. Va., asks what is the power of an engine 10-inch cylinder, 20-inch stroke, making 100 strokes per minute, and carrying 90 lbs. of steam? The effective power of your engine, if you *have* 90 lbs. on the piston, working full stroke, is 83.57 horse-power. You do not say whether the steam is throttled by your governor or not. If it is, the power would be less, and can only be determined by the indicator.

N. D. J., of Mass.—We know of no way to harden a casting of soft iron unless by ordinary case hardening. Possibly some of our readers may know of some effectual method, beside chilling in the mold, to render your castings hard. We think such knowledge might be useful to some.

J. G., of Texas.—"A friend of mine who has raised a large family, and they have all married off except one daughter, and no one knows how soon she may have an opportunity to try matrimonial felicity, and as he does not wish to break up house keeping, and his wife's hands are so drawn up with the rheumatism that she neglects the dairy work and her servants have all left her, and in order to live on the dainties of the dairy it is necessary that the cows be milked, HENCE" (Good Heavens! What does he want? The above reminds us of the preamble to the Declaration of Independence. "J. G." is no doubt a rigid parliamentarian, perhaps a member of Congress, and—) "he wants a milking machine." Inventors of milking machines to the rescue!

H. A., of Conn.—The light emitted by a solution of phosphorus in oil or ether is very feeble, and would not be sufficient for a miner's lamp. The light resembles the phosphorescent light of decaying wood or fish.

R. S. N., of O.—Vegetable fiber from whatever source it is obtained, when purified from foreign matter is always the same substance chemically. Paper may be made from any vegetable fiber, but one plant will be preferred to another for the purity, strength, abundance of the fiber, etc. In a few years more paper will be made from wood than from rags. Even now it is almost entirely used on daily papers.

J. C. W., of Pa., says he is using in his foundery Scotch pig, Lake Superior, and scrap iron, and finds much difficulty in getting sound castings. Notwithstanding careful skimming, a large amount of "stodge" finds its way into the flasks and injures the castings. He asks for a remedy . . . . He asks also what is the proper place to put the gage cocks in a horizontal cylinder boiler of 32 inches diameter. Answer 1; the Lake Superior and scrap iron will turn to "stodge" much more rapidly than the Scotch pig; probably you use too large a proportion of those qualities. You can keep much of this scoriæ from your castings by making high and wide pouring gates, thus allowing these lighter particles to rise from your castings. Unless you do this you will find an open, porous, and rough upper surface on your castings. A small quantity of sawdust or fine charcoal thrown on the surface of your iron in the ladle will take up much of the floating scoriæ. . . . . Answer 2: place your lower gage cock 2½ inches above the line of fire surface, the next 2½ inches above that.

H. M. B., of Ill.—The aniline colors are readily soluble in spirit varnish, and you will find varnishes so colored useful in making the transparent paintings for your magic lantern.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

For Sale Cheap—Second-hand Barrel Stave Cutter and Jointer, full set of Shoe Peg Machinery, Portable Grist Mill, and new set of Spool Machinery. H. H. Frary & Co., Jonesville, Vt.

NEW PUBLICATIONS.

ATLANTIC MONTHLY for August. Boston: Ticknor & Fields.

One of the best numbers of this most excellent monthly. The *Atlantic* is especially fortunate in its contributors, or rather in its managing editors; for it contrives to get the cream of current American literature. Among the other excellent articles in this number we call attention to "Hospital Memories," "Cincinnati," "Up the Edisto," and a "Lilliput Province." Indeed, every contribution and the criticisms of the Editors' department are especially superior and interesting.

SECOND ANNUAL CATALOGUE OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

It exhibits a very promising future for this new institution, and we are pleased to see that mechanical and civil engineering, practical chemistry, and mining occupy prominent positions in the course of studies. For particulars address William P. Atkinson, Secretary and Librarian, Massachusetts Institute of Technology, Boylston street, Boston, Mass.

RESULTS OF METEOROLOGICAL OBSERVATIONS made at Brunswick, Me., between 1807 and 1859, by Parker Cleaveland, LL.D., Professor in Bowdoin College.

This collection of calculations, interesting and valuable to the astronomer and the geometrician, is published by the Smithsonian Institution in a large quarto pamphlet which can be obtained by addressing B. Westermann & Co. New York.

SKELETON STRUCTURES, Applied to Bridges, by Olaus Henrici, Ph.D. New York: D. Van Nostrand, 192 Broadway.

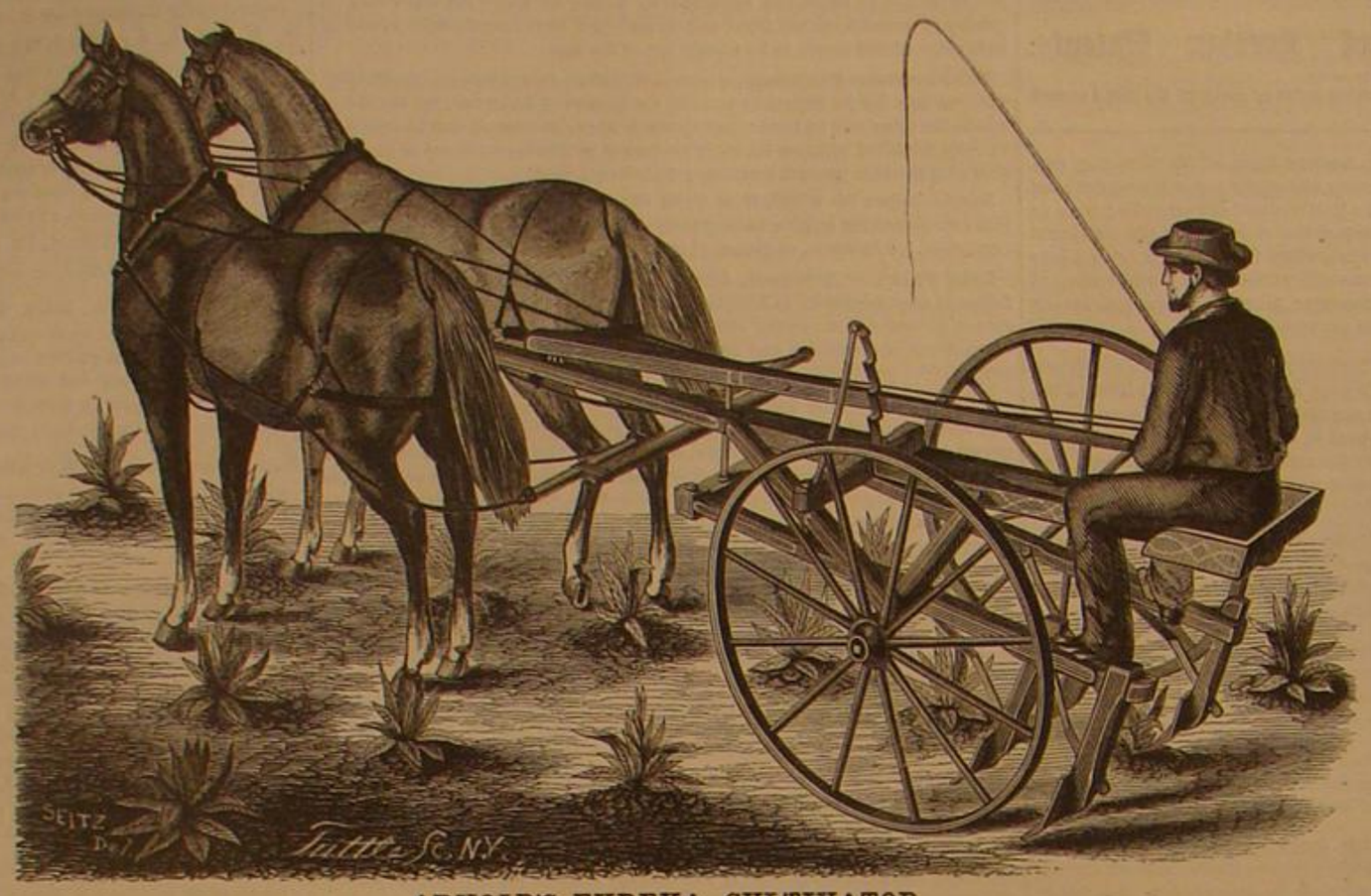
Especially valuable to the practical engineer and useful to the student in civil engineering. The plates accompanying the work will be found very useful both to the student and the working engineer. The calculations and directions are plain, and will save much time and brain labor now uselessly wasted.

ASTRONOMICAL OBSERVATIONS Made at the United States Naval Observatory during the years 1851-2. Published by authority of the Secretary of the Navy.

For astronomers, navigators, and scientific students these tables will probably be of great use in the saving of time in making calculations, and in assisting the solution of problems usually entailing a vast amount of labor. They are very systematically arranged and of easy reference.

Improvements in Cultivators.

This device for cultivating plants grown in rows or hills differs from some others in its construction. It belongs to the class the shares of which work on both sides of the row at the same time. For this purpose the axle is inclined from each wheel upward to the center, this arrangement giving a considerable hight from the ground to the longitudinal center of the vehicle. The two bars to which are secured the shares, are pivoted to diagonal braces extending from the axletree to the pole, and connected at their front ends by a bar pivoted at each end to those which carry the shares. By this arrangement the driver can move by his feet—which rest upon the bars—the shares either to the right or left to accommodate the cultivator to the sinuosities of the rows. The share bars can be readily elevated to pass over obstructions by means of the lever over the pole, which is pivoted to the pole at its front end and held in position by the toothed rack. These movements are entirely under the control of the driver. No cultivator which has yet come under our notice is so simple in construction and consists of so few parts. It would seem almost impossible for it to get out of order, and its parts are so easily made and combined that they could be built and put together by any ordinary mechanic. The number of shares can be added to or diminished as may be desirable.



ARNOLD'S EUREKA CULTIVATOR.

A patent was obtained for this device through the Scientific American Patent Agency Feb. 26, 1867, by Omar J. Arnold of Mount Ida, Wis., who will sell rights in all the States except Illinois, Indiana, and Michigan, and for information concerning rights or machines in those States, address Mark Finnican, Dowagiac, Mich.

French Photographs.

It seems to be generally admitted at the exhibition, that the pictures of Adam Solomon, an artist of Paris are pre-eminent in excellence. Photographic artists, who plumed themselves upon their merits, look upon the productions of Solomon with astonishment. Says the *Photographic News*:—

"The first excellence is the admirable arrangement of light and shade throughout the picture, as produced by the lighting and the skillfull disposition of draperies, accessories, and background, on none of which is in any case, the touch of a pencil to be found. The perfection of the chiaroscura, the rich depth and transparency of the shadows, the perfect modeling and effect of solidity and relief, not in the head simply, but in every part of the picture, are not qualities to be obtained by retouching; and we should be sorry if anyone who sees these pictures should deceive himself, and rob himself of the legitimate lesson to be acquired, by any fancy that the excellence was due to retouching, or trick of any kind, or to anything but legitimate photography of a degree of excellence very rarely attained. We do not lay any especial stress upon the fact that we have seen the negatives and the prints in the course of washing, but we earnestly urge photographers who have the opportunity, to honestly take to heart the lesson to be obtained by a careful examination of the pictures exhibited."

Aerial Navigation.

From the time of the fabled Icarus men have tried to solve by experiment the problem of navigating the air. So far the success has been confined to rising above the earth's surface by means of a gas of greater levity than the atmosphere, all mechanical means to rise above the earth and sustain the body in the air having failed. But in England they have an Æronautical Society of which the Duke of Argyle is President and Sir Chas. Bright, William Fairbairn, James Glaisher, and other prominent men are members. A paper has been read by Mr. Wenham, which is said to be "full of close reasoning, and differing entirely from the illogical speculations often put forth by enthusiastic projectors, who set to work according to methods that inevitably lead to failure." He examines at large the flight of birds, the extent of surface of wings of different kinds, the weight of bodies, the muscular strength required for flight, the much less power needed for horizontal or angular motion in the air than for perpendicular ascent, and other questions bearing on the subject. He considers that the attempt to simply imitate the flight of birds is impracticable, but concludes that "man is endowed with sufficient muscular power to enable him to take individual and extended flights, and that success is probably only involved in a question of suitable mechanical adaptations."

Boiler Burst While Being Tested.

On the 20th of July a new boiler while being tested with steam at the manufactory in Water street this city, collapsed its fire-box. An after examination by a competent engineer reveals the following facts:—There was no evidence of low water in any part of the boiler; the stay bolts were all bright; the surface of the ruptures clean, as were also the joints where chipped and caulked, showing there could have been no overheating. The cause of the rupture was simply a pressure of steam beyond the ability of the plates to sustain.

The boiler was 34 inches diameter, the fire-box circular and in diameter one and a half inches less. The stays were at the angle of a parallelogram of seven by nine inches, stay bolts three-quarters of an inch diameter, screwed and headed in the usual way, the heads slight. The boiler plates were three-sixteenths thick, apparently good iron. About one-half of the fire box collapsed pulling the heads of the bolts through the plates.

The boiler was an upright tubular boiler having hanging water tubes passing through the crown sheet and hanging in the fire box, and above the crown sheet to the top of the boiler were tubes to convey away the products of combustion. As will be seen from figures already given, the water space between the fire box and the shell was only three-quarters of an inch, altogether too little.

BELLERJEAU'S IMPROVED LAMP CHIMNEY.

Metal-topped lamp chimneys are in quite common use, but the metallic top is generally connected to the glass, and except for its preservation of the glass from heat-cracking, does not appear to be a very marked advantage. In this improvement the metal top is secured to the stand for the glass chimney by means of two metal strips or uprights, and the glass slips down over the metal top, and while resting its base upon the circular support, is steadied in place by the sheet-metal



top. It has its advantages in giving excellent support to the glass while the lamp is being moved about and in the case with which it can be lifted, as shown in the engraving. The edges of the flame, always the hottest portion, are directed against the metallic uprights, which thus defend the glass from intense heat, and the upper portion of the glass is adapted in its inside diameter to the outer diameter of the metal top, so that the draft of the chimney is not impaired.

While kerosene oil is so generally used it would seem as though this improvement, which can be applied to any lamps now in use, would become a favorite. Samples can be obtained, or the patent right may be purchased, by addressing the patentee, John Bellerjeau, or Bellerjeau & Gabel, 261 North Third street, Philadelphia, Pa. The patent for this device was granted June 4, 1867.

The Society of Arts' Albert Medal.

The Albert medal has this year been awarded to Mr. W. Fothergill Cooke, and Prof. Charles Wheatstone, F.R.S., in recognition of their joint labors in establishing the first electric telegraph. The first Albert medal was awarded, in 1864, to Sir Rowland Hill, K.C.B., "for his great services to arts, manufactures, and commerce, in the creation of the penny postage, and for his other reforms in the postal system of this country, the benefits of which have, however, not been confined to this country, but have extended over the civilized world." The second medal was awarded, in 1865, to his Imperial Majesty the Emperor of the French, "for distinguished merit in promoting, in many ways by his personal exertions, the international progress of arts, manufactures, and commerce, the proofs of which are afforded by his judicious patronage of art, his enlightened commercial policy, and especially by the abolition of passports in favor of British subjects." The third medal was awarded, in 1866, to Professor Faraday, D. L. C., F.R.S., for "discoveries in electricity, magnetism, and chemistry, which, in their relation to the industries of the world, have so largely promoted arts, manufacture, and commerce." In making the award this year, the council were placed in a somewhat peculiar position, inasmuch as by the terms upon which the medal was established they could only make one award, while the great object accomplished was due to the combined labors of two men. They felt, however, that so great a national work as the electric telegraph was especially worthy of reward by this society, and that the Albert medal could not be more worthily bestowed than in recognition of the services of those to whom the introduction of the telegraph was due. The award having been made, they have directed that the medal be struck in duplicate, and a copy, with a suitable inscription, be presented to each of the above-named gentlemen.—*Engineering*.

New Use for the Barometer.

Mr. J. Rofe writes to the *Geological Magazine*, and shows that colliery proprietors have only to watch the barometer, and provide in accordance with its indications, for the supply of air to the mines. Alluding to the well-known "Blowing Well," of Preston, in Lancashire, he states that some time since, in a well, recently constructed by him as a cesspool to some chemical works, he observed the phenomena characterizing the "Blowing Well." When the atmospheric pressure diminished, the air came from the well loaded to a disagreeable extent with the offensive vapor from the cesspool. On continuing his observations with a barometer, he found similar results. He concludes from these facts that a coal mine must be regarded as a gigantic well, from which, when the atmospheric pressure diminishes, the air expands and rushes out with great violence. This circumstance is not of itself dangerous, but if there be an excess of gas in the mine, and at the same time, from accident or carelessness, a means of ignition, then, indeed, the consequences are very likely to be serious. Hence the barometer becomes the miner's safest guide.

Petroleum as Fuel for Locomotives.

The Titusville *Herald* describes the fourth of a series of experiments made at the shops of the Warren and Franklin Railroad at Irvine, as follows:—"The apparatus used was Spencer's burner. It is described as consisting of a pan covering the bottom of the firebox in the locomotive, and taking the place of grates. On the pan are placed heaters or gas-generators, six in number, consisting of inclined plates of cast iron supported at an angle of forty-five degrees. Opposite to each heater is an injector, conveying the oil to the heater, where it is instantly converted into gases, oxygen being only furnished to the gases in their nascent state for combustion. The oil is contained in a tank on the tender, from which it is conveyed by feed pipes to the injectors, each pair of injectors being controled by a throttle by means of which the fire is regulated as readily as the light of a lamp. The locomotive used, weighed thirty-one tuns, and was of one hundred and fifty horse-power. No cars were attached. Under eighty-five pounds of steam the locomotive passed over four miles of track in less than eleven minutes. All in the party agree that oil may supersede wood and coal in railroad use."

There is at present no better field for invention than the contriving of furnaces for producing combustion safely and economically from petroleum. Also, in the feeding from and construction of tanks for conveying the liquid..

A Western Capitalist proposes to send wheat in a fleet of steam grain barges down the Mississippi River to New Orleans, and thence re-ship it to this city for the sum of thirty cents a bushel, just one-half the ruling rates when transported overland. "The longest way round is in this case, apparently, "the shortest way home."

Scientific American.

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BRIDGING OF NAVIGABLE RIVERS.

Whether railroads are hereafter to monopolize all the carrying trade of the country—the internal traffic—or not, is a question of some importance in view of the awful experience the country has already had by such disasters as the Norwalk accident, well remembered by our readers, and the attempt recently made in the Connecticut legislature to impair if not destroy the value of the Connecticut river as a navigable stream. We are glad to say that this attempt was unsuccessful.

There is no doubt that navigable rivers, as well as lakes and oceans, are the natural highways for the commerce of the nations. To shut up or impair these highways, unless some cheaper and more valuable highway is thus opened, is suicidal on the part of any people. For freight particularly, water carriage has been so far, and is now, the cheapest and most convenient, if not the most rapid; and that policy which would close or obstruct such a natural highway must be either short-sighted or selfish. The state of Connecticut and the city of Hartford, at the head of navigation on the Connecticut, have spent and are spending thousands yearly to improve the navigable facilities of the river, by the removal of bars, etc., yet it is proposed to hamper navigation for fifty miles from the sea on this river, by the erection of bridges, leaving only a narrow draw for the passage of steamers and other craft at points of the most difficult character.

When bridges can be made to span rivers at such a hight as to leave the stream clear at all stages of its surface for vessels to pass unobstructed under them no reasonable man can object, but when it is proposed to construct piers in the bed of a river which shall be *nuclei* for the accumulation of silt, thus forming dangerous shoals, and compel the navigator to stear his craft between the Charybdis on one side and the Scylla on the other through a contracted draw, endangering not only his vessel and cargo, but also the trains of cars for which the bridge was erected, it seems as though engineering talent was fallen to a low ebb, if some better device could not be adopted. Where an elevated bridge cannot be built, and a ferry is not admissable, one would suppose that a tunnel in most cases would be feasible. Certainly, before it was determined upon that a hitherto navigable river should be obstructed for the benefit of a railroad, it would appear proper to consult the possibilities of engineering science to prevent a public damage for the benefit of a chartered corporation.

DISCOMFORTS OF RAILROAD TRAVELING.

Viewed in the light of common sense and the advances made in the mechanic arts as applied to common life, it seems strange that our people should be subjected to so much annoyance in their peregrinations from place to place by the much vaunted and boasted steam cars; which according to some enthusiastic writers really annihilate space and neutralize time. We have already spoken of the outrageously careless manner in which the *impedimenta* of travelers are handled; the destruction of trunks by the rough handling of baggage men on our lines of travel is fearful.

But the unnecessary annoyances to which the traveler must submit calls for the severest reprimand. A short time since we had occasion to travel from Boston, on the Fall River and Newport line, a distance of less than thirty miles. The trip occupied over two hours, and although the day was insufferably hot, not a drop of water could be had, and none of the cars on the train were furnished with closets. A portion of the time occupied by the trip was spent at a way station waiting for a train, and we found it difficult to ascertain when the train was to start, as no one about the station seemed to posess either authority or information. In one room of the building was a stone jar in the form of a barrel, with a faucet apparently for holding water, but it was empty and so remained until the station master, after being importuned repeatedly sent a lounger after a pail of water.

It is somewhat remarkable that in a railway station one can find the running time of every railroad on the continent, except that of the very one to which the station belongs, and it is no less worthy of note that in no case is the amount of fare given on these gilded, framed, and bedizened posters. It is sometimes a matter of as much importance to the traveler to know the price as the time of a trip. Of course no one who has had any experience in traveling—American traveling—would ask a question of a ticket seller or other official, at least if he finds it difficult to pocket an affront or insult.

Another annoyance is the habit of keeping the ticket office closed until within a minute or two of the starting of the train, thus giving opportunities to pickpockets, who always delight in a crowd. On some railroads the car doors are kept locked, while the train stands on the track, until just on the point of leaving, and old persons, weak women, and tired children are compelled to stand on an open platform or be jammed in a mis-named sitting room, and afterward forced to join in a rush for seats just before the starting of the train.

In the construction or rather fitting of our cars, also, there is room for much improvement. The unavoidable noise of such heavy bodies as loaded cars passing over rigid iron rails, is hard enough to bear, but the ear-splitting rattling of the windows and the explosive slamming of doors could easily be avoided by simple mechanical contrivances. A slip of elastic rubber in the channel of the window sash and the jamb of the door would effectually prevent the incessant and annoying rattle-bang of our railroad cars.

Certainly something should be done to protect the traveling public from annoyances which form no part of the necessary discomforts of railway passage. The resources of mechanical ingenuity can easily provide a remedy for some of them, and common courtesy and sense on the part of railway officials and employés can prevent the rest.

THE COMMISIONER OF PATENTS---HIS INCOMPETENCY AND MISMANAGEMENT.

We have called the attention of our readers from time to time to the mismanagement of the Patent Office by the present Commissioner by which the work has been suffered to fall in arrears six months, more or less, and thousands of inventors are delayed month after month in their business.

The only excuse which the Commissioner renders for this extraordinary state of affairs is that he has no room in the Patent Office to accommodate the additional force required to do the work.

There is no truth nor force in this miserable attempt of the Commisioner to palliate his own incompetency. There is room in the office to accommodate more than twenty additional Examiners, and by simply filling all the rooms, as room No. 18 is filled, the office would accommodate thirty-two more Examiners—an additional force capable of examining at least twenty thousand cases a year more than are now examined.

In Room No. 7, the large class of Textile, Fabrics, and Sewing Machines is under the sole care of one man, and he a Second Assistant Examiner only. This state of affairs has existed since the first day of June, and no effort whatever has been made to apply a remedy. Of course the class is going behind every day—no one man can do its work. Now why does not the Commissioner promote this able Second Assistant to full Examiner and give him all the force he needs? Why keep him in a subordinate capacity doing a full Examiner's work, and yet in a large room alone? His room will easily accommodate three more assistants—he is begging for help—the Commissioner knows all these things, and yet tells us that he is compelled to let the work accumulate for lack of room!

In the class of Lumber ,the examining force consists of one principal Examiner and one First Assistant. There is space in this room for at least two more persons, and the Commissioner has been repeatedly asked to furnish more help, but with no results. The class of Fine Arts and Designs, is in the same situation. So, too, is Civil Engineering; and the same state of facts exists in at least five other rooms in the Patent Office. Desks are standing vacant and have been for months, and the principal Examiners in the rooms have begged the Commissioner to fill them, yet they are vacant to day.

Nothing but the most gross incompetency can be conceived as a reason for such a state of affairs. Want of room need not embarrass any one but the incompetent man at the head of the Patent Office. If he had half the qualifications for his place that some of his temporary clerks have, the business of the office would not have been a week behind at this day.

Only last March, Congress passed a law authorizing the Commissioner to appoint four Principal, four First Assistant, and four Second Assistant Examiners, in addition to the old force of the office. Not one of these appointments has been made up to the date of writing. On the contrary the old force is not full and never has been since this Commissioner was appointed! There are now eleven vacancies; or about one quarter of the places are not filled! What excuse, we ask, can be alleged for such conduct? Why is it that for months one quarter of the old force has been missing, and every one of the twelve new places has remained empty?—"Want of room?" There are and have been empty places in Gregory's room for three more persons; in Peale's room for three more; in James' room for two; in Dean's for two; in Taylor's for two; and in Bebbs', Shoepff's, Fales', Barnett's, Crawford's, Jayne's, Blanchard's, and Conolly's, for at least one each. We say again that the flimsy excuse of want of room is not true, and no one knows it better than the Commissioner.

The excuse used to be that there was not force enough, but the Commissioner never kept his force filled up, and besides he had full power to appoint and plenty of money to pay, as many temporary clerks as he desired. A temporary clerk in each Examiner's room would have enabled the Examiner to act upon at least two cases per day more than he could do without such a clerk. The appointment of a suitable number of temporary clerks would thus have enabled the office to act upon nine thousand six hundred cases a year more than it could act upon without them, and at an expense of $4,400 a year less than it will now cost to pay the additional force provided for by the Act of Congress of March last. If the Commissioner had appointed these temporary clerks a year and a-half ago the office would have been up with its work to day, and there would be no need of this great increase of permanent officials at high salaries.

We ask the President and the Secretary of the Interior to apply a remedy at once to this state of affairs. It is a burning disgrace to the country that a Bureau in which such vast interests are at stake should be in the hands of a person who cannot administer it better than the Patent Office is now administered.

THE NUISANCE OF STEAM WHISTLES.

A correspondent writes asking if the inventive talent of the country cannot be directed to some means to abate the dreadful nuisance of the screeching, screaming whistles now so universally used by locomotives, steamers, and manufactories. He says he lives in a village contiguous to the city of Lynn, Mass., on the line of a railroad, and at all hours of the day and night his ears are tormented with the unearthly noises of the execrable steam whistle. These noises are hideous to one of a nervous temperament, absolutely injurious to the sick, and hardly tolerable to the healthiest and most robust. He says that while in Great Britain he often stopped in the hotels attached to the railroad stations, at Malvern, Chester, York and other places and can recollect no such annoyance from this source as is here felt every day. The whistles used there, although of a shriller tone, have less volume of sound than ours, and do not exert that ear-splitting quality which seems to be inseparable from ours.

We sympathise with our correspondent, but know that there is a remedy. It may be that as a peeple we are less sensitive in respect to noise than some others.but it is certain that the nervous, the feeble, the sick, are greatly annoyed by the nuisance of that most horrible of inventions—excepting perhaps that of the Chineese gong—the steam whistle. Speaking of the gong, it is simply a matter of astonishment that our hotel keepers, throughout the country could ever have been induced to adopt this barbarous instrument with its infernal clangor and make it a part of their entertainment for the wearied and exhausted traveller.

In one of our most popular evening papers, a short time since, we noticed a protest against the discord of howling screeches which from numerous manufactories salute the ear several times a day, to denote the periods of commencing and leaving work, which suggested that one would be a sufficient horror for a whole neighborhood.

It certainly seems as though there could be no adequate reason for every concern in a town or city to possess its own independent whistle, and run its own independent time, so that the agony, instead of being over in two or three minutes should be prolonged for fifteen or twenty minutes. If one whistle is sufficient for a neighborhood why should ten or twenty seek to rival it?

But a whistle can be made, which, while more far-reaching than the sharpest, will scarcely annoy the most nervous. In Connecticut there is manufactured a modification of the steam whistle called the "steam gong" which gives a deep hollow sound, not at all unpleasant, nor jarring to the nerves. It has two instead of one bell, and each is deeper than that of the ordinary whistle, one being placed directly over the other and the steam emitted downward and upward from a disk placed midway between the two. One on Colt's Factory at Hartford could be heard heard in Middletown a distance of twelve miles, and yet was not unpleasant to the ear when in its immediate vicinity. Such a device would probably save the sensibilities of the sick and be more agreeable to the well, while it would fulfill all the objects of the present screaming nuisance. Possibly Tennyson puts it rather strongly when he says:

There is no joy but calm,

but it must be confessed, that noise in itself, is not particularly agreeable except to boys and roughs.

THE SILVER PALACE CARS.

The three direct connecting railroad companies between New York and Chicago—the New Jersey Central, the Pennsylvania Central, and the Pittsburgh, Fort Wayne, and Chicago—have lately placed upon the route a new and magnificent set of passenger coaches called the Silver Palace Cars. The inauguration of these new vehicles took place on the 22d ult., and we are indebted to Mr. Jonah Woodruff, Superintendents Stearns, Williams, and McCullough, for an invitation for the excursion to Chicago and back. In about thirty-six hours after leaving Jersey City, the terminus at Chicago was reached, where the excursionists, consisting of about two hundred and fifty ladies and gentlemen, were entertained in the most superb manner. In fact, throughout the whole journey the most ample provision was made for the comfort of the guests, and all enjoyed themselves highly.

The traveler from New York to the West, may now enter the Silver Palace Cars at Jersey City, and ride for almost a thousand miles—to Chicago—without any change. By day the cars present the ordinary appearance, except that they are much more richly furnished and are provided with more abundant facilities for comfort, such as lounges and state

rooms. At night they are quickly transformed into luxurious sleeping cars.

It is now some ten or twelve years since public attention was first directed to the feasibility of sleeping cars, by the publication of engravings in the Scientific American, illustrative of the first improvements of this kind; and among the earliest names that we find associated with the development of these inventions is that of Mr. Woodruff. He might justly be termed the King of the Sleeping Cars. He has devoted himself to their introduction with a persistence and energy deserving of all praise, and he merits the golden reward that he is now reaping.

"The Silver Palaces are among the most brilliant vehicles that ever rolled on iron wheels. The woodwork is black walnut, polished and elaborately carved; the carpets are velvet and Brussels; the seats are covered with moquet; and the whole car is most lavishly embellished with silver. Strictly, the metal is German silver fret work heavily plated, and glittering in the purest white. The lamps are of the same metal, large and ornamental. The effect of so much silver is very novel and beautiful, and this effect is enhanced by stained glass lights overhead, which shed a flood of blue tints upon the glittering silver pillars, and the fret work below."

These superb cars will undoubtedly attract large numbers of passengers, while the route they run, passing over the richest parts of the country, through glorious scenery, which is in the highest degree interesting and enjoyable.

Science Familiarly Illustrated.

GREENWICH TIME.

If we examine the time books of our trunk railways, we shall find in some of them a distinct statement that Greenwich time is kept "on this railway and all its branches;" in others, in which no similar notice occurs, the same rule is by universal consent followed; indeed, if uniform time were not thus kept, it would be an extremely difficult task to regulate safely the great number of trains which daily travel with varying speed over many of our principal lines, some of which must wait at certain points, while others, which run quicker, pass.

But the reader may ask, what is "Greenwich time?" and what "local time?" and why does Greenwich time possess such peculiar value over that of any other place as to cause it to be, so to say, at a premium? And what is "mean time?" These matters we will endeavor simply to explain.

The sun, as everybody knows, determines what we call day and night, on account of the alternate light and darkness; the daily return of the sun is therefore used as our ordinary measure of time. Two kinds of solar time are of necessity employed—*true solar time* and *mean solar time*. But why two kinds of solar time? Because true solar time cannot be conveniently used in practice, as we will explain. We must premise that true solar time at any place is such as is furnished by a sun dial; or more accurately, at noon, by noting when the shadow of a perpendicular line or rod falls due south (the true north and south line being supposed to be known), that instant being noon—true solar time. Now, let a clock at any place be set with the sun, on, say April 15. Suppose the clock to go uniformly and accurately for a year, then about the same day of the year following, the clock and sun will again be together. But will they have been together throughout the intervening year? Only on three occasions—about June 14, August 31, and December 24. At all other times, the sun will have been either somewhat before or somewhat behind the clock, the greatest deviations being fourteen and a half minutes in February, and a little more than sixteen minutes in November; the sun being after the clock at the former time, and before it at the latter time. The difference is caused by inequality in the motion of the sun, but as it would be extremely inconvenient to make our clocks keep with the sun throughout the year, and as the inequalities are comparatively small, we, in practice, neglect them altogether; and thus comes *mean solar time*, or *mean time*, that used in the daily business of life, as distinguished from *true solar time*, which agrees with *mean* or *clock time* only on four days of the year, at the times previously mentioned. Ingenious men have in ages past constructed clocks, styled "equation clocks," to keep time with the sun; but they can be considered as little more than curiosities, and not likely ever to come into general use, could they be made ever so perfect.

We have now to consider the distinction between *Greenwich time* and *local time*. The sun, as any one can see, travels through the sky from east to west. Evidently, therefore, to all places situated on a supposed north and south line, it will be noon, or one o'clock, or two o'clock, etc., at the same instant. Thus, when it is noon at Greenwich, it is also noon at all places directly north or directly south of Greenwich; and similarly for other hours; or, in other words, the local time at all such places will be the same as Greenwich time. And manifestly, as the sun comes from the east, it will be noon at all places east of our imaginary north and south line, before it is noon at Greenwich; correspondingly, at all places to the west of the same line it will be noon after it is noon at Greenwich; that is to say, local time precedes Greenwich time for all places to the east, and follows Greenwich time for all places to the west. The greater the distance of the place from Greenwich east or west, the greater will be the interval by which the local time will precede or follow that of Greenwich. The distinction between local time and Greenwich time enables us to explain the term *longitude*. The difference of longitude between any two places is merely the difference of their local times, and the longitude of any place is thus its difference in time from some point fixed on as standard. The selection of a place of reference is altogether arbitrary. The English count from Greenwich, the French use Paris, and similarly in other countries. Thus we see the Greenwich having long been the point from which longitudes were counted by the English, Greenwich time came to be that universally adopted when the necessity of uniform time arose.

Before the introduction of railways, every town and village in the kingdom kept its own local time. On the establishment of railways, however, any attempt to work them by local time could only lead to useless complication. Greenwich time was therefore employed, and gradually towns in the vicinity of railways also adopted Greenwich time, although at some places the "innovation" was opposed for a considerable period. At last, however, the use of Greenwich time came to be universal.

Having explained the distinction between *true solar time* and *mean solar time* or *mean time*, and also the distinction between *Greenwich mean time* or *Greenwich time* and *local time*, we will consider how, principally the clocks on railways are kept right. Now time is most accurately and regularly obtained in fixed astronomical observations. The standard points of reference to an astronomer are the fixed stars, as the positions of the principal stars are well known. The time of being due south, or, as it is called, the "time of southing," or any of them, being observed by the "transit instrument" the difference between the observed time and the time given in the *Nautical Almanac* is the error of the astronomer's clock. The clock used for such observations is a sidereal clock, one that keeps time with the stars, the length of the star or sidereal day being different from (and shorter than) that of the solar day. The error of the sidereal clock being thus found, it is mere matter of calculation (by the same indispensable aid, the ever necessary *Nautical Almanac*) to ascertain the error of the mean time clock. The astronomer being compelled to obtain correct time at every opportunity, for his own use, in order to be able to record with accuracy the instant at which any phenomenon that he may observe takes place, nothing is more natural than that he should willingly dispense to the public, for their benefit, that which he must, so to say, keep on hand. By connecting any such observatory to the electric telegraph system, this can be done to any extent. The observatories which have given greatest facilities in this way are, so far as we know, those of Greenwich and Liverpool in England, and Edinburgh and Glasgow in Scotland.

The distribution of time from Greenwich is very extensive. There is in the observatory at that place a clock which is kept showing exact Greenwich time, and this clock once each hour automatically indicates the time by telegraph to various points in London. One place at which time is thus received is the principal office of the Electric and International Telegraph Company; and in their office is a time-distributing apparatus, or "chronopher," the function of which is to distribute in many directions the signals received from Greenwich. A grand distribution is made at 10 A. M every day. The instrument so alters the connections of a great number of provincial wires used in the ordinary telegraphic work, that the Greenwich signal at that hour causes signals instantaneously to pass out on all these wires, indicating the time simultaneously at places north, south, east and west, to the extreme ends of the kingdom. All this is done certainly and promptly, entirely by automatic means. In this way, clocks on railways and in distant parts of the country become regulated, the town and village clocks being in their turn rectified by the neighboring railway clocks.

Now, before making special reference to what is done in the way of controlling clocks in these places we will speak further of the plan itself, as it is one likely to be of very considerable use, and well deserves to be generally known. Some years ago when galvanism first began to be of practical use to mankind, ingenious mechanicians invented systems for working clocks by use of this power alone, doing away with the customary weight or spring. Such clocks required only a simple train of wheels; they did not want winding up, and would go as long as the galvanic battery endured. It began to be supposed that a great advance had been made. In course of time, however, it was by universal consent allowed, that to depend entirely upon galvanic power was an unnecessary refinement at the best, if not indeed a mistake; the disadvantages (which need not be entered into here) outweighed the advantages, and galvanic clocks came into bad repute. The most valuable horological use of the power had not then been discovered—that of using it as an *auxiliary* only. But plans for its employment in this way began to be proposed, the most notably successful being one patented by a Mr. R. L. Jones about ten years ago. It consists as follows: Taking an ordinary wind-up clock, with seconds pendulum, the bob of the pendulum is removed, and a galvanic coil substituted. The coil is similar to a bobbin or reel of cotton, supposing the cotton to represent copper-wire insulated, so that the successive turns of the wire shall not touch each other: the coil is fixed with the hollow horizontal. Now if we set the clock going, it will still accumulate error as before. But let it be placed in telegraphic connection with some distant clock from which a *galvanic current* is received at each second of time, so that the current received shall circulate through a wire of the coil. While the current is passing, and no longer, the coil possesses magnetic properties, and such action is produced between it and a permanent steel magnet fixed to the clock case, and on to which the hollow of the coil swings at each vibration, that whether the clock be inclined to lose or gain on the standard clock, it will, by the magnetic action, be either accelerated or retarded as necessary, and maintained in perfect harmony with the standard clock, which has, so to say, merely to *guide* it, just as a man may steer, though he does not propel, a large ship. The first public application of the plan was made in the year 1857 to the clock of the townhall, Liverpool, which was adapted for control, and connected with a clock in the Liverpool Observatory. It had previously caused great inconvenience by its irregular performance; but since the commencement of the new system, the Liverpool merchants have had the satisfaction of possessing a clock, the first blow of the hammer of which, at each hour, is true to a second of time. The system has been extended in Liverpool, and since adopted both in Edinburgh and Glasgow. At the latter place it has been taken up in a remarkable manner. Not only are three large public clocks (including the clock of St. George's Church) controlled from a standard clock in the Glasgow Observatory, but also numerous smaller clocks, showing time to seconds, and situated in different parts of the city; and the system is to be extended, or perhaps now is extended, to the Clyde, for the benefit of the shipping.

At Edinburgh, the plan is used for a novel purpose. Some years ago, the citizens of Edinburgh determined to establish a gun which should be fired every day at the instant of one o'clock Greenwich time. Now, close to the gun there is placed a clock, which discharges the gun by releasing, at the proper instant, a weight, which acts upon the friction fuse of the gun. This clock must evidently be kept right, and this is done by the plan of which we have spoken. The clock is controlled by another placed within the Edinburgh Observatory, and the daily firing takes place with the greatest certainty and accuracy. The citizens of Edinburgh may congratulate themselves on having led the way in the establishment of so useful a public monitor, for, as connected with the subject we may further mention that time-guns have since been set up at Newcastle and Shields. These guns are fired by galvanic current from the observatory at Greenwich: the fuse here employed is a chemical fuse; that is to say, it is one *ignited* by the galvanic current, and it acts rapidly and well. The reports of the time guns may be heard at a considerable distance. To take time from them with accuracy, however, it is necessary to allow four and a half seconds for each mile the observer is distant from the gun, on account of the time taken by sound to travel the intervening space. And similarly for any *sound* signal. If the *flash* of the sun can be *seen*, no allowance is necessary, as light travels through any such distance in an infinitesimally small fraction of a second.

It is impossible to overrate the advantage of a reliable knowledge of exact time in all great centers of industry; and yet although time passes daily through London to many parts of the country, the people of London have (with one exception) few clocks on which they can implicitly rely. The exception—and a notable one—is the Great Clock in the New Palace at Westminster; for although so costly a production, it turns out as respects performance, to be perhaps the finest clock of the kind in the world. In the controlled clocks of which we have spoken, nothing depends on the goodness or badness of the clocks themselves, as they are kept accurately to time by the guiding power of the respective observatory clocks. But the Westminster clock is not controled by any other, and has thus to depend on its own merits. Telegraphic communication with Greenwich exists for the purpose of enabling the clock to report automatically its state every day to the Astronomer-royal; the Greenwich record, therefore, demonstrates the goodness of the machine. It is not allowed to deviate more than two seconds from true time, and we are told in one of the Astronomer-royal's Reports, that "the rate of the clock may be considered certain to much less than one second per week." The frame carrying the various trains of wheels of this celebrated clock is 15½ feet long, and four feet seven inches wide; the pendulum, which makes one vibration in two seconds, weighs between six and seven hundred weight; the dials, of which there are four, and which are illuminated at night, are each 22½ feet in diameter; and it is a day's work for a man to wind the clock up, both going and striking parts.

When we consider what is the duration of a second of time, and that such a large machine is able to perform for a week within this above mentioned limit, we may well marvel at the result, proving as it does the advance made in horological art

To railways, and their attendant telegraphs, is the improvement so far made, in the system of time-keeping in the kingdom, due. Wheresoever they penetrate, correct time should be easily attainable; and in our days, when we live so fast, and can scarcely stem the current of our daily work, an exact knowledge and an economical use of so important an element, is not to be disputed. We trust, therefore, that our endeavor to show, in a familiar way, what has so far been accomplished, will be acceptable to our readers, if only as illustrating the benefit arising from cooperation. The astronomer, possessing a knowledge of that which is so useful to mankind, has not the means of promulgating that knowledge. The electrician, on the other hand, cannot vie with the astronomer in his vocation, but possesses facilities for disseminating that knowledge to the world; and, by mutual good will, mainly do the systems which we have described exist. May such combinations ever continue to flourish and extend!—*Chamber's Journal.*

To Correspondents.

We would call the attention of our correspondents to the additional notice placed over the column devoted to their benefit. While we are at all times willing and ready to make any reasonable exertions for their interest, we would impress on them that, in their communications to us, all references to statements or facts made in back numbers of this paper should specify distinctly the volume and page. A compliance with this request will save us a large amount of unnecessary labor.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,728.—MANUFACTURE AND TREATMENT OF WHITE LEAD.—Robert G. Hatfield, New York city. June 12, 1867.

1,730.—MANUFACTURE OF BRUSHES.—Lewis McD. Hills, New Haven, Conn. June 13, 1867.

1,756.—SAWS AND SAW TEETH.—Ira Brown, Charles N. Brown, and John M. Gross, Providence, R. I. June 15, 1867.

1,763.—WOOD SCREWS, AND MEANS EMPLOYED IN THEIR MANUFACTURE.—John W. Hoard and Soloman W. Young, Providence, R. I. June 17, 1867.

1,863.—CHURN.—Wm. H. Tambling, Mazo Maine, Wis. June 26, 1867.

1,864.—COTTON GIN.—Charles Spofford and Chas. H. Hersey, Boston, Mass. June 26, 1867.

1,880.—COTTON BALE TIE.—R. G. Latting, New Orleans, La. June 27, 1867.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JULY 23, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
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On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Resident of Canada and Nova Scotia pay $500 on application.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

66,934.—CULTIVATOR.—William M. Ball, Morristown, Ind.

I claim the shaker bar, L, operated by the cam, K, the slide, N, hoes, C, tubes, H, and seed box, G, all arranged in the manner and for the purpose set forth.

66,935.—SKATE FASTENER.—E. H. Barney and John Berry, Springfield, Mass.

We claim, as a new article of manufacture, a skate fastener, or key, composed of the socket, B, the point, f, and the button, e, when made or combined in one piece, substantially as herein described and for the purposes set forth.

66,936.—TEA AND COFFEE POTS.—Alfred Bayley, Newark, N. J.

I claim necks or breasts of oval tin tea and coffee pots, when the same are formed of or upon the same piece or pieces as the sides of the pot.

Also, a bottom molding formed of or upon the same piece as the sides of oval tin tea and coffee pots, when combined in forming a pot with the neck or breast formed on or of the same piece as the sides.

66,937.—APPARATUS FOR CARBURETING GAS.—W. W. Bierce, Cleveland, Ohio. Antedated April 1, 1867.

1st, I claim the provision, in a carbureting vessel, of the floating chamber, E, provided with suitable absorbent material, substantially as set forth.

2d, The arrangement of reservoir, A, having the axial inlet, F, and hollow stemmed float, D E, provided with absorbents and adapted to operate as set forth.

66,938.—RUBBER HEAD FOR LEAD PENCILS.—J. B. Blair, Philadelphia, Pa.

I claim, as a new article of manufacture, an elastic erasive pencil head, made substantially in manner as described.

66,939.—PLOW.—John D. Bowen, Roseburg, Oregon.

I claim a cutter and bar sheath, cut in one piece out of a sheet of steel, and attached to the bar of the land side so as to be removable at will.

66,940.—NIGHT LATCH.—Edward W. Bertell, Newark, N. J.

1st, I claim the dog, y, on the cylinder arm of C, fig. 4, bearing on D*, shown in fig. 1, substantially in the manner and for the purpose herein set forth.

2d, I claim the frog-bridge, D, with its nose, D*, as shown in fig. 6, substantially in the manner and for the purpose herein set forth.

66,941.—PULLEY BIT FOR BRIDLES.—William Brower, Baltimore, Md.

I claim, in combination with a bridle bit, the pulley frames and pullies, hinged or swiveled to the ends thereof, so that by drawing upon the reins passing around said pullies, there shall be no tendency of the bit to turn in the horse's mouth, substantially as described.

I also claim so combining the pulley frames and pullies with the bit as that they can be removed therefrom without impairing its use as an ordinary bit, substantially as herein described and represented.

66,942.—FOG SIGNAL.—Felix Brown, New York City, assignor to John George Gunther, State of N. Y.

1st, I claim the blowing of air, compressed air, steam, or other gaseous fluid, through perforations of disks or plates, while one or both of them are rotating, substantially in the manner described.

2d, Constructing the sound tube or trumpet with a parabolically-shaped extension, substantially in the manner and for the purposes described.

66,943.—TELEGRAPHIC SWITCH BOARD.—Walter G. Brownson, Wellsville, Ohio.

1st, I claim my improved telegraphic switch board having the within-described system of switch buttons, C C, arranged upon parallel main lines, in combination with transverse series, 1 1 2 2 1' 1' 2' 2', etc., of switch plates, pins, or points, and with suitable ground and extra connection plates or points, the points, plates, or pins, 1 1, etc., in each particular series being connected together by wires, rods, or plates, transversely to said main lines, and each of said lines and each of their instruments having direct connection with one, and one only, of said series in regular order, all substantially in the manner and for the purpose herein set forth.

2d, I claim, also, the combination of a metallic spiral, an india-rubber or other equivalent spring, with the operating buttons, C C, of a telegraphic switch board, substantially as and for the purpose herein set forth.

3d, The combination of a base cap or cup, O, with a collar, N, and the shank, c, of a spring actuated switch-button, substantially in the manner and for the purpose herein set forth.

4th, The combination of a revolving swivel head, m, fig. 1, and attached metallic spring, n, with a metallic post or other support, L, for the purpose of making ground, or other connections, for telegraphic lines and instruments, substantially in the manner and for the purpose herein set forth.

5th, The combination of a recess or catch, i, with the rest plate, K, of a telegraphic switch board, substantially in the manner and for the purpose set forth.

66,944.—TELEGRAPHIC-BATTERY SWITCH BOARD.—Walter G. Brownson, Wellsville, Ohio.

1st, I claim combining the positive and negative poles of any number of batteries, separately, with the lines of a telegraphic system, or with the ground, by means of independent switch buttons, arranged upon a switch board to turn into contact with a point connected with the ground, and with points or plates connected with each line, all substantially in the manner and for the purpose herein set forth.

2d, Combining and uniting any two batteries, connected with the lines of a telegraphic system by means of suitable buttons and points or plates upon a switch board by means of a condensing key or button, H, combined with said board and the battery-connecting device thereon, all substantially in the manner herein set forth.

66,945.—TELEGRAPH REPEATING INSTRUMENT.—Walter G. Brownson and Daniel C. Shull, Wellsville, Ohio.

1st, The combination of the local battery circuit of any one of two main lines in a telegraphic system, with the repeater of the other line, by means of extra wires intercepting the local current between the sounder magnet and relay of first line, and so arranged as that said local circuit may be closed by the lever of the repeater, when not closed by the armature lever of said relay, and vice versa, substantially in the manner and for the purpose herein set forth.

2d, Metallic pins or rods passing through or secured to the sounder lever of a telegraphic repeater, in combination with the wires of a local circuit and a main line, and operating to open or close said line or circuit by the movements of said lever, substantially in the manner and for the purpose herein set forth.

3d, The combination of a main-line wire with a pin or rod on the sounder lever of a telegraphic repeater and with a ground-connecting spring or wire, so placed within reach of said pin as to be in contact therewith when the sounder is closed, substantially in the manner and for the purpose herein set forth.

4th, We claim elastic plates, strips, or springs, c and s, or c and w, in combination with posts, F F', and ground-connecting post, E, or G, and also, respectively, with insulated pins, c, on sounder, A, and insulated point on adjusting screw, o, of sounder post, E, when so arranged as that in the movements of the sounder, the contact of one point with its corresponding spring shall not be broken until contact is established between the second point and its spring, substantially in the manner and for the purpose herein set forth.

66,946.—TRIAL SQUARE.—John Burt and A. M. Miller, Sturgis, Mich.

We claim the employment of slotted pieces, e e e, substantially in the manner described, for the purpose of indicating at the top of the square the condition of the work.

66,947.—CIRCULAR SAWING MACHINE.—Dayton G. Canfield, Niagara Falls, N. Y.

I claim the combination of the adjustable mandrel frame, A, screw bolt, I, swivel nut, K, and bearing, J, constructed, arranged, and operating substantially as and for the purposes set forth.

66,948.—SASH FASTENING.—Josiah Ward Childs, Cincinnati, Ohio.

I claim, 1st, The slotted sliding plate, a, thumb piece, a", slots, c c, and guide pins, b b, constructed and arranged as above described and for the purpose set forth.

2d, The plate, c, latch, l, in combination with sliding wedge, a, as above described and for the purpose set forth.

66,949.—CHURN.—L. M. Cook, Owatonna, Minn.

I claim, 1st, the stationary dashboards, B B, substantially as and for the purpose described.

2d, The arrangement and combination of the stationary and movable dashboards, substantially as and for the purpose described.

66,950.—GAS APPARATUS.—R. T. Coverdale, Circleville, Ohio.

I claim, 1st, The combination of the central tube, b, feed pipe, d, gasometer, D, oil reservoir, E, cock, c, lever, g, connecting device, h, and retort, B, said parts being arranged substantially in the manner and for the purpose described.

2d, Constructing the gasometer with a central guide tube, b, and passing the feed reservoir pipe through this tube to the retort, substantially in the manner herein described and shown.

66,951.—APPLE CORER AND SLICER.—George Custer (assignor to himself and E. B. Frick), Norristown, Pa.

I claim the base, A, its block, B, uprights, a a, and cross piece, b, in combination with the sliding cross head, c, tube of knives, 1 1', rods, d d, cross piece, e, the whole being constructed, arranged, and operating substantially as described.

66,952.—APPARATUS FOR HEATING TIRES.—McD. Darrow, Rochester, N. Y.

I claim a tire heater having compartments, c c, and registers, f f, and which is otherwise constructed and arranged as described, and which operates as herein set forth.

66,953.—COMBINED CLIP AND BRACE FOR CARRIAGE SPRINGS.—John H. Deal, Hornellsville, N. Y.

I claim the double clip, a a, connecting strap, b b, and brace, D, constructed in the manner described, in combination with the double link plate brace, d d, applied substantially as and for the purposes herein set forth.

66,954.—STEPS FOR SPRING WAGONS.—John H. Deal, Hornellsville, N. Y.

I claim placing and securing a plate or disk, to form a step, on the iron or connecting link of platform springs for express or other wagons, substantially in the manner herein described for the purposes set forth.

66,955.—COOKING RANGE.—Royal E. Dean, New York City.

I claim the construction of a cooking range, the use or employment of a chamber, E, constructed and operating substantially as described for the purposes set forth.

66,956.—FIFTH WHEEL FOR CARRIAGES.—J. Deeble, Plantsville, Ct.

I claim forming a connection and bearing of the two parts of a fifth wheel, at their intersection with the reach, by means of the yoke, f, and the wheel, l, so as to support and hold the two parts of the fifth wheel together, the whole constructed and operated substantially in the manner herein set forth.

66,957.—COAL STOVE.—Wm. C. Durant, West Troy, N. Y.

I claim, 1st, In combination with a fuel magazine, B, of stoves, a deflector mouth piece, C, either of a single or compound form of construction, in manner substantially as herein described and arranged to operate as and for the purpose set forth.

2d, The combination of hook-headed pendent lugs or brackets, c, on fire-pot base-plate, W, with the respectively-located coinciding notches or recesses, e, in the flange of bed-plate ring, E, substantially as described, for the purpose of easily and quickly mounting or hanging said bed-plate ring with the fire grate, in operating position, in manner as set forth.

3d, The combination of the dumping fire-grate with an under-suspended and horizontally vibrating or shaking bed plate, and with a lever for operating them, when said fire-grate can be dumped but not vibrated independent of the bed plate, substantially as and for the purpose set forth.

4th, In combination with a horizontally vibrating grate and bed plate, and a lever for shaking them, the terminating of the end of the journal or shank by which they are vibrated, in a pocket, z, so that said shank shall not project beyond the exterior of the stove, but be accessible and operated from the outside by the shaker, through a suitable opening in said exterior, substantially as and for the purpose described.

5th, As arranged in combination with the exit pipe of a fuel magazine stove, I claim the employment of a boiler-hole plate, K, and in connection therewith, the oven, m, in manner substantially as herein set forth.

66,958.—PLOW.—Washington C. Evarts, Danby, N. Y.

I claim, 1st, Making a plow with the hinged mold boards, E E, cam wheel, D, attached to the midrib or beam frame, or other convenient part, and actuating the same as and for the purposes described.

2d, Making the cam wheel, D, adjustable by means of the hinged and slotted pieces, E E, for the purposes described.

3d, Hanging the mold boards on a separate and adjustable frame, R R, for the purpose of using thereby various sized and shaped mold boards for various uses, as described.

4th, Lap-hinging the various mold boards so far back of the plow points as entirely to conceal the hinges and protect them from the earth as it slides over the joint, as described.

5th, Extending the midrib of the beam frame, B, to near the wheel, D, and so shaping the same, in combination with the wheel, as to make an even and smooth path for the wheel, D, for the purpose of giving an even, steady motion to the cam wheel, as described.

6th, The combined whole, when virtually made and operated as described, for the purposes of double-wide furrow plow, cultivator, and digger, as set forth.

66,959.—CORN PLANTER AND GUANO SOWER.—John B. Gemmill, Strawbridge, Pa.

I claim, 1st, The hopper, C, when constructed with the two compartments, C1 C2, and provided with the reciprocating slides, E E1, and horizontal partition, F F1 G G1, for the purpose of depositing corn and a fertilizing material simultaneously, substantially as described.

2d, The springs, j, applied substantially as described, and employed for the purpose of ejecting the corn from the cells or discharge apertures of the slide, E, as set forth.

3d, The combination of the forked lever, L, pitman, M, crank, N, shaft, O, sliding frame, P, gear wheels, O1 Q1, and lever, P, all arranged to operate in the manner and for the purpose specified.

66,960.—CROSS HEAD FOR SAW MILLS.—Frederick Hermann, Grafton, Mich.

I claim the combination of the wheels, d, figs. 1 3 4 6, with the peculiar and novel method of hanging the same, by means of the boxing device shown in figs. 1 3 4 6, for the purposes and in the manner specified.

66,961.—FIRE ESCAPE.—John Heuermann, Davenport, Iowa.

I claim, 1st, The combination and arrangement of the fire-escape box, in all its parts, in the manner and for the purpose herein described.

2d, The method of attachment of such fire-escape box to an ordinary ladder, in the manner and for the purpose herein described.

3d, The method of attachment of the ladder to the fire-escape box, so as to be easily thrown to and from the building by means of the cam and ropes, arranged substantially as and for the purposes set forth.

66,962.—LIME KILN.—S. C. Hotchkiss, Sylvania, Ohio.

1st, I claim in a lime kiln the upwardly-inclining draft passages, g g h h, substantially as and for the purposes described.

2d, The combination of the upwardly-inclining passages, g g h h, with the outlet, a, and draft passage, f, substantially as and for the purposes described.

66,963.—STEERING APPARATUS.—Edward F. Howard, Boston, Mass.

1st, I claim a steering apparatus operated by means of two half screws whose threads run in opposite directions, passing through a double-threaded nut whose threads run in opposite directions, and to which the steering wheel is attached, substantially as described.

2d, I also claim, in combination with the slides, E E', operating as described the ball, b, and divided socket, s, arranged and operating as set forth.

3d, I claim the combination of the half screws, S S', constructed and arranged as described, with the double-threaded nut, N, constructed as described for the purpose of transmitting and changing the direction of motion, in the manner specified.

66,964.—PISTON PACKING.—W. S. Hudson, Paterson, N. J.

1st, I claim the combination of the adjustable packing ring, C, with one or more steam packed rings, B1 B2, so as to operate together substantially as and for the purpose herein specified.

2d, I claim the parts, A1 A2, of the piston, adapted for clamping the adjustable ring, C, as specified, in combination with steam packed rings, B1 B2 or their equivalents, as and for the purpose herein specified.

3d, I claim, in combination with packing rings arranged to operate substantially as herein specified, the projection, g, and piece, E, adapted for holding the splicing piece, G G1 G2, and consequently the whole adjustable ring, C, against turning around in the piston, substantially as and for the purpose herein set forth.

66,965.—VISE.—A. Jameson, Trenton, N. J.

I claim the combination of the plate, G, disk, H, and bolt, I, the whole being constructed and arranged for the confinement and adjustment of a vise on a bench or table, substantially as herein described.

66,966.—MACHINE FOR SHEARING SHEEP.—John V. Jenkins, Manchester, Mich., assignor to Richard B. Walker and Lewis Miller, Akron, Ohio.

I claim the jointed wrist so arranged that the wrist shaft can be placed at any angle from the vibrating beam or sway-bar, and accommodate itself to the connecting shaft without binding, cramping, or impeding the motion of the sway-bar or cutters, substantially as described.

I also claim a presser so arranged that the operator can at pleasure and while the cutters are in motion apply pressure upon said cutters to hold them to the fingers or release the pressure as occasion may require, substantially as described.

I also claim the holding or uniting of the cutters to the sway-bar by means of holes in the former and points on the latter to allow the cutters to be readily removed for sharpening and replaced, substantially as described.

66,967.—METALLIC BLIND.—J. M. Jomain, Paris, France.

1st, I claim a window blind or door constructed of a metallic plate fluted around and on its sides, and provided with slats formed in the said plate, as and for the purposes shown and described.

2d, A window blind or door of sheet iron or other sheet metal in which the slats are formed from strips partially detached from the said metal sheet or other sheet metal and bent, substantially as herein described.

66,968.—PAPER FASTENING.—M. H. N. Kendig, Washington, D. C.

I claim a paper fastener provided with a slot, a, or teats, a', in its legs or clasping points, substantially as and for the purpose set forth.

66,969.—COAL STOVE.—J. H. Keyser, New York City.

1st, I claim the application to a stove of the form and character described and shown of a conical jacket, G, which is provided with openings, c', c', corresponding to openings, c c, through the body of the stove, substantially as described.

2d, The parts, B C and D, in combination with the conical jacket, G, and suspended open-work fire pot, E, substantially as shown and described.

3d, The relative arrangement shown and described of the openings, c' through the conical jacket, G, the opening, c, through the stove and the suspended openwork fire pot, E.

66,970.—CURTAIN FIXTURE.—E. B. Lake, Bridgeport, N. J.

I claim the roller, c, and its pulley, e, turning in brackets secured to a window sash in combination with an endless cord passing round the pulley, e, and around a pulley, l, and a justable pin, n, or their equivalents, secured to the window frame, all substantially as and for the purpose described.

66,971.—STEAM ENGINE.—John L. Lay (assignor to himself and H. O. Perry), Buffalo, N. Y.

I claim the arrangement of the man holes, H I, with reference to the packing, L, and pistons, D E, as and for the purposes set forth.

I also claim the packing, L, constructed, arranged and operating substantially as and for the purpose described.

66,972.—STEAM ENGINE.—John L. Lay (assignor to himself and H. O. Perry), Buffalo, N. Y.

1st, I claim the combination with the abutting vertical cylinders, A B, with the piston rods, E G G L, and cross head or heads, F, arranged and operating substantially in the manner and for the purpose set forth.

2d, I also claim forming a man-hole in the piston, K, substantially as and for the purpose specified.

3d, I also claim the arrangement of the manhole, P, in the bottom head of the lower cylinder with the man-hole, O, substantially in the manner and for the purpose described.

4th, I also claim the man-hole, N, in the intermediate head of the vertical abutting cylinders, A B, arranged with reference to the man-hole, G, in the piston head, substantially as and for the purpose set forth.

5th, I also claim the guide arms, l l, in combination with the rods, G G, and cylinders, A B, operating substantially as and for the purpose specified.

66,973.—STEAM ENGINE.—John L. Lay (assignor to himself and H. O. Perry, Buffalo, N. Y.

I claim the arrangement of a high and low pressure cylinder, A B, inclined as described and connected by the pipe, E, in combination with the double crank shaft, D, connected with and operated by both, substantially in the manner and for the purpose set forth.

66,974.—STEAM ENGINE.—John L. Lay (assignor to himself and H. O. Perry), Buffalo, N. Y.

I claim a frame for supporting the cylinders, F F, of vertical compound engines composed of the converging standards, A A and H H, cap or intermediate plate, C, flanges, g g, and brackets, D D, or equivalent, with the pillars, G G, combined and arranged substantially in the manner and for the purpose set forth.

66,975.—STEAM ENGINE.—John L. Lay (assignor to himself and H. O. Perry), Buffalo, N. Y.

1st, I claim the arrangement of the high-pressure cylinder, B, concentrically within the low-pressure cylinder, A, when both are closed by the same heads, C D, and the pistons actuate rods attached to the same cross head below the cylinders.

2d, I also claim the valve, L, provided with the cavities, u u, recesses, v, valve chamber, r, and hollow trunion, s, in combination with the ports, m n, o p, and chamber, g, for operating the two cylinders of a high and low-pressure engine, substantially as set forth.

3d, The valve constructed as described in combination with the concentric cylinders, A and B, of a high or low-pressure engine.

66,976.—STEAM ENGINE.—John L. Lay (assignor to himself and H. O. Perry), Buffalo, N. Y.

1st, I claim the employment of a tube, H, in combination with the piston rod, G, and cylinders, A B, of a high and low-pressure engine, substantially in the manner and for the purposes set forth.

2d, I also claim the valve, K, consisting of the rod, f, and pistons, g h i, arranged with reference to the ports, a b c d, and chamber, e, substantially as specified.

3d, I also claim the above-described valve in combination with the high and low-pressure cylinders, A B, provided with the tube, H, the whole arranged and operating substantially as described.

66,977.—BEEHIVE.—G. W. Leffingwell, Columbus, Wis.

I claim connecting the swing comb frames together by means of metallic loops or staples, B B, fixed in alternate sides of the frames, A, and a movable wire or rod, C, passing perpendicularly through the same so arranged as to permit the frames to open from alternate sides, substantially as and for the purpose described.

66,978.—MANUFACTURE OF AXES.—John Lippincott, Pittsburgh, Pa.

I claim the method hereinbefore described of securing the steel bit to ax polls and other edged tools by inserting the bifurcated edges, x x, of the bit into a slot or scarf on each side of the stock or poll so as to lap the edge of the stock or poll over the bit and then welding them together, substantially as and for the purposes hereinbefore set forth.

66,979.—BRICK MACHINE.—W. H. Lotz and F. Baumann, Chicago, Ill., assignors to W. H. Lotz.

1st, We claim a double toggle lever having two or more sets of legs, arranged to come into operation successively for the purpose of first pressing the brick in the mold and then removing the same therefrom, substantially as described.

2d, The slide, E, for delivering the clay to the molds and having attached to and moving with it a solid portion or metal block, F, to operate as a cover to the mold during the operation of pressing the brick, substantially as set forth.

3d, We claim the cam, J, when arranged to hold the cover of the mold while the brick is being pressed, substantially as described.

4th, We claim the stationary pins, e, located in the mold, and having the plunger that presses the brick slide on or around the pins, as and for the purpose set forth.

5th, We also claim the use of the supplementary plunger, w, resting on or supported by a spring and having the plunger, I, arranged to slide on or around it for the purpose of accommodating itself to the quantity of material in the mold, substantially as described.

6th, We claim regulating the amount of material delivered to the mold by adjusting or limiting the distance that the pressing block or plunger is withdrawn from the mold, substantially as described.

7th, We claim the screen, Z, arranged to operate in combination with the crushing rolls, W, and having a vertical motion imparted to it, substantially in the manner shown and described.

66,980.—ANIMAL TRAP.—David J. Martin, Covington, Ohio.

1st, I claim the employment of the spring trigger or catch, F, for the purpose of engaging the sliding door, D, in the manner specified.

2d, In combination with the above I claim sliding door, D, cord, H, and treadle, G, substantially as and for the purpose described.

66,981.—CARPET FASTENER.—John Matson, Bridgeport, Ct.

I claim the carpet fastener, constructed substantially as herein described, as an article of manufacture, consisting of the base, A, upright, B, and ing, D, with the screw, C.

66,982.—RENOVATING HARNESS AND OTHER ARTICLES MADE OF LEATHER.—Caroline McCleary (executrix of the last will and testament of David McCleary, deceased, assignor to George H. McCleary), Hollidaysburg, Pa.

I claim the composition for cleaning old harness and other dry and hard leather composed of the ingredients in the proportions and prepared and applied in the manner substantially as herein described and set forth.

66,983.—HARVESTER RAKE.—Jacob Miller, Canton, Ohio.

I claim in combination with a rake or fork for clearing the platform of a harvesting machine and revolved horizontally over said platform by an arm or arms driven from the main wheels, the cam, and rack and pinion motions, for projecting and withdrawing said rake or fork as well as for turning it on its arm, so that it may properly traverse the platform, enter, sweep around and deliver the cut grain, substantially as described.

I also claim the spring guard, c, for strengthening the tines, d, substantially as described.

66,984.—BURGLAR AND FIRE-PROOF SAFE.—L. H. Miller, Baltimore, Md.

1st, I claim so arranging the bolts or fastenings of a fire-proof safe door as to avoid spaces or chambers about the bolts or lock in which powder or other explosive substance might be used to open the safe, said object being effected by means substantially as described.

2d, Applying the bolts, b b, to a sliding guard plate, E, which is inclosed within the safe door so as to move in a plane parallel or nearly so to the plane of that face of the door from which the said bolts project in combination with the slots, g, in the door frame, substantially as described.

66,985.—MUSTACHE GUARD.—C. E. Mitchell and M. Moriarty (assignors to Charles E. Mitchell and Philander Evans), Bangor, Me.

We claim the said mustache guard or combination of the plate, A, and either one or two auxiliary plates, B C, and their studs d e, or the equivalents thereof, the said auxiliary plate or plates having one or more springs applied to it or them to operate it or them, as specified.

66,986.—BOLT CUTTER.—L. J. Newlan, Barton, N. Y., assignor to himself and Stephen F. Mack.

1st, I claim making the frame of a bolt-trimming tool of the parts, B G and H, for the purpose of supporting and controlling the other parts, substantially as figured and described.

2d, I claim, in combination with the described frame of my bolt trimmer, the use of two cammed levers, A and A, hinged on the transverse pieces, B, and of two jaws or knife holders, C and C, hinged on the pieces, H, when made and operating as described.

3d, I claim the square, many sided, or other shaped holes for the knives, F and F, in the jaws, C and C, so made that the knives can be turned or changed so as to suit the cutting of bolts in various places and positions in combination with the other figured and described parts of my bolt trimmer, as set forth.

4th, I claim the described hand tool made of the several figured and described parts, as a combined whole, making a convenient and effective instrument for trimming off the bolts of carriages and other similar uses, as described.

66,987.—SOAP.—Thomas W. Nichols, Trout Creek, N. Y.

I claim the combination of the above ingredients, used in the manner and for the purpose described.

I claim the use of cantharides, glycerin and beeswax, in the manner and for the purpose described.

66,988.—WOOD-PLANING MACHINE.—G. H. Ober, Newbury, Ohio.

I claim the herein-described cutter head, A, provided with a serrated rim, D, when used as and for the purpose set forth in combination with the adjustable cutters, C.

66,989.—MEAT CHOPPER.—Henry Obrecht, Mahanoy City, Pa.

I claim the lever, F, rod, O, wheel, K, plate, H, knives, G, and swivel, L, combined and arranged substantially as and for the purpose specified and set forth.

66,990.—HAY ELEVATOR.—Wm. L. Overhiser, Stockton, Cal.

I claim the single rope, I, in combination with the pulleys, H and K, and the block, L, for the purpose of effecting the simultaneous motion of the forks, M, in opposite directions, substantially as described.

66,991.—HORSESHOE MACHINE.—A. Reese, Pittsburg, Pa.

1st, I claim a former, either fixed or movable, and of the shape of the inside of a horse shoe, in combination with flexible arms, o, fitted with lugs, o', attached to and operated by a revolving disk or cylinder, and guides, d d, and flange, b', or their mechanical equivalents, for bending horseshoe blanks, substantially as and for the purposes hereinbefore set forth.

2d, Discharging the shoe when bent around the fixed and movable former, b, by a roller, c', operating against the lower end of a bent swinging bar, B,

to which the former is attached, substantially as and for the purposes hereinbefore set forth.

66,992.—MACHINERY FOR FITTING UP STOVE-PLATE PATTERN BOILER-HOLE SEATS.—Aaron P. Rich, Troy, N. Y.

I claim the employment of a rotating tool holder, J, having a vertical feed motion, and its shaft, H, passing through a bed plate in manner substantially as set forth, in combination with circumjacent adjustable bearing or "bed" screws, q, and a slotted bed plate, D, with adjustable clamp and stay pieces, substantially in manner as herein described and for the purposes set forth.

66,993.—AUTOMATIC BOILER FEEDER.—G. A. Riedel, Philadelphia, Pa., assignor to the Automatic Boiler Feeder Company, Pa. Antedated July 9, 1867.

1st, I claim the valve, C, and steam opening, d, in combination with a plunger, E, which is caused to bear on the valve by the pressure of the steam, substantially as and for the purpose described.

2d, The cylinder, s, and hollow plunger, p, in combination with the reservoir, H, and rod, h, with its piston, o, the whole being constructed and operating as and for the purpose set forth.

66,994.—RAILROAD RAIL COUPLING.—T. E. Sexton, Wilmington, Del. Antedated July 18, 1867.

1st, I claim the two plates A and A', lapped together and adapted and secured to the ends of two rails, substantially as described for the purpose specified.

2d, The lips, e, on the plate, A', arranged to underlap and confine the folds of the plate, A, as set forth.

66,995.—VENETIAN BLINDS.—G. F. Smith, Philadelphia, Pa.

1st, I claim the application to a venetian blind of the roller, A, in combination with the flat take-up bands, B B, and the suspended operating cord, C, the said parts being constructed and applied to operate substantially as and for the purpose described.

2d I also claim, in combination with the subject matter of the preceding clause, the application of the ratchet wheel, G, the jointed gravitating pawl lever, E, the brake bar, F, and the suspended cord, H, the same being constructed and applied to operate substantially as and for the purpose described.

66,996.—LOOM PICKER.—Oren B. Smith, Palmer, Mass.

I claim the application of the screw bolt and its nut to the picker and the staff, substantially as described, that is, so that when the screw is set up into the nut, neither of them can turn independently of the part against which it is borne.

I also claim the construction of the screw and nut, viz.: with the ears, b b b b, arranged on them, as and for the purpose specified.

66,997.—MACHINE FOR CUTTING VENEERS.—T. B. Smith, Ansonia, Conn.

I claim the cylinder, H, with its cutters, a, upon a carriage, E, with the stationary cutter, d, upon its carriage, E, with the mandrel, C, when arranged so that the two carriages are moved to present the cutters upon opposite sides, substantially as and for the purpose herein set forth.

66,998.—FEED-PISTON HEATER.—E. R. Stilwell, Dayton, O.

1st, I claim the feed-water purifier, having its filtering chamber, f, and its cap or hood, b', arranged in the relation to corrugated pans or corrugated plates, c, and to inlet and outlet pipes, a d, substantially as and for the purpose set forth.

2d, The filtering chamber constructed and arranged as shown and described, within the horizontal chamber, A B, which has its outlet, d, arranged as shown.

66,999.—TOILET GLASS.—John Stofer, Cleveland, Ohio.

I claim the pivoted rest, D, hinged arm, B, bracket, A, and glass, E, combined and arranged in the manner substantially as set forth.

67,000.—MACHINE FOR MAKING CAST-STEEL CAR WHEELS.—John Blake Tarr, Chicago, Ill.

1st, I claim the condensation of cast-steel car wheels while in a molten state by means of hydrostatic pressure, applied substantially as described.

2d, The use of two or more piston rods, J J J, to connect the movable section, N, follower, C, with the piston, I, in an apparatus for casting cast-steel car wheels for the purpose of obtaining uniform pressure on the metal in the mouth, substantially as described.

3d, The gage hooks, e e, or their equivalents, applied to the follower, C, for regulating the thickness of the casting, substantially as described.

4th, In a machine which is adapted to molding and pressing cast-steel car wheels, I claim connecting the core, D, with a piston moving in its own cylinder, so that said core can be raised and depressed by hydrostatic pressure, substantially as described.

5th, The combination of a cylinder, H, piston rods, J J J, and follower, C, in a machine for casting car wheels, substantially as and for the purpose described.

67,001.—CRANK MOTION.—Thomas Taylor, New Orleans, La.

1st, I claim, in combination with a single crank, the two slotted connecting rods and single frame, constructed and operating together, substantially as and for the purpose described.

2d, I also claim, in combination with the crank and two connecting rods, the crank slides and disconnecting mechanism, substantially such as described, for allowing said rods to pass their dead points or centers, as set forth.

67,002.—PLOW.—Johann Tietz, Baltimore, Md.

1st, I claim the forked plow standard, C, as and for the purpose described.

2d, The reversible mold board, F, in combination with the standard, C, and the braces, D D, substantially as and for the purpose specified.

3d, The adjustable clevis, N, substantially as and for the purpose described.

67,003.—DEVICE FOR PULLING METAL HOOPS FROM THE FINISHING ROLLS OF ROLLING MACHINES.—Charles W. Walley, New Orleans, La.

1st, I claim the automatic pulling of hoops from the finishing rolls of rolling mills by means of a reciprocating carrier, arranged and operated substantially as herein described for the purpose set forth.

2d, The tongs carrier, C, with its appliances herein enumerated, substantially as described for the purpose set forth.

3d, The combination of the tongs carrier, C, and its appliances, with the guide ways, B B', as described, for the purpose set forth.

4th, The combination of the tongs carrier, C, and its appliances, the guide ways, B B', chain, D, and tooth wheel, E, with the adjustable block, P, substantially as described for the purpose set forth.

5th, The combination of the tongs carrier, C, and its appliances, the guide ways, B B', the endless chain, D, tooth wheel, E, and block, P, with the friction cone, y, substantially as described for the purpose set forth.

67,004.—POTATO DIGGER.—John Walmsley, Buffalo, N. Y.

I claim the arrangement of the riddlers, g g and g' g', in the manner and for the purpose described.

I also claim the head, h, provided with lugs, s, and holes, i i, for the insertion of the riddlers, in combination with the combined point and share, F, screw bolts, n n', and end, J, of the sole, constructed and arranged substantially in the manner and for the purpose set forth.

67,005.—FAGOT FOR SCYTHES.—H. Waters, Boston, Mass.

I claim a fagot or pile having an arrangement of iron and steel for two or more scythes, substantially as described.

67,006.—MEANS FOR RINGING BELLS.—P. L. Weimer (assignor to J. A. Weimer and L. E. Weimer), Lebanon, Pa.

1st, I claim the application of ratchet teeth to the crown of a bell, which is adapted for being rotated by a vibrating lever and pawl while being rung, substantially as described.

2d, An independently-vibrating lever, C, provided with a weight and a pawl, or their respective equivalents, and applied to an oscillating yoke, B, having a rotating bell suspended from it, substantially as described.

67,007.—BRICK MACHINE.—J. A. Welsh (assignor to himself, B. D. Anderson, R. S. Finley, Solomon K. Harner, William H. Wilson, and Chauncey W. Newton), Xenia, Ohio.

1st, I claim the conical hopper, B, having the box, C, on its side, with an opening, d, leading therein, substantially as and for the purpose set forth.

2d, The combination of the hopper, B, having its mouth rectangular in form, corresponding to the shape of the side of the brick, and slightly smaller than the mold which is to receive and form the brick, with the rotary table, I, having the mold, c, formed therein, when arranged to operate substantially as described.

3d, In combination with a series of movable molds, I claim the use of one or more rotating disks for cutting off the clay and smoothing or forming the surface of the brick.

4th, In combination with the rotating table, L, having the molds, c, formed therein, I claim the stationary table, U, when arranged to support the clay in the mold while being passed in from the hopper, as set forth.

5th, So arranging the table, I, and the screw, N, that each shall have an intermittent movement alternately to permit the wheel to remain stationary while the screw is pressing the clay into the mold, and the screw then remain stationary while the table is rotating to remove the filled mold, and present an empty mold, substantially as described.

6th, I claim the plunger, F', when arranged to operate in connection with the table, I, as set forth, for the purpose of removing the bricks from the molds after being pressed, substantially as set forth.

7th, The reservoir, J, in the interior of the plunger, having the openings, o, for the gradual escape of the oil for saturating the cloth, h, and oiling the molds, as described.

8th, The combination and arrangement of the driving wheel, D, when constructed as described, with the wheels, E and F, for the purpose of imparting to the screw, N, and the table, I, intermittent motions, as herein described.

67,008.—SEEDER AND CULTIVATOR.—William and James Whait, Independence, Iowa.

We claim the seed box with oscillating bottom shaft, E, provided with wings, levers, d and g g g, cultivator, F, and cords, h h h, when all are arranged substantially in the manner and for the purpose herein set forth.

67,009.—SULKY HARROW AND CULTIVATOR.—William and James Whait, Independence, Iowa.

We claim the cultivator, B, harrow, C, levers, h h and b, and cords, i i and m, the whole being combined and operated as and for the purpose set forth and described.

67,010.—NUTMEG GRATER.—R. W. Whitney and Joseph P. Davis, South Berwick, Me.

We claim the follower, D, suspended upon the bent elastic wire, E, in combination with the handle, A, and rotary grating disk, C, all arranged and operating substantially as described.

67,011.—KNIFE SHARPENER.—McClintock Young, Frederick, Md.

I claim a knife sharpener in which files are used for the abrading or reducing surfaces, and which files are adjustable therein, so as to present new surfaces when the others are worn out or become clogged, substantially as described.

67,012.—MEDICAL COMPOUND.—I. Yount, Gettysburg, Pa.

I claim the medical compound as above described, substantially as and for the purpose specified.

67,013.—WASHING MACHINE.—W. W. Adams, West Derby, Vt.

I claim the combination of the reel cylinder, C, fluted roller, H, and pivoted frame, G, with each other and with the box or trough, A, substantially as herein shown and described and for the purpose set forth.

67,014.—SCREW DRIVER.—J. A. Ayres (assignor to National Screw Company, Hartford, Conn.

I claim a screw driver with a dove tailed edge, substantially as herein described.

67,015.—WINDOW BLIND FASTENER.—J. R. Baker, Jersey City, N. J.

I claim the combination of the fastening, C F E, with the strap, D, of the hinge and plate, G, substantially as herein shown and described for the purpose specified.

67,016.—DOG MUZZLE.—H. Belmer, and C. H. S. Schultz, Cincinnati, Ohio.

1st We claim an adjustable dog muzzle constructed substantially as and for the purpose specified,

2d, the combination in a dog muzzle of the flexible wires, A, and strap or collar, C, substantially as and for the purpose set forth.

3d The provision in a dog muzzle of loops, s, in the manner and for the purpose set forth.

67,017.—FENCES.—Isaac Boone, Troy, Ohio.

I claim an adjustable fence consisting of the rails, A, batterns, B, base pieces, C, pins, F, and wedges, G, when used in connection with the brace wire, H, as and for the purpose set forth.

In combination with the elements of the preceeding clause, I also claim the serial holes, J, for the ready adjustment of braces, H, to enable a fence to suit any variable surface of ground as and for the purpose stated.

67,018.—STEAM ENGINE GLOBE VALVES.—J. Briggs, Roxbury, Mass.

I claim the valve constructed and arranged with the pocket partition between the outlet and inlet and with the taper plug valve, substantially as described.

Also in combination therewith, the changeable fulcrum post and lever for the purpose specified.

67,019.—DUST PAN.—A. Brigham, Cold Brook, Mass.

I claim a dust pan in which the bottom, B, conveying sides, C, and inclined back, D, are arranged as described and shown in the accompanying drawings.

67,020.—SNAP HOOK.—C. B. Bristol, New Haven, Conn.

I claim the combination of the hook and loop part (having a bridge, b, and stud, c, with the tongue part having a stud, e, and the spiral spring, d, when the parts are constructed arranged, and fitted to operate, substantially as herein described and set forth.

67,021.—STAND FOR DISPLAYING CLOTHING.—W. E. Brock, New York city.

I claim a dummy for displaying articles of dress formed of sheet metal struck up in sections and secured together in any suitable manner substantially as described.

67,022.—PASTEBOARD BOX.—Lucius Carrier, Providence, R. I. Antedated July 19 1867.

I claim making the sides and corners of pasteboard and similar boxes, by cutting and bending the flap, a, or its equivalent to form the corner and uniting the said flap with the adjoining side by dove-tailing the two parts substantially as described for the purpose set forth.

67,023.—STUD AND BUTTON FASTENER.—Victor Charlet, Hoboken, N. J.

I claim the head, A, having the revolving and stationary plates provided with the locking device adapted to be locked open or closed in the manner substantially as and for the purpose specified.

67,024.—METHOD OF MAKING SOLID BLANKS FOR WAGON shackles.—J. B. Clark, Plantsville, Conn.

I claim the method of making and forming the solid blanks for wagon shaft shackles of one piece of metal the grain thereof running parallel or nearly so with the direction of each arm substantially as set forth.

67,025.—COMPOSITION FOR DENTAL PLATE.—G. F. J. Colburn, Newark, N. J.

I claim a composition for the plates of artificial teeth composed of the ingredients No. 1 and 2 with any suitable coloring substances such as Nos. 3 4 5, substantially as set forth.

67,026.—BASE FOR ARTIFICIAL TEETH.—G. F. J. Colburn. Newark, N. J.

1st. I claim a base for artificial teeth composed of the composition herein described, and a metallic plate arranged or combined substantially as set forth.

2d. A base for artificial teeth having its under or lingual surface composed of the composition set forth and applied to a metallic plate substantially as shown and described.

3d. I claim the composition herein specified when used for attaching one or more teeth and gums to a metallic or other base for artificial teeth,

67,027.—STEAM ENGINE LUBRICATOR.—Joseph Collett (assignor to himself and J. Smith), Williamsburgh, N. Y. Antedated July 15, 1867.

I claim the combination of the steam way or passage, c c, and grease passage or passages, e f, with their valves, I J, arranged for action in connection with the reservoir and grease outlet or discharge chamber, substantially as specified.

2d. The valve, J, the steam way or passage that admits steam to the upper portion of the reservoir, in combination with the stopper or cover to the lubricator so arranged in relation thereto that said cover on being shut uncloses and retains open the valve, essentially as and for the purpose herein set forth.

3d. In combination with the grease discharge valve, I, that closes by the action of the steam, the hand adjustable valve, H, for joint or separate action as herein set forth,

67,028.—WAGON BED.—E. F. Conner, Greensbury, Ind.

I claim an adjustable extension of a wagon bed consisting of the several parts, D E and F, arranged to operate substantially in the manner, and for the purpose set forth.

67,029.—TONGUES FOR BREAST JOINTS, ETC.—Solomon Davidson, New York city.

1st. I claim the base, a, provided with ears or lugs, b, and an eye, e' in combination with the tongue, B, constructed and operating substantially as and for the purpose set forth.

67,030. —DOOR BELL.—M. L. Delavan and Job Dyson, New Britain Conn.

2d, Making the socket which receives the end of the tongue solid, with the base, a, substantially as and for the purpose set forth.

We claim the combination with the slide, F, or its equivalent carrying or operating the hammer, G, of the vibratory or oscillating cam, I, controlled by a stop or stops as described, and wiper, J, or its equivalent, for operation together by the turning or rotation of the handle, B, in either direction to strike the bell, substantially as specified.

67,031.—METHOD OF LOADING AND UNLOADING VESSELS.—G. A. Fournier des Corats, Paris, France.

1st. I claim the vertical screws, d, in the vessel, a, having gear wheels, b, provided with nuts, e, operated by means of the endless screws and longitudinal rods arranged in such a manner that two or more tiers of cars may be supported in said vessel and raised or lowered substantially as described for the purpose specified.

2d. The combination of the turn tables, j, rails, l, traction chains and pulleys h o, opening boards, k, arranged in relation to the vessel, a, and operated as herein described for the purpose specified.

67,032.—BREAD CUTTER.—A. M. Dexter (assignor to Isaac Townsend), Philadelphia, Pa.

1st, I claim in a bread cutter, the use of a gage lever operated by the knife shaft in combination with the gage shaft furnished with teeth meshing on the toothed segment of the lever,

2d. The crank handle, C, riveted to the knife handle at one end and secured to the knife shaft at the other, as and for the purpose herein specified.

67,033.—BREECH-LOADING FIRE-ARM.—Julius Elson, Boston, Mass.

1st, I claim the device for releasing the breech block from the position required for discharging the gun, and returning to to the same position and at the same time retracting the cartridge shell, consisting of the vertical sliding breech block, g, to which one end of a coiled spring, h, is attached, the hammer, H, operating the levers, I and K, the latter provided with a hinged piece, K1, and spring, K2, which act on the bell crank lever, l, and operating also the plate, b, with the wheel, a, and pin, f, all constructed and arranged as described.

2d, I claim the combination of the plate, b, with the wheel, a, constructed as described, the springs d and p, click, c, and the bar, f, as and for the purpose described.

3d, I claim the lever or arm, K, constructed as described in combination with the levers, l m and o, and pin, n, the same composing the mechanism for retracting the cartridg shell.

4th, I claim the projections, c' c'', on the barrel, c, and the hinge, B', by means of which the barrel is secured to the stock as described.

67,034.—OFFICE CHAIR.—Robert Fitts Jr. (assignor to Walter Heyward Chair Company), Fitchburg, Mass.

1st, I claim the bent wood legs, E E, in combination with the pedestal nut, D, constructed and secured together substantially as described.

2d, The cross head, C, of the screw, a, pivoted to the spider, B, in combination with the seat, A, constructed and operating substantially as and for the purpose herein described.

3d, The combination of the cross head, C, the spider, B, and the spring, c, arranged and operating substantially as herein described.

67,035.—TUNNEL.—Richard Foley (assignor to himself and Edwin Ferguson), New York city.

1st, I claim the construction and arrangement of a tunnel when composed of an outer and inner skin, or lining of metal supported in position by means of the angle iron ribs, in the manner and for the purpose herein described.

2d, The construction and arrangement of a tunnel as herein described when made in sections, which are united and held in position by the collar, m, which overlaps the ends of adjoining sections, in the manner and for the purpose herein described.

3d, The construction and arrangement of the sewer, f, when used in combination with a tunnel, in the manner and for the purpose herein described.

67,036.—CAR WHEEL.—David Forrest, (assignor to himself and James Eldridge), Eastport, Maine.

I claim the combination and arrangement of the body, A, having an annular groove, removal annular flange piece or guard, C, having flange, e, rim, B, having pins fitting into the transverse slots, F, in the periphery of the body A, all constructed as described whereby the rim, B, is screwed in place by means of the guard, C, and reversed by removing said guard, substantially as described for the purpose specified,

67,037.—PUMP.—Henry Getty, Brooklyn, N. Y.

I claim the hollow plunger, P, acting in its up stroke as a solid ram and in its down stroke as a water passage provided with a valve and piston packing at its lower end and working in the cylindrical chamber, A B, provided with an annular collar at the point of their junction forming a stuffing box through which said plunger, P, reciprocates all arranged and operating substantially as set forth.

67,038.—SAW MILL.—Alfred Gifford and R. L. Felts, Milroy, Ind.

We claim the arrangement of the driving pulley, O rod, N, slotted lever, M, pulleys, I L, belt, K, the shafts, B J, pawl, O, and spring, P, to operate in the manner and for the purposes specified.

2d, The adjusting of the inner end of the pawl, O, by means of the spring, P, and cord, m, and the lever, Q, or its equivalent substantially as and for the purpose set forth.

67,039.—LIFE PRESERVING MATTRESS AND RAFT.—John Golding, New York City.

I claim the combination of the mattress bed, A, with the floating box, B, the latter having the compartments, c c, and being constructed of cork as described and provided with snaphooks and eyes or their equivalents the whole being constructed and arranged substantially as and for the purposes specified.

67,040.—POTATO DIGGER.—C. G. Grabo, Detroit, Mich.

I claim, 1st, The shovel and catcher, H, constructed as described in combination with the finger wheel, R, and with the frame, A, of the machine substantially as herein shown and described and for the purpose set forth.

2d, The combination of the receiving and separating box, M, furnished with an upper grate or screen, m1, and lower screen m2 with the frame of the machine substantially as herein shown and described and for the purpose set forth.

3d, The combination of the supporting board, N, with the frame, A, of the machine and with the receiving and separating box, M, substantially as herein shown and described and for the purpose set forth.

67,041.—HARVESTER.—A. B. Graham (assignor to himself and W. B. and C. A. Worden, Waukegan, Ill.

I claim, 1st, The clearer, V, when attached to the end of the finger bar, I, and provided with the wing, W, substantially as and for the purpose set forth.

2d, The oblique arms, a' a' at the upper parts of the fingers, k, in connection with the arms b' b', at their under sides substantially as and for the purpose specified.

67,042.—TRAINING HOPPLE.—W. M. Greenwood, Cincinnati, O.

I claim the arrangement of pads, A and D, straps and buckles, B C E F, and elastic band, G, as and for the purpose set forth.

67,043.—CUT-OFF VALVE.—L. Griswold, Portland, and G. Caul, York, Wis.

1st, We claim the cylinders, C E and F, with the piston valves and rods constructed and arranged substantially as described for the purposes set forth.

2d, In combination with the above we claim the pipe, f, as herein set forth for the purpose specified.

67,044.—DOOR FASTENING AND KNIFE.—A. W. Hall, New York City.

I claim a pocket knife provided with a pivoted or hinged screw whereby it is made to subserve the purpose of a door fastener, substantially as specified.

67,045.—SAFE.—Joseph L. Hall, Cincinnati, Ohio.

1st, I claim the bolt or bolts, C, and the casing, A, constructed with mortises, l and l', to receive the bolt or bolts, C, when thrown in either direction, substantially as and for the purpose herein described and set forth.

2d, Constructing one or more of the plates composing the door or doors and jambs, rabbets, or casings of safes or other receptacles with the tenons and grooves entering and fitting each other, when the doors are closed for the purpose of obstructing the entrance to the safes, as herein described.

67,046.—CONNECTING DOORS AND CASINGS OF SAFES.—Joseph L. Hall, Cincinnati, Ohio.

1st, I claim constructing the abutting edges of doors and casings of safes and other secure receptacles with dovetails, g, closely fitting corresponding mortises, g', substantially as and for the purpose herein described and specified.

2d, In the series of plates in the doors of safes, the plate or plates, F, having their hinged ends projecting over the plates immediately outside of them, and so arranged that they shall enter a rabbet in the body of the safe when the door is closed, and the bolt plate, H, when the same are constructed and operated substantially as specified.

3d, The conical or tapering arbors, 1, in combination with two or more plates of metal in the doors and casings of safes and other secure receptacles, the arbors being secured in the plates by keys, 2, or in other substantial manner.

4th, The combination in the doors and casings of safes of one or more sets of dovetailed plates and angle iron, B and C, one or more plates, F, and bolt plates, H, and conical or tapering arbors, 1, secured by means of keys or rivet heading upon the inside of the safes, when the same are arranged substantially as herein described and for the purpose specified.

67,047.—BOAT DETACHING TACKLE.—F. C. Hargrave (assignor to himself, F. F. Bibber, and R. W. Bibber), Boston, Mass.

I claim in combination with the sliding rods, k, and lever, l, the stationary blocks having swing tumblers in notches of which the tackle rings are held, these tumblers being locked in position and operated to detach the boat, substantially as set forth.

67,048.—MANUFACTURE OF CARPET LINING.—John R. Harrington (assignor to Geo. W. Chipman), Brooklyn, N. Y.

I claim combining with paper rolls from which the strips to inclose the lap or fibrous material are fed, the card cylinder and cylinder screen, for forming the lap, the whole being arranged and operating together substantially as described.

I also claim forming or constructing a carpet lining by inclosing the lap between a wide and a narrow strip of paper and bending the projecting edges of the wide strip over upon and cementing or securing them to the surface of the narrow strip, substantially as set forth.

I also claim the arrangement of the cement cylinder and its rolls, in connection with the feed guide and paper rolls, substantially as described.

I also claim the method of folding the lining, substantially as set forth.

67,049.—SNOW PLOW.—R. S. Harris, Dubuque, Iowa.

I claim the combination of the inclined supporting car, A, inclined elevator boxes, C, endless chain of buckets, F, flaring scoop, B, ice and snow cutters, I J, and guide spouts, E, substantially as described for the purpose specified.

67,050.—MACHINE FOR MAKING PAPER BOXES.—C. B. Hatfield (assignor to N. M. Kerr and B. W. Beesley), Philadelphia, Pa.

I claim, 1st, A chuck or box holder, A, arranged to rotate in a fixed position outside of the frame, F, substantially as described.

2d, The combination substantially as described of a slotted chuck rotating in a fixed position, with a presser-off rotating concentrically with the chuck having an endwise motion on its axis.

3d, A vibrating head holder or disk receiver arranged substantially as described, for the purpose of holding the disk to form the head of the box against the ring constituting its sides.

4th, The combination, substantially as and for the purpose described, of a vibrating disk receiver or head holder with a vibrating holding frame.

5th, The combination of the chuck, A, flanged and grooved former, B, and sliding frame, C, when arranged and operating substantially as described.

6th, The combination substantially as described of a chuck rotating in a fixed position outside the frame, a rotating former mounted in a traversing frame, and a vibrating head holder or disk receiver for the purpose of uniting the head and sides of the box by a single continuous operation.

67,051.—MACHINE FOR MAKING PAPER BOXES.—C. B. Hatfield (assignor to N. M. Kerr and B. W. Beesley), Philadelphia, Pa.

1st, I claim the combination, substantially as described, of the cover pad or receiver, E, with the yielding ring, F, for the purpose set forth.

2d, The combination, substantially as described, of the holding chuck, vibrating pad and yielding rings, for the purposes set forth.

3d, The combination, substantially as described, of the holding chuck, A, turning brush, B, and smoothing brush, C, for the purposes described.

4th, The smoothing brush, C, arranged on an inclined adjustable shaft, as and for the purpose described.

5th, The combination, substantially as described, in a machine for making paper boxes, of a vibrating pad, a chuck projecting beyond its supporting frame and rotating in a fixed position, a brush to turn down the inner edge of the cover, and an auxiliary smoothing brush revolving inside the box, for the purpose of finishing the covering of the box without removing it from the machine.

6th, A revolving brush for turning dowh the edge of the covering paper, substantially in the manner described.

7th, A brush rotating within the box, substantially as described, for the purpose of smoothing the turned down edge of the paper.

67,052.—MODE OF PUTTING UP MATCHES.—Edward J. Hill, Milwaukee, Wis.

I claim, 1st, The use of india rubber or gutta percha to produce either friction or percussion in the manufacture and construction of match safe, cases, wrappers, or holders, or for safes, cases, or wrappers or holders for tapers, and for gas, lamp, and cigar lighters.

2d, The use of folded sand paper, or layers or leaves thereof, or of any other suitable material, in combination with india rubber or gutta percha, to produce friction or concussion in such manufacture.

3d, The book-like form of constructing safes, cases, wrappers, and holders matches, tapers, and cigar, gas, or lamp lighters, substantially as herein described.

4th, The mode of protecting the pasted or dipped ends of matches, tapers, and lighters by a wrapper of folded paper or any other suitable material, substantially as herein described.

5th, The use of folded paper, cloth, leather, or any other suitable material, to protect the ends of the matches, tapers, or lighters, in combination with leaves, layers, or folds of sand paper or any other suitable material, substantially as herein described, in such manufacture.

6th, The combination of the folded or protection wrapper with leaves or layers of sand paper or any other suitable material, and india rubber or gutta percha or its equivalent, substantially as herein described.

67,053.—BOILER FOR HEATING BUILDINGS.—Chas. F. Hitchings, New York City.

I claim, 1st, The fire chamber, A, and return flue, D, of the boiler constructed of two hollow shells or divisions, F F, united by a vertical joint as described, and having projecting chambers, G G', arranged to form the crown to the fire box and lower surface to the return flue, substantially as specified.

2d, The water bridge, C, connected and communicating by upper and lower branches with the one side or half of the body of the boiler, but loose or detached from the other half or division thereof, essentially as described.

3d, The water tubes, K, arranged to cross the return flue connected and communicating with but the one half or division of the water body or case of the boiler, as herein set forth.

67,054.—HORSE RAKE.—John B. Hoag, Oxford, Ill.

I claim the sliding rod, c, in combination with the staple, d, in the handle, C, the lock block, D, and catch rod, e, arranged and operating substantially as and for the purposes herein described.

67,055.—EXTENSION BEDSTEAD.—J. Holzman, New York City.

I claim, 1st, Constructing a bedstead so that it can be either lengthened or widened at will, or both lengthened and widened, substantially as herein shown and described.

2d, Making the side bars, A A, on each side of the bed of two pieces, and connecting the same by means of loops formed on the slats or independently, as described.

3d, Making the bars or rails, E E, which form the heads of the bedsteads, of two pieces, so that the bedstead can be widened as set forth.

4th, So constructing a bedstead by securing a longitudinal and a cross bar to each of the posts, the other ends of these bars being free, and arranging the slats extensibly, that the bedstead can be extended or contracted at will and be folded as set forth.

67,056.—FAUCET.—Wm. H. Humprey, Lansingburg, N. Y.

I claim a faucet consisting of the body, A, slide, K, with its stops, lever handle, D F, detachable disk, c, spring, G, and projection, M N, with its stops, all constructed and arranged as hereinbefore specified and described.

67,057.—DEVICE FOR TETHERING ANIMALS.—Warren Johnson, Fisherville, N. H.

I claim the swivel for connecting the pole, E, to the upright or stake, A, the same consisting of a tube, B, with a collar, C, permanently attached and secured on the upright or stake, and a collar, D, fitted loosely on the tube

and provided with a hook projection to bear or rest upon the fixed collar, C, substantially as shown and described.

67,058.—SCOURING AND SCRUBBING MACHINE.—Simon Kaufman, Fairbury, Ill.

1st, I claim the brush or scrubber, f, or its equivalent, set in a block, C, in combination with a slotted frame, A, and having a reciprocating motion imparted to it by the driving wheel, D, or in any equivalent manner, operating in manner and for the purposes substantially as herein shown and described.

2d, The block frame, B, carrying the brushes or scrubbers, f, or their equivalents, in combination with the slotted frame, A, in manner substantially as and for the purposes described.

3d, The slotted frame, A, handle, H, cross piece, C, all as set forth, and their respective equivalents, in combination with the driving wheels, D, and axle, E, block frame, B, and crank, d, and their respective equivalents, substantially as herein shown and described.

67,059.—TUBING CLAMP.—Henry Kewley, Perry, Ohio.

I claim the collar, J, jointed sections, A B, pawl, D, lever, E, and spring, F, arranged in relation to each other in the manner and for the purpose set forth.

67,060.—SASH FASTENER.—G. King, J. Gomber, and L. T. Shope, Frederick, Md.

We claim the arrangement of racks, b b, fastened on the sides of the sashes, B, behind the molding, A, and held engaging with the metal projections, c, upon the inside of wooden frame by means of the springs, d d, having rollers, all constructed, described and arranged in such a manner that the sashes shall be pressed outward to raise or lower, as herein set forth.

67,061.—PIE PLATE.—J. F. Kohler and S. B. Conover, New York City.

We claim the plate constructed in two portions in such manner that one portion may be detached to separately support the pie or like article, substantially as herein set forth.

67,062.—BARREL CRESSET.—John F. Little, Lockport, N. Y.

I claim the annular base, A, in combination with the perforated fire cylinder, B, and grate, l, constructed, arranged, and operating substantially as and for the purpose set forth.

67,063.—DESK AND TABLE.—A. A. McMore, Brooklyn, N. Y.

I claim, 1st, The parts of the table top, B and C, attached to the frame, A, arranged and operating substantially as and for the purposes described.

2d, The case, D, attached to the part, C, substantially as described.

67,064.—CAR COUPLING.—J. P. Morris, Bloomington, Ill.

1st, I claim a bumper, constructed after the manner as shown herein, with ledges, b b, recess, C, catches, D D, spring, E, substantially as and for the purpose specified.

2d, The combination of the bumper, link, link block, and the several parts of each to each other, substantially as described for the purposes specified.

67,065.—CARTRIDGE BOX.—W. H. Morris, Cold Spring, N.Y.

1st, I claim the employment or use in a cartridge box of two or more blocks B, provided each with one or more rows of holes to receive the cartridges, and connected together by hinges or joints, substantially as and for the purpose set forth.

2d, Having the upper and lower surfaces, either or both, of the block rebated or ground longitudinally, so as to form planes of different hights, one for each row of cartridge holes, to admit of the ready withdrawal of the cartridges from the blocks, substantially as shown and described.

67,066.—RUDDER.—Thomas W. Murray, New York City.

1st, I claim a rudder for vessels, provided with a cast-iron post, A, having a flange or projection, a, into a wooden blade, B, which is secured to the post by metal strips, e e, substantially as and for the purpose pecified.

2d, The rudder post, A, when secured to the stern posts, C, by means of the metal straps, g, in the recesses, i, in such a manner that said posts are allowed vertical play without unshipping or becoming detached, as herein shown and described.

67,067.—CHAMBER PAIL.—James H. Orr (assignor to himself and John P. Gilbert, said Gilbert assignor to Lewis Graves), Long Island City, N. Y.

I claim, 1st, The top piece or cover, E, constructed as described, its lower edge or flange resting upon the ring, D, upon the inside of the pail, and having its opening, F, immediately over the sliding plate, H, as herein described for the purpose specified.

2d, In combination with the sliding doors, K, and cap or top plate, E, of a chamber pail, I claim the sliding plate or cover, H, substantially as described and for the purpose specified.

67,068.—POTATO DIGGER.—J. D. C. Ontwater, Newark, N. J.

I claim, 1st, The combination of curved tines with the share, substantially as described.

2d, The combination of curved tines and geared mechanism for operating them with the share, substantially as described.

3d, The combination of curved tines and geared mechanism with the share and its sole, substantially as described.

4th, The combination of all the last-mentioned elements with the coulter, substantially as described, with the pointer roller, H.

67,069.—WASHING MACHINE.—B. R. Platt and J. A. Gray, Holland, Mich.

I claim the double-concave reversible roller frame, C, constructed as described, in combination with the hinged frame, F, and with the box or tub A, substantially as and for the purpose herein set forth.

67,070.—LAMP.—Wm. Porter, Belleville Township, N. J.

I claim, 1st, Relieving the internal pressure in a lamp through the agency of water or its equivalent, operating substantially as described.

2d, The tube, T, and reservoir, R, or their equivalents, placed in connection with a lamp, and operating substantially in the manner and for the purposes herein set forth.

3d, The float, F, or its equivalent, attached to the wick, substantially and for the purpose described.

67,071.—RAILROAD SPIKE.—Louis Postawka, Boston, Mass., assignor to himself and A. J. Wondra, New York City.

I claim the spike, B, its upper part square, and its lower round part, b, split longitudinally, forming prongs, d d, beveled upon their inner sides, and separating when driven into the wood in a place coincident with the axis of said spike, as herein shown and described.

67,072.—SAD IRON.—David H. Priest, Watertown, Mass., assignor to himself and George Farwell, North Bridgewater, Mass.

I claim, 1st, The combination and arrangement of the stone, A, and the iron B, as applied to a sad iron, substantially in the manner and for the purpose above set forth.

2d, I claim the cold-air chamber, C, constructed and arranged and as applied to a sad iron substantially in the manner and for the purpose above set forth.

67,073.—LATH FRAME.—Albert Reed, Mankato, Minn.

I claim a lath frame constructed substantially as and for the purpose described.

67,074.—QUARTZ MILL.—Thomas Rowe, New York City.

I claim the arrangement of a central discharge in the collar, E, which forms the step for the vertical shaft, D, carrying the mullers, B, and the rakes, G H, substantially as and for the purpose described.

67,075.—BROOM HEAD.—James A. Sinclair (assignor to himself and Western T. Sinclair), Woodsfield, Ohio.

I claim the combination with the head block, A, metallic casing, G, fenders or stays, C C, clamps, F F', bars, D D', bolts, E, and handle, B, substantially as described and for the purpose specified.

67,076.—POTATO DIGGER.—Henry P. Smith, Denton, Mich.

1st, I claim the forks, J, and screens, K, constructed and arranged as herein described, in combination with the shaft, G, as and for the purpose set forth.

2d, The combination of the cog wheel, O, and segmentally-toothed cog wheel, P, with each other and with the shaft, G, and axle, A, substantially as herein shown and described, for the purpose of communicating an intermitting motion to the fork shaft, G, as set forth.

3d, The combination of a cultivator or shovel plow, X, with the axle, A, and tongue, Y, substantially as herein shown and described and for the purpose set forth.

67,077.—CHAIR SEAT.—Lewis A. Smith, Cincinnati, Ohio.

I claim a chair seat formed of metallic strips, B, passing continuously around the supporting bars and woven into two webs, as represented.

67,078.—CULTIVATOR.—William E. Smith, Oquawka, Ill.

I claim the couplings, G, composed of two parts, d d, connected by a vertical bolt, h, and having packing, i, interposed between them and the pin, f, and connected to the axle and plow beams, substantially as and for the purpose set forth.

67,079.—MACHINE FOR CUTTING BUNGS.—William L. Standish, Pittsburg, Pa.

1st, I claim the hollow taper steel cutter c, the guide pin d, the guide box E, and the die, e, constructed, combined, and operating substantially as and for the purpose herein described.

2d, The combination of the saw G, and the sliding frame H and D, constructed and operating substantially as and for the purpose herein specified.

3d, The ratchet wheel k, and pawl k', in combination with the feed rolls k2 k3, and the slide frame H, arranged and operating substantially as and for the purpose specified.

4th, The combination of the hollow cutter c, the guide pin d, the guide bar E, the die e, the saw G, the ratchet k, the feed rolls k2 k3, and the slides D and H, or the equivalents of them, or either of them, when combined and organized substantially as described, for cutting the blocks and pointing or tapering the ends of bungs, plugs, or taps in the manner specified.

67,080.—TOP FOR CEMENT-LINED PIPES.—Nathan Stephens, Brooklyn, N. Y.

I claim the lead or other like soft metal branch, C, with its stopper or stoppers fitted to project through the sheet-iron pipe A, and arranged in relation thereto, and its cement lining and covering, B B', for use in concert or combination therewith, substantially as specified.

67,081.—SPINDLE STEP.—Francis A. Sterry, Canton, Mass.

I claim the cup, C, constructed as described, in combination with the screw-threaded reversible spindle step, B, as herein set forth for the purpose specified.

67,082.—DISINFECTING AND ANTISEPTIC COMPOUND.—Joseph Strigel, Louisville, Ky.

I claim the discovery of the use and effect of the horn shavings and drugs mentioned in the preparation of the said disinfecting and antiseptic compound, when used in the proportions and manner mentioned in the above specification.

67,083.—TOY BALL PLAYER.—Isaac P. Tice, N. Y. City.

1st, I claim the combination with one or more figures, substantially such as herein described, of the ball E, mounted upon the vibrating rod, n, substantially as and for the purpose herein set forth.

2d, The three figures, B C D, constructed with vibrating or impelling arms, a, and arranged in relation with each other and with the ball E, mounted upon the vibrating rod, n, substantially as and for the purpose herein set forth.

67,084.—STOVE-PIPE SHELF.—J. Turner, Marshalltown, Iowa.

I claim the revolving shelves, D, when made and operating substantially as and for the purpose herein shown and described, in combination with the rings or flanges, C C, on the stove pipe, A, all made and operating substantially as herein shown and described.

67,085.—CHURN.—C. Vogt and X. Krapf, Allentown, Pa.

We claim the arrangement and combination of the churn barrel, C, adjustable hinge, g, cam-shaped damp, j, adjustable brake, D, and driving shaft, B, all constructed and operating substantially as and for the purpose set forth.

67,086.—CURTAIN FIXTURE.—H. Voight, Buffalo, N. Y.

I claim regulating the tension of the roller cord by the winding of a cord attached to the lower pulley or bearing thereof, around a spindle, substantially as set forth.

I also claim the combination of the knob, I, spindle, h, and friction bearing, l, with the cord, j, and pulley, E, arranged and operating substantially in the manner and for the purpose set forth.

I also claim the axial pin, O, of pulley, E, constructed as described, in combination with the frame, F, provided with slotted openings, r r', and stop, s, arranged and operating with the roller cord and pulley, D C, substantially as and for the purpose specified.

67,087.—APPARATUS FOR THE MANUFACTURE OF BICARBONATE OF SODA.—Alois Föhr von Föhrnhoff, Brooklyn, N. Y.

I claim the arrangement and combination of pipes, A C E F, blower, B, and reservoir, D, for the purpose and substantially as set forth above.

67,088.—MACHINE FOR WASHING AND DRYING DISHES.—A. W. Ward, Fishkill, N. Y.

1st, I claim the combination of the two brushes, D and I, revolving in opposite directions with the shafts, C and H, to which they are removably attached, with the box, A, and gearing, by which they are operated, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the sponges, P and V, and disks, O and U, revolving in different directions with each other, with the box, A, and with the gearing by which they are operated substantially as herein shown and described, and for the purpose set forth.

67,089.—SEALING PAD-LOCKS.—R. M. Webb and I. Hermann, New York City.

1st, We claim the spring spindle, H, with sharp cutting edge, a, operating in combination with the key, N, against the seal in cap, P, substantially as described for the purpose specified.

2d, The sleeve, L, encircling the spindle, H, with arm, M, and notch, c, operating in combination with the spring spindle, H, and key, N, having projection, g, substantially as described for the purpose specified.

67,090.—CHURN.—William Weddington, Winterset, Iowa.

1st, I claim the combination of the hollow staff or tube, C, having one or more elbow tubes, E, attached to its lower end with the body, A, of the churn substantially as herein shown and described, and for the purpose set forth.

2d, The connection of the horizontal crank, wheel or pulley, G, band, j, pulley, E, with the tube, C, substantially as herein shown and described, and for the purpose set forth.

67,091.—PAPER NECKTIE.—H. Whitney, Watertown, Mass.

I claim the paper necktie constructed as described, consisting of the part E, provided with the parallel transverse slits I, to receive the folded part or ends of the tie, F, the buttonhole piece H, upon the lower side adapted to be turned back against the part E, as herein set forth for the purpose specified.

67,092.—DOCUMENT ENVELOPE.—J. W. Wilcox, N. Y. City.

I claim constructing a box or document envelope, with double ends throughout and treble ends in part, by folding and uniting flaps cut out of one sheet of paper or other material, substantially as herein described.

67,093.—CULTIVATOR.—Jacob Wilson, Somerford, Ohio.

1st, I claim the combination and arrangement of the doubletree D, rods c, levers E, and whiffletrees H, with the frame A, mounted on wheels, substantially in the manner and for the purpose set forth.

2d, The two plow beams, I J, connected together by the cross arms, h, and connected at their front ends by bolts to the pendants, G G, with the pendant guides, O, passing through loops q, at the outer sides of the beams I, substantially as and for the purpose specified.

3d, The attaching of the plow standards, M M, to the cross arms, h, of the plow beams, I J, by means of the swivel bolts, l, in connection with the straps, P, passing over the fixed pulleys, Q, and the stirrups, p, all arranged to operate in the manner as and for the purpose specified.

4th, The raising and lowering of the plow beams, I J, through the medium of the levers, o, semi-circular bars, n, and straps, m, arranged substantially as shown and described.

67,094.—GATE.—E. R. Wolfe, Plymouth, Pa.

I claim the combination and arrangement of the bent lever, D, spiral spring, E, and jointed connecting rod, F, or its equivalent with each other, and with the gate, C, and post, B, substantially as herein shown and described, and for the purpose set forth.

67,095.—CHURN.—R. S. Arnall, Wright City, Mo.

I claim the arrangement of the churn box, B, with the vibrating frame, M, connected and used with the frame, A, as and for the purpose set forth.

67,096.—STEAM GAGE DIALS.—E. H. Ashcrott, Lynn, Mass.

I claim, in combination with a steam gage, A, the graduated dial, B, as shown and described, whereby the temperature corresponding to any pressure is indicated at the same time by the pointer.

67,097.—TINNERS' FOLDING MACHINE.—R. H. Birt, Kokomo, Ind.

1st, I claim the combination of the bed-plate and stationary standard, B, with the adjustable standard, C, and lever, D, and former, E, and adjustable former, E2, substantially as and for the purpose set forth.

2d, The combination of the parts, A B C D E and E2, constructed and arranged substantially as described, with the folding door or lever, G, substantially as and for the purpose set forth.

3d, The door or lever, G, in combination with the adjustable springs, H, constructed and arranged substantially as and for the purpose set forth.

67,098.—COTTON TIE.—E. B. Bishop, New Orleans, La.

I claim the projecting lips, C C, cut as described at their junction with the plate, the whole being constructed as described, for the purpose set forth.

67,099.—SEWER PIPE MACHINE.—W. K. Black, Philadelphia, Pa.

1st, I claim the revolving screw shaft, B C D, suspended from its bearings when leaving a space between it and the bottom of the cylinder, as and for the purpose specified.

2d, The construction of the shaft, B, of wrought iron and the spiral flange, D, and shaft, C, of cast iron forming the cutting, tempering and forcing parts, B C D, substantially as described for the purpose specified.

3d, The suspended core pin, I, in combination with the funnel, H, substantially as described for the purpose specified.

4th, The removable ring, G, supporting the removable die, H I, substantially as described.

5th, In combination with the revolving screw, the door, F, of the sectional cylinder extending from top to bottom thereof, for the purpose described and in the manner specified.

67,100.—CLOTHES PIN.—A. W. Brinkerhoff, Upper Sandusky, Ohio.

1st, I claim constructing a clothes pin out of one piece of sheet spring metal possessing in full the spring, clasp, and levers for expanding the lips, as and for the purposes set forth.

2d, I claim such manner or form of construction of clothes pins when made out of one piece of sheet metal as will secure both the spring and fulcrum between ascending levers and so that by pressing the levers together at their upper ends their inner sides shall be brought to bear against the fulcrum and thereby spread the lips in applying or removing it from the line.

67,101.—JUMPING HOOP.—C. L. Browne, Brooklyn, N. Y. Antedated July 5, 1867.

I claim the invention of a jumping hoop by the combination of a wooden cross piece with a hoop secured thereto by metal connections or by mortise, as in annexed drawings.

67,102.—CLOTHES DRIER.—L. S. Calkins, El Paso, Ill.

I claim the use of the two frames herein described constructed and hinged together at their upper ends and provided with the blocks, e e, substantially as and for the purpose herein set forth.

67,103.—LIFTING JACK.—Samuel J. Clark, Detroit, Mich.

I claim the combination and arrangement of the lever, A, the standard, B, the hinge, C C, ratchet, D, pawl, E, and hook, F, for the purposes above described.

67,104.—MODE OF PRESERVING WOOD.—Charles E. Clarke, George Hadley, and John C. Clifford, Buffalo, N. Y.

We claim the within described process of treating wood for the purpose of preserving, protecting, solidifying, or coloring the same.

67,105.—CHURN.—John E. Cryer, Greenpoint, N. Y.

1st, I claim the spiral threaded shaft, B b, in combination with the traversing nut, E e, and with oscillating dashers arranged to operate substantially in the manner and for the purpose herein specified.

2d, I claim the fork link, H H1 H2, connected to the nut, E e, and arranged to operate relatively thereto and to the spiral threaded shaft, B b, and to the hand lever, G, or its equivalent, substantially as and for the purpose herein specified.

3d, I claim mounting the within described partially revolving shaft, B B', between pivots, a c, in the manner represented, one of the said pivots being fixed on a cross bar, C C1 C2, secured in bearings, A1 A2, by means of the removable wedge, D, so as to allow the whole to be connected and disconnected in the manner and for the purposes herein set forth.

67,106.—THRASHING MACHINE.—J. Cummings and H. Harrington, Woodstock, Canada.

We claim, 1st, The combination and arrangement of the alternating reciprocating bars, H H, having also a vibrating up and down motion at the front end with the straw carrier, C, having a longitudinal reciprocating motion and a vibrating up and down motion at the rear end substantially as and for the purposes set forth.

2d, The thin elastic metal tips, b, on the near end of bars, H, running in the cross-guide piece, I, as described and for the purpose set forth.

3d, The perforated board, H, under the crank shaft, J, and forming a part of the slatted carrier, C, as and for the purpose specified.

4th, The pendent screen or dividing board, B, constructed, arranged and operating as described; employed in combination with the bars, H, and carrier, C, as set forth.

5th, The construction and arrangement of the grain carrier, L, forming part of the shoe, and provided with the inclined slatted screen, M, at the end, as shown in combination with the carrier, C, and reciprocating bars, H H, the whole arranged and operating substantially as specified.

6th, Connecting both the shoe and straw carrier by the rod, o, and operating them by the same rock-shaft, A, in the manner described.

67,107.—FOLDING SEAT AND ARM.—F. J. Dibble (assignor to himself and Marshall E. Hunter), Chicago, Ill.

1st, I claim, in combination with a folding seat, C, a folding arm, L, operating substantially as herein specified.

2d, The combination of the seat, C, arm, D, axle, F, slot, I, and pin, H, with the jointed arm, L, arranged and operating as and for the purposes specified.

3d, The combination of the folding arm, L, with the seat, C, the arm, D, axle, F, slot, I, and pin, H, and rubber, J, substantially as and for the purposes set forth.

4th, In combination with the last above, I claim the arrangement of the rubbers, K K, or their equivalent, in the manner and for the purposes described.

67,108.—MODE OF BURNING HYDROCARBON LIQUIDS.—Clark Fisher (assignor by mesne assignments to himself), Trenton, N. J.

1st, I claim the apparatus substantially as described.

2d, The location of the apparatus outside of the chamber where the combustion is effected, so that it may not be affected by the heat of the same.

3d, The method of regulating the supply of steam by the screwing outward or inward of B.

4th, The delivery of liquid hydrocarbon for combustion in the form of spray, by means of a jet of steam, substantially as herein described.

67,109.—MACHINE FOR MANUFACTURING SHEET-METAL PANS.—John Goodin, Erastus F. Blair, and John Lyda, Georgetown, Ohio.

1st, We claim the expansive die, H H' H'', provided with curved corner grooves, h', and constructed and operated substantially in the manner and for the purpose specified.

67,110.—SKATE FASTENING.—G. Gunderson, Chicago, Ill. Antedated July 11, 1867.

1st, I claim the plate, D, having the projections, a a b, in combination with the plate, c, spring, g, lock, e, boot, C, and skate, A B, when constructed, substantially as and for the purpose set forth.

67,111.—ENVELOPE.—W. E. Haskins, New York City.

I claim the trapezoidal projections, D D, of the box envelope between the flap, A, ends, E E, and the upper corners of the joint, B, folded in the medium line, b d, and lines a d and d e, whereby the corners of the envelope are completely closed, substantially as described, for the purpose specified.

67,112.—BOILER TUBE CLEANERS.—William P. Heffron (assignor to himself and George H, Sayre), Chicago, Ill.

1st, I claim the combination of the traveling or feed wheel, G, and a series (one or more) of revolving cutters, M, arranged and operating substantially as and for the purposes herein specified.

2d, The combination of the cutter-holder, with its cutters and traveling wheel, G, with the gearing shown, for the purpose of operating the same as and for the purpose set forth.

3d, In combination with said traveling wheel and revolving cutters, I claim the case, A B, provided with a central opening for the tube, arranged and operated substantially in the manner and for the purposes described and set forth.

67,113.—HYDRAULIC CRANES.—D. S. Hynes, Brooklyn, N.Y.

1st, I claim the combination of the cylinder and ram with an internal central support, constructed substantially as and for the purpose described.

2d, The arrangement with the cylinder and ram of a jib, constructed with a mast, said mast being provided with a suitable guide above the jib, substantially as and for the purpose described.

3d, The arrangement in the lower part of the mast of a device for unlocking or releasing it from the ram, substantially as described.

4th, The arrangement with the jib of an intermediate brace substantially as and for the purpose described.

5th, The combination with the carriage running upon the jib of a vertical friction roller, substantially as and for the purpose described.

6th, The introduction of air under pressure at any convenient point in the cylinder, for the purpose of blowing the water out that may remain, and in its connecting pipes after use, substantially as described.

67,114.—AUTOMATIC DENTAL MALLET.—Hial Hodge and Joseph P. Noyes (assignor by mesne assignment to Samuel S. White) Binghamton, N. Y.

1st, We claim the combination substantially as shown and described in the drawing and specifications before referred to, by which the blow is produced by simply pressing down the finger-piece, h.

2d, The graduation of the force of the blow by the screw, combined with the finger-piece, substantially as shown and described.

3d, The combination, substantially as shown and described, by which the point, f, is held firmly in its place, and any sliding in the instrument avoided, thus enabling it to be used as an ordinary hand plugger whenever desired.

67,115.—CORN PLANTER.—W. W. Hubbard, Edinburgh, Ind.

1st, I claim the log or drag, A, provided with a seed or corn hopper in its rear end, or used with it, as and for the purpose set forth.

2d, The handles, D, lever, E, and seed slide C, arranged with the log with a hole through its center, and hopper, B, as and for the purpose set forth.

3d, The hoe or coverer, I, connected to the drag and handles, and operating substantially as and for the purpose set forth.

4th, The mole or flange, L, on the under side of the log or drag, used substantially as and for the purpose set forth.

67,116.—COMPOUND LOCK FOR DOORS.—George Hubert, Lancaster, Pa.

I claim the supplementary lock, consisting of the bolt, I I, with its projecting arm, K, and the spring tumbler, I, with its curved flange and opening, the same being constructed and arranged as described, so as to be operated by an independent key for securing the main bolt of the lock in the manner substantially as set forth.

67,117.—FENCE.—William D. Hunt, Scott, N. Y.

I claim providing the wires of a wire fence with a series of spur wheels, substantially as and for the purpose set forth.

67,118.—CHURN DASHER.—A. B. Hurd, Watkins, N. Y.

1st, I claim the combination of the plug, C, at the bottom of the churn, with the tubular rod, A, sliding over it, for displacing the air, as herein set forth.

2d, The combination of the spiral wheels, d, with the dasher wings, b, arranged and operating in the manner and for the purpose set forth.

3d, I claim the special construction and arrangement of the churn dasher, with all its parts, as herein specified.

67,119.—FOLDING CHAIR.—Joseph Hyde, Troy, N. Y. Antedated July 18, 1867.

I claim the employment of the center arm pieces, C, in combination with the back pieces, B B, and with the lower pieces, D D, and each being so arranged and attached as to allow or permit the said chair or couch to be folded or unfolded in the manner and for the purposes substantially as herein described and set forth.

67,120.—PEN RACK.—Gustav Jedamski (assignor to William Staehler), New York City. Antedated July 14, 1867.

I claim the spring, B, formed with a recess, a, and double springs, b e, as and for the purpose described.

67,121.—PROCESS OF MAKING STEEL.—Thomas H. Jenkins, Nyack, N. Y.

I claim melting wrought iron in crucibles or pots in admixture with a percentage of crude cast iron, after such crude cast iron has been treated, while in a highly heated state, in a bath, substantially as described.

67,122.—COMBINED FERTILIZER AND SEED SOWER.—Horace M. Keith, West Bloomfield, Mich., assignor to himself and F. A. Flower, Oakland Co., Mich.

1st, I claim the cylinders, H H, revolving in the box, G, and carrying fertilizing material for distribution, as herein specified.

2d, The bands, e e, with their strips, d d, in combination with perforated cylinders, H H, as and for the purpose set forth.

3d, The wings or flanges, J, within the perforated cylinders, as and for the purpose set forth.

4th, The arrangement of the cylinders, H H, claims, L L, divided axle, B, levers, D D, wheels, a a, and the box, E, with its slides, as and for the purpose set forth.

67,123.—BEEHIVE.—Ed. Kretchmer, Pleasant Grove, Iowa.

I claim the comb frames, R, provided with the bar, ll, and bars, o o 10, constructed and arranged substantially as and for the purpose described.

67,124.—SHELF BRACKET.—C. F. Kuhnle, Washington, D. C.

I claim the bracket, A, consisting of the pieces, a a', at right angles to each other, braced by supports, b, and provided with two or more projections, c, and flanges, d, substantially as described.

67,125.—WASHING MACHINE.—J. Lamb, Hubbardston, Mass.

I claim the said washing machine, as composed of the tub, A, the cover, B, the shaft, C, the handle, D, the cross, E, and the pins, F, combined and arranged in manner so as to operate substantially as described.

67,126.—WAGON BRAKE.—George Long, Marlboro Township, Ohio.

1st, I claim the peculiar combination and arrangement of the front bed piece, D, connecting link, K K, and compound levers, E I E I, substantially in the manner and for the purpose specified, and

2d, The peculiar combination and arrangement of the lever, O, with the lever, P, forming a compound anti-brake lever, substantially in the manner and for the purpose specified.

67,127.—MANUFACTURE OF ILLUMINATING GAS.—William L. Lowrey, Saratoga Springs, N. Y.

I claim, 1st, The manufacture of gas by roasting the material in a retort, and passing the gaseous products through a chamber partially filled with charcoal, at a high heat, and then through a condensing chamber filled with charcoal, substantially as described.

2d, The retort, A, in combination with the decomposing chamber, B, and the condensing chamber, C, when arranged and operated in connection with a cooking stove, range, or similar heating apparatus, substantially as set forth.

67,128.—SPRING WAGON.—Warren Mansfield, South Braintree, Mass.

I claim, 1st, The arrangement upon rockers, B, of springs, C, connected as described, with the wagon body at l, and

2d, The arrangement of volute spring brace, d, connected as described, with wagon body, H, and rocker, B, when the rocker carries springs, C, attached to the wagon body, substantially as described.

67,129.—DENTAL PLATE.—E. J. Merrick, Rochester, N. Y.

1st, The use of an elastic base over the entire surface of the upper jaw, and the back portion and sides of the palatine arch.

2d, The manner of making the elastic base smooth on the lingual side by means of its being vulcanized in contact with polished metal.

67,130.—MACHINE FOR CLEANING AND ASSORTING CRANBERRIES.—G. L. Merrill, Chicago, Ill.

I claim, 1st, The arrangement and combination of the adjustable chute-board, B M, partitions, D E, and reverse board, C, substantially as and for the purpose set forth.

2d, The combination of the board, K, and movable stop, N, when constructed as and for the purpose specified.

67,131.—DIE FOR MAKING PLOW BRACES.—Gilpin Moore (assignor to Deere & Co.), Moline, Ill.

I claim the dies, A and B, constructed substantially as shown and described, for making plow braces, as set forth.

67,132.—SLEIGH BRAKE.—Joseph Myers, Camden, Pa.

I claim the arrangement of the lever, B, connecting rod, C, with the levers, E G and I, shaft, I, and connecting bars, H and F, upon the sleigh or slide, as and for the purpose herein specified.

67,133.—ICE-CREAM FREEZER.—Charles W. Packer, Philadelphia, Pa.

1st, I claim the cross, B, hinged to and retained on the vessel, A, and carrying a wheel, G, having a recess adapted to receive the end of the dasher spindle, substantially as described.

2d, The combination of the cross bar, B, its plate, D, bevel wheels, G and F, spindle, E, and bevel wheel, K, on the cover of the vessel, I.

3d, The combination of the said cross bar, B, its plate, b b, and pins, e, with the studs, f f, on the vessel, A.

4th, The strip, K, arranged to vibrate on a dasher, substantially as set forth.

67,134.—COLLAR.—John H. Parmelee, Chicopee, Mass., assignor to himself and William Ball.

I claim as a new article of manufacture, a paper or cloth collar having one or more semi-circular, semi-elliptical, or rectangular slits or cuts in the band thereof, forming a tongue, made substantially as herein described and for the purposes specified.

67,135.—Gate.—Eli Pettevs, Chesterlown, N. Y.

1st, I claim the use of the bar, H, with its arm, J, with the segment, G, in combination with the rear bar of the gate and its pinion, as and for the purpose set forth.

2d, The cross bar, I, provided with its cords or rods, s s, in combination with the bar, H, as constructed and used, substantially as set forth.

3d, The shaft, t, provided with the oval collar and used in connection with the loops, a, as and for the purpose set forth.

4th, The arm, J, lever, K, spring, L, and latch, M, arranged and used substantially as and for the purpose set forth.

67,136.—Grate.—Nelson Pramer, Troy, N. Y. Antedated July 14, 1867.

1st, I claim the combination of a cylindrical or other shaped grate, A, with a stationary horizontal bar or support, D, in the manner and for the purposes substantially as hereinbefore fully described and set forth.

2d, The employment of the hook, C, in combination with the recess, E, by means of which the grate is operated in the manner and for the purposes substantially as hereinbefore described and set forth.

67,137.—Boat-detaching Tackle.—Thomas M. and Thomas J. Raser, Philadelphia, Pa.

1st, We claim, in combination with the two jaws of the hook pivoted together, as described, the spring, b, latch spring, c, with its catch, c', tongue, d, with its catch, e, and the groove, d', all constructed and operating substantially as described.

2d, In combination with a hook, constructed and operating as above described, I claim the pin, f, as and for the purpose described.

3d, In combination with a hook constructed and operating as described, I claim the check pin, i, and groove, j, as and for the purpose described.

4th, In combination with the tongue, d, and groove, d', I claim the guard plates, g, on each side of the tongue, arranged and operating as and for the purpose described.

67,138.—Winding and Setting Watches.—Henry Rothfelder, New York City.

1st, I claim the lever, B, lever catch, r, stud, s, and spring, m, in combination with the wheels, d e a and q, and with the button, k, all constructed and operating substantially as and for the purpose set forth.

2d, The cam-shaped shoulder, k, on the ring, j, in combination with the pin, l, and barrel, g, constructed and operating substantially as and for the purpose described.

67,139.—Brace for Bits.—W. F. Seavey, Portland, Me.

I claim the horizontal sliding slotted plate, C, when moving in the slot in the part, 2, of the bit brace and further secured by the screw, d, and having the three slots, 3 4 5, substantially as and for the purposes herein set forth and described.

67,140.—Combined Knob, Latch and Lock.—Balthasar Seegmüller, New York City.

I claim the hooked tumbler, f, pivoted on the bolt and provided with a knob passing through a slot in the lock case in combination with the saddle operated by the handle, substantially as and for the purposes set forth.

67,141.—Broadcast Seeder.—Jacob Slauder (assignor to himself and Levi C. Smith), Osborn, Ohio.

1st, I claim the reversible seed board, N, attached to the seed box as above shown when constructed and used substantially as and for the purpose described.

2d, The adjustable bottom, c c', of the seed box which may be elevated or depressed at pleasure, substantially as and for the purpose specified.

3d, The combination of the plow beams, K K, the plow standards, H H, the beam, G, and the lever, I, substantially as and for the purpose described.

4th, The arrangement of the alternate short standards, H', on the plow beams, K, and the long standards, H, affixed to the beam, G, substantially as and for the purpose specified.

67,142.—Coupling Reaches for Bob Sleighs.—Abraham L. Smith, Marengo, Mich.

I claim the arrangement and combination of the two metal reach bars, C and D, with each other and with a pair of bob sleds, when such bars are constructed and connected substantially in the manner and for the purposes herein set forth.

67,143.—Extension Gate.—C. S. Snead, Louisville, Ky.

I claim the peculiar construction of the gate, as herein described, to allow the expansion or contraction, the application of the intermediate washer, C, to prevent the rubbing of bars, the slots, D, to allow the extension and limit the same, and the foot roller, E, to prevent the sagging of the gate.

67,144.—Machine for Applying and Measuring Forces.—H. T. Stanard, Wayne, Mich.

1st, I claim the frame, F F F, in triple form, as described.

2d, I claim the combination of the double lever, C C, with the frame, F F F, as specified, to obtain a triple bearing for the fulcrum pin, thereby securing greater strength.

3d, I claim in combination the arms, N and R, index wheel, h, pointers, 3 and 4, scale, o o, chain or cord, 5 and 6, spring, 7, all combined and operating as specified.

67,145.—Mode of Preserving Dead Bodies.—Colin Cree St. Clair, Washington, D. C.

1st, I claim the preserving of dead bodies by encasing them in liquid cement compositions which harden by drying, substantially as and for the purpose described.

2d, The composition described composed of one part plaster of Paris with two parts of hydraulic cement, substantially as and for the purpose specified.

3d, The use of the glass plate, D, and the tube, E, in connection with the encasing of bodies in the composition or cement, substantially as and for the purpose described.

67,146.—Window Blind Fastening.—Theophilus Stover, Cambridgeport, Mass.

1st, I claim the construction of two latches, a a', upon the spring plate, B, for the purpose of being received and held by notched catches, substantially as described.

2d, The pin, E, constructed with a head, b', and shoulder or gage, b, upon it for the purpose of being used in combination with a latch spring, B, and suitable catching devices in the construction of a window fastening, as set forth.

3d, The back shoulder abutments upon the catches when the same are raised higher than the forward shoulders and prevent the latches passing too far back, as herein set forth.

4th, A reversible blind catch, D, which is adapted for being driven into vertical or horizontal joints between the brick of a wall, substantially as I have explained.

5th, The combination of lifting rod, g, and double catch or latch studs, a a', with a spring, B, which is applied to the bottom edge of a window and blind sustained by a pin, E, substantially as described.

67,147.—Cotton Press.—Edward Stuart, Shufordsville, Miss.

I claim the combination of the peculiar construction of cogs and eccentric wheel so as to prevent cogs from breaking with great pressure, as described in the specification.

67,148.—Potato Digger.—John M. Wilcox, Albany, N. Y.

I claim the revolving raking apparatus, t, and standing knives, v, in combination with the plow or scoop, f, and separator, w, substantially as and for the purposes set forth.

I also claim the reciprocating fingers, l, actuated in the manner specified, in combination with the separator, w, and plow, f, as set forth.

67,149.—Washing Machine.—Reuben B. Will, New Market, Va., assignor to Wesley H. Colton, Shenandoah County, Va.

1st, I claim the construction of a washing machine dasher of a drum, D, and studded arms, e e, arranged within a semicircular wash box having a concave bed of rollers, substantially as described.

2d, The centrally arranged rib, d, in combination with the removable covers, B, and the concave wash box having vibrating beating arms applied within it, substantially as described and for the purposes described.

67,150.—Melodeon.—Granville Wood, Detroit, Mich.

I claim the employment of an air chamber, C, over the reeds, F F, when the reeds are placed and arranged therein in such a manner that they do not receive the currents of air admitted by the swell direct, but changed in direction and equalized in force, substantially as and for the purposes herein specified.

67,151.—Rules for Calculating Time and Measures.—David W. Wright (assignor to Thos. L. Wright), New York City.

I claim the combination of the above described slide, s, having upon it initial day letters and otherwise marked and numbered, substantially as above specified, with stationary part of said scale constructed, marked, and divided substantially as above described.

67,152.—Cultivator and Seed Sower.—Henry Zurbrick, Elizabethtown, Ohio.

1st, I claim the hopper, H, hinged to the bed piece, I, the bed piece, I, hinged to the frame, J, and the frame, J, adjustably bolted or hinged to frame, A, as and for the purpose herein specified.

2d, The arrangement of the lever, L, and its connections with the frame, J, for the purpose of elevating its rear, and throwing the seeding apparatus out of gear, substantially as specified.

3d, The arrangement of the spanks, P, with the covering device attached to the same and with the adjustable frame, J, as and for the purpose specified.

67,153.—Baby Jumper and Cradle.—Robert Ashe, Somerville, Mass., assignor to himself and George W. Eldredge.

I claim the combination of the brace, A, the seat or cradle, B, and the rods, C, with their springs, a, when the latter are arranged and secured at such a distance apart as to prevent the seat or cradle from tipping to one side, substantially as set forth.

I also claim in combination with the above, making the springs, a, adjustable so that they can be advanced or withdrawn in order to increase or diminish their power of resistance, substantially as described for the purpose set forth.

I also claim making the front portion, 5, of the cradle removable so that the remaining portion may be used as a chair or seat, substantially as set forth.

67,154.—Construction of Fire-proof Safes.—H. H. Bryant, Boston, Mass.

1st, I claim the combination with the inner and outer walls or cases of a safe or other structure of a similar nature, of water, or liquid, vessels or tanks located between the said walls or case, under an arrangement substantially as herein described.

2d, The combination with the cases, a and d, of the removable water or liquid tanks or vessels, and flanges or supports by which the same are held in position in the space intervening between said cases, as and for the purposes described.

3d, In a safe or other similar structure as herein specified, I claim the construction and arrangement of one or more sides of the outer wall or case, so that the same may be readily removed without injury to the said structure, as and for the purpose shown and set forth.

REISSUES.

2,692.—Car Seat and Couch.—Horatio Allen, New York City. Patented June 12, 1866.

1st, I claim the combination with the floor and sides of a railroad passenger car of couches of a rhomboid form, placed diagonally to the length of the car, as herein described, and con tructed of two seat pieces, A A', two corner pieces, E E', and two central posts, F F', and supported by frames and legs; said couches being convertible into a pair of seats by putting out of the way the two corner pieces, E E', and securing in a vertical position the center pieces, F F', by the cap pieces, G, said pair of seats having a relative position diagonal to the length of the car, all substantially in the manner and for the purpose herein described.

2d, I claim the combination with the seat herein described, and uses of a railroad passenger car, of upper couches of rhomboidal form, placed diagonally to the length of the car as herein described, and constructed of a frame supported as herein described, all substantially in the manner and for the purpose herein described.

3d, I claim the diagonal combination and construction of the two seats in the pairs of passenger seats in railroad cars, substantially in the manner and for the purpose herein described.

2,693.—Harvesters.—Thomas Brett, Geneva, Ohio. Patented Nov. 17, 1863.

1st, I claim so arranging the seat of harvesters that it may have a lateral movement upon a suitable frame or ways, in combination with one or more springs acting in concert with said seat, for the purpose specified.

2d, The frame, A, attached to the harvester, in combination with the plate, B, and spring, D D, all arranged to operate in the manner substantially as and for the purpose herein set forth.

2,694.—Horse Rake.—Adam R. Reese, Phillipsburg, N. J., assignee of Nathan Matz. Patented Feb. 26, 1866.

1st, I claim the combination in a two-wheeled wire-tooth horse rake of a rock shaft to support the rake teeth, located between the wheels and within their periphery, with a foot lever and a hand lever to raise and lower the teeth, and a seat to support the driver while operating the levers.

2d, Supporting the upper ends of the wire teeth of a two-wheeled horse rake by an iron rock shaft or rod arranged parallel to the axle or nearly so, within the periphery of the wheels.

3d, In combination with a two-wheeled horse rake having a stationary axle, a support for the teeth located within the periphery of the wheels, a seat for the driver, and a hand lever and a foot lever by which to raise or lower the teeth.

4th, The combination with the rake teeth of two bars arranged within the periphery of the wheels and parallel to each other (one to sustain the teeth against backward strain, while the other keeps them the proper distance apart), a lever to raise or lower the teeth, and a driver's seat from which the lever is operated.

5th, In combination with a two-wheeled wire-tooth horse rake, the support for the teeth located within the periphery of the wheels, the lever to raise or lower the teeth, the seat for the driver from which the lever is operated, and the springs, S', arranged and operating substantially as described, to assist in holding the teeth to the ground.

6th, In combination with a two-wheeled wire-tooth horse rake, a driver's seat; a hand lever by which the driver while in his seat can raise or lower the teeth, and a rock shaft independent of the axle to support the teeth, each being located between the wheels and within their periphery.

7th, In combination with a two-wheeled wire-tooth horse rake, having the upper end of the teeth attached to a rock shaft located between the wheels and within their periphery, a driver's seat and foot lever to raise or lower the teeth.

2,695.—Saw.—E. M. Boynton, Grand Rapids, Mich., assignee of Alfred Boynton. Patented Nov. 27, 1866.

I claim a saw provided with the cutting teeth, A, and the clearing teeth, B, constructed and arranged substantially as described.

2,696.—Car Brake.—J. A. Goewey and D. S. Wood, Albany, N. Y., and Joseph Jones, West Albany, N. Y., assignees of Wm. D. Goodnow by mesne assignments. Patented Oct. 18, 1864.

1st, We claim connecting the brake cars, F F, to horizontal guide bars affixed to the truck, substantially as and for the purposes set forth.

2d, In combination with the horizontal guide bars, k k, the spiral springs, H, to repel the brakes from the face of the wheels, substantially as set forth.

3d, Also in combination with the plank or hang frame, E, of the car body, and the brake cars, F F, the guide and safety rods, k k, arranged and operating substantially as and for the purposes set forth.

4th, Also the combination of the brake bars: F F, levers, G G', connecting bar, N, springs, H H, and chains, m o, with the truck wheels, B B, arranged and operating substantially in the manner and for the purposes shown and described.

2,697.—Fagot for Railway Rail.—Wm. Lewis, John Price, and Francis Naylor, Danville, Pa. Patented July 19, 1864.

1st, We claim the corrugated steel slabs or form pieces, A A', for fagots for railroad rails.

2d, We also claim forming the piles for the manufacture of steel-faced rails by the combination of iron bars with facing slabs of cast steel provided with intermediate projections on their inner surfaces, for the purpose of facilitating the welding of the steel to the iron, substantially as set forth.

2,698.—Fireplace.—John B. Ryan, Cincinnati, O., assignee of Calvin Dodge. Patented March 18, 1856.

1st, I claim the use of a deep recess or fire chamber placed back of the fire basket of the grate and out of the reach of the draft, in combination with the horizontal covering over the recess and fire basket of the grate and out of the reach of the draft, in combination with the horizontal covering over the recess and fire basket, extending down below the mouth of the chimney, constructed and arranged substantially as heretofore described, for the purpose of consuming the smoke and causing the ignition of the gas (which would otherwise be lost) and thus increasing the amount of heat thrown into the room, and by the slow combustion of the fire effecting a great saving of fuel.

2d, The arrangement in a fireplace, above the grate, of a reverberating covering, F, extending forward from the rear wall of the fire chamber to a point below the breast of the chimney, and employed to retard the products of combustion and direct the heat into the room, substantially as described.

2,699.—Fireplace Heater.—H. H. Welch, Athens, Ohio. Patented Aug. 8, 1865.

I claim as a new article of manufacture the fireplace heater, A, constructed as herein described, that is to say, with the projections or corrugations, D E, and pipes, B C, for the purpose explained.

2,700.—Meat Chopper.—Metropolitan Washing Machine Company, Middlefield, Ct., assignees by mesne assignments of C. A. Foster. Patented June 5, 1866.

1st, I claim the combination in a meat chopping machine with a vibratory cutter or cutters having a descending and transverse stroke, of a tub and mechanism for rotating the same intermittently, i. e., during the intervals between the strokes or while the cutter or cutters are lifted off the bottom of the tub.

2d, Forming the frame in two parts, one stationary, the other movable, the two being connected together by a horizontal hinge joint, or its mechanical equivalent.

3d, In a meat chopper frame composed of two parts united by a hinge joint as described, the combination with the movable part thereof of the vibratory cutters and such appurtenances of the machine as overhang, or are held within the tub, so that the said cutters and appurtenances may be bodily lifted out of the tub, as and for the purposes described.

4th, The combination with the stationary and movable frames of the locking device.

DESIGNS.

2,709.—Mirror Frame.—Russell Frisbie (assignor to E. Stevens & Co.), Cromwell, Ct.

2,710.—Caster Covering.—W. J. Howard, Petersburgh, Ky.

2,711.—Plates of a Stove.—Wm. L. McDowell, Philadelphia, Pa.

2,712.—Oil Can.—Charles Pratt, New York City.

PATENT OFFICE DECISION—METHOD OF NUMBERING COUPONS, ETC.

Elisha Foote for the Board.

The numbers of the coupons attached to goverment bonds have heretofore been printed on some part of the face of the coupons, and when such coupons have been stolen it was easy to change the number by adding a figure or perhaps by taking off one from some part that did not disfigure the engraving. The improvement consists in putting not only the numbers on the face but also upon the back of the instrument, and making the figures comprising the latter of such size as to cover the whole engraving on the back. By this device no figure can be added, for there is no room for it; no one can be abstracted for it would leave a vacant space; and none can be changed without defacing the engraving beneath it; and it is believed that a means of preventing a source of extensive frauds upon the public has thus been provided.

In engraving for bank bills such size and form have heretofore been given to the figures denoting the denomination that they could not be changed without destroying the bill, and in some cases the figures have been made to extend over the whole face of the bill, and the Examiner has regarded these as being in effect the same device and as anticipating the applicant's invention.

The figures in the bill were a portion of the engraving and constituted a part of the design of the artist. And when the plate had been made thousands of bills of the same form could be printed from it. It was a somewat different problem to make numbers that could not be counterfeited when they were to be stamped on an engraving already made, and each one upon the immense numbers of different coupons, was to be different.

It is said that the engraved figures having been made to cover the whole bill, there was little or no invention in making stamped figures do the same. This objection has great force, and seemed to the Examiner to be insurmountable. But on the other hand the new device is one of great practical utility and public importance. It was not so manifest as to occur to any one else before the applicant conceived it, and immense quantities of these coupons have been numbered in other ways and the public sustained gaeat losses in consequence. These considerations we think should determine the case in favor of the applicant. It often happens that inventions of great practical utility are made which being once produced seem to be entirely obvious; and we have sometimes to regard the results produced rather than the means that produced them, in judging of the sufficiency of an invention. While we are opposed, as strongly as any one, to patents for trifling and unimportant devices, at the same time, whenever a real improvement is seen, we believe that we act in accordance with the intent of patent laws and the spirit of judicial decisions in giving to it a favorable consideration.

The Examiner's decision is reversed.

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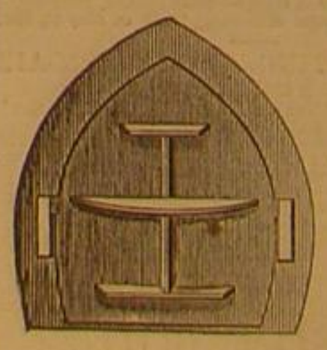
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Vol. XVII.--No. 10. [NEW SERIES.] NEW YORK, SEPTEMBER 7, 1867. $3 per Annum. [IN ADVANCE.]

Improvement in Brick Making Machines.

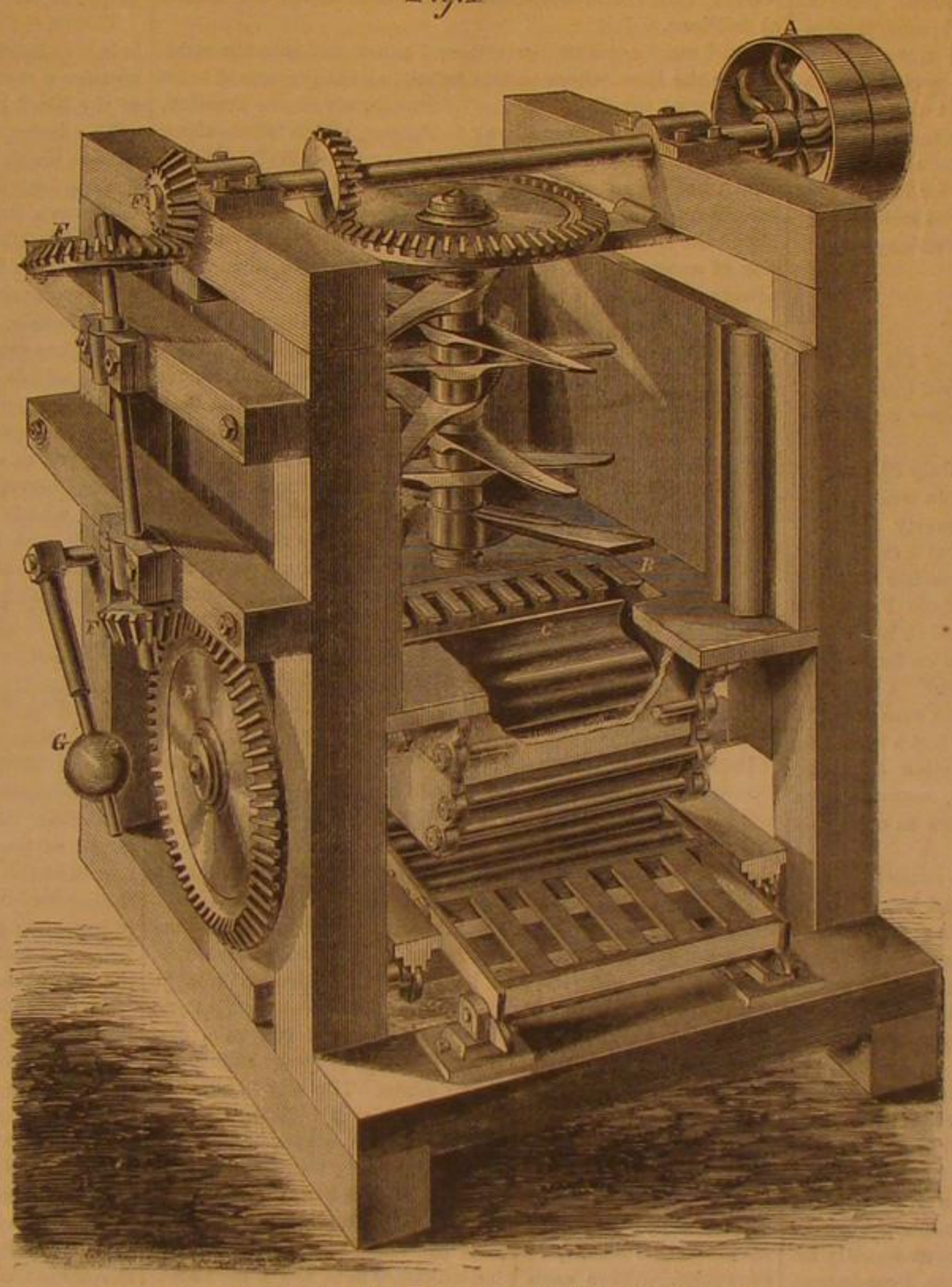
This machine was patented through the Scientific American Patent Agency, July 2d, 1867, by A. J. Sprague, of Toledo, Ohio, assignor to himself and Paul Jones, of the same place. It has some important peculiarities of its own in its construction and working. Fig. 1 is a perspective view, with the front of the mud mill and press box removed to show the rotating, grinding arms, and the pressing appendage; and Fig. 2 is a vertical section of the parts below the mud mill.

As will be seen from Fig. 1, the arms of the mud mill are rotated from the power applied to the shaft at A, through the medium of bevel gears. These arms are inclined upward to lift and present repeatedly the clay to their action, while the lower series act as scrapers to force the prepared clay into the mold box. This mold box is guarded against the introduction of stones, roots, or any extraneous substances by means of a grate, B, directly over it. Inside the mold box is a curved presser, C, which in its rotation takes the clay from the grate, B, and forces it into the molds placed under the box. The molds are introduced at D, Fig. 2, behind the mold box and in front of the follower, E, same figure, which is actuated from the prime mover by means of the bevel gears and pinions, F, Fig. 1, which give the forward movement of the mold boxes, by means of a simple mechanical contrivance of a pin and a bearing, and the backward movement is controlled by a weight, G, or some similar device. The frame on which the molds travel is furnished with rollers directly under the mold box, in Fig. 1, and is held up to place, as in Fig. 2, by the cams, H, on a shaft. In Fig. 1 these are seen turned down to give room for reaching any of the parts under the mold box. The action of the mold platform is reciprocatory with that of the compressor, C, so that as soon as the compressor has passed over the width of the mold the bricks in the mold are thrown out at the front, to be taken away, and the frame and compressor are ready to fill another set of molds.

This machine runs regularly at the rate of 43,000 bricks per day of eight hours. The compressor delivers the bricks in a very condensed state, smooth and hard. The clay is thrown into the mud mill just as it comes from the bank, and moistened with water as it passes through. The result is a superior quality of bricks insured by the enormous pressure of the compressor.

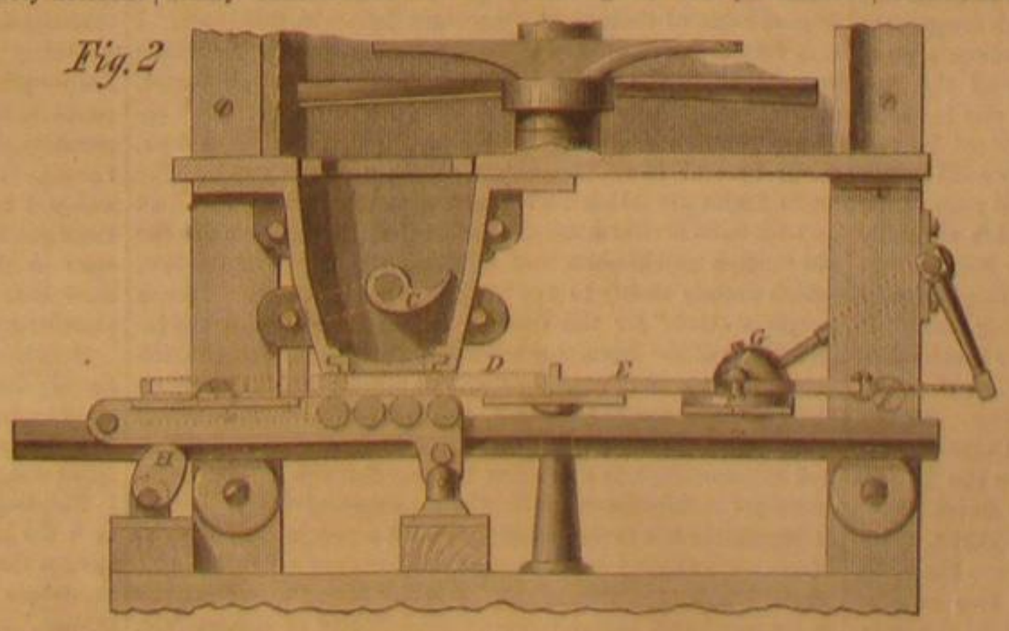
Further information relative to the machine may be obtained by addressing as above, A. J. Sprague & Co., Toledo, Ohio.

Fig. 1



SPRAGUE'S IMPROVED BRICK MACHINE.

Fig. 2



The Poison of the Cobra-di-capella.

The *Melbourne Argus*, for April 26th, contains an interesting article, by Dr. G. B. Halford, on the above subject, from which we extract the following:—"The melancholy accident which so lately happened with the cobra-di-capella induced me to make some experiments and observations upon the action of the reptile's poison. When a person is mortally bitten by the cobra-di-capella, molecules of living 'germinal' matter are thrown into the blood, and speedily grow into cells, and as rapidly multiply; so that, in a few hours, millions upon millions are produced at the expense, as far as I can at present see, of the oxygen absorbed into the blood during inspiration; hence the gradual decrease and ultimate extinction of combustion and chemical change in every other part of the body, followed by coldness, sleepiness, insensibility, slow breathing, and death. The cells which thus render in so short a time the blood unfit to support life are circular, with a diameter on the average of one seventeen-hundredth of an inch. They contain a nearly round nucleus of one two thousand-eight-hundredth of an inch in breadth, which, when further magnified, is seen to contain other still more minute spherules of living 'germinal' matter. In addition to this, the application of magenta reveals a minute colored spot at some part of the circumference of the cell. This, beside, its size, distinguishes it from the white pus or lymph corpuscle. Thus, then, it would seem that, as the vegetable cell requires for its growth inorganic food and the liberation of oxygen, so the animal cell requires for its growth organic food and absorption of oxygen. Its food is present in the blood, and it meets the oxygen in the lungs; thus, the whole blood becomes disorganized, and nothing is found after death but dark fluid blood, the fluidity indicating its loss of fibrine, the dark color its want of oxygen, which it readily absorbs on exposure after death. It results, then, that a person dies slowly asphyxiated by deprivation of oxygen, in whatever other way the poison may also act, and so far as the ordinary examination of the blood goes, the *post-mortem* appearances are similar to those seen after drowning and suffocation. I have many reasons for believing that the *materies morbi* of cholera is a nearly allied animal poison. I hope also to show the presence of the poison of our snakes in the blood of bitten and inoculated animals, and to make some experiments on the possibility of saving life.

The Opal.

This mineral is known by a number of names, as hyalite, hydrophane, cachalong, girasol or fire opal, wood opal, precious opal, etc. The precious opal is the variety most generally known as applicable to jewelry purposes. It was known to the ancients and derives its name from a Greek word signifying the eye. It occurs in porphyry, sometimes associated with galena and blende, and again in vesicular cavities in amagdaloidal rocks. Dr. Feuchtwanger, in his "Treatise on Gems," says it is found in Hungary, particularly in the neighborhood of the village of Czerwinceza; also in the Faroe Islands, Saxony, and South America. The Hungarian opal is found of various qualities, and is obtained from mines which have been wrought for several centuries, and, according to the archives of that part of the country, there were, in the year 1400, more than three hundred workmen engaged at the mines near the above vilage; whereas there are but thirty at present engaged there, on account of the scarcity of large suitable specimens.

The precious opal is principally used for rings, ear-rings, necklaces, and diadems; the smaller specimens for mounting snuff-boxes, rings, chains, etc. It is ground on a leaden wheel with emery, and is polished with rottenstone and water on a wooden wheel; and, in order to increase its luster, it is lastly rubbed with putty, by means of buckskin, or a woolen rag and red chalk. Its form is generally that of a semicircle, lens, or oval; sometimes of a table, and then also with some facets: but great care has to be taken that the edges, on account of the softness of the stone, do not wear off. It is also apt to spring in a temperature suddenly changing. When mounted, it receives a colored foil, or a variegated silk stuff, or a peacock-feather on the back, but it looks best in a black casing.

Cracks and fissures may be removed by leaving the precious opal for some time in oil. Very frequently the precious opal is distributed in small particles in the matrix, called mother of opal, which is cut by the jewellers as boxes, and other ornaments; and very often, too, this matrix is plunged into oil, and exposed to a moderate heat, whereby the base grows blacker, and the true precious opal retains it ray of colors. In order to preserve the surface of the precious opal against wear and tear, it is covered with a thin plate of quartz crystal. The pecious opal still stands in very high estimation, and is considered one of the most valuable gems. The size and the beauty displayed by its colors determine its value; and those playing in the red and green colors bear the highest price. Its value has latterly increased on account of the scarcity of the larger specimens. Formerly, a solitary large precious opal, playing in the red color, was sold for two to three hundred ducats; and one playing in both red and green colors, about five lines long, was sold at Paris for two thousand four hundred francs; and lately a single opal, of fine colors, and the size of a dollar, was sold near the locality for three hundred thousand florins; in this country precious opals are sold by the importers at the rate of four to ten dollars per carat, and single specimens, suitable for pins or rings, from two to twenty dollars. The mother of opal is, however, much cheaper; one of five lines size is sold for three to five dollars.

All experiments for imitating the precious opal have hitherto proved fruitless; they were made either by preparing an enamel and adding several metallic oxides, or by affixing to the back of a clear or common opal or enamel, a polished thin plate of the mother of pearl, which may sometimes deceive the ignorant.

The most magnificent Hungarian opal in the London Exhibition, called "the mountain of light"—a very appropriate name—weighed 526¼ carats, and was estimated at 4000 pounds sterling.

From Honduras, at Gracias á Dios, large quantities of opals have been imported into this city for the last ten years, at first by the late Mr. De la Raye, and latterly by Mr. Aaron C. Burr; and many large and beautifully cut specimens are in

the possession of Mr. B. Palmer, of this city; they are by no means inferior to the Hungarian opal. A very large opal, cut and polished by himself, which he values at four thousand dollars, is one and three quarters inches long by one and a quarter inches wide; another, one and a quarter inches long by one inch wide, he prizes at seven hundred and fifty dollars; and a third, one and one eighth inches long by one inch wide, he values at four hundred and fifty dollars.

The ancients held the opal in great estimation, and the anecdote of the Roman senator, Nonius, is well known—that he preferred exile to parting with a magnificent opal which Marc Antony coveted.

In the French crown-jewels are two very large and beautiful opals. One is set in the center of the Order of the Golden Fleece, and the other forms the clasp of the imperial cloak. They were purchased for 75,000 francs. The Empress Josephine possessed the unique opal which was called "The Great Fire of Troy," on account of the great fire sparkles.

The Vienna Cabinet possesses a very large opal, but unfortunately it is cracked. Count Walewski, who is a great amateur of gems, possesses a very beautiful opal, which is oval, the size of a franc-piece, and is said to be extraordinarily brilliant.

The Imperial Mineralogical Cabinet at Vienna, contains the most celebrated specimens of precious opal; one, particularly, may be mentioned here: it is four and three quarter inches long, two and a half inches thick, and weighs seventeen ounces. It was discovered about 1770, at the above locality, and transported to Vienna. It displays the most magnificent colors; is perfectly pure, and not accompanied by any matrix. Half a million of florins were offered for it by a jeweller of Amsterdam, and refused on account of its uniqueness; and the Viennese have not yet dared to put even any approximate value upon it.

EDITORIAL CORRESPONDENCE.

From Berlin to Vienna—Military Oppression of the People—Saxon Switzerland—City of Prague—Its Ancient Curiosities—Agriculture in Austria—A Barbarian Emperor away from Home.

VIENNA, July 31, 1867.

My last letter left me in the streets of Berlin wrapped up in winter clothing, and exercising myself pretty freely to keep warm. I have since changed latitude, but I cannot yet say that I have experienced hot summer weather with the exception of a single day on the railway trip from Prague to Vienna. The air was laden with that oppressive heat that always precedes a thunder storm, and one came on during the night and has left the atmosphere cool and clear. I had previously heard that Vienna was a hot place, and sure enough, on the day of my arrival I thought that at last a spot had been reached where more direct communication could be held with the sun. The temperature here, however, does not vibrate so far in either direction as it does in our country.

I must not neglect to say something of the country and of the people that dwell between the upper and nether mill stone of Germanic power and influence. The feet of the avenging gods have trodden out the independence of Bohemia, and for three hundred years her people have been under Austrian rule. Brave little Saxony, sitting like a diamond in a net-work of States, has not yet exactly been crushed under the feet of the gods; but, as I mentioned in my last, the king holds nominal sovereignty; a sort of civil government over a country and people as interesting as any other in Europe; and unless new wars and fresh hecatombs of human beings are required to satisfy the ambitious lusts of kings, upon the death of King John Nepomucéne, who is now sixty-seven years old, Saxony will pass under the dominion of Prussia. If Europe could be carved up and divided about equally between the four great powers of Russia, France, Prussia, and Austria—each strong enough to take care of itself—and if these great powers would, even now, agree to reduce their standing armies in proportion to the numbers of male inhabitants in each, the world might be reasonably assured against frequent wars, and great burdens would be lifted from the backs of these poor, oppressed people. But I suppose, as of old, "Millions must die that Cæsar might be great."

Dresden, the Court city of Saxony, is in some respects one of the most delightful places in Europe, and much frequented by English and Americans who can enjoy the advantages of good society, excellent educational privileges, and the fine arts, which are fostered with much care. The city is cut in twain by the river Elbe, and the sections are united by two very fine stone bridges. The old bridge is a very solid structure, and has stood long and manfully against the rush of waters and the shock of floating masses of ice which annually storm its strong piers and abutments. This bridge was piously built with money raised by the sale of dispensations from the Pope for eating butter and eggs during Lent. It seems to have been built according to Scripture instruction, otherwise it would have been carried away, as, when the snow melts, the water often rises sixteen feet in one day. Saxony is now strongly Protestant, though the Court is Catholic. The new railway and carriage bridge which connects the Leipzic with the line that runs to Prague, is one of the finest pieces of bridge engineering in Europe, and cost $750,000. It is 1,420 feet long, 54 feet wide, and rises 40 feet above the river. It has twelve arches of 100 feet span, besides two smaller ones. When both these bridges are lighted up in the evening, it would require the skill of a Gerard Dow to paint a picture that could do justice to the effect produced by the light thrown upon the rapid waters of the Elbe and the little steam crafts that go flitting up and down like so many fairies. I was fortunate enough to have a room at the Hotel Bellevue, where I could take in the whole scene, and it impressed me at the time as one of the finest effects that I had ever beheld. Dresden is famous, however, in the eyes of travellers, not for its fine bridges or beautiful environs, but chiefly for its Picture Gallery, which contains the finest collection of pictures in Germany. This preëminence it owes to Augustus III. who was a prodigious patron of the arts, and lavished vast sums of money to acquire some of the most exalted works of the old masters. This collection contains Raphael's famous "Madonna Di San Sisto," which is a miracle of majestic art and beauty combined. When Frederick the Great bombarded the city of Dresden, he ordered the cannoniers to train their guns so as not to injure this noble gallery of art, and though he entered the city as a conqueror, such was his respect for the gems which it contained, that he asked permission of the Electress to visit the gallery as a stranger; and even Napoleon, who was notorious for his robberies of the gems of captured cities to enrich the treasures of Paris, respected these Dresden pictures. The palace of the King is an old, weather-beaten building, wholly devoid of architectural symmetry, and is so shut in by surrounding buildings that one is sadly puzzled to make head or tail of it. Inside there are rich treasures, which amply compensate for its ugly exterior. The "Grüne Gewolbe," or "Green Vaults" are stored with crown jewels, regalia, and other rare objects of art and *virtu*, valued at millions.

But I must not dwell in cities; I must get into the country, up the Elbe, where nature seems to have performed some of her most wonderful freaks. Immediately above Dresden, and on the line of the railway to Prague, which winds along the river, commences what is called the "Saxon Switzerland," which has been the scene of many fierce struggles. Immense masses of columnar sand-stone rock, rising precipitously above the river, have been worn and hollowed out by the action of water until they resemble ruined palaces, dismantled towers, triumphal arches, and broken fortresses. Intervening are fissures and deep caverns into which the rays of the sun never penetrate. Upon the crest of one of these mountains which rises a thousand feet above the stream, stands the fortress of Königstein, from the top of which the view takes in a landscape of peculiar wildness and sublimity, extending in every direction as far as the eye can reach.

At Bodenback we reach the frontiers of Bohemia, and here in the politest manner possible, the Austrian custom officers search baggage. Here, as elsewhere, tobacco is the bug-bear. If the traveler has no tobacco he can pass unmolested; and as elsewhere through France and Germany, no passport is required. What a blessed thing it is for Kings and Emperors that everybody is adicted to the use of the "vile weed." It is made the prolific source of revenue; and but for it I am not sure that kingdoms and dynasties would tumble into financial collapse.

It takes about nine or ten hours, slow travel, to go from Dresden to Prague, but the whole distance amply satisfies and interests the traveler. The villages that skirt the river are usually squalid looking places, consisting of small, one-story huts, with an occasional chateau or convent, which always seem larger by reason of their surroundings. A large building, no matter how mean it may appear, is always considered a splendid building. Prague, the Capital of Bohemia, is really a fine old city, and but for the presence of a large garrison of Austrian troops, who hang about every street and corner, it would be a delightful place in which to reside. But the presence of so many troops does not improve either the comforts or the morality of the place. The city is not only very ancient, but it abounds in magnificent buildings, and is no less rich in historic recollections. Like Dresden, it is divided by a small river called the Moldau: but, unlike Dresden, Prague is built upon the hills, which lends to the city a very pleasing appearance. The old stone bridge that connects the divided city is one of the most curious that I have ever seen. Above each pier, on either side, are placed some colossal, and some life-like statues and groups of the Saviour, Apostles, Prophets, Priests, and Kings, and on one of the stone caps there is fixed a bronze railing, which, I understood, was put there to mark the spot where, by order of one of the Kings, an offending bishop was thrown over into the river. This tragical act of Kingly tyranny is carefully recorded in an old picture which hangs in the ancient cathedral. John Huss and Jerome of Prague, two of the great reformers performed some of their more important labors in this place. I was very much interested in an old Jewish Synagogue which was erected in the year A. D. 583. The gothic roof, however, is *new*, having been put on in the 14th Century. The entrance to this old mosaic temple is through a narrow door, down several stone steps—not unlike a burial vault. The walls inside are black and grimy with the accumulated dust and cobwebs of centuries. Here, also, within the ark are the old written parchments, and in front the tables of the law, which mutely testify to the patient waiting of the "Chosen people of God," for the coming of the Messiah and the ingathering of the Jews. Around about the temple are gathered this strange race of unbelievers. The streets leading through their quarters are very narrow, and reek with filth and foul odors. How human beings can live in such an atmosphere and surroundings, is a mystery to me. But the baleful influences are vividly traced upon their forms and faces. Yet it is impossible not to feel deeply for such a people. Across the Moldau are thrown two very fine modern suspension bridges, one of which is just finishing. Not far from Prague, a little to the northeast, is the famous battle-ground of Koniggratz, where the proud Hapsburgs of Austria were defeated, one year ago, by the Goths and Vandals of Prussia.

The run from Prague to Vienna is made in nine hours, by express, eighteen hours by slow train; but the whole distance is comparatively tame, except near Brunn, where there are several tunnels and some fine railway engineering. The plains of Austria, about Vienna, resemble our small western prairies. As far as the eye can reach the land appears to be a continuous field of wheat and Indian corn; it being the only country I have yet seen where corn is cultivated as a staple crop. The cultivation, however, of all the lands is done in strips or patches, which forms one of the most singular features of European landscapes. The subdivision of farm lands has been going on for so many generations that now the hard working peasant may possess a small farm twenty rods wide and a half a mile long. Here, as in many other parts of Europe—only, as it seems to me, a little more so—the women do nearly all the labor of the field. I have counted thirty engaged at one time in reaping down a field of wheat. I have seen no agricultural machinery at work except a rude kind of two-wheeled plow, which is no more than the Egyptians did three thousand years ago. The old-fashioned grain cradle is sometimes used, but the sickle, in the hands of women, like the days of Moab and Ruth—though I suppose Moab worked—seems yet to stand its ground against all the ingenuity of McCormick, Hussey, Wood, and others. However, labor is so cheap here and farms, as a general thing are so small, that it would scarcely pay to employ expensive machinery, such as is necessary to the proper cultivation of the large farms in our country.

Vienna is the most beautiful European city out of Paris. It is bisected by the Danube, and through this water communication a considerable trade is carried on with the commerce of the Black Sea.

The Great Barbarian of Turkey, together with the Crown Prince, his nephew, are now here on a visit to the Emperor Francis Joseph. In consequence of the death of Maximilian, who was a brother of this Emperor, no public reception was accorded to the Sultan, but a splendid review of artillery took place, which I was fortunate enough to witness, where I had a chance to see a Christian and a Barbarian Emperor or Sultan ride side by side. This tour of Abdul Aziz is the first which has ever been made by a Turkish Sultan beyond the limits of his own dominions. The religion of Mahomet, it seems, does not permit the Sultan to cross his own frontier into a foreign territory, on pain of losing his crown and his head, and in case of so doing, he must not return. Permission of leave, however, was accorded to him by the Grand Mufti, who is the spiritual head, or Pope, of the Empire, a King above Kings, who commands and it is done. It is to be hoped that some new and improved ideas may get into the Sultan's mind as the result of his northern tour.

S. H. W.

For the Scientific American.

THE FIFTEEN-INCH BALL VS. THE ENGLISH PRESS.

The old saying that the wish is often father to the thought seems be pretty well demonstrated by the tone of many of the English mechanical and popular journals, in their discussions on the late trial of the 15 inch gun against the 8 inch *Warrior* target at Shoeyburyness. Waiving, as it seems, the real merits of the case, which alone should be regarded in a dry mechanical subject of this nature, our English cotemporaries indulge in a good deal of swagger; they bluster as though Brittania had just passed through a serious danger and had escaped without loss of prestige.

The method adopted by some of these journals, of interlarding their ridicule of the American smooth bore system with a sort of scientific jargon made up by mixing a few technical terms with a senseless discussion about "racking," "punching" and "local effect," is well illustrated by the following extracts from the *Pall Mall Gazette*, London, Aug. 1:

"The confusion of thought which is implied in the argument that because the gun succeeded in making holes of so many inches deep on the target, therefore, the American ordnance is more powerful than we have supposed it to be, is so desperate that we scarcely know how to break it down, except by facing it with a point blank statement that the *deeper* the American gun penetrated the *worse* for the Americans and the better for ourselves."

And then comes the following rendering of this dynamic Sanscrit:

"It is no argument against our position to urge that we measure the efficiency of our own system of artillery wholly by the amount of penetrative effect which we derive from it—that the deeper our shot and shell go, and the thicker the targets they pass through, the louder do we crow and the better are we pleased. This argument, we say, does not touch our position, for the simple reason that the American system of gunnery is not our system, but is based upon an opposite theory. The Americans, we are always told, attempt to *rack* and *not to penetrate.(?)*, and whatever claims to consideration their guns may possess have always been urged with reference to their power as *racking* not as *punching* engines (?). Now it cannot be too generally understood that racking and punching are not only distinct but antagonistic effects.

Punching means intense local effect; racking means a largely distributed and non-local effect. It is almost impossible to have a *local* and a *non-local* effect at the same time, for very much the same reason that we *cannot at one blow knock a man down and not knock him down.*

The deeper we penetrate the less we rack, and the more we rack the less we penetrate. Therefore to say of the racking system that it penetrates deeply is simply to say that it fails in inverse proportion to its penetrative effects as a racking system."

The engineer of the *Pall Mall* next observes that he is met at this point by two arguments; these arguments (?) really seem to be the offspring of some morbid dynamic action of his overtasked brain. Here are the arguments. "First, that even granting the American gun failed to produce any racking effect, it at least penetrated deeply, and that as practically

it matters little to a ship how it is destroyed, therefore as a gun produces so much destructive effect, it matters little of what nature that effect may be. Second, that the American guns were never designed to rack exclusively, but to produce a tremendous combined destructive effect."

These buckram "arguments" are then sumarily disposed of thus; with respect to the first, "we have to observe, that whatever penetration may be accomplished under the heavy shot and *low velocity* (?) or American system, very much greater penetration can be obtained by the light shot and *high velocity* (?) or English system." This is shown to be "evident" because "just as a pistol bullet will pass through a plank balanced on its edge, while a slowly applied force of whatever amount will merely topple the plank over."

This scientific writer, next seizing the bull by the horns, describes an imaginary system of ordnance which he boldly dubs the "American system," and then proceeds to knock down the wooden knight thus set up by bowling at him such crushing balls as this "A heavy shot and low velocity compose in short the very worst system which could possibly be applied to obtain penetration, and if the Americans merely desire such an effect, we can only say that they have set about its accomplishment with a singular want of intelligence and scientific knowledge. (!) *The truth is, however, that they desired no such effect, nor aimed at obtaining it.* (!)"

And finally the conclusion of this remarkable discussion is that "the present American system of big smooth bore guns is purely a make-shift and a temporary system" because no doubt as this Bunsby on ordnance observes, "they absorb so much power in producing a partial penetrative effect that the remaining *balance of power* is insufficient to strain and seriously damage the structure."

The more absurd portions of these extracts are italicized and it is improbable that in all the writing in foreign journals on American ideas or systems, that more ignorance of fact has been exhibited or more eroneous conclusions formed than in this article, published as it is in one of the most intelligent journals in Europe and the one, *par excellence*, which pretends to be the best informed on American affairs.

It will be observed that the assumed *low* velocities of the big smooth bore's shot and the assumed *high* velocity of the gimlet projectile from the English 9 inch rifle, together with the idea which he gratuitously and untruthfully tacks on to the American system, that it was designed for "racking effect" and not for "penetration," is the foundation on which the *Pall Mall* and other English writers have constructed their card board house on American ordnance.

Let us glance at the subject of the comparitive *velocities* and *vis-viva* of the shot of the rival guns, and then at the "racking" business. It will then be seen how woefully ignorant the English writers are, on a subject which occupies so much of their time and has demanded so much investigation.

After the three rounds with the 15 inch gun, mentioned in the last issue of the SCIENTIFIC AMERICAN, had been fired against the target, the 9 inch Woolwich rifle—the crack gun of the British navy—was pointed towards it. The following was the result: weight of shot 250 lbs—velocity 1,337 feet per second—charge 43 lbs of English powder. Energy of the 250 lb shot, moving at 1337 ft. per sec. is equal to a force of only 6,930,500 pounds acting through a space of one foot or only 161,197 foot pounds for each pound of powder. Referring to the previous trials with the 15 inch gun, (and, in order that the comparison may be more exact, selecting a round when the same English powder was used) it is seen that with a shot weighing over 450 lbs. a velocity of 1,214 feet per second was obtained with but 50 lbs of the same powder as was used in the rifle. Hence we have a resulting dynamic effect equivalent to over 10,328,400 pounds acting through a space of one foot against an energy of but 6,930,500 pounds acting through the same space developed by the English rifle and while we find a pound of powder in the 9 inch rifle was exerting but 161,197 foot pounds, a similar quantity in the 15 inch was developing more than 206,570 foot pounds. In order still further to illustrate the superiority in power of the 15 inch smooth bore over its rival, the 9-inch rifle, it will be only necessary to state, that with its service charge of 60 lbs American powder, such as is directed by the ordnance circular to be used, it imparts a force of no less than 13,500,000 of foot pounds to its projectile, against 10,328,400 the maximum developed by the same gun on the English trial ground. It is of course very clear that if 3,172,000 foot pounds more energy had been imparted to any of the 15 inch balls on the late trial, they would have riddled and smashed or "racked" if the *Pall Mall* prefers, this formidable target. Even Shoeburyness jockeying could not prevent this result.

Lastly, respecting the gibberish of the *Pall Mall* machinist concerning "racking" and "racking system" and that the Americans "desired no such effect" as penetration, it will be well to observe, both for his own and the information of the rest of the British journalists who have industriously circulated this foolish opinion, that such a stupid idea as that of defeating an iron clad by "racking" her, is one which has never been entertained by either branch of the American service. The word "racking," while it is scarcely, if ever, heard among artillerists on this side of the water, seems to have been seized upon by the English engineers and industriously used to conceal their ignorance of the principles of the large smooth bore system of ordnance. N.

Steam Gong

In reply to several correspondents asking where the steam gong can be obtained, we would say that the article is made by the Steam Boiler Feeder Company, of Worcester, Mass. It produces two tones, not harsh like the whistle, but musical and pleasing. It has been heard thirty miles, and can be applied to any common boiler, and only a small quantity of steam is required to sound it. Abraham Fitts is the inventor of this gong. It was patented more than two years ago through the Scientific American Patent Agency, and has been frequently noticed or advertised in our columns.

Correspondence.

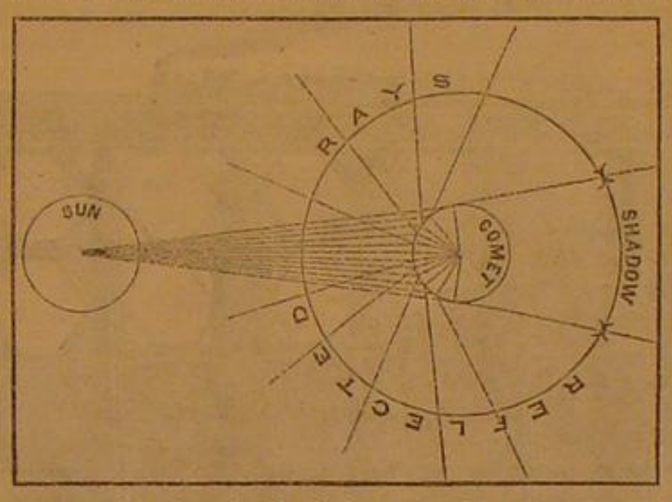
The Editors are not responsible for the opinions expressed by their correspondents.

Are the Tails of Comets Reflected or Refracted Light?

MESSRS. EDITORS:—In Vol. XVII., No. 8, page 82, of the SCIENTIFIC AMERICAN, Dr. G. M. Ramsay contributed a very interesting article about the nature of the tails of comets. He supposes that they are nothing else but rays of light reflected from the comet.

The theory that the tails are rays of light, might prove to be correct, but the question arises, is it reflected or refracted light? We intend to show with the diagram, that it cannot be reflected but must be refracted light. We suppose the comet to be spherical; the reflerted rays are drawn according to the law of reflection, and consequently are reflected fan-shaped toward the sun, leaving a vacant space in the rear of the comet, marked in diagram, "Shadow."

Now as it is a general rule, that the tail of a comet is always in opposition to the sun, whether the comet is approach-



ing or receding from it; the light cannot be reflected, or else the tail would spread out towards the sun. Furthermore, if we suppose that the rays are reflected, we must also admit that the body of a comet consists of a solid and ponderable substance, capable of reflecting light Now as we know that the tail of a comet is always in opposition to the sun, and as it is generally supposed that the comets consist of an imponderable, gaseous, or vaporous substance, not capable of reflecting light, we believe that the tails of comets are, as Dr. Ramsay has so nicely explained, rays of light; however not reflected, but refracted, rays. If this proves true, then the comets, unlike the planets of the solar system, are gaseous or vaporous bodies, moving as immense lenses through the solar system, refracting the rays of the sun to the rear (filling the space marked "Shadow" in diagram with refracted light), and so forming the once so much feared tail.

AUGUST WILHELM.

Philadelphia, Pa.

Tin in Missouri.

MESSRS. EDITORS:—The tin-ore district of Missouri is at present confined to the six townships in Madison County, numbered 3. 2, 5, 6, and 7 east 5th P. M., and 33, 5, 6, and 7, east 5th P. M. There are indications in other towns and counties not yet much examined.

The ore is found in beds and veins of greater or less extent, the largest being in towns 33, 5, and 6. The ore is found in the form of oxide and sulphuret, associated with tungsten and its ores, copper, iron, soapstone, kaolin, asbestos, and serpentine. The largest veins have a bearing east of north and south of west, with cross veins at various angles and dykes at nearly right angles. The ores are so abundant and so easy of access, in a heavily timbered region, well supplied with water power afforded by the St. Francis river and its tributaries, that it is a very inviting field for the man of energy and the capitalist. The country is healthy, mountainous, with rich valleys, railroads built and building, and near the Mississippi. The Iron Mountain Railroad is within a few miles and about to be extended, which will afford communication with the cities north, south, and east. The great amount of mineral of various kinds and the extensive pineries and forests of red cedar and other valuable timber are great inducements to emigration. The most extensive deposits of tin ore and other minerals are on government lands subject to entry at $1.25 per acre, at the office in Ironton, Mo., which office will be open in a few days. No pretended entries lately made at this office are good, as there has been no Receiver there for some months.

The existence of tin ore in this region has long been suspected, and rude attempts at smelting have been made by the early settlers at various times, and the remains of an old furnace are to be seen which was probably used centuries ago. A shaft was sunk by Prof. Swallow's men, when making the geological survey of the state, in Town 32, 5, from which some asbestos was taken by the workmen. In 1862 or '63 a gentleman with Dr. Koch, of St. Louis, on examining further in this shaft, found some slight evidences of tin ore, soon after which Mr. Lane leased this land and bought the Lloyd farm, adjoining. On each of these tracts are veins of tin ore and its usual associates.

In 1858, some specimens were obtained by Dr. John Farrell from adjacent towns, which afforded traces of tin. The search for a workable vein has been pursued, with the interruption by the rebellion, at various times since, with little result, until in May, 1867, when in Town 33, 6, large beds and veins of tin ore in its different forms were discovered, with its associates, tungsten, talc, etc., etc. It is greatly to be desired that these lands go into the hands of energetic capitalists, that the state and whole country be speedily benefitted by their full development. Parties are invited to examine south-eastern Missouri, for unusual mineral and other natural wealth. J. F.

The Prussian Patent Laws.

MESSRS. EDITORS.—In No. 4, Vol. XIV, is an article on the Prussian patent laws which is not quite correct and may, if not explained, operate to the detriment of American inventors.

The existing patent law of Prussia bears the date of June 1843, not of 1815, and can be found in the body of laws published July 11th, No. 23. Foreigners can procure patents as well as natives; they must make application through a German—citizen of the Zollverein, not a Prussian, merely—as the states of the Zollverein have an arrangement between them, by which a citizen of any of the states may receive patents in all others, and if he has a patent in one state he has the preference for his invention in all the states.

The patents for foreigners are not taken out in the name of the German only, but also in the name of the foreign inventor. The form for applications ("communications") is about the same as in England; it purports that a patent is to be granted to a citizen of Germany for the foreigner. It is not correct that only six months are allowed for introducing the invention; for inventions difficult to introduce, a year is allowed, and that term may be prolonged if good reason is adduced. Prolongation is granted, also in the other states, so that inventions may often remain two or three years before being introduced.

The protection, it is true, is not certain enough for all inventions, as machines and tools, only, are exclusively protected; for articles of common use, therefore the protection is insufficient; but you may, nevertheless, be wholly protected if you take out patents in all Germany; as the law forbids the manufacture of articles thus protected they can be made nowhere without your consent. The time is really too short, but for the greater part of inventors it is sufficient.

The reform of the patent laws is proposed to parliament and probably a longer time will be granted under the new code. In Austria and Bavaria the period is fifteen years; in Saxony and Wirtemberg, ten years, and in some cases the term is extended. In these countries, containing a population of 52,000,000, most patents are as easily obtained as in the United States. It is true the principle followed by the Prussian Government retards many inventors, but there is reason to believe the new parliament will enact a more liberal law, probably fixing the term at fifteen years; meanwhile inventors should lose no time in securing their inventions, especially for machines and tools. W.

Frankfort-on-the-Main.

Illuminating Gas from Naphtha.

MESSRS. EDITORS:—In your valuable paper of Aug. 17th, in an article on the "Dangers of Gas made from the Volatile Constituents of Petroleum," I think an unintentional error has been made in regard to the Gloucester, Mass., fire and explosions. The facts, as furnished by Mr. Dale himself, are these: The gas not burning with its usual brilliancy, an examination of the machine was made, and, believing that it was too full, a portion of the gasoline was drawn off in open pans in the cellar, and the vapor was lighted by the lantern used as a light in removing it; this on fire, the alarm was given for the firemen. The fire was, however, extinguished before their arrival. The firemen rushed in with lanterns, against the entreaties of Mr. Dale and his friends, and the vapor was again and again set on fire and explosions were the result. The machine is rendered useless by the burning, and although the bands were burned off, there was not the slightest explosion in the machine or contents therein. Mr. Dale further writes that he has used it since 1864, and will replace it with a new one, his faith in it being undiminished. Fifty dollars will repair the damage to the house. In suburban places a substitute for petroleum lamps is very much needed, and it is believed that American inventors can furnish an excellent and safer one. J. L. DOUGLASS.

New York city.

A Challenge to Watchmakers.

MESSRS. EDITORS:—I state to the watchmaker world that I can produce an eight day watch, of the size of an English one-day lever, that varies less than any eight-day watch that can be made with one balance. The trial is to include all the offices that the perfect watch has to perform. We have "hunter case watches;" why not use them as hunters do their watches, on horseback. J. MUMA.

Hanover, Pa.

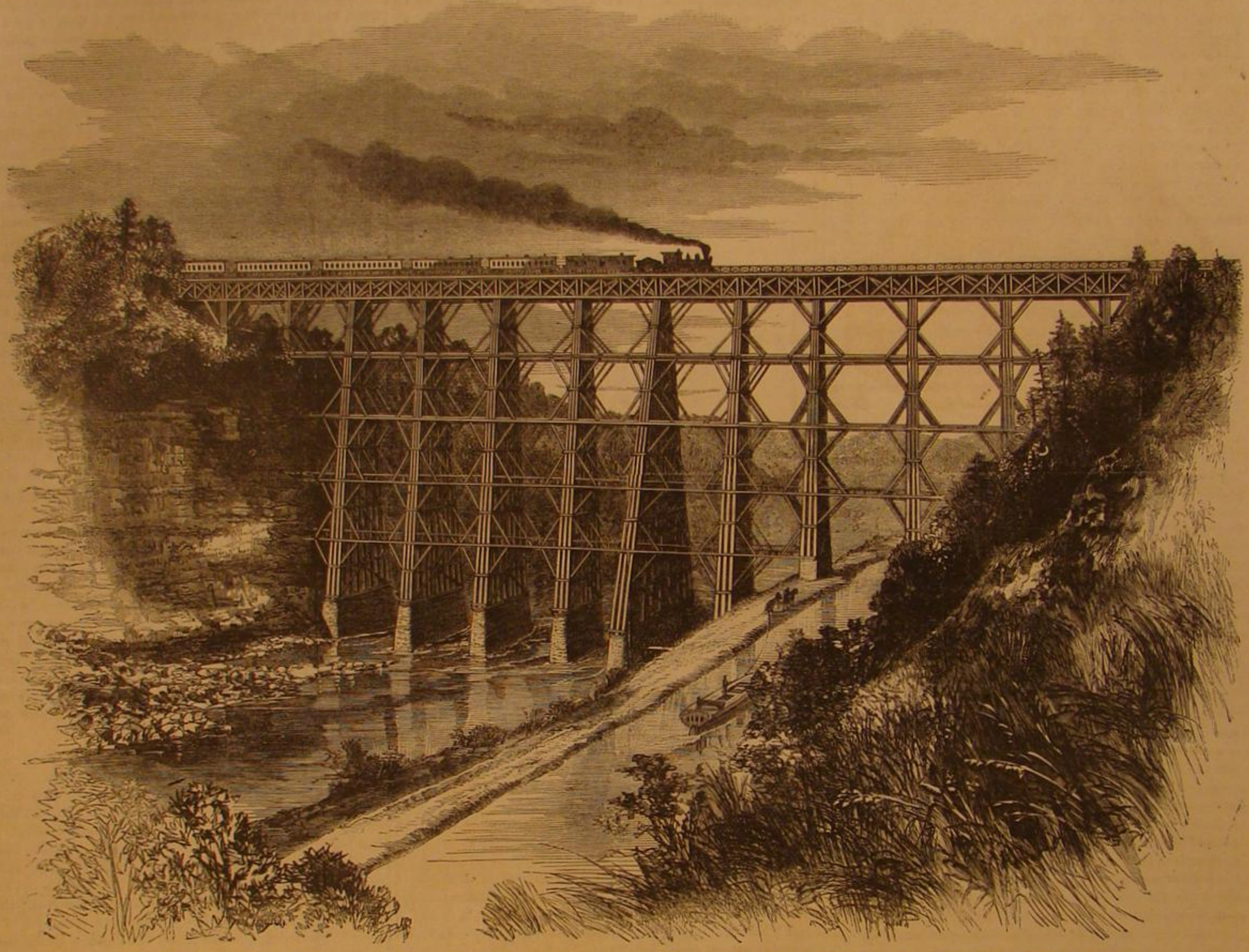
Effect of Our Fifteen-Inch Projectiles.

During Admiral Dupont's attack on Fort Sumter the rebel records show that the fort was struck over fifty times by our large projectiles. There are some ten instances noted in which the shot penetrated between two and three feet, and two cases in which they penetrated five feet. In half a dozen cases the projectiles made craters above five feet in hight and from four to eight feet in width. In another case a shot made a crater ten feet in hight and eight feet in width, and the parapet wall at this point was cracked twenty-five feet in length.

We are indebted to Geo. W. Childs, Esq, proprietor of the Philadelphia *Ledger*, for a very beautiful framed picture of the Ledger Buildings. The artist is F. Gutenkunst, one of the best photograhers in the country.

Erie Railway Bridge at Portage.

Probably there is no line of railway on the continent that surpasses the Erie road in variety of scenery; and though the traveler passes repeatedly over it, he will still be greeted with fresh surprises. The peaceful meadows, cultivated fields, cosy homes, and pretty villages alternate with dark forests, dashing waterfalls, beetling crags, and frowning mountains. Apart from these charms, the magnificent structures by which the engineer has overcome what would appear at first as insurmountable natural obstacles, are objects well worthy the observation of the tourist. Among these is the bridge across the Genesee and the canal at Portage, a view of which is given in the engraving. It is doubtful if it is surpassed by any



RAILROAD BRIDGE ACROSS THE GENESEE RIVER AT PORTAGE, NEW YORK.—ERIE RAILWAY.

wooden structure, erected for a similar purpose, in the world.

It is erected on thirteen stone piers set in the bed of the river, the stone being built sufficiently high to avoid all danger of freshets. The bridge itself is a huge mass of timber, rising to the height of 234 feet and is 800 feet in length. It was completed in 1853. It is said to be so constructed that any timber in the bridge can be removed and replaced at pleasure.

The scenery at this point is wild and picturesque. The Genesee River enters the ravine only to seek lower and still lower depths. Directly below the bridge and in sight of the cars, is the first fall, a half horse shoe about forty feet high, and a quarter of a mile further to the north is another fall, one of the most beautiful cascades in America. The fall is 80 feet high, and when the water is low the appearance is that of a most exquisite veil of lace thrown out in front of a black rock.

The Manufacture of Iron and Steel by Means of Magnetism.

In a literary cotemporary, Mr. W. Robinson gives a detailed account of his patented process for manufacturing iron and steel by means of magnetism. At present we do not see any reason to doubt the results which he therein states that he has obtained; but we do think that he has failed to give the *rationale* of that process, which, of course, in the description of any process, is the thing strictly necessary to be set forth, else such process naturally falls into the category of empyricisms, and not into that of science as applied to art and manufacture. Still, if the results be good, there is no reason why the process should not be followed, providing it be economical. But Mr. Robinson says that he did not fall upon this process by accident, but after lengthened research; consequently, one naturally looks for something like a scientific exposition of it. He says that the object of his research has been the practicability of making wrought iron by the aid of the magnet instead of the laborious, tedious, expensive, and somewhat uncertain process of puddling. The facts that led him to believe that such was practicable were the following: He found that some files by using became magnetic, and that such files always lasted much longer in use without showing signs of being worn than others; but he has not been able to ascertain how this magnetization comes about. We think if he tries he will find out that any file will become slightly magnetic if he draw-files with it, and not only so, but that any piece of iron or steel will become magnetic if it be filed while it is being turned in the lathe. Another principal fact was, that he found when a compact mass of iron filings were formed between the two poles of a magnet and then broken by force, the appearance was exactly similar to the fracture of a bar of tough iron. These and other facts led him to try the experiment of applying a magnet first to castings while being poured and till consolidation, and then to the melting furnace. In the first instance the castings were bright, like newly cast lead, and would bear riveting when cold, while other castings from the same ladlefull of metal were the ordinary gray, and brittle. In carrying out the process in the furnace to replace the puddling process, two pieces of iron were built into the furnace so that their inner ends might be in contact with the melted metal, and their outer ends in contact with the poles of a magnet. When the metal was in a melted state and a magnet applied, the magnetic arc was shown through the melted metal by blue flame and intense ebullition, and in twenty minutes the iron was gathered into a ball, and this iron when rolled was of the finest quality.

Now, suppose there to be no mistake about these results, what is the mode in which the magnet acts upon the crude iron? The mode in which the same or a similar result is arrived at may help us to an explanation. The two principal methods of turning crude iron into malleable iron and Bessemer steel is by the oxidation of the carbon and other matters out of the crude iron. In the puddling process successive portions of the melted iron are brought to the surface by stirring, and into contact with the air till the greater portion of the carbon passes off in the form of carbonic acid gas, etc., and the same thing is obtained much more readily and perfectly by the Bessemer process, by forcing the air through the melted metal. Now, we believe that it is an established fact that crude iron cannot become malleable till the carbon is driven off; therefore, if magnetism produces malleable iron from cast iron it is by driving off the carbon in some way; but if it be driven out it must be in the gaseous form. To render carbon gaseous oxygen is necessary, and it so happens thot among the gases oxygen is a paramagnetic; therefore, in the magnetic sphere there will be a concentration of oxygen. But this will not account for the oxidization of the carbon unless it can be shown that the carbon is brought in contact with the oxygen. On the surface it will be brought in contact with a condensed atmosphere of oxygen, but without stirring how is the carbon which is mixed or in combination with the metal below to be reached? There seems to be but one way of accounting for it, viz., this:—The particles of iron being magnetic, but the particles of carbon not being so, the particles of iron are necessarily colligated together when under the action of the magnet; and the carbon squeezed out, the carbon will necessarily rise to the surface and there burn, which it apparently does, from what Mr. Robinson says, producing a great heat and intense ebullition of metal, and even melting the lining of the furnace and the bricks. What ever the mode of operation may be, the results being as stated —and we see no reason to doubt them—this method of converting crude iron into malleable iron is by far the simplest and most economical yet discovered. Mr. Robinson has not yet been able fully to carry out his process; existing trade interests have worked against him; but that is what every inventor must expect—at least, in England. "Vested interests" are all-powerful for obstruction.—*Mechanics' Magazine.*

Honey, it is well known when taken fresh from the comb is a clear yellow sirup containing no trace of solid sugar. Upon straining, however, it assumes a crystalline appearance, and finally becomes a solid lump of sugar. M. Scheibler has found that this change is due to photographic action, crystalizing only when exposed to the light. This explanation furnishes us the reason why bees are so careful to work in perfect darkness, always carefully obscuring the glass windows which may be placed in their hives. The young bees can feed on the liqnid honey only, and if light were allowed access to it, the sirup would gradually acquire a more or less solid consistency sealing up the cells and in all probability proving fatal to the inmates of the hive.

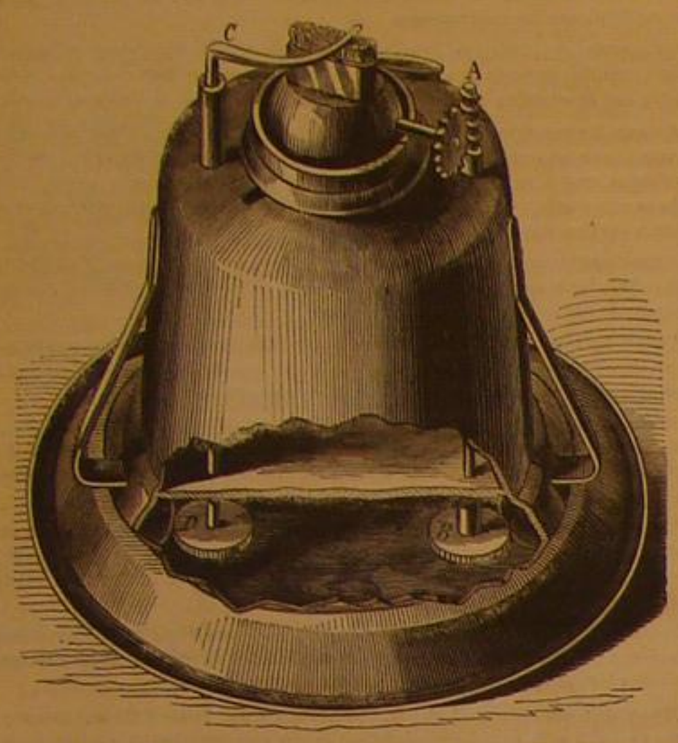
Vitality of Seeds.—The manner in which species of the floral kingdom are accidentally disseminated over wide regions, is shown by the fact that in the Exposition gardens a great variety of plants foreign to France have spontaneously sprung up under the walls and around the building. The seeds from which these new acquisitions to the natural flora have germinated, were conveyed to Paris in the packing of the articles sent from various countries. The several plants around the house of "Gustavus Vasa," which are peculiar to the country of that monarch, from their rare beauty are attracting considerable attention.

The Commissioner of Patents' Journal published weekly in the British Patent Office in London, contains the claims of all the patents issued in the United States.

SILVINS & HAIN'S IMPROVEMENT IN LAMPS FOR LANTERNS.

Those who are compelled in their business to frequently use lanterns, as watchmen, farmers, and some railroad employés, understand the annoyance of a dimply burning lantern lamp when its light is most needed on a stormy or windy night. Under such circumstances it is impossible to trim it or to elevate the wick without getting into some shelter for the purpose. But in the engraving we have a device by which these operations can be performed under almost any circumstances, and without removing the lantern from the protection of its glass case.

The engraving represents an ordinary lantern lamp secured to the lantern in the usual way by springs. A portion of the side and bottom projecting flange is broken away to expose the working parts. Through a tube reaching from



top to bottom is passed, on one side, a wire shaft having a worm gear, A, on its top for working the wheel, by which the wick is raised or lowered, as on an ordinary kerosene lamp. By turning the thumb-wheel, B, under the bottom, the elevation of the wick can be governed. On the other side of the lamp is a similar shaft, having on its upper end a curved horizontal arm, C, that can be swept across the wick to remove any crust which may have gathered. This is turned, also, by a similar thumb knob, D. By these simple contrivances it will be seen that, except filling the lamp anew with oil, it can be trimmed in a storm as well as in a calm.

The device was patented through the Scientific American Patent Agency, June 11, 1867, by Jacob Silvins and William T. Hain, who may be addressed at Sunbury, Pa., for further particulars.

A New Cement and Building Material.

In a communication to the French Academy of Sciences, M. Sorel describes a new cement, being a basic hydrated oxychloride of magnesium. It is obtained by slacking magnesia with a solution of chloride of magnesium in a more or less concentrated state. The denser the solution the harder it becomes on drying. This magnesium cement is the whitest and hardest of all those known to this day, and it can be molded like plaster, in which case the cast acquires the hardness of marble. It will take any color, and has been used by the inventor for mosaics, imitations of ivory, billiard balls, etc. The new cement possesses the agglutinative property in the highest degree, so that solid masses may be made with it at a very low cost by mixing t up on a large scale with substances of little value. One part of magnesia may be incorporated with upwards of twenty parts of sand, limestone, and other inert substances, so as to form hard blocks; while lime and other cements will hardly admit of the incorporation of two or three times their weight of extraneous matter.

By means of these artificial blocks, buildings may easily be carried on in places where materials for the purpose are scarce. All that is required is simply to convey a quantity of magnesia and chloride of magnesium to the spot, if there be none to be had there, and then to mix them up with sand, pebbles, or any other matter of the kind close at hand; blocks can be made of any shape, and imitating hewn stone. This magnesian cement may be obtained at a very low cost, especially if the magnesia be extracted from the mother ley of salt works, either by M. Balard's process, whereby magnesia and hydrochloric acid are obtained at the same time, or else by decomposing the ley, which always contains a large proportion of chloride of magnesium, by means of quick lime, which by double decomposition yields magnesia and chloride of lime containing a certain quantity of chloride of magnesium, and which, with the addition of various other cheap substances may be used for whitewashing.

Storage of Petroleum in England.

A select committee of the House of Commons on protection from fire has recommended that no oil produced by distillation from coal, shale, peat, petroleum, rock oil, Rangoon or Burmah oil, or other bituminous substance, and used for illuminating purposes, should be sold for such purposes with an igniting point under one hundred and ten degrees Farenheit.

"The committee point out that stringent measures have been adopted in America as to the sale of petroleum, and add that there is reason to fear that much of that oil, with a low igniting point, will be imported into England. They suggest that it would be well to have all mineral oils imported tested as to their igniting point and marked before being stored, and to place careful restrictions on the mode of storing. The classification of goods in storing is also recommended for consideration."

A Manchester paper, commenting upon this report, says:—

"Petroleum has already been the object of legislation. By an act passed a year or two since it is directed that not more than forty gallons shall be kept within fifty yards of a dwelling house, or of a building in which goods are stored, without a special license. But this act goes on the assumption that the igniting point of the oil is one hundred degrees Farenheit. The great source of mischief, however, is the use of petroleum which ignites at a point below that limit. Some of the petroleum which is sold is capable of ignition at a point as low as sixty-eight degrees. Moreover, it has been shown that in some cases, after a mineral oil lamp has been burning for twenty minutes, the temperature of the brass ranges from one hundred to one hundred and ten degrees, so that even when the flame is blown out the heat of the brass part of the apparatus is more than sufficient to explode the vapor which is given off. In the United States a law has been passed imposing heavy penalties on any one selling petroleum oil for illuminating purposes which is inflammable at a less temperature than one hundred and ten degrees Farenheit; and as far as we are concerned, the effect of this and other restrictions has been to stimulate the export of the forbidden oils to this country."

HOLLAND'S PERMANENT WAY.

In England great attention is being paid to improving the condition of the railroads by the construction of a permanent way not liable to decay, displacement, or breakage. The subject is also very properly assuming some importance in this country. In time, it is confidently believed, our present system of cheaply laid and rapidly decaying roads will be superseded by others of an enduring character. The engraving represents an attempt of this sort, which was patented July 16, 1867 by Robert M. Holland of Philadelphia.

Fig. 1.

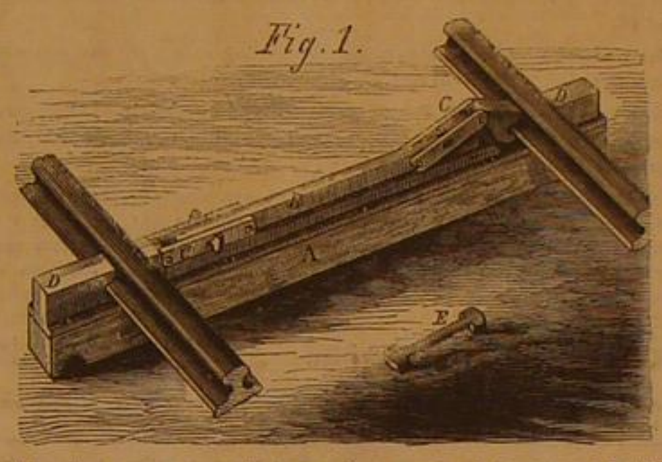


Fig. 2.

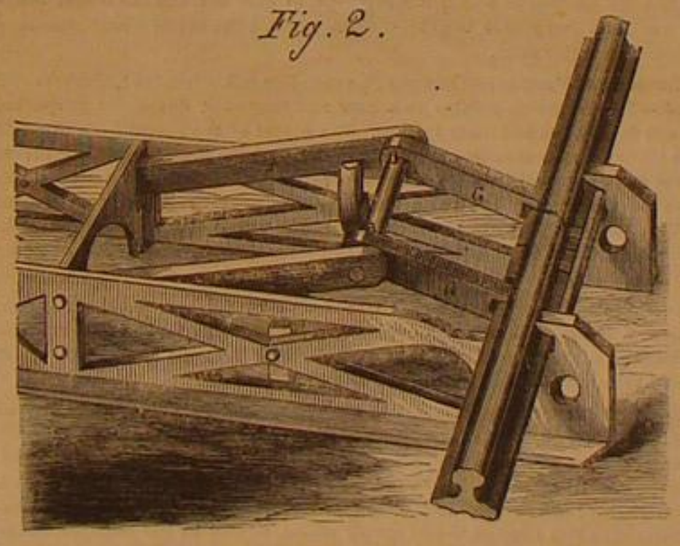


Fig. 1 presents a view of a sleeper with the iron attachment for securing the rails in place, and Fig. 2 a girder to be used at cuts, culverts, etc. The sleeper, A, may be of wood, as usual, having the casting secured to the top, or it may be wholly of iron with a broad base. A central rib, B, rises from the plate between the rails, having, at a proper distance from each rail, a pivot projecting from each side with which engage links, C, on either side of the rib. These links are pivoted to blocks formed with upper and lower flanges, and shaped so as to accurately fit the side of the rail. The ends of the plate are similarly formed, as at D. It will be seen that when the links are pressed down into position the rail, or the ends of two rails, will be held with great steadiness. To give perfect security a key is passed through a slot in the links and the rib and turned partially around, so the heads may stand across the slot. The key is seen removed at E. It is not believed, however, that this key is absolutely necessary to retain the block and links in position. At one end of the sleeper, Fig. 1, the links are seen raised so that the rail can be removed or seated, and at the other end they are locked.

Fig. 2 is a frame or girder of cast iron showing the rails in place. The links and blocks, F and G, are shown quite distinctly. It is evident that with these devices no spikes are necessary to fasten the rails, nor are any chains required to hold their ends. The labor of laying and repairing tracks will thus be materially reduced.

Further information may be obtained by addressing Leonard Repsner, Camden, N. J.

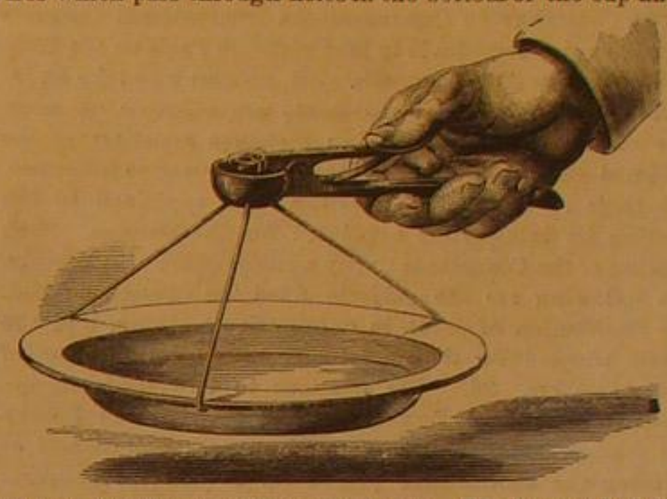
Trial of McCormick's Reaper at Chalons.

Mr. McCormick having accepted an invitation from the Emperor Napoleon to give a private exhibition of the working of his reaping machine, a trial was made a short time since on the Imperial farm near Chalons, at which the Emperor was present, accompanied by Marshal Neil, General Le Beuf and Tisseraud, Director General of the Imperial Agricultural Estates. The trial was a complete success, and gave so much satisfaction to the Emperor that he immediately gave orders for the purchase of three of the machines for use on his private farms, and earnestly expressed the intention of encouraging the adoption of the invention throughout France, on account of its great labor-saving properties, and said that he would set the example by putting it in operation on all imperial farms. Such distinguished attention as this has been shown to no other foreign exhibitor, and it is considered certain that to Mr. McCormick will be awarded the highest honors of the Exhibition.

WILLETT'S PLATE LIFTER.

The engraving presents a view of one of those handy household implements for which American inventors have become famous.

It is a light handle of cast metal having a cup-shaped receptacle, at the end, and just behind that ears for the reception of a thumb lever which is there pivoted. The short end of this lever projects into the cup and has secured to it three wires which pass through holes in the bottom of the cup and



are bent into hooks at their outer ends. The long end of the lever is kept up by a curved spring except when depressed by the thumb, The engraving shows plainly the manner of using. The wires are placed over the rim of a plate—being spread to their full extent by the spring—when the thumb presses the lever down contracting the hooks toward the center and holding the plate firmly.

One obvious advantage of this over those which grasp the utensil at one point only, is that it is not likely to drop the plate and can be carried steadily without spilling the contents of the vessel. It is made of such materials, also, and is so simply constructed as not to break or get out of order. Patented June 4, 1867. State and county rights and samples can be procured by addressing the patentee, John B. Willett, West Meriden, Conn.

The Silver Mint of Japan.

At the silver mint at Yeddo the following processes are continually going on:—A lump of silver of the necessary fineness, obtained either from the government mines or by melting down Mexican dollars, is placed in an iron ladle and reduced to a molten state by means of a charcoal fire and a pair of blacksmith's bellows. It is then poured into a mold, from which it is taken out in the shape of thin rectangular bars, which are immediately thrown into a tub of cold water. On being taken out a man seated on the ground shears off with a pair of large fixed scissors all jagged pieces adhering to the angles. They are now handed to another man who weighs them one by one, and a piece is cut off, if necessary, to reduce the bar to its proper weight. The next process is that of dividing the bar by a fixed pair of shears into eight equal portions, of the size of ichibus; this is done by a workman cutting it as accurately as his practised eye will enable him, and his work is tested by weighing—light pieces being rejected, and the heavy ones reduced to their proper weight by the scissors. The pieces are now heated white hot in a charcoal fire, plunged into water, boiled and washed in a kind of brine, from which they come out with a moderately bright surface. They are next very slightly milled on the two sides, and more deeply on the edges, by means of a milled hammer. They are now ready for stamping. A man places one of the pieces on a stationary die, and lays on the top the other die; a second man, armed with a huge hammer, gives one blow on the upper die, and the coin is struck. The blows are dealt in rapid succession, and the whole scene reminds one of a blacksmith's shop. Boys now punch small stars on the edges by means of chisels and hammers. The coins are weighed one by one for the last time, and the light ones rejected. The imperial stamp is added by means of another stamped chisel and mallet, and the coins are complete. They are rolled up in paper packets of one hundred; each packet is weighed and with a seal, which serves as a guarantee of its contents, and gives it currency as one hundred ichibus. While every operation is performed in this primitive manner, perfect order prevails in the estalishment; every man goes through his portion of the work in silence and with the regularity of clockwork, and many evince considerable skill. There are about three hundred hands employed in the building. When the men enter in the morning they are made to divest themselves of their own clothes, and put on others belonging to the mint. At the end of the day's work a gong sounds, when the somewhat curious spectacle is presented of three hundred

men springing from the ground on which they had been seated, throwing off their clothes, and rushing, a naked throng, to one end of a yard. Here they pass through the following ordeal in order to prove they have no silver upon them: Their back hair is pulled down and examined, they wash their hands and hold them up to view, they drink water, and then halloa, and, lastly, they run to the other end of the yard, clearing two or three hurdles on their way; after which they are allowed to put on their own clothes and depart. Mr. Sidney Locock, Her Majesty's Secretary of Legation, from whose report of this year these statements are taken by the *Times*, believes that the mint has been only twice entered by foreigners, and states that the apparent absence of all restrictions with regard to touching and handling the coins points to the probability that it is not often open to the public; but he remarks that even if it were, the manners and customs of the country are not such as would preclude a mixed assemblage of visitors from going over it and remaining to the end. The quantity of silver being coined daily at the beginning of this year was fifty thousand momme, which, at the rate of 23 momme to the ichibu, would give a daily total issue of over twenty-one thousand bus, or about £1,500. The whole of these are produced by the simplest manual labor, unaided by a single piece of machinery.—*Mech. Magazine.*

Editorial Summary.

THE CO-OPERATIVE CONGRESS.—An International Congress of co-operative societies is to take place in Paris on the 16th, 17th, and 18th of this month. All persons who take an interest in the co-operative movement are elligible as members of the Congress. Foreign members assisting at the Congress will be permitted to speak in their native language, and their speeches will afterwards be explained to the meeting by interpreters appointed for the purpose. Each member of the Congress is to pay a subscription of ten francs. The following are the subjects fixed for discussion: 1st. The distribution of profit in co-operative societies, and the system adopted for the moral and material prosperity of their members. 2d. The relations to be established between the societies of France, and also between the French and foreign societies. 3d. The advantages and means of inducing the agricultural population to join the co-operative movement. 4th. The introduction of the co-operative system in education. 5th. The liability of members of co-operative societies for amounts exceeding those of their shares. The sittings of the congress are to be public.

NEW USE FOR ALUMINUM.—It is well known that paper is one of the best substances for dulling steel cutting or piercing instruments, and especially is this the case when the paper is gummed, as in sheets of postage stamps. To make the rows of holes which nearly divide the stamps, in the French postage-stamp manufactory, a machine is used provided with some 300 needles of tempered steel, which latter fit into holes in an under plate of tin bronze. In the course of a single day the perforated bronze plate becomes unfit for use, the holes being so worn that the paper instead of being pierced, is merely embossed. M. Hulot, the director of the mint, has substituted aluminum bronze for the common alloy of copper and tin, with the best results, the lower frame lasting as many months as before it did days.

ALL WORK AND NO PLAY.—Aristotle says that the end of labor is to gain leisure. It is a great saying. We have in modern times a totally wrong view of the matter. Noble work is a noble thing, but not all work. Most people seem to think that any business is in itself something grand; that to be intensely employed, for instance, about something which has no truth, beauty, or usefulness in it, which makes no man happier or wiser, is still the perfection of human endeavor, so that the work be intense.

MISSOURIAN MAMMOTH VEGETATION.—A sycamore tree in Mississippi County, Mo., has a trunk forty-three feet in circumference. Another in Howard county is thirty-eight and a half feet in diameter. A cypress in Cape Girardeau county measures twenty-nine feet in circumference. A black walnut in Benton county is nearly eight feet through. There is a willow in Pemiscot county that has grown to the size of twenty-four feet in circumference and one hundred feet in hight. In the same county there is a dogwood six feet in circumference. Mississippi county boasts of a sassafras three feet in diameter, and grape vines and trumpet creepers grown to a circumference of eighteen to twenty-two inches.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The question of the manufacture of iron is now attracting considerable attention in South Australia, the iron ores of this colony being unbounded in quantity, lie close to the surface of the ground, and are of extraordinary richness, some of them even of 70 per cent. The scarcity of coal for smelting, is compensated for by the inexhaustible forests of wood. Even if coal had to be imported from New South Wales, the extreme richness of the ores would doubtless more than make amends for the extra cost of fuel.

The Brenner railroad across the Tyrol Alps, and running from Ignspuck to Botzen, was to have been opened about the middle of the present month. This road opens a new and direct connection between Italy and central Germany.

The new canal around the Des Moines Rapids on the Mississippi is to be two hundred and fifty feet wide.

Railroad men lately visiting Colorado have proposed building and stocking a branch road from the Central Pacific to Golden city and Denver, if the Colorado people will do the grading, this latter expense amounting, perhaps to $600,000. Gilpin county promises to contribute one third of this sum and the road will without doubt be built.

The manufacture of jewelry in France is continually on the increase. Paris is the center of the trade but there are great branches of it at Lyons, Marseilles and Besancon. A great lapidary trade has arisen, moreover, in Jura. The quantity of gold annually used by French jewellers and goldsmiths is estimated at seventeen tuns, while the manufactured silver amounts to eighty-nine tuns.

The bituminous coal from mines in Hopkins county, Ky., has been tested under the direction of the Louisville Board of Trade, and is pronounced equal to the Pittsburg coal for the manufacture of gas, making a purer and better heat and burning up better.

The works and village of the A. & W. Sprague manufacturing company at Baltic, are situated partly in Franklin and partly in Lisbon, and run 1,973 looms, and 70,000 spindles. The manufactures are print cloths and light shirtings, of which, 1,461,280 yards, in 35,187 pieces were turned out in May, this year. If joined together, this product would reach over 845 miles.

Jasper is now procured to almost any required extent, at St. Gervais, in Savoy, where the quarry has a surface of at least 24,000 square yards, and a depth of about twenty-two yards.

Railroad rails are not made in Italy. Eleven years ago attempts were made to supply them at the establishment of Pietrassa, near Naples, but it was found that they could not be delivered at less than double the price of those imported from England or Belgium. Neither can chairs, turn tables, etc, be manufactured cheaply enough to compete with similar articles of foreign production.

Within sixteen years the two colonies of Victoria and New South Wales have produced a gold supply valued at £150,000,000 sterling. The yield of Australian gold for the year 1866 was exactly one half that of 1856, and during these ten years the product has steadily declined on an average of over a half million of pounds sterling per year.

A farmer in Fulton, Wis., lately cut over thirty-two acres of standing wheat, with a Clow reaper, in one day. Considering that this work was done with a single pair of horses, and the thermometer indicating over 90°, the feat stands without a parallel in the history of reaper trials.

The yield of the Galena, Ill., lead mines which are the principle ones of the country, has largely diminished of late years. In 1842 they produced 31,753,630 pounds of pig lead, the average price of which was $2 24; in 1845 the production was 54,491,869 pounds which sold for $2 96; the production from this time forward, steadily decreased up to 1855 when it amounted to only 30,125,550 pounds at $6 00. Since the year 1848 we have been dependent on foreign countries for the bulk of lead used in this country, and strong efforts have been made to have pig lead placed on the free list. In 1857 the duty was reduced from 20 to 15 per cent and under the present tariff it is two cents per pound.

The first steel tires manufactured in this country were made at the works of William Butcher in Philadelphia.

Dr. H. E. Tweddles of Pittsburg, Pa., has patented a new process of manufacturing oil whereby all the hazard and risk attendant upon the use of fire in distilling the crude petroleum, and the expense and nuisance of subsequent purification by acids and alkalies, are entirely avoided. Steam is the only agent used, and it is utterly impossible to ignite the oils during the operation. But six or eight minutes is required to convert crude into refined oil.

The Worcester (Mass.) *Spy* says that every thing from a pin to a steam engine is manufactured in that city.

A locomotive on the East Pennsylvania railroad recently passed between Allentown and Reading, a distance of thirty-six miles, in exactly thirty-five minutes.

The California *Alta* claims that, contrary to the generally received account—which accredits to Marshall, the discovery of gold in that country in the year 1847—Abel Stearns, a native of South Carolina, as early as 1840 sent twenty ounces of the precious metal taken from a spot some eighteen or twenty miles from the present site of Los Angeles, to the Philadelphia mint.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

WATER WHEEL.—O. W. Ladlow, Bellefontaine, Ohio.—This invention relates to a new and useful improvement in horizontal water wheels and has for its object the varying of the discharge of the water from the wheel by ranging the capacity of the issues, and also by regulating the action or suction of the draft wheel, whereby the capacity of the wheel may be regulated to suit the amount of power it is required to give out and the wheel made to work at a less power than its maximum, with the use of a proportionate amount of water only.

DEVICE FOR PREPARING SPRING PLATES.—James B. Cleveland, Hackensack, N. J.—This invention relates to a new and improved device for preparing plates for vehicle and other springs. The object of the invention is to avoid the labor now necessarily expended in rendering the plates smooth or giving them an even or true surface, work now performed by means of a grindstone. The invention consists in subjecting the plates, previous to the operation of rolling, to the action of dies whereby they are reduced to an uniform thickness throughout their entire length and consequently will admit of being rolled perfectly smooth and true.

DETACHING BOATS FROM THEIR DAVITS.—E. C. Hurlbut, Middle Haddam, Conn., E. H. Snow, Hartford, Conn.—This invention relates to a new mode of detaching boats from their davits whereby with a single movement boats may be speedily and safely dropped into the water.

MODE OF DRYING CLOTHES.—Harvey Brown, New York City.—This invention has for its object the facilitating of the drying of clothes, and to this end I provide a portable or adjustable closet, box, or compartment, constructed in such a manner that it may be readily put up for use and also taken down with facility; the clothes being suspended on suitable lines within the compartment or box alluded to and the air within, heated by any suitable means so as to evaporte the moisture from the clothes and rapidly dry the same.

CORN AND CANE HARVESTER.—Edward H. Clinton, Washington Prather and Henry O. Hutchinson, Iowa city, Iowa.—This invention relates to a new and improved machine for cutting standing corn and sugar cane and depositing it in gavels for shocking or for convenience of depositing it where carts or wagons for carrying it out of the field to any place where required.

OIL CAN.—J. H. Goodwin, Scotland Neck, N. C.—This invention relates to a new and improved oil can of that class which are more especially designed for oiling machinery and are generally constructed of rather small dimensions so that they may be conveniently handled and placed in drawers, on small shelves, or put on a work bench without monopolizing much room. The present invention consists in constructing the oil can in such a manner that it may be placed and kept in quite shallow draws, be conveniently carried in the pocket if necessary, to be capable of being manufactured at a less cost than those in present use and still be stronger and more durable.

PLOW.—C. W. Grant, Iona Island, N. Y.—This invention has for its object the converting or transforming of any ordinary tillage plow into an implement capable of performing many important offices for which the ordinary plows are either entirely incompetent or very imperfectly adapted. Such for instance as working the soil to a great depth by bringing the unfertile portion from any desirable depth not exceeding two feet and communicating and mingling it thoroughly with the surface soil, or, if desired, by bringing the sub-soil wholly from the bottom and placing the surface soil below, entirely, reversing it and performing the work called "trenching" when done by a spade.

CARBURETING APPARATUS.—E. J. Fraser, Erie, Pa.—This invention relates to a new and useful method of charging atmospheric air with the vapor of volatile liquids or hydro-carbon oils, whereby the air is rendered inflamable and fitted for illuminating purposes.

OSCILLATING PISTON STEAM ENGINE.—W. M. Elrod, St. Louis, Mo.—This invention consists in the peculiar construction of the piston and the valve, and arrangement of the ports together with the device for reversing the motion of the engine.

WATCHES.—E. Jewell, Louisville, Ky.—This invention relates more particularly to the American watch so called, and consists in incircling the plates, carrying the watch movement with a band or rim, so formed as to spring and fasten itself in place without additional means; the object being to prevent dirt or dust from entering the movement and thus injuring and interfering with its perfect running.

SLATE CUTTER.—T. H. Drummond, Hartford, Conn.—This invention consists in forming and using a box knife or a series of knives attached to the lower edge of a box, of a form to correspond with the shape of the slate, and in using in connection therewith elastic blocks or cushions.

MANUFACTURE OF AUGERS AND AUGER BITS.—James Swan, Seymour, Conn.—This invention consists in forming the twist or pod of the single twist auger or auger bit in dies, by blows or by pressure, different dies being employed to suit the progressive stages of the process.

PRINTING PRESS.—C. Potter, Jr., Westerly, R. I.—This invention relates to a new and useful improvement in that class of printing presses known as the drum cylinder, and which is provided with a reciprocating form bed. The invention consists in an improved means for ensuring an easy and smooth movement of the form bed by avoiding jars or concussions at the termination of its strokes, said means also serving to hold the form bed down upon its ways when near the termination of its strokes, the form bed having a tendency to rise at these points, and which has hitherto been prevented by gibs attached to the form bed hooping or projecting under frame work of press, a rather expensive arrangement.

MEASURING LIQUIDS.—Purcel Brinkerhoff, Chillicothe, Mo—This invention is to furnish a simple and portable vessel by which liquids can be measured from a barrel or reservoir, without resorting to different sized measuring cups for that purpose.

STRAINER AND COOKING APPARATUS.—John Baumeister, Detroit, Mich.—This invention consists in arranging vessels with perforated bottoms over a boiler and in strainers without bottoms which are placed in the said vessels.

HYDRO EXTRATOR.—E. C. Cleveland, Worcester, Mass.—This invention consists in so supporting or hanging and arranging the basket of the hydro-extractor, that is to be revolved at a great speed as to move about from side to side freely for a limited distance, thereby changing the upright shaft from a vertical line.

ATTACHMENT TO PREVENT HOGS FROM ROOTING.—John Batts, Evansville, Wis.—This invention relates to an attachment to the snout of hogs, for the purpose of preventing them from rooting.

PIPE WRENCH.—W. C. Abbe, Petroleum Center, Pa.—This invention relates to an improved construction of a wrench for coupling and uncoupling gas and other pipe or tubing, bolts or round screws of any kind.

DOORS FOR STOVES AND FURNACES.—Frank S. Bissell, Pittsburgh, Pa.—This invention consists in so arranging a stove or furnace door that it is closed by springs, which springs operate upon it whenever it is not held open by force.

WAX THREAD SEWING MACHINES.—George Elmes, West Farnham, Canada East.—This invention relates to an improvement on Townshend's Wax Thread Sewing Machines to regulate the pressure of the feed movement.

VOLUTE SPRINGS.—John Freeland and Daniel Ward, New York City.—This invention relates to an improvement in the construction of volute springs for railroad car springs and other purposes.

MEAT MASHER.—James Lefeber, Cambridge City, Ind.—This invention relates to a new and useful improvement in the construction of a machine for mashing or breaking the fiber of beef steaks or other meat in order to make the meat tender.

SEWING MACHINE.—C. Stebbins, Pike Co., N. Y.—This invention relates to improvements in sewing machines, and consists in part of the new improved mechanical devices whereby the movement of the needle is regulated according to the varying thickness of the material which is being sewed, in such a manner that slack thread shall be given when the eye of the needle reaches the surface of the material, in order to enable the needle to descend through the work, whatever may be the inequality in the thickness thereof.

ANTI-DYSPEPSIA BITTERS.—Christopher T. Provost, New York city.—This invention relates to a new composition for curing dyspepsia and indigestion, and consists in the combination with hard cider of certain ingredients by which the anti-dyspeptic qualities of the old cider will be increased and its flavor and taste improved. This composition will be an excellent tonic, and not a stimulant, as most of the so-called stomach bitters generally are.

RAILROAD FROG.—Adolph Philippi, Elizabethport, N. J.—This invention relates to a new railroad frog which is so arranged that the wheels will be by it guided smoothly and without shocks upon the regular track, and which is made elastic by a bed of very thin wood laid between it and the sleeper.

CHURNING MACHINE.—Gurnsey & Crandell, Rhinebeck, N. Y.—This invention has for its object to furnish a churning machine simple in construction, easily operated, and which may be manufactured at a comparatively small expense.

FENCE.—L. H. Bowlus, Knoxville, Tenn.—This invention has for its object to furnish an improved fence, adapted for use in places liable to be overflowed by high water, which shall be so constructed that the panels may be thrown down so that the drift may pass over the fence without injuring it and which can be set up again in a very short time,

SEEDER AND CULTIVATOR.—F. B. Johnson, De Witt, Iowa.—This invention has for its object to furnish an improved broadcast seeder which, shall be so constructed and arranged that it may be easily adjusted for use as a cultivator.

EXPANDING DIE.—B. T. Loomis, New York city.—This invention has for its object to furnish an improved expanding die, so constructed that it may be adjusted to cut a screw thread upon bolts or pipes of different sizes.

SAWING MACHINE.—Esau Tarrant, Muskegon, Mich.—This invention has for its object to so improve the construction of sawing machines that the lumber may be sawn straight and of any required thickness without its being necessary to adjust rolls, as is the case with the machines in common use.

WASHING MACHINE.—D. H. Kranser and G. N. Bowman, Pottsville, Pa.—This invention has for its object to furnish an improved washing machine, simple in construction, not liable to get out of order, easy to be operated, and which will do its work thoroughly and quickly.

CHURN.—C. L. Eggert, Lawrence, Kansas.—This invention has for its object to furnish an improved churn, simple in construction, easily operated, which shall bring the butter in a very short time, and by means of which the butter may be gathered.

WHEELS FOR WAGONS AND OTHER VEHICLES.—S. B. Welton, Waterbury, Conn.—This invention has for its object to so improve the construction of the axle box and hub that the box may be easily removed and replaced, and that it may be readily adjusted to compensate for its wear.

WASHING MACHINE.—Geo. W. Havermale, La Harpe, Ill.—This invention has for its object to furnish an improved washing machine, simple in construction easy to be operated, which will do its work quickly, thoroughly, and without injury to the most delicate fabric, and which will operate with equal efficiency upon a small or large quantity of clothes.

COMPLETE ANTI-FOULER, TO PREVENT ROPES FROM FOULING SHIPS' PROPELLERS.—Richard Harvey Hudson, Glasgow, Scotland.—This invention relates to a device for preventing ropes from fouling ships' propellers, and consists of two disks, each made in two sections, of steel, or of iron or other metal sheathed with steel, and fixed securely, one disk to the stern post before, and the other to the rudder post abaft the screw.

TRACE FASTENER.—G. W. Fink, Pleasant Plains, Ill.—This invention relates to an improved method of securing trace tugs, and consists of an arrangement of the tug trace and singletree attachment whereby a prolongation of the trace or the trace tongue presses against the neck or eccentric groove of the button of the attachment, and holds the loop in which the trace tongue is arranged firmly against the neck of the button attached to the ferule.

BEDSTEAD.—B. F. Woodside, Atlanta, Ga.—This invention has for its object to furnish an improved bedstead so constructed and arranged as to be easily and quickly folded into a compact form for storage, transportation, or for speedy removal from the house in case of fire.

COTTON PRESS.—James G. Cummings, Columbus, Miss.—This invention relates to improvements in the construction of a press for packing cotton and other substances in bales by horse power, or any convenient motor, especially adapted to use on cotton plantations.

PHOTOGRAPHIC APPARATUS.—David H. Houston, Cambria, Wis.—This invention relates to improvements in the apparatus used in photographic manipulation, and has for its objects: First, the carrying a large number of sensitive plates, prepared either by the dry or wet process, in a single frame, at the same time increasing the portability of the equipment of the photographer; second, the more complete exclusion of light from the sensitive plate up to the very moment it is to be exposed, and after exposure; third, the substitution of a single frame, which I call a carrying frame, for numerous copying frames, which are entirely dispensed with; fourth, the automatic adjustment of the sensitive plate in the camera and returning the same to the carrying frame after exposure; fifth, simplifying the manipulations of the photographic process.

TREATMENT OF THE PRECIPITATES OF LEAD.—Geo. T. Lewis, Philadelphia, Pa.—This invention consists in the mechanical treatment, by friction and pressure, of the precipitated carburate of lead, obtained by bringing carbonic acid in contact with a solution of basic acetate of lead, by the ordinary process, known as the French process, for making white lead by solution.

UNDERGROUND RAILROAD.—Josiah Dixon, New York city.—This invention consists in an improved mode of constructing railroads, in cities, underground or below the level of the streets.

LEACHING TAN BARK.—Abraham Steers, New York city.—This invention relates to a new process for leaching tan bark, in which the ground bark is first washed out cold, with water or weak tanning liquor, then heated with steam, and finally washed out with water let on from below. The tan bark to be extracted is enclosed in a leach, by preference round and detached, and provided with a perforated false bottom and a perforated false top, between which the tan bark is enclosed. The menstruum is admitted from above, through the false top, and passed from one leach to the other, and after all the strength has been extracted which can be got out by a cold menstruum, the bark is steamed from below and the menstruum is let off from below, so that the formation of channels in the bark is prevented, and the menstruum is not permitted to run the bark without working out its strength.

APPARATUS FOR SOLDERING TROUGHS.—Charles and Geo. Fisher, Tecumseh, Mich.—This invention consists in constructing an apparatus in such a manner that in manufacturing tin, zinc, or sheet-metal troughs or gutters, they may be held firmly in their place, when the different sections are being soldered together.

NIGHT CART.—John H. Lynch, Baltimore, Md.—This night cart is so adjusted upon the axle as to be capable of being tipped backward to discharge its contents at a rear opening when the shutter is opened. The door of the charging opening above, as well as the shutter in the rear, have packing rings which fit their openings tightly, and they are held closed by lever and chain or rack and pinion.

MACHINE FOR CUTTING AND GRINDING CORN FODDER.—Alexander Goodhart, Newville P. O., Pa. In this invention an apparatus for cutting the fodder is combined with another for grinding it in such a manner that after the fodder has passed through the cutter it falls among the teeth of the grinding apparatus and is thoroughly ground.

LINING FOR COAL-OIL BARRELS.—Wm. R. Bree, Pottsville, Pa.—In this invention a coating of a composition, the ingredients of which are glue, molasses, and lime water, is applied to the inside of the barrels to render them impervious to the oil.

MACHINE FOR TURNING AXLES.—Geo. S. Knight, Syracuse, N. Y.—This invention relates to a machine in which axles and shafting, of whatever description and form, can be turned in a very accurate and rapid manner, and by means of which any rings or grooves, around such axles or shafts, can be very neatly and accurately executed.

WINDMILL POWER REGULATOR.—Joseph Schenker, Brownsville, Mich.—The object of this invention is to provide a machine whereby standing or stagnant water, either in lakes, or tanks, or cisterns, may be utilized to drive heavy machinery, in such a manner that by the windmill the water is pumped into an elevated tank or reservoir, whence it falls down, and by the fall, enough power is developed, in proportion to the hight and diameter of the column of water, to drive a large machine.

PUMP.—C. Vernland and E. D.T. Lucie, Quincy, Ill.—This invention consists in the arrangement and construction of the valves in a horizontal pump, and also in the construction of the piston, which is made so as to be watertight at all times, without the use of complicated devices for the purpose.

CORN CULTIVATOR.—P. F. Brittain, Genesee, Ill.—The object of this invention is to construct a corn plow, which is so arranged that the plows can be set more or less apart, and be raised and lowered at will, and be easily handled throughout and be cheaply made. A device for marking the rows is attached to the frame of this plow, and the latter can be adapted for throwing the ground upon, or cultivating the corn, and for throwing the ground from the corn, as may be desired.

LOCK.—E. G. F. Arndt and C. E. L. Moebius, N. Y. city.—This invention consists in so arranging a spring bolt lock that it may be used as a common bolt lock, or as a night lock, and which can be so locked from the inside, by a guard plate, that the bolt cannot be moved by a key.

DIE FOR CUTTING THREADS ON TUBING.—William T. Cole, New York city.—This invention relates to a device whereby screw threads are cut on tubes and other cylindrical, solid, or hollow articles, and consists in making the die, by which the screw thread is cut, of two or more pieces, which are pivoted to a vertical suspended plate, and which are clamped together, so as to form a circular die, while the thread is being cut, but which are thrown apart by means of springs or weights, as soon as the thread has been cut, thereby allowing the easy removal of the tube.

CARRIAGE PROP.—William Finn, Poughkeepsie, N. Y.—This invention relates to a new manner of attaching the standard of a carriage prop to the side of the bow, and also to a device for preventing the nut by which the joint bars are held on the standard, from being turned and lost by the motion of the said joint bars and by the rattling of the wagon.

PETROLEUM STILL.—E. G. Kelley, New York city.—This invention relates to a still for evaporating petroleum or other hydro-carbon liquids, that is provided with two or more exits for the vapor, each of them being connected with a separate condenser or cooler for the purpose of separating while the still is in continual motion.

WRENCH.—Geo. C. Taft, Worcester, Mass. Patented Aug. 13, 1867.—This invention relates to an improvement in wrenches, and consists in attaching the head of the rosset to the stationary jaw of a wrench by means of a swivel, in such manner that the screw may turn freely in the sliding jaw and move it back and forth.

WAGON.—Edward Robbinson, Greenbush, Wis. Patented Aug. 13, 1867.—This invention relates to a device to be attached to ordinary farm wagons for the purpose of preventing the tongue from striking the horses or rocking the collars when driving over rough roads.

MACHINE FOR BENDING TIRES.—Francis Mills, Mt. Vernon, Ind. Patented Aug. 13, 1867.—This invention relates to a new and improved machine for bending iron for wheel tires, and consists in an arrangement of feed and shaping rollers, operated by a hand crank, in such manner that a bar of iron shall be bent in any desired curve by passing through the rollers.

RAT TRAP.—Isaac Connell, Spencer's Station, Ohio.—This invention has for its object to furnish an improved rat trap, simple in construction and effective in operation.

SADIRON.—C. C. Hare, Louisville, Ky.—This invention relates to an improvement in sadirons, and consists in a sadiron having a detachable handle.

HARROW.—Lemuel Beckelshymer, Leavenworth, Kansas.—This invention relates to harrows mounted upon wheels and receiving a reciprocating transverse movement from the said wheels by the interposition of gearing.

TIRE FOR WHEELS FOR VEHICLES.—Henry A. Potter, Providence, R.I.—This invention has for its object to furnish an improvement in the construction of wagon tires and in the manner of attaching it to the wheels.

BASE BALL TABLE.—William Buckley, New York City.—This invention consists of an improved base ball table by means of which a new game for parlor or other in-door amusement is furnished, and which is played according to the rules and regulations of the game of base ball.

REVOLVING CYLINDER STEAM ENGINE.—Charles Scott and William H. Morton, Hamilton, Ohio.—This invention relates to a new and improved application of the steam engine for the purpose of producing rotary motion, and the invention consists in suspending the cylinder on trunnions, and revolving it with the fly wheel.

PROPELLING STEAM CARRIAGES AND OTHER MACHINERY.—Elijah Ware, Bayonne, N. J.—This invention relates to a new and improved method of altering the speed and thereby increasing the power used in the propulsion of steam carriages, and for other purposes; and it consists in a combination of wheels which operate so that the gear wheels may be made to exert increased power when desired, as will be described more fully hereafter.

COOK STOVE.—James Grimes, Portsmouth, Ohio.—This invention relates to an improvement in the construction of cast iron cook stoves, to provide for excessive expansion and sudden contraction of the top plate, and thereby prevent the general injury resulting therefrom to the whole stove, by the derangement of all the other plates, which depend upon their relation to and connection with the top plate, for keeping their proper places in all cook stoves.

WATER PAILS, ETC., OF CHEMICALLY PREPARED PAPER.—John William Jarboe, Greenpoint, L. I.—The present invention relates to the manufacture of water pails and other articles of household furniture, such as refrigerators, ice coolers, wash basins, spittoons, chamber pails, and pots, etc., made of chemically prepared paper, which are coated with varnish after the article is formed and dried.

MANUFACTURING FRUIT CANS.—John C. Underwood, and Peter Johnson, Richmond, Ind.—This invention relates to a new and improved method of manufacturing fruit cans, and it consists in constructing an apparatus by which the body of a can is expanded to the proper size or diameter, so that all the joints are easily soldered, and also in an arrangement by which the rosin for soldering is properly distributed.

CHAIR.—F. J. Coates, Cincinnati, Ohio.—This invention has its seat and back so hung to the frame forming the legs, that the back can be brought to a greater or lesser angle of inclination, and there secured or held, according as may be desired.

MOIST AIR VENTILATOR.—Thomas S. Bowman, St. Louis, Mo.—This invention consists in surrounding the stove pipe with an air drum, the bottom of which is connected with a base which contains water, which water is evaporated and discharged into the room with fresh air.

FISH FLAKE.—Joseph Foster, Beverly, Mass.—The object of this invention is to provide a fish flake or frame for curing cod and other fish, by drying, which is so arranged as to be adjustable in its position for exposing the fish more or less to the sun, as required, and protecting them from his rays in the heat of the day by means of a screen.

DUST BRUSH.—J. B. Wood, Lansingburgh, N. Y.—This invention consists in inserting the bristles properly trenched, knotted and wound at one end, and by such end dipped in liquid shellac or varnish, and in one end of a metallic ferule having a cross plate or partition about half way of its length, in combination with a metal handle driven into the open end of such ferule, and there secured by soldering, melting, or in any other suitable manner.

FLAT IRON HEATER.—John H. Yates, Batavia, N. Y.—This invention relates to an improvement in the construction of flat iron heaters, and consists in a conical deflector, which is so arranged as to direct the heat in its passage up through the heater, against the bottom of inclined planes on which the flat irons are placed to be heated.

AXLE BOX.—Hugh Brady, Factoryville, N. Y.—The nature of this invention consists in inclosing in the axle box a number of sets of friction rollers, hung loosely upon circular bearings, each set of rollers being separated by partitions, which are formed of rings made fast by screws through the axle.

ROCKING CHAIR.—Daniel Witt, Worcester, Mass.—This invention relates to a new and useful improvement in the construction of rocking chairs, and consists in mounting the seat upon a stationary frame, or set of legs, instead of rockers, and suspending it on central pivots, to have an oscillating motion, which is regulated by spiral springs under the front and rear of the seat.

IMPROVEMENT IN HORSE HAY RAKES.—Josiah D. Heebner, Norristonville Pa.—In this invention the rake is lifted over the windrow by a tripping pole, which can be instantly caused by the driver to catch against the ground, raise, and, when the machine has advanced three or four feet, drop the rake again, without other assistance from the driver than that of the first throwing the tripping pole into gear.

IMPROVED PORTABLE SPORTING AND LIFE BOAT.—John M. Cayce, Franklin, Tenn.—This boat is a light frame covered with watertight cloth, and capable of folding together. It is provided with horizontal arms having floats at their extremities, which can be thrown out so as to make the width of the whole floating apparatus equal to its length, and render capsizing nearly impossible.

COFFEE POT.—James C. Walker, Waco Village, Texas.—In this invention steam is introduced from a boiler through a tube into the centre of a vessel containing the coffee. The latter vessel is within the coffee pot, and the essence of the coffee in it is extracted by the joint action of the steam and water within the coffee pot.

PORTABLE FORGE.—John M. Cayce, Franklin, Tenn.—In this invention the blast is obtained from fans situated beneath the forge and worked by a treadle.

HARVESTER WHEEL.—Isaac S. and Henry R. Russell, New Market, Md.—In this invention the wheel is connected with the axle by a device which enables it to change direction in turning, so as always to move in the direction of the curve.

ORE ROASTING FURNACE.—George B. Field, New York City.—This invention relates to revolving ore roasting and desulphurizing furnaces, provided with an attachment for agitating the ores while roasting. The invention consists in making the various parts of such attachment hollow or tubular, for the admission of steam or water to keep them from being destroyed by the intense heat to which they are subjected.

ORE ROASTING FURNACE.—George B. Field, New York City.—This invention consists in the use of a peculiar shaped ledge or shelf in the furnace, made hollow for the introduction of steam or water, and the construction of an aperture or part through which the cavity or shelf may be cleaned from the outside of the revolving cylinder.

MINERS' PICK.—Henry M. Hamilton, New York City.—This pick has an eye in which the sides are partly parallel and partly flaring. The parallel opposite portions of the eye adhere to the helve and give it stability to resist jarring loose, while the flaring portion becomes jammed in the eye and sets the pick firmly without wedges.

BLASTING CARTRIDGE AND FUSE.—A. Rollason. Patented in England Dec. 15, 1866.—In carrying out this invention a case or shell is made of paper or other suitable material, similar to a rocket case. This case is to be closed at the bottom, and is to be placed in a mold, after which, if the cartridge be intended for blasting purposes, the end of a fuse, such as is commonly used in mining operations, is placed inside the case, either on one side of it or down the center. The end of the fuse is made to rest on the bottom of the case, which is then to be filled with gun cotton or other analogous compound consisting of pyroxiline rammed down very tight with a rammer or by hydraulic pressure. In this latter case the patentee does not use a sheet or case, as before named, but simply incloses the cartridge in any suitable wrapper, either water proof or not, as may be desired, the fuse during the filling of the cartridge being protected from injury by being received in a groove prepared for it in the rammer. When making cartridges for artillery purposes, or for sporting or other guns or rifles, the gun-cotton or pyroxiline compound may be modified or reduced in strength or explosive power by mixing with it unprepared cotton, wool, paper pulp, or other inexplosive fiber or pulverized material.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 50 cents a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

S. R., of Ky.—The metals sodium, magnesium, and aluminum have as yet been manufactured only in small quantities, and have no steady market prices. By the oz., one dollar and upwards would be charged in this city for either of them. Sodium is the only one of these which has come into regular use. When made into an amalgum it is found very useful in gold mining, and various metallurgical processes.

W. J., of Ala.—The processes of butter making mainly depends upon physical action. The butter is fully formed in the cream, and the effect of the churning is simply to bring the isolated particles in one mass. A high temperature favors the process of softening the globules of butter and rendering them more adhesive.

N. D., of Mich.—"Are there any sweet substances besides sugar, honey, manna, glycerin, sugar of lead, and liquorie, and are not all sweet substances of the chemical nature of sugar?" There are dozens of sweet substances which you have not named. One of the most extraordinary of all sweets is hyposulphite of silver, which is so intensely sweet that a single grain will render a gallon of water perceptably sweet. There is no property common to these substances but their sweet taste, and it is by this only that they can be classed together.

J. M. F., of Ohio.—Hydrochloric acid is generally most convenient for precipitating silver from solutions, and will be quite effectual for your purpose.

R. H. L., of Texas.—The fact that dust does not rise when the air is quiet, is sufficient evidence that it is heavier than air. If you were able to see the currents of air, the cause of the dust rising would be manifest to you. Behold how the winds raise the waves, "mountain high," and yet the water is 800 times heavier than air.

H. M. B., of Ohio.—The plates of galvanic batteries need to have considerable thickness in order to conduct the current, and therefore you will not be successful in the use of gold leaf laid on glass for the negative plate.

A. C. W., of Vt.—A liquid quartz paint will be suitable for painting your slate ornaments. The solid body of the paint may be mineral matter which you can find in your neighborhood, the proper shade of color seems to be the most important quality.

H. M. S., of Mich.—Your battery is in good order as you describe it except that the zinc plate needs amalgamating. Get two or three ounces of quicksilver, and smear it well over the zinc, and the battery will work as well as it ever did.

S. P. D., of Va., says:—"Suppose you suggest through your paper the propriety of manufacturing ready made teeth to be kept in the stores the same as ready made clothing, shoes, etc. The present price is out of all question. Teeth should be within the reach of all." We would state that if the teeth wanted are saw teeth, they can be furnished in any quantity in this city; so, also, if teeth for the human jaw, but in both cases it requires an experienced hand to insert them. We have artificial legs, arms, and eyes kept on hand, and expect to see the day when artificial heads of wood as well as leather may be found on the shelves of our stores as well as on human shoulders.

J. P. H., of Mass.—Delicate flat springs of steel or brass can be tempered by judicious hammering without the use of fire or water. For some purposes this is much better than the ordinary method. For your mortising machine a spring of tough, elastic wood is better and cheaper than one of steel. Wooden wagon springs have been used, and, we believe have proved excellent.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Pattern Letters and Figures to put on patterns for castings, etc., etc., are made by Knight Brothers, Seneca Falls, N. Y.

G. M. Danforth & Co., Inventors' Exchange, see advertisment.

New invention. A potato digger which puts the potatoes in a bag and the small ones apart in a box. The original was made by a blacksmith at very little cost, which will be saved by the work on three acres of potatoes. Patent rights sell: C. G. Grabo. Address care of Schober Bro., Detroit, Mich.

For sale a valuable patent for the State of Pennsylvania. Its equal is seldom offered. A good chance for a live man, for particulars, address Postoffice Box 220, Mexico, N. Y.

Manufacturers of paper collars or similar goods desirous of manufacturing a new paper vest under patent will please address, W. D. Overell, Box 773, New York City.

C. Koch, Godfrey, Ill., desires to communicate with makers of Drop Presses, for stamping out tin ware.

H. A. Anderson & Co., Brownsville, Minn., wish to purchase a first rate stump puller.

Manufacturers of water proof paper or felt please send address with sample and price to A. P. Curry, Chagrin Falls, Ohio.

Novelty works of Adrian, Mich., want circulars of factories of small tools, such as Lathes, Planers, Milling rack, Drill Presses, etc., also of tools for clock making. Makers of trap and other springs, of horn and hard rubber, also steel and silver plated screws, please send circular as above.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,830.—COVERING BUCKLES AND OTHER METALLIC TRIMMINGS FOR CARRIAGES AND HARNESS WITH A COATING OF VULCANIZED OR HARD RUBBER, GUTTA PERCHA OR OTHER GUM.—Andrew Albright, Dryden, N. Y., June 1, 1867.

1,939.—MEANS OF AND APPARATUS FOR WASHING AND DRYING MOIST SUBSTANCES, OR DRYING AND BURNING GRANULAR SUBSTANCES, OR EVAPORATING LIQUID SUBSTANCES, AND FOR ECONOMIZING THE WASTE HEAT PRODUCED IN SUCH PROCESSES.—George Gordon, San Francisco, Cal. July 2, 1867.

2,024.—METALLIC EYE FOR LACES.—Louis C. Hoffmeister, Philadelphia, Pa. July 10, 1867.

2,029.—WOOD-PLANING MACHINE.—Baxter D. Whitney, Winchendon, Mass. July 10, 1867.

2,030.—CIRCULAR SAW MACHINE.—Baxter D. Whitney, Winchendon, Mass. July 10, 1867.

2,034.—MANUFACTURE OF REFINED SUGAR.—Edward P. Eastwick, Baltimore, Md. July 11, 1867.

2,050.—CONSTRUCTION OF THE PERMANENT WAY OF RAILWAYS.—Gustavus Natorp, New York City. July 11, 1867.

2,051.—APPARATUS FOR CUTTING OR MINCING MEAT, ETC.—David Lyman, Middlefield, Conn. July 12, 1867.

2,052.—LIFE BOAT AND DETACHING TACKLE FOR BOATS.—Milton V. Nobles, David Decker, and Wm. J. Dounce, Elmira, N. Y. July 12, 1867.

2,056.—MANUFACTURE OF CORSETS.—Joseph Beal, Granville Webster, Edward Sawyer, and John Hunt, Boston, Mass. July 12, 1867.

2,058.—POWER LOOM.—Erastus B. Bigelow, Boston, Mass. July 12, 1867.

2,117.—SELF-LUBRICATING BOLSTER FOR SPINNING MACHINES.—Erastus N. Steere, Providence, R. I. July 19, 1867.

2,131.—APPARATUS FOR CLEANING BOILER AND OTHER TUBES.—John B. Christoffel, Samuel Booth, and Samuel Booth, Jun., New York City. July 22, 1867.

1,948.—MACHINERY FOR PRINTING FROM A CHAIN OF TYPES.—John McAdams, Brooklyn, N. Y. July 3, 1867.

2,103.—LOOM.—George Crompton, Worcester, Mass. July 17, 1867.

OVERELL'S DEVICE FOR PIERCING CIGARS.

Smokers well understand the annoyance of the unwinding of the cigar wrapper at the end received into the mouth. This frequently follows the common habit of biting off the end of the cigar, which loosens the wrapper and wastes the filling. The piercing by a pocket knife is inconvenient, and if the cigar is "ripe" and dry it often breaks the wrapper and proves as unpleasant as biting or cutting off the end.

A neat little implement, lately invented, is shown in the engravings. Fig. 1 is a perspective view showing the manner of using, and Fig. 2 exhibits the internal arrangement, being a vertical section. The stand may be of metal or wood and ornamented in any manner desired. A large base gives security in standing it upon a counter or table, and the form may be of any style which combines use and elegance. From the

Fig. 2

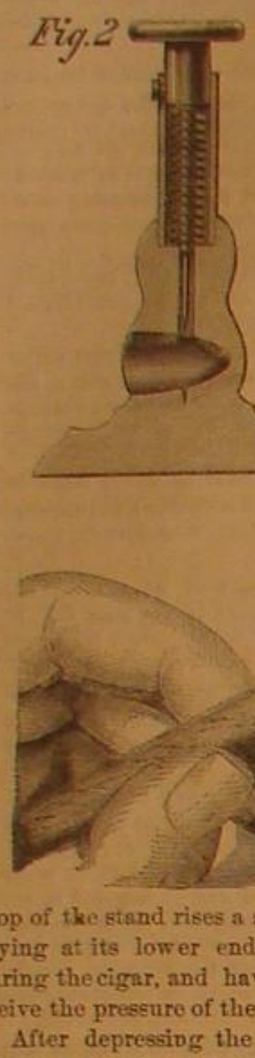


Fig. 1



top of the stand rises a sheath in which a piston moves, carrying at its lower end a needle of proper form for puncturing the cigar, and having at its upper end a button to receive the pressure of the finger or thumb.

After depressing the plunger and needle a spiral spring restores them to their original position. A recess in the side of the stand, where the needle impinges upon the cigar is of a form to hold the cigar end in shape while being punctured, and prevents all unrolling, cracking, or breaking of the wrapper, while the needle makes a hole sufficiently large to insure a good draft. Of course by partly rotating the cigar, after one puncture has been made, other holes may be pierced if desired.

This device is intended, principally, for the use of tobacco stores, hotels, etc., although it may be carried in the pocket by a slight modification of its form.

For rights to manufacture address W. D. Overell, 46 King street, New York City.

An Improvement in Car Windows Wanted.

Among the many ills the travelling public are subjected to, one of the most irritating is in opening car windows. When the half suffocated denizen of the city leaves the seething, crowded marts of commerce for his summer residence in the rural districts, he naturally desires to inhale as much fresh air as circumstances permit; in fact, he desires to respire a purer atmosphere than the one he left. Such being the bent of his inclinations, the first impulse on entering a close, crowded car is to open the window. The window, however, with that irritating species of inanimate obstinacy offers a passive resistance, and defies the efforts of even the obliging conductor, who is generally called upon to perform what physically stronger men than he failed in doing. By this time the unlucky traveler in search of fresh air becomes thoroughly irate, as the constrained position he has to maintain, and the want of a leverage or purchase for the arms when endeavoring to open the window, is not only painful from the strain but actually has an injurious effect upon the nerves, especially when one gets his labor for his pains. Some method ought to be introduced by which these provoking windows can be raised and lowered with facility, and without the tremendous exertion now requisite. In addition to this it is exceedingly disagreeable for a lady travelling alone to be obliged to ask one of the gentlemen among her fellow passengers to open or close a window. A request of this kind is often misconstrued into an invitation to conversation, and results in a subjection to impertinences, until the gallant is reminded by sharp rebuke that his intrusive conversation can be dispensed with. —*N. Y. World.*

How to Keep Cool.

Be sparing in your diet, which should consist principally of fruits, berries, and vegetables. Avoid every thing of a greasy nature; also spices, condiments, and sweets. Drink nothing but water. Chew nothing but food; chew that well, but do not chew too much of it. Excess in eating is one of the principal causes of that lazy, listless, relaxing feeling experienced by so many persons in hot weather. Dress lightly, and change often. Wear nothing at night which is worn during the day. Bathe the body every morning with cool or cold water. Keep a clean conscience as well as clean body and clean clothing, and don't get excited. If uncomfortably warm at any time, immerse the hands, or feet, or both, in cold water for a short time, or let a stream of cold water run upon the wrists and ankles. This will cool the whole body in a short time.

NEYNABER'S AUTOMATIC BOILER FEEDER.

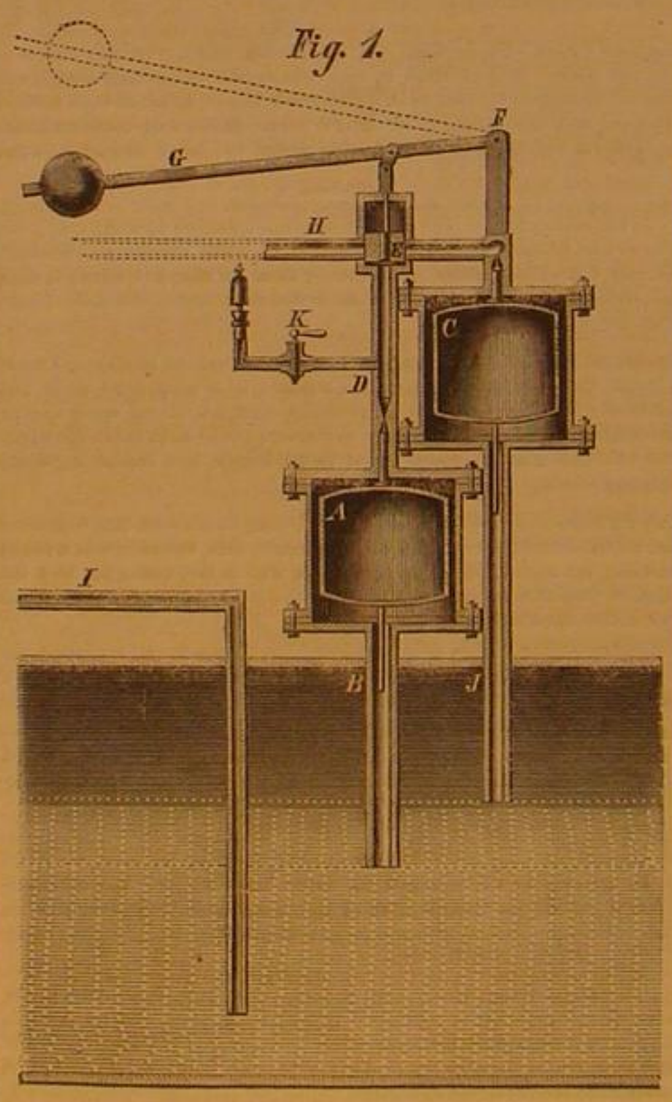
The nature of this invention consists in the construction and application of valves, by means of which the steam of a boiler is brought to act on a piston or alarm whistle when the water falls to a given point, said action of steam being maintained until the water in the boiler rises to a certain point, and is then cut off, and thus a motive power is gained from the moment when the boiler wants feeding until it is sufficiently fed, and no longer, which so gained motive power can be used to perform the work of feeding the boiler automatically.

Fig. 1 represents the boiler feeder. A, is a valve, consisting of a float to which, at the upper part, the valve stem is pivoted. This valve stem is of peculiar construction and one of the most important parts of the apparatus. It terminates in a parallel plug of one eight of an inch diameter and one half an inch long. This plug slides into a hole and thereby closes or opens it, and is so constructed that the pressure of the steam on the plug is reduced, and friction avoided, so that by means of the weight of the float the valve will always open when the water descends through pipe, B. The plug acts also as a punch in case that any dirt should fill up the hole.

C, is a second valve of the same construction, with the exception of having a larger valve stem and seat. D, represents a pipe for the purpose of having attached, a steam whistle, or also, a steam trap for the separation of the steam from any water. E, represents a piston, which is moved by the steam escaping through the valves, A and C. F is the support of the lever, G, with weight attached. H is a steam pipe, leading steam to a pump. I represents a feed pipe for feeding the boiler. The ends of pipes, B and J, are provided with sieves to prevent foreign substances from entering the pipes.

The operation is as follows: the boiler being filled with water to the upper dotted line, water extends into pipes, B and J, lifts the floats, A and C, and these shut up the apertures at their tops. As the water evaporates below the upper line steam will enter pipe, J, and the water therein will descend; but as the opening of pipe, H, is closed by the piston, E, (which is acting there as a slide valve also), no steam can escape through pipe, H, until the water falls by evaporation below

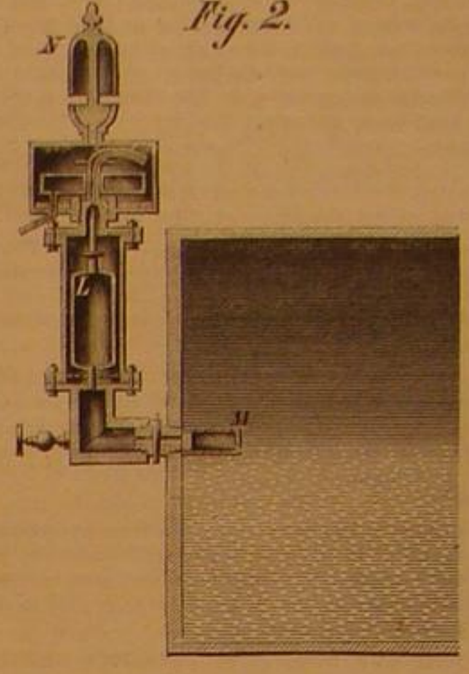
Fig. 1.



the lower dotted line in the boiler, then steam will flow through pipe, B, the water descend, the float, A, fall, steam find a way through pipe, D, lift the piston, E, which opens by this movement the apertures of pipe, H, and the steam escaping through this pipe can be used to put a separate feeding pump in motion. The movement of the lever, G, caused by the motion of piston, E, can also be used to start or stop a pump by moving the belt on or off the tight or loose pulley, or to open or shut, by means of a lever, the stop cock of a hydrant supplying a feeding pump attached to the engine. The lever can also be connected with the lever of the stop-cock, K, in such a manner that the alarm whistle will be blown when the boiler needs feeding; but as the lever, E, ascends toward its position indicated in dotted lines, the stop-cock will be shut until the feeding operation is performed and the lever descends again by means of its weight. The feeding pump will supply the boiler by means of pipe, I. As soon as the water rises in the boiler to the lower line, water will enter again pipe, B, will lift the float, A, which will close the aperture at its top; but the piston, E, being raised once, will be kept in its position, corresponding with that of the lever as shown in dotted lines, until the water rises to the upper line, when water will enter also pipe, J, and lift the float, C, which then will also close the aperture at its top, and cut off the steam. The pump work will now stop (or the water will be cut off), the steam in pipe, H, condenses, and the piston, E, will by means of the weight be brought down and the whole apparatus will again resume the position first described. This Automatic Boiler Feeder will recommend itself; it is simple in its construction so as to make it durable and reliable.

Figs. 2 and 3 represent the alarm device adapted for steam boilers, to give alarm when the water in the boiler evaporates to a given point, making a most convenient and reliable low water detector.

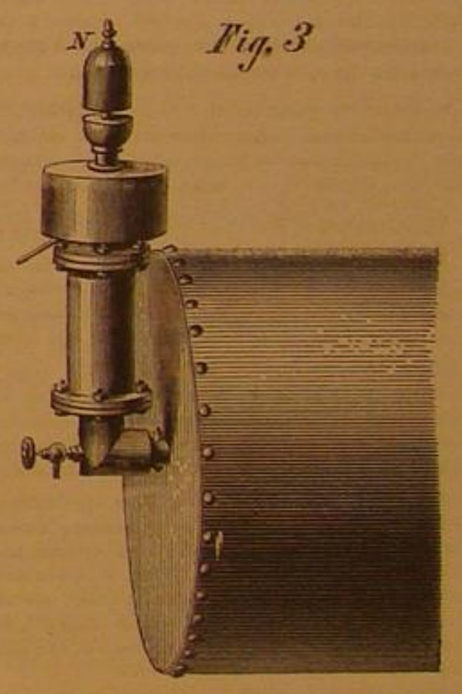
Fig. 2.



This alarm device consists of the single valve, L, whereby the orifice of pipe, M, is kept closed as long as the water stands above the dotted line, but is opened as soon as the wa- falls below the line, to allow the steam to flow through pipe, M, for the purpose of blowing an alarm whistle, N. The apparatus is represented in Fig. 2 in the state of allowing the steam to flow through it, for the purpose of blowing a whistle.

A small quantity of water will rise with the steam and to prevent an ejection of water, out of the alarm whistle, the pipe of the whistle may have an interposition of a steam box by which the water can be separated from the steam and afterwards be drawn off by means of a cock, or by the application of a steam trap, as illustrated in Fig. 2.

Fig. 3



The advantages of this contrivance are plainly seen. It does not require any adjustment after it has given alarm, but is always ready again. This device can be put on outside of the boiler, and its proper place will be at the point of the middle gage cock. It can be put on in place of the middle of the three gage cocks, and the middle gage cock again put on the bracket of the alarm device. The bracket can be provided with a stop-cock. This device has been in successful operation at different places in Philadelphia. Patented June 4, 1867.

For other particulars in regard to the Automatic Boiler Feeder and Alarm Device, address the inventor and patentee. Several state rights, including California are for sale by A. F. W. Neynaber, 425 Girard Avenue, Philadelphia, Pa.

ASSOCIATION OF ENGINEERS AND ARCHITECTS.

A semi-annular meeting of this association has just been held in Worcester, Mass., lasting two days. We have no official report of the proceedings, but from a correspondent we learn that Mr. G. P. Low of the Boston and Maine Railroad read a valuable paper on the "Social Relations of Engineers," and among others were papers on the "Currents of the Minnesota and other Rivers," "Copper," "Architecture," "New Methods and Instruments for Drafting," "Improved Crosshead for Locomotives," "Timber Foundations for Masonry," "New Design for a Traveling Crane," and "Street Roadway Pavements."

When the full report of the meeting reaches us, we have no doubt of finding something in it of value to our readers.

SLIPPED INTO THE SEA.—Forty acres of bog land in the county of Mayo, the north-west extremity of Ireland, undermined by heavy rains after long continued drought, lately disappeared in the depths of the Atlantic. Ten acres of standing crops and several houses were destroyed.

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NEW YORK, SATURDAY, SEPTEMBER 7, 1867.

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PETROLEUM FOR FUEL---ITS ECONOMY CONSIDERED.

In last week's issue we determined the amount and the cost of the heat generated by the combustion of petroleum. The following is a resumé of our conclusions: Petroleum, weight for weight, has 50 per cent. more heating power than coal, a fact expressed by the ratio 21 to 14, or 3 to 2. If oil costs 21 cents per gallon and coal $6 per tun, then the oil heat costs six times more than the coal heat. Oil, equivalent in price to coal at $6 per tun, would cost 3½ cents per gallon; and coal, equivalent to oil at 21 cents per gallon, would cost $36 per tun.

It should be observed that the figures used in the discussion are as favorable to petroleum as could be chosen; to avoid the inconvenience of fractions, we have selected the nearest simple expressions which would make the best case for petroleum. Thus we have reckoned the gallon of oil at 7 pounds, the coal of $6 per tun as ¼ cent per pound, and we have assumed that actual practice in burning oil and coal was fairly conformable to the ratio 3 to 2. As to the practical experiments, we regret that we are obliged to say, that on the question of the economy of burning, they appear quite unsatisfactory. No authentic account of the economical results attained in the experiments with Colonel Foote's apparatus at the Charlestown Navy Yard, or on board the gunboat *Palos*, has come to our notice. Is it not a little remarkable that, in the voluminous publications in newspapers and elsewhere, the one most vital point was ignored? In the experiments with the same kind of apparatus at the Battery in this city, the whole force of the steam evaporated seems to be used in blowing the fire under the boiler. In the experiments at the Brooklyn Navy Yard, which have been very skilfully conducted under the supervision of Lieutenant Clark Fisher, 12 to 13 pounds water were evaporated by one pound of oil; but against this (in a discussion of economy) must be placed the steam raised by an independent boiler, which was used in urging the fire. Mr. Richardson, in some of his experiments at Woolwich, England, needed one-fifth of the whole steam evaporated to secure perfect combustion! So it appears that, in practice thus far, oil, weight for weight, has really done but little better than coal. We are of the opinion, however, that the ratio 3 to 2, by improvements of the burning apparatus, may be attained, but better than that nothing is to be hoped for, and perhaps nothing is possible.*

As the matter now stands, the use of oil for steam fuel seems almost chimerical; the discussion of such a question here seems a waste of good ink and paper. But petroleum fuel for ocean navigation has been so much praised, that, deprecating the patience of our intelligent readers, we devote a few lines to its showing up. We use the simple figures which we have adopted above. A first-class ocean steamship puts on board 1,500 tuns of coal, of which she uses about 150 tuns per day. At $6 per tun, the cargo costs $9,000. An equivalent of oil, at 21 cents per gallon, would cost $54,000. The difference between the cost of coal and oil is $45,000; these are surely great figures for oil. But it is claimed that the use of oil will save the wages of firemen and coal passers, and a great amount of stowage. How much stowage room, if any, is to be saved after the oil is so tanked that it will be safe, does not clearly appear; but, for the argument, allow one-fourth. The accounts of oil and coal respectively stand about thus:

Cost of oil	$54,000	Cost of coal	$9,000
Deduct 375 tuns extra freight, $5 per tun	1,875	Add 10 days wages of 80 men, $3 per day	2,400
Cost of oil trip	$52,125		$11,400
Cost of coal trip	11,400		
Loss by oil	$40,725		

It is said that petroleum can be had in California at $3 per barrel (7½ cents per gallon), while coal is dearer than here. Interpolating this cost of oil in the above statement, the loss by using the oil would be a loss of only a little over $7,000 per trip. Unfortunately for this most hopeful estimate, no petroleum has yet been found in California. In California, Mexico, and on the West India Islands, there is abundance of a bituminous tar, erroneously called petroleum, which some time may be useful for fuel, but which is wholly unadapted to most of the devices for burning petroleum. The question, whether six or seven thousand barrels of crude Pennsylvania petroleum may be put on board a first-class steamship with less impunity than gunpowder and nitro-glycerin, need not come into the discussion.

WHAT IS LABOR?

To its present inhabitants, at least, this is a new country. The wildness and luxuriance of nature must be tamed and pruned to fit it for the highest needs of the race. One result is that as a people we are practical; we praise labor; we admire muscle; we reward it with political honors; our preachers preach "muscular Christianity;" our young men—nay our old men—contest for the meed of victory in base ball; the race is to the swift and the battle to the strong; gymnasiums and calisthenic schools are a part of our educational institutions, and brain work is at a discount, or rather, muscle rules.

So long as this pride of bodily strength and physical energy, is kept in its proper place, all is well, but are we not encouraging a sentiment which is unjust to the brain workers of the race? It is true that the crowning glory of a man is his physique? Are the laborers, the muscle men, the only ones who labor? Do not others who stand in the pulpit or on the rostrum, who study in libraries, experiment in laboratories, think, investigate, and write in parlor and sanctum, actually labor? Is the projector and director less a worker than he who delves and digs? We think not. All honor to the well directed muscle which expends itself in transforming the wilderness, in improving our homes, and in constructing machinery and other appliances for human comfort and happiness; but at the same time, justice to the thinker, the writer, and speaker, who elaborates the crude idea and transforms from the shapeless ore of thought the coin of the mind.

The inventor knows how often his nights are passed in sleeplessness, and his days in abstractedness, in order to elucidate and perfect his unformed ideal. The editor knows how hand and brain become exhausted in the effort to lead, or even to keep up with the never ceasing march of improvement. The mind and body are too intimately connected for the exercise of one not to weary the other. The thinker feels a languor of the body as well as an exhaustion of the mind after protracted intellectual work. The writer calls into play a set of muscles which are among the most easily tired. The almost unceasing movement of the hand and arm in the act of writing is scarcely surpassed in any merely manual labor. Back and forth across the page and from inkstand to paper, for hours, the hand must go, until the wearied muscles refuse to perform their office. The constrained position is next in exhaustive tendency to an enforced confinement in the stocks. Often the body becomes so debilitated that when the writer is released his appetite is gone, and a languor which forbids healthy sleep succeeds.

But apart from the bodily weariness induced by the bodily exertion, the overstrained brain reacts on the body and produces a sense of physical strain not at all different from that experienced by the muscle worker. The enforced action of the will, which compels concentration of thought on one subject, produces intense weariness and pain of body. Then the frequent diversion of the attention from one subject to another, compulsory on the business man, who overlooks the different departments of his business, and the requirements of many persons, who intrude upon him every moment during the day, is anything but conducive to ease of body.

Except for those who perform the simplest and most mechanical labor, there must be brain work with muscular exertion. The unthinking worker only half works. His is the labor of the slave or the ox, with no incentive but the hour of release and the gratification of appetite. The mechanic is thoughtful of the process which the machine he tends is elaborating. He observes its failures and shortcomings and straightway sets the brain at work to improve the device. Or he finds employment for mind in devising an improved tool. Hence come some of our most valued inventions. Is this brain thought no labor? Does it not weary? It would be ridiculous to argue otherwise.

To return to the mental laborers, who among the people age faster? Their hair grows gray and their bodily functions refuse their office sooner than those of the merely mechanical laborer. Theirs is the harder lot, for the mind driven for hours in one track, refuses to stop at beck or call, and it becomes master of the enervated body and denies it rest; while the mere muscle worker finds repose as soon as the strain on the muscles is relaxed.

He is the hardest laborer who drives the brain only, and he is the most reasonable worker who judiciously divides the responsibilities and duties of life between brain and muscle.

RECENT PROMOTIONS AT THE PATENT OFFICE.

For many months the Commissioner of Patents has been promising, promising, to use the authority vested in him by law, to augment the working force of the Patent office, and thus relieve applicants for patents from the grevious delays to which they have so long been subjected. We are happy to record the fact that the Commissioner has at last taken one little step in the right direction, and now, if he will only go ahead in the same line, it may yet be possible for an inventor to obtain a patent before he grows gray.

The following is the list of promotions:—Assistant examiners Schœpf, Thatcher, Stewart, Deane, Peters and Gregory, have been promoted to be Primary Examiners.

Second assistant examiners Thayer, Coombs, Nolen, Hayes, Mygott, Tasker, Curle, Bovee, Spear, Mitchell, and Grinnell, have been appointed first assistant examiners.

Nearly all of these gentlemen have had experience in the duties of the offices to which they are now promoted, and their appointment in preference to new men will undoubtedly be of great advantage to the Patent office.

But their promotions have added nothing to the working forces, though they may perhaps pave the way for such addition. Now, Mr. Commissioner, fill up the ranks with active men, bring up the work at once, and dont wait to be urged and complained about from one end of the country to the other.

NITRO-GLYCERIN---IMPORTANT DECISION.

None of us can ever forget those fearful explosions of nitro-glycerin which took place about three years since. They were heralded by the disaster of the Wyoming Hotel in this city. A small box which had been left in the baggage-room was discovered to be on fire, and was lifted into the street at the edge of the sidewalk, when immediately it exploded with such force that it shook the ground for many blocks; the sound was heard in the most distant parts of the city, the buildings in range were greatly injured, and no vestige of the box and its contents was afterwards discovered. This was at 11 o'clock of a Sunday, the most quiet hour of a quiet day; and only one life was lost, but about a score were wounded. This seemed sufficiently fearful to those who were in the neighborhood. It needed the succeeding events to startle the whole world.

On the 3d of April, 1865, nitro-glycerin exploded in the hold of the *European* while at her dock at Aspinwall. The *European* was a powerful iron steamer, and had cost nearly $200,000. She was literally torn in pieces. A dock four hundred feet in length was destroyed, and great damage was done to the shipping and buildings of the neighborhood. In this case, as at the hotel disaster, Providence seems to have interposed for the saving of life. The number of killed was only sixty.

Then came in quick succession the details of still more fearful nitro-glycerin explosions in other quarters of the globe—from San Francisco and Sidney. In a few months we had paid tribute to this demon, hundreds of lives and millions of property. Then vengeance and punishment were ready for the guilty abettors of the destruction, if they could be found. But the efforts of justice were slow, and it may be that many years more will elapse before the law can give the demanded relief.

One of the most important cases now pending in the courts is growing out of the Panama explosion. As the event of this suit will determine others of similar character we give the latest information about it, which came by the Atlantic Telegraph.

THE NITRO-GLYCERIN EXPLOSION AT ASPINWALL—IMPORTANT LEGAL DECISION.

LIVERPOOL, Wednesday, Aug. 21.

The important suit of the West India and Pacific Steamship Company *vs.* WILLIAMS & GUION, just tried in the Liverpool Court of Assizes, has resulted in a judgement for the plaintiffs, with damages assessed at £130,000 sterling.

The suit grew out of the nitro-glycerin explosion at Aspinwall, New Granada on the third of April, 1866, by which the steamship *European*, belonging to the plaintiffs, was badly damaged while lying at her wharf in the above-named port.

The explosion also resulted in the loss of sixty lives, including those of the Captain and other officers of the steamer. The steamship *Caribbean*, of the same line, being in port at the time also sustained serious damages.

The ship was valued at from £36,000 to £40,000. Her cargo was insured for about £80,000. The damage to the *Caribbean* was estimated at nearly £10,000.

The owners of several buildings on shore, which were demolished, put in their claims for damages to a considerable amount additional.

The underwriters declined to make good the losses, and threw the responsibility upon the owners of the *European*, upon the ground that they were culpable in carrying explosive matter on their ship, and below deck.

The plaintiffs in turn brought suit against Williams & Guion, as the shippers of the nitro-glycerin, claiming that they were guilty of deception in shipping the article under the name of "glonoin oil," (a substance unknown to chemists and to commerce,) and thus involved the plaintiffs in their great losses and liabilities.

The defendents replied that they acted in the matter only as "forwarders;" that the explosive material came to them from a Hamburg house, with instructions to forward to BANDMAN, NEILSON, & Co., San Francisco, via. plaintiff's line; that they themselves were deceived by the descriptive title of glonoin oil in the manifest, and had no knowledge or suspicion of the dangerous character of the freight which thus passed through their hands in the usual course of their business.

The judgement rendered is understood to definitely settle the fact that the plaintiffs are entitled to damages, and that they cannot recover their losses from the underwriters; but the question whether the defendents are ultimately liable, or whether the plaintiffs must look to the original shippers at Hamburg, the originators of the fraud, goes to a higher tribunal for argument and decision.

Large Issue of Patents.

The patents issued for the week ending May 30, numbers, exclusive of designs and reissues, one hundred and ninety. Of these, seventy-five were secured through the home office of the SCIENTIFIC AMERICAN Patent Agency, exclusive of quite a number obtained through our Washington office. Who can say that genius is dormant, if business is generally dull?

PUBLICATION OF CLAIMS OF PATENTS SOUGHT TO BE REISSUED.

The Commissioner of Patents has put in force a new and important rule of practice in respect to applications for reissues. They are no longer to be kept secret, and information respecting the same will be furnished upon inquiry, as well as copies of proposed claims for publication. (Rules of Patent Office, §59.)

The following is the text of the official order:

U. S. Patent Office, August 17, 1867.

Hereafter all applications for reissue will remain before the examiner for thirty days without action, in order to afford time for opposition, and all such applications filed since the 1st inst. will be in like manner retained until the expiration of thirty days from date of reception by them.

(Signed) A. M. Stout,
for the Commissioner.

The wisdom of this new regulation at once commends it self to every inventor or practitioner in patent business.

Previous to the issue of this order all applications for reissues of patents have been made the secret of the petitioner and the Patent office, and upon *ex parte* statements, claims of the most wide reaching import and extensive application have received the sanction of an exclusive government grant, and have suddenly obtruded themselves upon third parties, bearing in their train the countless evils of protracted and expensive litigation. The practice of the reissue of patents has of late years far transcended the bounds which Congress at first contemplated, and has been resorted to in cases where only a strained interpretation of the law could authorize it. A brief survey of the provisions of the law on this subject may not be uninstructive in order to understand its import, and nature, and mode of its evasion.

The first actual provision on this subject was made by the law of 1832 (4 Stat. at Large 559) but prior to that time under the act of 1793 and other statutory provisions, the Secretary of State had power to receive the surrender of the patent, cancel the record thereof, and issue a new patent for the unexpired term, when the defect in the specification arose solely from mistake; as an indispensable necessity to the faithful execution of the promise made by the government to reward the inventor. (Grant *vs* Raymond, 6 Pet. 242; Grant *vs* Mason, 1 Law and Int. Rev. 23; Morris *vs* Huntington, 1 Paine 355-6.)

The Patent Act of 1832, (ch. 162), in pursuance of this implied power, in express terms, acknowledges the right of an inventor to a reissue when his patent is invalid or inoperative, and where by inadvertance, accident, or mistake, the terms and conditions prescribed for obtaining a patent had not been complied with. The prerequisite to the reissue was distinctly announced to be an invalid or inoperative patent, caused by defect in the formalites necessary for procuring the same, or by an insufficient specification.

The Patent Act of 1836, (ch, 357, sec.13,) contains the next provision on the subject, and the right to a reissue is there restricted to the cases where the same result is reached by reason of an insufficent or defective specification, or on account of the patentee having claimed more than he had a right to claim as new, and is continued to be confined to the case when the error has arisen by accident and without fraudulent intent. The only enactments made since that time have been introduced by the law of 1837, (sec. 8,) which regulated the powers and proceedings of the Commissioner upon the application and its partial repeal by the act of 1861, (sec. 9).

Two classes of cases have been properly the subject of review under these statutes but all based on the event of the patent being inoperative or invalid. The first class comprehends cases in which the invalidity results from a defective or insufficient specification; the second includes those in which the same objection arises by reason of the patentee having claimed more than he had a right to claim. (Goodyear *vs* Day, MS.)

The first case seems to arise from an insufficient, the second from an excessive breadth in the specification, but both depend on the prior and controlling condition that the patent is thereby rendered inoperative or invalid. The patent must be one which has no validity in the sense of entitling the patentee to an action for its infringement, (Morfit *vs* Gaab, MS.) If such a state of facts arises, and the patentee by an honest mistake has failed to secure that which he has in reality invented, and which he intended to patent, then the remedial operation of the statute becomes effectual and the consequences of inadvertence are obviated, *ex parte*. (Dyson, App. Cas,) This provison for a reissue was intended to secure inventors, as a deserving and useful class in the community, from the consequences of mistake, and was never intended to serve as an engine for the unfair expansion of claims, and the oppression of equally deserving inventors in kindred subjects, nor as a field for at once exhibiting the refinements and defects of language. To do this, the expressions of the statute must be stretched beyond all rules of correct interpretation and the word "inoperative" must be synonymed into such diluted terms as suit the convenience of the applicant.

How greatly these provisions of Congress have been perverted from their original purpose, members of almost every branch of industrial occupations can testify, so that a few years since so flagrant had become this abuse as to call down upon it the animadversion of the Supreme Court of the United States in the case of Burr *vs* Duryee, (1 Wall. 575) where it is pointedly remarked that instead of a surrender being made of invalid and inoperative patents to obtain a reissue, they were frequently obtained in the case of patents which had been repeatedly adjudged valid, and the opportunity of a reissue, instead of being resorted to for protection, was the occasion of the insertion of expanded and equivocal claims for the purpose of "catching" some fortunate competitor.

It is a remarkable fact that notwithstanding this severe condemnation of the practice by the highest court of judicature in the country the reissue of valid patents with amended, expanded and elastic claims, and for very transparent purposes, has been steadily on the increase and the decision of the court which has prohibited any examination upon a trial of the proceedings before the commissioner upon the reissue except in cases of very notorious and palpable excess of power or fraud, (however beautiful in other respects,) has been to shut the door upon every avenue of escape from the added claims except through a long and expensive defense to an action for infringement, (Allen *vs* Blunt, 2 Wood and M 138; Day *vs.* Goodyear MS., Battin *vs* Paggart 17, How. 84.)

We trust that the rules now adopted for securing open handedness in the application for reissues of patents, which has been long secured in England by the statute of 5 and 6 Will 4 c. 83, may demonstrate their wisdom by a fairer interpretation of the law and a more effiectual remedy against the grasping claims of neighboring inventors. It should be the policy of an inventor to court inquiry in the very outset, and at once save himself from the wearisome anxieties of protracted litigation and preserve others from the like misfortune. The dignity of this government grant likewise will be largely added to, if, instead of being as it now is too often the favorite theater of overlapping claims and contentious differences, it proves as it should be the secure and acknowledged property of him whose ingenuity and success, have singled him out as the meritorious object of protection and reward.

MEETING OF THE ACADEMY OF SCIENCES.

The National Academy of Sciences is an outgrowth of the American Association for the Advancement of Science, and was duly incorporated in accordance with an act of Congress, four years ago. The society is in some respects, under the direct patronage of the Unlted States, being required to report to Congress, and it being expressly provided in its act of incorporation "to hold itself in readiness to investigate, examine, experiment, and report upon any subject of science or art, whenever called upon by any department of government, the actual expense of such investigations to be paid, but the Academy shall not receive any compensation." The number of members is limited to fifty, and is divided into two classes; the class of mathematics and physics, and the class of Natural History. The late lamented Professor Bache was the last president of the Society, and its roll of membership embraces the names of the most eminent scientists in the country. The regular meetings are held each year, one in the city of Washington, the other at any place that may be selected by the Academy.

The semi-annual session this year was held in the city of Hartford, continuing over four days. We append a report of their proceedings, premising that most of the subjects treated were strictly scientific or technical in character and were not designed to be presented in a popular form, but merely for the edification of the eminent savans constituting the body.

The first public meeting of the Academy was opened by "a protest against the modern Nomenclature of Zoology" by Prof. Agassiz. In the Linnaean nomenclature the generic and specific names are retained together and under the authority of the one who proposes the names. But the later system, sanctioned by the British Association, allows the name of the species only, to bear the name of the discoverer. The tendency is, hence, to undervalue the labors of those who investigate the higher or generic classification. The action of the British Association in seeking to revise the nomenclature of past times, so as to make it conform with this modern plan, was also severely criticised in this protest.

"The Duration of the Electrical Discharge" was the subject of a paper by Prof. Rood of Columbia College. Wheatstone in his experiments had given one millionth part of a second, and in later researches Fetterson in 1861, had found one-twenty-five-thousandth part of a second to be the duration of the electrical discharge. Prof. Rood explained by diagrams illustrating his own experiments, how this discrepency in results originated, and stated that he himself, had found the duration varied from the twenty-six to the thirty-thousandth part of a second. Following this paper Prof. Agassiz introduced the subject of "Homocery and Heterocercy" relating to the form of termination of the vertebral column in fishes. This subject first attracted his attention in the course of his studies on fossil ichthyology, but some of his conclusions then adduced had since been disputed by European naturalists. On this occasion he sought by answering their objections to reëstablish his first views. He believed that this question of homocery and heterocery had an importance beyond its mere icthyological bearings, and concerned all animals possessing vertebral columns, Man and the fish are the two extremes of vertebrated animals, in this the former having the shortest and the latter the longest tails.

Prof. Gibbs of Harvard, gave the results of some late experiments on the precipitation, 1st, of copper by hypophosphorous acid; and 2d, of copper and nickel by alkaline carbonates; 3d, The employment of sand and glass filters in quantitative nalysis; 4th, The estimation of manganese as pyrophosphate.

The second days' proceedings began with an abstruse lecture on the varities of Algebra by Prof. Peirce of Harvard. The speaker went deeply into investigation and comparison of Algebraic methods, with strictures on the views of Hamilton and De Morgan. "Certain points in the Theory of Atomicities," was the subject of a paper read by Prof. Gibbs. The "Significance of Classes in the Animal Kingdom," was treated by Prof. Agassiz. The German naturalist, Oken, based the classification of animals on character, and as far back as 1811, he expressed views indicative of a belief in the existence of classes as the representatives of structural ideas. Since his day there has been but little advancement beyond that time. The speaker had suggested a plan of classification based on the preponderence of nerves, of muscle, or of solid frame. He believed that the division of the class of reptiles by Blainville into reptiles and batrachia, should form two totally distinct groups as they had features totally different. The latter formed an embryonic class, their growth an embryological growth, and this fact might determine their place in a future and perfect system of classification.

On the third day's session Prof. Agassiz discoursed "on the structural character of Selachians." He had chosen this subject because they are not well known, and additional information was desirable, and because during his recent tropical trip he had facilities for gaining information enjoyed by few naturalists. From his studies the Professor was convinced that the Selachian group should include besides sharks and skates, the class known as chimaera. Selachians are the first existing vertebrates and hint at the structure of man. He entered at large into the peculiar structural features of the class, showing that from every point of view, the selachians were a prophetic and explanatory type. President Hill, of Harvard, next addressed the Academy on a new problem in curvature, after which Prof. Hall, of Albany, remarked upon the "Geological relations of the Mastodon and fossil Elephant, as indicated by the position of the Cohoes Mastodon." The Mohawk river for some miles west of Cohoes and thence to the Hudson, is now running in a new channel, its old bed having been dammed up by gravel. The elevated plateau below the falls which a few years ago was covered with swampy matter, is marked by a number of pot holes of a remarkable character penetrating to a greater or less depth into the rock. The bones of the Cohoes Mastodon were found in three separate holes, but they evidently belonged to the same individual. These bones could not have been left thus separated if the commonly received opinion which accounts for all fossil remains by supposing the animal to have been imbedded in swamps, were correct, and hence the Professor argued that the monster after death was brought down by the river, left on a projection of the bank; in time the severed bones were washed into the holes where they were found or the remains of the mammoth were carried thither, preserved in the ice of the ancient glacier covering the country and were dropped here at its melting. Prof. Agassiz coincided with the latter supposition, but thought that Professor Hall did not go far enough in his views on the glacial action. Not only was the disposition of the bones the result of that action, but the potholes were also formed by glaciers. They were caused by waterfalls, as the formation of precisely similar holes by these means, in Switzerland fully demonstrated. The next paper was read by Gen. Barnard on the "Precession and Nutation of the Equinoxes, as resulting from the theory of the Gyroscope with remarks explanatory of the deviation of rifled projections." This gentleman contributed to Silliman's *Journal* some time ago, what is considered the best solution of that singular paradox, the gyroscope, ever given. The present paper was a further elaboration of his views with the applications above stated.

On invitation Hon. Henry Barnard then addressed the body on the plans and purposes of the new National Department lately established for the purpose of collecting statistics which will show the progress of education in the United States.

Professor Gibbs opened the last day's proceedings with a paper on "use or extension of the use of the Spectroscope, and its more advantageous construction." He had experimented for some time unsuccessfully to get a greater dispersive power. At last by adding sulphur to a solution of bi-sulphate of carbon, he obtained a transparent pale yellow fluid, with three times the dispersive power of flint glass. The next speaker was Professor Hall on "Certain Geological Series when traced in the Geographical Extension." Certain formations in this State have received different names at a distance of three hundred miles without any reason. The source of the sedimentary formations in the West is the same as that of the lake formations in New York.

Professor Agassiz said that the difficuty Professor Hall found (as to the occurrence of different fauna in formations otherwise the same) was identical with the difficulty we feel about the occurrence and vanishing of groups of animals. At present every area on the surface of the earth has its own peculiar animal and plant life, and no satisfactory proof existed but that the same state of affairs existed in former periods.

Professor Agassiz spoke again on the practical value of geologic investigations, showing how, in spending six weeks on the Amazon, he had been able to determine that the Amazon does not form a delta, because the residuum melts away, and the ocean encroaches on the shore. The process of washing away the coast is so rapid that no hydrographic works can be undertaken by the Brazilian government, except at a distance from shore, and a prospect of having to rebuild. Professor Agassiz then read a paper on the "Circulation of Blood in the Skate," and was followed by Professor Gibbs, on "a Method of determining Wave lengths in the Solar Spectrum." In concluding the public sessions, Professor Henry remarked on the mission and importance of the National Academy to the general interests, and closed with thanks to the public for the interest shown throughout their meetings.

Kerosene Lamps.—If any one wants a real good lamp let them try the "Victory"—an appropriate name. Its superior qualities and a picture of the lamp itself, are set forth on our advertising pages to which we refer the reader.

he Suez Canal---Its Present and Prospective Condition.

A correspondent of the San Francisco *Bulletin* gives the following account of the Red Sea and Mediterranean canal:

"Having landed at a little stone pier opposite Suez and on the Asiatic side, a walk of 15 minutes brought us to the bank of the canal. This is an enterprise undertaken and carried on by a French company, and is intended to connect the Red Sea with the Mediterranean and to be large and deep enough to permit the largest class of vessels to pass through into the Indian ocean. Though the distance is only about 70 miles, this is undoubtedly one of the most formidable civil undertakings of modern times. And, considering the admitted doubt of its feasibility, this is even a more daring attempt than the Pacific Railroad. The building of the Pacific Railroad was never a question other than of money and time. But after cutting this canal about 20 miles of the line to the requisite width an obstacle, thought by many to be unsurmountable, has been met with. It passes through a shallow lake for a considerable distance, and it is in this that the trouble has developed. The bottom is a quagmire, and as fast as it is thrown out fills up again by oozing in from the bottom and sides. A difficulty under which the railroad company labor, has also been found to threaten the canal builders even more formidably than it has that enterprise. It is the drifting sand of the desert that constantly moves with the wind, filling up and covering over every obstacle in its path. The railroad managers are obliged to be at work constantly to keep their track above ground. And it is claimed by many engineers to be practicably impossible to keep the canal open, even if it ever is finished. The original capital of the company was 400,000,000 francs. They had also an extensive grant of land along the line of the route from the late Viceroy of Egypt. But the present Viceroy Ishmael Pacha, is rather unfriendly to French influence and inclines to the English. This is encouraged and urged on by the diplomats of that nation, who see pretty plainly the plans of France to get possession of all northern Africa. The Order of the Bath has just been conferred upon the Egyptian with appropriate ceremonies. He has therefore withdrawn the grant of land and compromised with the company by a subsidy of money instead, amounting to about 80,000,000 francs. The original capital had been well invested, and the management has been able to report to the company that while an amount has already been expended in the prosecution of the enterprise nearly equal to the original capital stock, still a sum remains in the treasury of about the same amount for future operations. The report which has recently appeared claims that the work is going on in a successful manner, and that in six years the whole will be complete."

"Though began long before the Pacific Railroad, unless the Frenchmen are wide awake, the American road to India will be completed ahead of them. The canal is intended to be 300 feet wide and 25 feet deep. That part near to Suez, and which we visited, is being executed in the best possible manner, and if it all shall be finished equal to this section, the Suez Canal will be a work in the engineering line never before approached in the history of that science. But when it is finished the power of the Turk in Africa will have passed away and one more step toward making the Mediterranean a French lake will have been taken. The line of the canal runs almost due north from a point opposite Suez debouching at Port Said in the Mediterranean. The Russian line of steamers from Alexandria to Odessa on the Black Sea touch at this port once in a fortnight. It is about 50 miles east of the Damietta mouth of the Nile. The canal is already cut to a width and depth sufficient to permit the passage of boats from Suez to Port Said. From Suez north to a distance of 20 miles barges are towed by men or horses, and from that point to the sea small screw steamers ply back and forth. This is done by means of a small channel or ditch cut in the middle of the intended canal, and is about 25 feet wide. The ship canal is being down on each side of this to the requisite width, but in no place has it reached a sufficient depth. The depth is to be obtained by excavations to a point where the water shall prevent this class of operations, and after that by dredging. The great canal has one feeder from this branch of the Nile to supply it with water, the balance coming from the lake and the two seas that it is intended to connect. The steamers of the Peninsula and Oriental Company do not come up to Suez, but anchor in a harbor about five miles further down. In fact the little vessels that do reach the town do so only at high tide, and for a great part of the 24 hours in the day lay high and dry in the mud and sand."

ARTIFICIAL DIGESTION.—A London physician, Dr. Marcet, has announced a process by which natural digestion is similated by artificial means, and solid food may thereby be prepared for invalids. Dr. Marcet takes fifty-eight grains of muriatic acid having a specific gravity of 1·1496; fifteen grains of pepsine—the organic principle procured from the stomach of a pig or other animal. Diluted in a pint of water and added to a pound of raw meat, the whole is allowed to simmer over a water bath at about the temperature of the body, 98° F. When the meat is by this means sufficiently broken up, it is strained and the acid neutralized by eighty-one grains of bicarbonate of soda. The product is of a most agreeable character, easily digested and vastly more nutritious than beef tea. Where pepsine cannot be obtained, the doctor has found strips of calves' stomachs answer very well.

MOWING MACHINES are not very generally used in England, and the chief obstacle to their introduction has been the land lord's dread of the destruction of game, as the machines show no mercy to sitting pheasants and partridges.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING AUGUST 20, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

67,836.—FLOUR BOLT.—R. H. Alexander, Plato, Ohio.

I claim constructing a bolting reel with a hollow perforated shaft, such shaft being furnished with a hollow open end journal, all substantially in the manner and for the purposes described.

2d, The construction of the lever, G G G1, so that it will operate upon the the sliding hook rods, h h h1 h1, and cause the hooks, l l, to either stop or free all the knockers, g g, or a portion of them, as may be desired, substantially as and for the purpose set forth.

67,837.—BRIDLE REIN.—Wm. D. Andrews, New Yor city.

I claim the safety riding or driving reins, E, whether the same be made separately from, or are inclosed, and move freely within and through the ordinary driving reins, A, or whether with or without check rein attached, as described, when the said reins are combined with, arranged and attached to the reins, E, in the manner and arranged so as to operate as described for the purpose specified.

67,838.—SLEIGH BRAKE.—John Ast, Maquoketa, Iowa.

I claim the combination of the cranks, E, and rod, B, and lever, L, with the slotted levers, C C, so as to operate substantially as above described.

67,839.—MANUFACTURE OF WHITE PAINT FROM ZINC ORES.—Nathan Bartlett, Birmingham, and George T. Lewis, Philadelphia, Pa.

We claim the employment of steam, in combination with water, in the manufacture of white paint from zinc ores, the water being so arranged that the products of combustion arising from the furnace shall be caused to pass through or come in intimate contact with the water on their way from the furnace to the bags or settling chamber, and the steam being caused to mix with such products before they pass through or come into such contact with the water, substantially as set forth.

67,840.—VALVE FOR GAS GENERATORS.—John H. Beacher, Philadelphia, Pa.

1st, I claim a valved regulator, constructed and operating substantially as set forth, in combination with and forming a part of a gas generating apparatus, as specified.

2d, The throttle valve composed of two disks with intervening strips of leather, as set forth.

67,841.—MUFF.—Louis Bauhoefer, Philadelphia, Pa.

I claim, as a new article of manufacture, a muff consisting of two or more sheets of suitable material, cut folded and stretched so as to form a number of compartments, each of which contains a body of cork, as set forth.

67,842.—AMALGAMATING PRECIOUS METALS.—John B. Beers, San Francisco, Cal.

I claim the use of amalgamated woven wire gauze or amalgamated perforated sheet metal.

I also claim, in combination with amalgamated wire gauze or perforated sheet metal, the canvas or cloth arranged under the wire gauze or perforated metal.

I also claim, in combination with the amalgamated wire gauze or perforated metal, the use of corrugated amalgamated sheet metal plated either with or without the canvas or cloth.

I also claim, in combination with amalgamated plates, the use of iron wire gauze or screens, arranged on or above the plates, substantially as described for the purpose set forth.

67,843.—CORN PLOW.—Andrew Canfield, Lyon, Iowa.

I claim the adjustable beams, A A, with joint at B, and the open link, C, also the slotted bar, D, with the clamps, E E, when constructed, arranged and operating substantially as and for the purposes above set forth and described.

67,844.—CORN PLOW.—Andrew Canfield, Lyons, Iowa.

I claim, 1st, The double bolted clevis, B, for the purpose described.

2d, The adjustable stay bar, D, for the purpose above described.

3d, The combination and arrangement of a one-horse corn plow that may be readily changed to any required width, also changed to any number of shovels from one to three, making a single, double, or three-shovel plow.

67,845.—PORTABLE FORGE.—John M. Cayce, Franklin, Tenn.

I claim the arrangement in a portable forge of the fire-pot, D, the side tubes, K K, discharging currents of air that meet at the center of the fire pot with the fans, F F, the treadle, H, and the tool shelf, L, substantially as and for the purposes specified.

67,846.—SPORTING LIFE BOAT.—John M. Cayce, Franklin, Tenn.

1st, I claim the braces, G G, in combination with the frame, B2 B1, rods, H, keys, g g, and reel, A, substantially as and for the purpose described.

2d, The floats, K K, in combination with the arms, I I, attached to them and to the boat, substantially as described.

67,847.—LIDS FOR PAILS, KETTLES, ETC.—S. B. Cox, Buffalo, N. Y.

I claim the combination with the grooved india-rubber ring, the fasteners, and the vessel and its cover or lid, the whole arranged and combined substantially as herein set forth, of the flexible conductor pipe, C, secured to the said cover or lid by the screw joint, D.

67,848.—CORN-CANDY CUTTER.—David Davenport (assignor to Henry C. Wilkins), Albany, N. Y.

I claim the traversing block, E, carrying the knives, K K, crossing each other and operated by the spring, S S, and treadle, T, to cut the cake of candy entirely across, in each direction, at one operation.

Also, the combination of the subject matter of the above claim with the slotted plate, b, the recess, a beneath it, as described.

67,849.—TUNNEL.—Joseph Dixon, New York city.

I claim a subterranean or submarine tunnel, the walls and roof of which are constructed of rectangular metallic plates, each one of which has a lip or flange turned up around its four edges, the plates being bolted together through the flanges, arranged so as to break joints, and packed tightly at the seams, substantially in the manner and for the purpose specified.

67,850.—HARVESTER RAKE.—John A. Dodge, Auburn, N. Y.

I claim, 1st, The combination, substantially in the manner described, of the continuously revolving rake and reel arms all traversing the same track and controlled by the same guide, with a guide which lifts the beaters or reel vanes suddenly after pressing the grain back upon the platform to avoid disturbing the gavel while the rake passes over the platform to take off the grain without being lifted.

2d, The combination, as described, of the arch, f, with removable block, 1, for the purpose of adapting the beater arm to be changed to a rake arm, and vice versa.

3d, The arch or bend, f, in the rake arm, as and for the purpose described.

67,851.—HARVESTER RAKE.—John A. Dodge, Auburn, N. Y.

I claim, 1st, The combination, substantially as described, of a cam plate and locking washer with a fixed spindle, for the purpose set forth.

2d, The combination, substantially in the manner described, of a series of rising and falling rake and reel arms revolving around a fixed spindle or axis with a cam guide to control their vertical movements, a cam plate to hold the rake down when raking off end, and locking washer to hold the cam plate firmly in position.

67,852.—HARVESTER.—John A. Dodge, Auburn, N. Y.

I claim, 1st, The combination of the driving axle, flanged thimble, and sprocket wheel, arranged for joint operation, substantially as described.

2d, The combination, substantially as described, of the loose driving wheel, the driving axle, the flanged thimble, the sprocket wheel, and the retaining collar, E, for the purposes set forth.

67,853.—HARVESTER RAKE.—John A. Dodge, Wm. H. Stevenson, and Howard S. Stevenson, Auburn, N. Y.

We claim, 1st, The combination, substantially as described, the combined rake and reel arms with the collar, the cam groove, and the fixed rake post.

2d, The combination, substantially in the manner described, of the cam guide and rake post, whereby the flanged collar, to which the raking and reeling mechanism is attached, can be removed by detaching the cam guide from the rake post.

67,854.—MEAT CHOPPER.—Augustus F. Doebert, Lancaster, N. Y.

I claim, 1st, The combination and arrangement of the set screws, K K, and rubber cushions, L L, with the timbers, E E, carrying the knives, D D, for the purpose and substantially as set forth.

2d, The revolving chopping block, B, having an intermittent revolving movement and a ratchet wheel, L, connected therewith, in combination with the pawl, J, and crank, B2 for the purpose and substantially as herein described.

67,855.—MOLDERS' FLASK.—Mathew M. Donnell, Cincinnati, Ohio. Antedated Aug. 11, 1867.

I claim an improved molders' flask with adjustable ends, constructed in the manner substantially as and for the purpose set forth.

67,856.—MOLDERS' FLASK.—Mathew M. Donnell, Cincinnati, Ohio. Antedated Aug. 11, 1867.

I claim the combination of the lug, F, with its countersunk hole, f, in combination with the pin, E, with its waist, e, when the two are united and held together by soft metal, in the manner described.

67,857.—MODE OF FORMING A STEEL SURFACE SHEET AND BAR IRON.—Josiah W. Ellis, Pittsburgh, Pa.

I claim the herein described method of forming a cast steel surface on bars or sheets of wrought iron.

67,858.—CLOTHES WASHER.—F. Ernst, San Francisco, Cal.

I claim placing the fabrics to be washed between perforated plates or sieves, E and D, in a closed vessel of any suitable construction, so that a vacuum, F, may be created beneath the lower plate, substantially as described.

67,859.—METAL CAN FOR PUTTING UP ALKALIES.—Horace Everett, Philadelphia, Pa.

I claim the within described can composed of a sheet iron cylinder with folded and compressed ends, and cover, and bottom, adapted to the said ends, all as set forth for the purpose specified.

67,860.—SEEDING CULTIVATOR.—James B. Ewell, Baltimore, Md.

1st, I claim the detachable swivelling front truck constructed and combined with the frame, as described.

2d, The combination, substantially as described, with the main frame of the diagonally-arranged plows, having drag bars of varying lengths.

3d, The combination, substantially as described, of the diagonally-arranged rocking lever and cams with the vertically moving plow beam, L.

4th, The combination, as described, of the diagonally-arranged hopper and feed cylinder with the frame.

5th, The combination of the diagonal seeding cylinder, the driving gear, and the shipping mechanism, with the main frame and driver's seat, as and for the purpose described.

6th, The combination, substantially in the manner described, in a seeding cultivator, of a seed hopper, a feeding cylinder, and a series of plows all arranged diagonally to the path of the machine.

7th, The combination, substantially in the manner described, of the leading truck, the cultivating mechanism, and the seeding mechanism.

67,861.—HOOKS AND TERRETTS.—William R. Ferguson, Marseilles, Ill.

I claim a hook, F, and terrets, G G, having bases, D C C, made to fit the outer layer, A, of the back pad, and secured to it by means of rivets, h h h h, and washers, J J J J, substantially as and for the purpose herein specified.

67,862.—ORE-ROASTING FURNACE.—George B. Field, New York city.

1st, I claim the tube, G, in connection with the agitating apparatus, substantially as and for the purpose described.

2d, The eduction pipe, H, having its extremity bent upward, substantially as and for the purpose specified.

3d, The introduction of water or steam inside of hollow shelves, rakes, or agitators for the stirring or manipulating of ores in ore-roasting furnaces, substantially as and for the purpose specified.

4th, The introduction of steam generators in the inside of roasting furnaces for the purposes specified.

67,863.—APPARATUS FOR DISTILLING AND RECTIFYING SPIRITS.—André Foubert, New York city.

1st, I claim the agitating condenser, formed with the diaphragms, h, the vapor pipes, i, the caps, k, and pipe, o, supplying water for cooling the liquid on the diaphragms, as and for the purpose specified.

2d, The arrangement of the still, d, the agitating condenser, n, the rectifying column, p, and the condensers, s and t, as and for the purposes specified.

67,864.—APPARATUS FOR DISTILLING SPIRITS.—Andre Foubert, New York city.

I claim the still, a, into which the diaphragms, g h i, pipes, k, and caps, b, are introduced, the water being returned to the still by the pipes, m n, and the temperature of the liquid on the diaphragms being regulated by water flowing through the pipes, o o, as set forth.

67,865.—MACHINE FOR MAKING BUCKLES.—Merwin Fowler (assignor to Turner, Seymour and Janes), Wolcottville, Conn.

I claim the series of dies, constructed and arranged substantially as specified, and acting successively to bend up a piece of wire into a buckle bow or frame, substantially as set forth.

67,866.—BOILER GAGE COCK.—John French, Newport, Ky.

1st, I claim the special valve stem, A, in combination with the body of the cock, C.

2d, The spiral valve stem, A, the button or cap, B, in combination with the body of the cock, C, substantially as described.

67,867.—STEAM-ENGINE OIL CUP.—F. H. Furniss, Cleveland, Ohio.

1st, I claim, in combination with an oil cup, a pawl, and ratchet, so arranged as to operate the key or plug of said oil cup, substantially as set forth.

2d, The pendulum, F, ratchet wheel, J, and pawl, K, in combination with the plug, substantially as and for the purpose set forth.

3d, The gage or regulating screw, E, and plug, D, in combination with the oil cup, substantially as and for the purpose described.

67,868.—MARBLE CEMENT.—G. G. Gariboldi, Buffalo, N. Y.

I claim a marble cement, made, applied, and used in the manner, substantially as herein described.

67,869.—COOLER FOR LIQUORS ON DRAUGHT.—Joseph Gatley, Philadelphia, Pa.

I claim the cooler, A, suspended from beneath the faucet, B, or tap hole, or other opening through which liquors are drawn, from their containing vessels, substantially as shown and described.

67,870.—TUCK MARKER FOR SEWING MACHINES.—H. C. Goodrich, Chicago, Ill.

1st, I claim providing a tuck marker to be used upon a sewing machine, with a flange or lip, b, arranged in relation to the creasing devices, and operating substantially as and for the purposes set forth.

2d, I claim, in combination with a tuck marker provided with a flange or lip, b, the arrangement of a gage, D, provided with the projections, E F, substantially in the manner and for the purposes described.

3d, I claim the combination of the tucker, A, provided with the lip, b, and measuring scale, B, and with the spur, c, with the gage, D, provided with the projections, E F, when arranged and operating substantially in the manner and for the purposes described.

67,871.—PLATFORM SCALE.—W. P. Goodman (assignor to Davis, Lawrence & Co.), Dublin, Ind.

1st, I claim the balance weight upon the end of the steel-yard beam, above the level of the fulcrum, when constructed with a cap, B, for piercing such weights as may be necessary in the adjustment of the steel-yard beam, and cap, B, substantially as described.

2d, The combination of the cup, B, and cap, B1, when the latter is constructed with its sides of unequal weight, substantially as and for the purpose set forth.

3d, The corner irons, K, supporting the hooked and notched hanger, K1, in combination with the notched blocks, K2, supporting the platform levers, substantially as set forth.

4th, The levers, F G H, and I, constructed with an eye in the end, and knife-edged bearing, H, in combination with the rocker block, K2, on which they are suspended, substantially as described.

5th, The combination of the rocker-block, N2, ball blocks, N, balls, N1, and check blocks, L1, substantially as set forth.

6th, The combination of the frame, L, check block, L1, and rods, M, substantially as and for the purpose set forth.

7th, The combination of the shears, O, with fins, O1, and the notched pivots, P, substantially as and for the purpose set forth.

67,872.—CLOTHES LINE REEL.—G. B. Griffin, Madison, Wis.

1st, I claim the frame, A, the reel, B B1, B2, the line, C, and the blocks, E E, when combined and arranged as described.

67,873.—MOP HEAD.—H. M. Guild, Springfield, Mass.

1st, The arrangement of the jaws, A B, hinged at C, and having the threads a a, etc., of the screw cut thereon, in combination with the nut, E, arranged so as to fit said screw threads, a a, and to bring together the jaws, A B, by turning the end holding the mop, substantially as shown and described.

67,874.—APPARATUS FOR ATTACHING WEIGHTS TO SUBMARINE ARMOR.—David Hale, assignor to himself and A. Hale, Boston, Mass.

I claim a weight-holding and attaching device for submarine armor, the same consisting of the box, divided into weight pockets or compartments, and having eyeletted flanges for securing it in place, substantially as shown and described.

67,875.—MINERS' PICK.—H. M. Hamilton, New York City. Antedated August 1, 1867.

I claim a pick or mattock, constructed with an eye open at each end, and whose sides are partly parallel and partly flaring, and adapted to the introduction of a handle whose sides are of counterpart form, and whose flaring sides are adapted to wedge in said eye, substantially as described and represented.

67,876.—CURTAIN FIXTURE.—C. T. Herrick, Independence, Iowa.

I claim the cam, E, provided with a groove in combination with the cord, 1, yoke, C, and rail, A, substantially as and for the purpose set forth.

67,877.—CAR VENTILATOR.—Robert Hitchcock, Springfield, Mass.

I claim the combination of the valve, E, having the cap, c, with the case, A, having pieces, C and C', and vent hole, F, the whole being constructed and arranged substantially as herein described.

67,878.—SHAFT COUPLING.—Hiram A. Hurd, Seymour, Ct.

I claim a coupling on the face of each part, of which are formed projections, E E, and recesses, D D, one side, a, of each of the projections of a dovetail form, the other side, d, at right angles, the two parts set together and secured by key, G, inserted between the right angles or parallel sides, substantially as herein set forth.

67,879.—BRICK MACHINE.—W. G. Hyndman, Cincinnati, Ohio, assignor to himself and Henry Martin.

I claim the "wiper," D, with its flange, d, constructed and operating substantially as and for the purpose herein specified.

I also claim the construction of the outlets, G, G, with the rounded or champered corners, g g, and abrupt corners, h h, substantially as and for the purpose herein set forth.

I also claim the conical or tapering die rollers, a a, for the purpose herein set forth.

I also claim the arrangement of the rollers, a a, so as to be adjustable out and in, between the rollers, m m, substantially as and for the purpose herein specified.

I also claim the device for fastening the cloth covering around the die rollers, consisting of the longitudinal and annular grooves, r r r, and fastening strips of wood, or equivalent, substantially as set forth.

67,880.—CEMENT FOR LINING OIL BARRELS.—Samuel H. Jones (assignor to himself and Charles W. Bready), Sandy Spring, Md.

I claim the mixture and cement of zinc, chalk, alcohol, turpentine, and water, in their several proportions, as herein described, and for the purposes set forth.

67,881.—THREAD WAXER FOR SEWING-MACHINES.—George F. Kendall (assignor to E. M. Dickinson & Co.), Fitchburg, Mass.

I claim the arrangement and combination of the rotary elastic disks, g h, with the shouldered shaft or pin, the collar, the nut and the screw of the pin, the whole applied to or arranged with the trough and the depresser, as set forth.

I also claim the construction of the trough, with the shoulder, a, at its bottom, and with the rotary depresser applied to the trough, so as to operate with such shoulder as set forth.

67,882.—HARVESTER.—L. G. Knillen, Worcester, Mass.

1st, I claim the combination, substantially as described, with the main axle

of the main gear wheel, C, the spring-ratchet, c, the eccentrically slotted tubular bed piece, D, and the shipping lever, C', for the purpose of throwing the mechanism into and out of gear.

2d, The combination, as described, of the main gear-wheel, the countershaft, carrying gears of different sizes, and a shipping lever, with the crank shaft and its pinions, all the axles being arranged with their axes parallel to each other, for the purpose of changing the speed to adapt the machine to either reaping or mowing.

67,883.—HARVESTER.—L. G. Kniffen, Worcester, Mass.

1st, I claim the shoe, L, constructed and arranged to operate as and for the purposes described.

2d, The combination with the hollow vibrating coupling arm, through which the pitman vibrates endwise, of the shoe clasping and oscillating around the coupling-arm, all the parts being constructed and arranged for joint operation, in the manner described.

3d, The combination, as described, of the finger-beam, the detachable hinged shoes, the coupling arm, and the brace-rod, with the tubular bed piece, for the purpose of changing simultaneously from a front to a rear cut machine, and from a mower to a reaper, or vice versa.

67,884.—HARVESTER.—L. G. Kniffen, Worcester, Mass.

1st, I claim the arrangement as described, in a two-wheeled hinged jointed harvester, of the swinging raker's seat, with respect to the tubular main frame, driving wheels and reversible couplings, as set forth.

2d, I claim the combination of the main frame and coupling arm, with the adjusting spring catch, V, as and for the purpose described.

3d, The driver's or raker's seat, constructed of independent springs, as described.

67,885.—HARVESTER.—L. G. Kniffen, Worcester, Mass.

1st, I claim the socket plate, O, constructed to act both as a support for the lifting and tilting mechanism, and as a detent to hold the finger-beam vertical when folded for transportation, substantially as described.

2d, The combination of the lifting lever, with the swinging ratchet arranged and operating as described.

3d, The combination and arrangement substantially as described, of the socket, the lifting lever, and the swinging ratchet with the main frame, and cutting apparatus.

4th, The combination, substantially as described, of the lifting lever, the tilting lever, and the hand lever, for the purpose of either lifting or tilting the cutting apparatus.

67,886.—TURNING AXLES.—George S. Knight, Syracuse, N. Y.

I claim an improved machine for turning axles and shafting, composed of the movable jaws, B and C, cutters or "clamp mills," F and G, and screw, D, or their respective equivalent, all made arranged and operating substantially as and for the purpose herein shown and described.

67,887.—CIGAR MACHINERY.—W. Kramer, Wilwaukee, Wis., and Joseph Wise, New York City.

1st, We claim the table, c, apron, e, and mold, d, in combination with the roller, i, substantially as and for the purposes set forth.

2d, A removable mold for the reception of the filling tobacco, in combination with an apron passing into such mold, substantially as and for the purposes set forth.

3d, The arrangement of the roller, i, stock, h, table, c, mold, d, and tightening roller, g, for the apron, e, as and for the purposes set forth.

4th, The roller, l, fitted and actuated suostantially as specified, in combination with the cloth, o, and roller, v, as and for the purposes set forth.

67,888.—HARVESTER RAKE.—I. Lancaster, Baltimore, Md.

I claim the application to reapers with grain binding attachment, having the platform in the rear of the reaper platform, and parallel to it or rake and fender, constructed and operated substantially as described, and for the purpose mentioned.

67,889.—HINGE.—George W. Lane, Plantsville, Ct.

I claim the two parts of the hinge, A and B, constructed so as to be attached together, and operate in the manner described.

67,890.—PLOW.—W. E. Levoy, Cincinnati, Ohio.

1st, I claim the mode of adjusting the land of the plow, substantially as set forth and described.

2d, I claim the peculiar form and curves of the mold beard, B, substantially as set forth and described.

3d, I claim the particular form and construction of the upright or sheath, G, with the brace, I, the socket, T, and the draft rod, J, in connection with the adjustable bar, K K', with the nut, L, and pin, O, as set forth and described.

4th, I claim adjusting the angle of the plow to any required slope of ground, or to level land, by means of the adjusted shackle bar, or its equivalent, substantially as set forth and described.

67,891.—WINDOW FASTENING.—Jonathan Luther, and Alexander Marsh, Worcester, Mass.

We claim the peculiar formation of a base or main piece with shoulders and lips, a a, as shown in figs. 1 and 3, in combination with spring, F, lever, C C C, and pin, E, as shown in fig. 2, for the purpose as above described.

67,892.—NIGHT CART.—John H. Lynch, Baltimore, Md.

1st, I claim the box, A, provided at the rear with a tight fitting shutter, I operated by means substantially as described.

2d, The door, C', with packing membrane and rounded corners, and secured substantially as described.

67,893.—ANIMAL TRAP.—H. Mansfield, Wassau, Ind.

I claim the combination of thimble, D, cup, C, cord, I, pully, J, hooks, o, loop, H, and standard, B, when constructed substantially as and for the purpose set forth.

67,894.—MODE OF VENTILATING AND WARMING RAILROAD CARS.—A. J. Marshall, Warrenton, Va.

I claim, 1st, In combination with a pneumatic engine, which is arranged in front of a locomotive, and adapted for being driven by means of an engine operating independently of the locomotive-driving engine, I claim the arrangement of a primary conduit, constructed as described, with flexible connections, and forming the passenger coach, and adapted also to serve as a medium through which to supply and condense air in such coach, substantially as described.

2d, In combination with a primary conduit, C4 for conducting air, and forming the roof a railway coach as described, I claim the secondary conduits, E, arranged within the car, and communicating with the said conduit for the purpose of abundantly distributing pure air to service pipes, b b, which are provided with registers, c, and arranged substantially as described.

3d, In combination with a railway coach having a double roof, or air conduit, communicating with and receiving air from a forcing engine, arranged upon the locomotive, I claim means substantially as described for warming said air, and distributing it throughout the coach, substantially as described.

4th, The warm air distributing conduits or foot rests, g g, applied beneath or between the seats of a railway coach, provided with registers, and communicating with air-heating apparatus, substantially as described.

67,895.—PAPER FASTENER.—John W. McGill, Washington, D. C.

I claim the within-described fastener, made of a single piece or strip of sheet brass, or other flexible material, bent into a T-shape by having the ends which form the legs or shanks turned over or under and run through a hole in the enlarged centre of the head of the fastener to secure said legs or shanks tightly together, so that when said legs or shanks are run through the paper or other material designed to be bound and turned down on the other side, they will not enlarge the hole in the paper, but will lie snugly together and make a close joint, substantially as herein set forth and described.

67,896.—OILER AND FILLER.—Alexander Millar, Roxbury, Mass., assignor to himself and Alfred Odiorne, Medford, Mass.

I claim, in combination with the reservoir ejecting pipe, cylinder, and piston, the false bottom, c, shallow chamber, d, and valve, f, constructed and arranged to operate substantially as set forth.

67,897.—CAR SPRING.—John S. Miller, assignor to himself and L. L. Davis, Springfield, Mass. Antedated August 5, 1857.

I claim the combination and arrangement of the spring for cars, etc., formed of a cushion of air inclosed in a case, C, of rubber, or similarly elastic material, placed within a cylinder, A, operated upon by a piston, B, the whole constructed and operating substantially as described.

67,898.—CARTRIDGE BELT.—Anson Mills, U. S. A., Fort Bridger, Utah Territory.

I claim the combination and arrangement of a series of receptacles, e e, for metallic cartridges, with a pliable band or belt, A, formed and fitted to be worn about the body, substantially as herein set forth.

67,899.—PEN HOLDER AND ERASER.—Wm. A. Moore (assignor to John G. Powell, John M. Hudder, and John M. Hudders), Philadelphia, Pa., assignor to Wm. A Morse.

1st, I claim the combination of the eraser, D, with the tip, B, and the handle, A, of a pen holder, as shown and specified, and for the purpose set forth.

2d, I claim the combination of the eraser, D, fig. 2, cap or shield, H, and handle, s, of a pen holder, as shown, and for the purpose specified.

67,900.—STOVEPIPE SHELF.—O. B. Olmsted, Beloit, Wis.

1st, I claim an improved stove pipe shelf, A A, constructed of a perforated disk in two parts

2d, In combination with the foregoing, I claim the collar, K, with the projections, D D, as and for the purposes specified.

3d, I claim the ribs, C C, when the whole is constructed substantially as herein set forth, for the purpose specified.

67,901.—MACHINE FOR CLEANING WOOL.—S. R. Parkhurst, Bloomfield, N. J.

1st, I claim the carding cylinder, a3, in combination with the cylinder, f or g, stripper, h or i, and picker cylinder, d, substantially as and for the purposes specified.

2d, I claim the doffer, e2, in combination with the mechanism substantially as specified for opening and cleaning wool or other fiber, whereby the said fiber is delivered from the picking or cleaning mechanism in the form of a sliver or bat, substantially as set forth.

67,902.—FENCE.—William Pettingell, Painesville, Ohio.

1st, I claim the base herein described, and constructed as shown in figs. 2, 5, 3, 6, and 7, viz: the skeleton or open halves, D D, angular dovetailed tenons, F F, lugs, H H, rim, G, broad flat ring, I, provided with notches, J J, combined, arranged, and operating as and for the purpose set forth.

2d, The said described base in combination with the halves of the post herein described, provided with angular dovetailed mortises, K K, fig. 8, and the bolt shown in fig. 1, as and for the purpose set forth.

67,903.—RAILROAD FROG.—A. Philippi, Elizabethport, N. J.

The construction and arrangement of the frog-point, A, and side-rails, B B, secured to the chair, C, by means of bolts, e e, passing through the body of the rails and frog-point, and countersink in the same, in combination with the wooden beds, D, placed in the chair, C, and upon which the frog-point, A, and side-rails rest, the grain of the wood running crosswise, in the manner and for the purpose specified.

67,904.—ADJUSTABLE HINGE.—James G. Ralph, Aurora, Ill.

I claim the arrangement and combination of the hinge, A A, and plates, D, when constructed substantially as and for the purpose set forth.

67,905.—TRAVELING TRUNK.—Louis Ransom, Lansingburgh, N. Y.

1st, I claim a Traveling Trunk which when closed, as in fig. 1 of the drawings, shall have the form of a cylinder.

2d, In combination with a cylindrical traveling trunk, I claim two or more raised hoops or bands around the circumference thereof, to serve as wheels upon which the trunk may be rolled, while they protect the body of it from contact with the ground.

67,906.—SEWING MACHINES.—T. K. Reed, East Bridgewater, Assignor to David Whittemore, North Bridgewater, Mass.

I claim, in combination with hook, needle, and cast-off, the supplemental presser-foot, constructed and operating substantially as and for the purpose set forth.

67,907.—APPARATUS FOR MAKING NITROUS OXIDE, ETC.—M. S. Renslow (assignor to himself and Flavius Searle), Springfield, Mass.

1st, I claim controlling the amount of heat used in generating nitrous oxide or other gases, by means of a regulating or changeable outlet, p1, applied to a gas receiver having a variable capacity, when used in combination with a device for regulating the flame beneath the generating retort, substantially as described and herein set forth.

2d, I claim the variable receiver, a, having a changeable outlet, p1, in combination with the rod, c, and the lever, f, all constructed and operating substantially as described and for the purposes herein set forth,

3d, I claim the variable receiver, a, having a changeable outlet, p1, in combination with the rod, e, the bar, d', all constructed and operating substantially as described and for the purpose specified.

4th, I claim, in combination with the lever, f', the spring, y, and piece, f, having the pin, y', all constructed and operating substantially as described, and for the purpose herein specified.

67,908.—PLATFORM SCALE.—W. W. Reynolds (assignor to Howe Scale Company), Brandon, Vt.

I claim the arrangement of the links, H, as shown and described, to wit: having the links fitted in slats, i, in the bed or framing, A, and resting on pins, j, as shown in figs. 3, 4, and 5, of the drawings.

67,909.—APPARATUS FOR THE MANUFACTURE OF VINEGAR.—John R. chardson, New Haven, Conn.

I claim the arrangement of the self-dumping bucket, so as to operate to empty into the generator, substantially as and for the purpose specified.

67,910.—MACHINE FOR THE MANUFACTURE OF HORSE-SHOES.—A. J. Roberts, Boston, assignor to himself and B. F. Brown, Dorchester, Mass.

I claim, in combination with the series of movable formers or pattern blocks, the swinging die-block, e2, when arranged to operate as set forth.

Also, in combination with the swinging die-block, the auxiliary presser rolls, d2, actuated by the levers which carry the rolls, V, substantially as described.

Also, in combination with with revolving formers and the bending rolls, the calk benders, operating substantially as set forth.

Also, in combidation with the movable formers and bending mechanism, the dischargers, g2, operated substantially as described.

Also the arrangement of the formers around the periphery of a wheel grooved centrally of its periphery, as and for the purpose substantially as described.

Also the sliding feed-carriage with its spring pawls, when arranged in connection with the cutting and bending mechanism, and when operated by the cam on the main shaft substantially as described.

Also, in combination with the bending mechanism, the griping jaw, g, for holding the bar while being cut, and the tooth, r, for holding the blank at its centre to prevent it from sliding endwise as the bending-rolls begin to act, substantially as set forth.

Also the cutting-blade, o, when arranged to operate in combination with the feeding mechanism, movable former blocks, and bending rolls, and when operated by the cam on the main shaft, substantially as described.

Also in a horse-shoe machine, the described arrangement of the feeding, cutting, griping, and bending mechanism, to be all operated directly from the main driving shaft, substantially as described.

Also the arrangement around the periphery of a wheel of a series of formers or pattern blocks, operating in succession, with the described bending mechanism substantially as set forth.

67,911.—TRUSSES.—Lloyd Roberts, West Haverford, Pa.

I claim the pad, B, rendered adjustable to or from the bar, A, substantially as and for the purpose described.

67,912.—APPARATUS FOR RECTIFYING SPIRITS.—August Roos, New York City.

I claim the rectifying condenser formed of the case, n i, with the segmental rings placed alternately, to arrest the vapors as they pass up through said condenser, as and for the purposes set forth.

67,913.—TRIP HAMMER.—T. J. and R. L. Root (assignors to Thomas J. Root), Andover, Ohio.

We claim, 1st, The vibrating head, E, grooved vertical shaft, F', and vibrating rod, G, in combination with the rock head, B, and treadle, F2, as and for the purpose specified.

2d, The lever, T, constructed as described, grooved shaft, F', toothed plate, V', recess in head, A, as described, and plate T3, in combination with the vibrating rod, G, ball, H', set screw, I', and bearing, S, arranged so as to operate as and for the purpose specified.

3d, The ball, H2, and set screw, J', (applied to the rod, H,) bearings, R, and treadle, F2, in combination with the subject matter of the 2d claim, as herein stated.

4th, The combination of the adjustable bearings, R R and S S, vibrating rod, G, and rod, H, with the rock shaft, O, and treadle, F2, so as to operate substantially in the manner and for the purpose specified.

67,914.—HARVESTERS.—Isaac S. and Henry R. Russell, New Market, Md.

We claim, 1st, The vibrating support, H, substantially as and for the purpose described.

2d, The wheel, A, having its axle operating in the pivoted socket, C, substantially as and for the purpose described.

67,915.—COMBINED GATE AND FENCE.—John W. Sanford, Bath, N. Y.

I claim the manner of putting together these double gates and posts with fence in combination, with sills to be set in the ground.

67,916.—BROOM HEAD.—John W. Sanford, Bath, N. Y.

I claim the combination, of the rod, c, screwed into the handle, the adjustable nut, e, cap piece, d, and band, h, fastened to the rod, c, all as and for the purposes specified.

67,917.—HORSE HOES.—George W. Sawin, Nashua, N. H.

1st, I claim the combination as well as the arrangement of the rake, I, with the blades, D D', A, and A', made substantially as described and for the purpose set forth.

2d, The combination and arrangement of the gathering in blades, A A, with the blades, D and D', made substantially as described and for the purpose set forth.

3d, The combination of the movable blade, B, with the adjustable bars, C and C', made substantially as described and for the purpose set forth.

67,918.—SPEAKING TUBES.—J. B. Shannon, Philadelphia, Pa.

I claim the flap or plate, D, hinged to and arranged on the corner of the mouth-piece, A, in respect to the opening, d, in the said cover, as and for the purpose set forth.

67,919.—REFLECTORS FOR WINDOWS.—Charles G. Smith (assignor to himself and Alexander Turner), North Bridgewater, Mass.

I claim the duplex adjustable reflector substantially as described, that is, as composed of the box, A, or its equivalent, the two mirrors, B B, the arm, C, and its clamp screw, b.

I also claim the combination of the duplex reflector, made as described, (viz.: of the box, A, its mirrors, B B, arm, C, and clamp screw, b,) with the supporter, composed of the screw, E and a, bar or bars, D E, applied together and to the arm, C, substantially as specified.

67,920.—METALLIC TIPS.—Benj. F. Sparrow, Boston, Mass.

I claim the metallic upper and sole tips or guard, as made without any central flange, and with holes through it to receive screws, and arranged so that such screws may enter the outer edge of the sole when covered by such tips.

67,921.—PRESERVING ANIMAL AND VEGETABLE SUBSTANCE.—Lewis H. Spear, Braintree, Vt. Antedated August 15, 1867.

1st, I claim subjecting animal or vegetable matter to the action of a solution of a mixture of borax (biborate of soda) or any other compound of boracic acid, in connection with sulphite of soda or any other compound of sulphuric acid, in the manner substantially as herein described, for the purpose specified.

2d, I claim subjecting animal or vegetable matter to the action of a solution of sulphite of soda or any other compound of sulphurous acid, in the manner substantially as herein described, for the purpose herein specified.

3d, I claim subjecting animal or vegetable matter to the action of a solution of borax (biborate of soda) or any other compound of boracic acid, in the manner substantially as herein described, for the purpose herein specified.

4th, I claim subjecting animal or vegetable matter to the action of a solution of boracic acid, in the manner substantially as herein described, for the purpose specified.

67,922.—PENCIL SHARPENERS.—E. Spencer, Lambertville, N. J.

1st, I claim the arrangement of the gripe, d, for preventing the points of the pencil sharpener from spreading, substantially as herein described.

2d, The filling, c, in the points of the pencil sharpener, for the purposes herein specified.

67,923.—COTTON GINS.—Charles Spofford and Charles H. Hersy, Boston, Mass.

1st, We claim the clearers, U V, substantially as and for the purpose described.

2d, We also claim the yoke, Q, or its equivalent for connecting the clearers, U V, and stripper, T, to secure their simultaneous action, substantially as set forth.

3d, We also claim bracing the stripper, T, to the upper clearer, U, to stiffen and retain the former in place, substantially as and for the purpose specified.

4th, We also claim the breast beam, L, with its groove, f, and apron, M, in combination with the grating, N, consisting of the slotted bar, O, and pins, 7, operated by screws, h, or otherwise for regulating the pressure of the breast beam against the periphery of the upper feed roll, H, substantially as described.

5th, We also claim the upper feed roll, H, constructed substantially as described and for the purpose set forth.

6th, We also claim a feed roll, H, in which spiral metallic strips, y, are employed as and for the purpose set forth.

67,924.—MODE OF LIQUORING SUGAR IN CENTIFUGAL MACHINES.—Richard T. Sprague, Boston, Mass.

I claim the use, with a centrifugal sugar bleaching machine, of a portable liquoring tank constructed and operating as described.

67,925.—FAUCET.—F. P. Striker, Buffalo, N. Y.

I claim the plug, B, in combination with the movable segment, G, and groove, E, operating substantially as described and for the purpose herein set forth.

67,926.—MEDICINE.—Louis Stroever, Philadelphia, Pa.

I claim a medicine for the cure of fevers, when the said medicine is made of the ingredients herein described, and about in the proportions specified.

67,927.—PERMUTATION LOCK FOR DOORS, ETC.—T. J. Sullivan, Rochester, N. Y.

1st, I claim connecting the shaft, B, with the head, C, by the collar, D, and jaw nut, E, as herein set forth.

2d, Connecting the combination wheels to the frame, G, which is secured within the lock in the manner set forth so as to avoid extending the shaft through them or removing them with the back plate, as specified.

3d, Combining the lever, H, with the dog plate, K, by the dog, q, in such a manner that while they are bound together each is allowed a free action, as set forth.

4th, The combination of the slide, L, with the dog plate, k, and lever, H, as and for the purpose specified.

5th, The combination of the cam disk, J, with the lever, H, slide, L, and dog plate, k, as specified.

6th, Discounting the heavy bolt work of a safe door from its operating shaft when the door is locked, as specified.

7th, The combination of the bent arm, B, with the lever, H', and the bolt of the lock for the purpose set forth.

8th, The segment, Q, in combination with the dog, q', and wheels, F' F' F', as and for the purpose set forth.

67,928.—WATER METER.—J. D. Sumner, Lexington, Mass.

I claim the combination of the disk, B, flanged or tongued at or near its periphery and carrying the vanes or floats, e, with the case, A, recessed and grooved in its interior substantially in the manner and for the purposes herein set forth.

67,929.—DUMPING PLATFORM FOR HARVESTER.—Daniel M. Swartz, Lewisburg, Pa.

I claim a dumping platform, B, revolving intermittingly backward from the motion of the harvester and provided with one or more rows of teeth, C C, substantially as and for the purpose herein specified.

I also claim the cog and ratchet wheel, H, provided with the holes, h h, and groove, l, in combination with the spring pawl, I, and operating lever, L, substantially as and for the purpose herein described.

I also claim the combination of the revolving platform, B, ratchet wheel, H, spring, I, and lever, L, substantially as and for the purpose herein specified.

67,930.—BED BOTTOM.—Charles B. Tucker and L. S. Babbit, Chicago, Ill, assignors to L. S. Babbit.

I claim the arrangement of the rollers, D D, in combination with levers, F F, rods, E E, and springs, C C C, constructed to operate under slats, I, substantially as and for the purpose set forth.

67,931.—DEVICE FOR SOLDERING CANS.—J. C. Underwood and Peter Johnson, (assignors to themselves Charles A. Valle and David Nordyke,) Richmond, Ind.

1st, We claim the springs, a, in construction with the expander shaft, D', bands, E, and hinges substantially as and for the purpose specified.

2d, The frame, F, disc, d, and adjustable spring guide, k, constructed and arranged as described for centering the can substantially as herein set forth.

3d, The combination and arrangement of the expander, D, frame, P, and rosin box, G, substantially as described for the purpose specified.

4th, The compartments, G', and wheels, H, with the pan, G, for distributing the rosin constructed and arranged to operate substantially as and for the purpose set forth.

67,932.—COFFEE POT.—J. C. Walker, Waco Village, Texas.

I claim the coffee pot above described, consisting of the boiler, A, tube, D, perforated at e e e, and box, E, having the perforated bottom, E," and tube G, all arranged and combined in connection with the pot, B, substantially as and for the purpose described.

67,933.—FRUIT LADDER.—S. S. Whaley, Tidioute, Pa.

1st, I claim the arrangement of the ladder upon the trundling frame in combination with the platform, A, arranged so as to be adjustable and fixed thereon substantially as herein set forth.

2d, The receptacle formed by combination of the trundling frame, B, and and platform, A, in combination with an adjustable ladder, substantially as set forth.

3d, The harness, c, combined with a ladder so as to support the person thereon substantially as set forth.

67,934.—BREAST STRAP SHIELD.—H. F. Wilson, (assignor to himself and George Esmond,) Fort Wayne, Ind.

I claim the revolving hook, A, in combination with the flange, B, the same being constructed in the manner and for the purpose substantially as described.

I also claim hook, A, flange, B, frame, C, and roller, D, the whole being combined arranged and constructed in the manner and for the purpose substantially as described.

67,935.—STEAM GENERATOR.—C. O. Winegar, Drytown, Cal.

I claim connecting each series of tubes to separate and independent chests at both ends so that each series of tubes can expand and contract without straining the others or being strained themselves.

I also claim arranging the tubes in each tie so as to form a connection between all the chests and all the tubes used substantially as described.

67,936.—STEAM ENGINE GOVERNOR.—J. H. Wooster, Strykersville, assignor to himself and Robert Dunbar, Buffalo, N. Y.

1st, I claim the arrangement of the governor, balls, A, sliding on rods, B B, radiating from the driving shaft of a steam engine and held by coiled springs, C, their arms, h', connecting with the eccentric which operates the cut off valve in such manner that the outward movement of the balls will be communicated to the eccentric and thereby control the cut off, substantially as described.

2d, The connection of the rod, h', to the eccentrics, consisting of the hub, d', collar, G, with crank like extensions, h, connected to the hub, d', by the set screw, g', constructed and arranged as set forth.

67,937.—PIPE WRENCH.—W. C. Abbe, Petroleum Center, Pa.

I claim the segmental jaws, B C, in combination with the lever, A, constructed and operating substantially as and for the purpose described.

67,938.—COMBINED LOCK AND KNOB LATCH.—E. G. F. Arndt and C. E. L. Moebius, New York City.

1st, I claim the square or polygonal hub, D, when arranged between the arms, c and d, of the bolt, in the recess, e, which is narrow at the ends substantially as and for the purpose herein shown and described.

2d, The stem, H, when made partly square, (or polygonal) and partly round in combination with the guard plate, M, and spring, O, all made and operating substantially as and for the purpose shown and described.

3d, The vibrating tumblers, E and F, when pivoted together and arranged substantially as herein shown and described, in combination with the bolt, C, spring, G, and square or polygonal hub, D, all made and operating substantially as herein shown and described.

4th, The guard plates, L and M, in combination with each other and with the stem, H, and pin, K, all made and operating substantially as and for the purpose herein shown and described.

5th, A spring bolt lock which is constructed that it can be operated by a stem, H, and key, J, or by the latter and a night key, N, or by all three, or by the key, J, substantially as and for the purpose herein shown and described.

67,939.—BOILER.—John Baumeister, Detriot, Mich.

I claim the strainer, C, constructed and arranged substantially as described in combination with the vessel, B, and the boiler, A, for the purpose set forth.

67,940.—HARROW.—Lemuel Bickelshymer, Leavensworth, Kansas, assignor to himself and Granderson T. Deering.

1st, I claim the harrow shoes, K1 or K, to which the teeth, k, are attached, in combination with the connecting bars, L, levers, M, connecting bars, N, and crank wheel, O, by which motion is communicated from the gearing to the said shoes or shoe, substantially as herein shown and described.

2d, The combination of the lever, G, with the stationary frame, C, or tongue, D, and with the movable frame, F, substantially in the manner here in shown and described and for the purpose set forth.

67,941.—DISINTEGRATING AND BLEACHING WOOD AND OTHER MATERIALS TO FORM PAPER PULP.—Jean Bernard Biron, France.

I claim the employment, as a bleaching agent, of alkaline sulphurets, in the manner and for the purposes substantially as above set forth and described.

67,942.—DOOR FOR STOVES AND FURNACES.—Frank S. Bissell, Pittsburgh, Pa.

I claim a stove or furnace door which is closed by springs, substantially in the manner herein shown and described and for the purposes set forth.

67,943.—ANCHORING STATIONARY MACHINERY.—Samuel Boone, Le Gros, Ind.

I claim the anchors, A B, secured to the power, H 1, by means of the swivelled screw rods, A C and B F, all constructed as described, whereby the force of the draft is resisted, substantially as described for the purposes specified.

67,944.—FENCE.—L. H. Bowlus, Knoxville, Tenn.

1st, I claim pivoting or hinging the lower end of the central cross bar, b3, to the lower part of the short post, A, substantially as herein shown and described and for the purpose set forth.

2d, Securing the panels, B, when in an erect position by hooks or catches, C, pivoted to the upper parts of the posts, A, and taking hold of the central cross bars, b3, of the said panels, substantially as herein shown and described and for the purpose set forth.

67,945.—VENTILATING ATTACHMENT FOR STOVES.—Thos. S. Bowman, St. Louis, Mo.

I claim the base, B, and the drum, C, arranged and operating as herein shown and described, in combination with a stove and stovepipe, substantially as and for the purposes set forth.

67,946.—AXLE BOX.—Hugh Brady, Factoryville, N. Y.

I claim the friction rollers, e e, hung in the disk bearings, g g, in combination with the partitions, d d, enclosed in the axle box, a, constructed, arranged, and operating substantially as and for the purpose herein described.

67,947.—LINING FOR OIL BARRELS.—William R. Bree, Pottsville, Pa.

I claim the composition above described, when made and used, substantially as and for the purpose specified.

67,948.—MEASURE FOR LIQUIDS.—Purcel Brinkerhoff, Chillicothe, Mo.

1st, I claim the combination of the vessel, A, with the cylinder, B, tube, C, groove, b, and apertures, d r rl, all arranged and operating substantially as described.

2d, The nozzle, f, combined with the cylinder, g, and the cylinder, B, substantially as described.

3d, The lever, J, stop guide, m, in combination with vessel, A, and supply pipe, G, all arranged and operating substantially as and for the purpose set forth.

67,949.—CORN CULTIVATOR.—P. F. Brittain, Geneseco, Ill.

I claim the marking device consisting of the bars, h h, beam, G, and standards, H, in combination with the frame, A, of a corn plow, substantially as set forth.

67,950.—CLOTHES DRIER.—Harvey Brown, New York city.

I claim the combination of the compartment, A, removable bars, C, and cleats, D, substantially as described and for the purpose specified.

67,951.—BASE-BALL TABLE.—W. Buckley, New York city.

1st, I claim the base-ball table, constructed as described, consisting of the table, A, bases, B C D E, bat, F, lever, G, runners, K, keys, M N O P S, fielders, T, movable line, U, and balls, W V, all operating as described for the purpose specified.

2d, The pivoted runners, K K U, operated by levers and keys, substantially as and for the purpose shown and described.

3d, The V-shaped catchers, T T, constructed substantially as and for the purpose specified.

67,952.—ATTACHMENT FOR PREVENTING HOGS FROM ROOTING.—John Butts, Evansville, Wis.

I claim the roller attachment, A, substantially as and, for the purpose described.

67,953.—CENTRIFUGAL MACHINE OR HYDRO EXTRACTOR.—E. C. Cleveland, Worcester, Mass.

1st, I claim the hydro extractors and the basket when hung for operation, substantially as and for the purpose described.

2d, I also claim, in combination with the above, the counter weights applied to the basket shaft, substantially as and for the purpose specified.

67,954.—DEVICE FOR PREPARING PLATES FOR SPRINGS.—Jas. B. Cleveland, Hackensack, N. J.

I claim the combination of the dies, C C1, blocks, G, fixed dies, d d, in the block, E, slotted lever, D, wheel, C, and roller, A A, as herein set forth for the purpose specified.

67,955.—CORN AND CANE HARVESTER.—E. H. Clinton, W. Prather, and H. O. Hutchinson, Iowa City, Iowa.

1st, We claim the discharging frames, I I, applied to the frame, A, and actuated through the medium of the lever, J, substantially as described.

2d, The combination of the circular saws or cutters, H, arms, N N, connected with the shafts, M, provided with the arms, u, at their upper ends, and discharging frames, I I, all arranged in connection with the mounted frame, A, to operate substantially in the manner and for the purpose set forth.

67,956.—CHAIR.—Francis J. Coates, Cincinnati, Ohio.

I claim the combination and arrangement of the seat, F, pivoted centrally to the sides, C, and having upon its under side the quadrant-shaped sector, I, provided with teeth, a, upon its circular edge, and the spring lever, J, having the prong, b, and hinged to the forward rail, D, substantially as described for the purpose specified.

67,957.—CRANK CONNECTION.—Ed. R. Cole, Pawtucket, R. I.

1st, I claim, in combination with the sliding box, E, and grooved guide of the shaft, A, the adjustable sides for the groove or way of the sliding box, substantially as and for the purpose specified.

2d, I also claim the adjustable sides for the groove or way of the sliding box, substantially as and for the purpose described.

67,958.—DIE FOR CUTTING THREADS ON TUBES.—Wm. T. Cole (assignor to Jacob F. Hunter and Peter P. Keller), New York city.

1st, I claim the combination of the base plate, A, pivoted die plate, B, spring, C, lever, H, and link, I, arranged substantially as described.

2 d, The combination with the above of the clutch, C, applied and operating in the manner and for the purpose specified.

67,959.—ANIMAL TRAP.—Isaac N. Connell, Spencer's Station, Ohio.

1st, I claim the combination and arrangement of the trigger plate, K, arm, M, supporting bar or bolt, I, with each other and with the pivoted platform, H, and box, A, of the trap, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the spring, N, with the pivoted platform, H, and bar or bolt, I, substantially as herein shown and described, and for the purpose set forth.

3d, The removable pivoted partition, O, and weight, P, arranged in relation with the trigger plate, K, pivoted platform, H, bar, I, and trigger, L, as herein set forth for the purpose specified.

67,960.—CHURNING MACHINE.—Gurnsey Crandell, Rhinebeck, N. Y.

I claim the combination of the sliding bar, E, connecting rod or rods, F, crank shaft, G, fly wheel, H, and operating rod, I, with each other and with the frame, A, substantially as herein shown and described and for the purpose set forth.

67,961.—COTTON PRESS.—Jas. G. Cummings, Columbus, Miss.

1st, I claim the bevel wheel, C, provided with the projecting rim forming an annular track resting on rollers, h h, and having the hub, i, for the passage of the screw, F, step, K, which bears the bevel wheel, C, and is secured to the frame, G, and trunk, A, when all are constructed and arranged as herein set set forth for the purpose specified.

2d, I claim, also, the shifting head block, B, in combination with the rollers, d d, the rail track, e e, and the trunk, A, arranged and operating substantially as and for the purposes herein described.

67,962.—CAR BRAKE.—John Davis, Alleghany City, Pa.

I claim the sliding frame o, clevis, 13, and pawl, 11, when used in combination with the hand lever, 14, provided with ratchet, o, chain, u, and shaft, g, provided with arms, p 7 and 8, constructed, arranged, combined and operating in the manner, substantially as herein described.

2a, The shaft, g, provided with arms, 7 8 and p, when used in combination with the springs, f and e, rods, t and m, and brakes constructed, arranged combined and operating in the manner substantially as herein described and for the purpose set forth.

67,963.—SLATE CUTTER.—T. R. Drummond, Hartford, Ct.

1st, I claim the four sided box knife, F, the elastic block, G, and the cushion within the cutters on the block, D, arranged and operating substantially as described and for the purposes set forth.

2d, In combination with the cutter box knife, F, I claim the springs, a a, or their equivalents and also the use of springs under the cushion of the block, D, substantially as and for the purposes set forth.

67,964.—CHURNS.—C. L. Eggert, Lawrence, Kansas.

I claim the combination and arrangement of the gear wheels, G H I, and shafts, C D E, with each other, with the dashers, J K and with the frame, E, and body, A, of the churn in combination with the double dashers, J and K, constructed, arranged and operated substantially as herein shown and described.

67,965.—SEWING MACHINE.—George Elmes, Chestertown, N. Y., assignor to himself and F. B. Wells, Canaan, N. H.

I claim the reciprocating rod, A, provided with the incline, e, on the head, a, the pin, d, and the spiral spring, g, in combination with the driving wheel, C, and presser foot of a wax thread sewing machine, arranged and operating substantially as and for the purposes herein shown and described.

67,966.—OSCILLATING PISTON ENGINE.—W. H. M. Elrod (assignor to himself and G. L. Williams), St. Louis, Mo.

1st, The oscillating piston, C, the hollow shaft, E, the oscillating valve, D, with its hollow valve stem, F, combined and arranged substantially as shown and described for the purpose of forming an oscillating piston steam engine as set forth.

2d, I claim the lever, m, the disk, J, the arm, h, the lever, C, and the pins or studs, i i and k k, arranged substantially as described for the purpose of reversing the motion of the piston as set forth.

3d, I claim the chamber, G, on the side of the cylinder, substantially as shown and described.

67,967.—TRACE FASTENER.—G. W. Fink, Pleasant Plains, Ill.

1st, I claim the cock eye or button, C, furnished with the eccentric groove, c, substantially as described.

2d, The metallic loop, B, constructed to carry the prolongation of the trace, A, with the eye, b, fitted to receive the buttom, C, substantially as described.

3d, The combination of the trace tongue, A, with the eccentric groove of the cock eye, substantially as described.

67,968.—CARRIAGE PROP.—William Finn, Poughkeepsie, N. Y.

1st, I claim the standard, C, when provided with a dovetailed wedge shaped tenon, d, in combination with the plate, B, which has a wedge shaped dovetailed groove, c, in a circular projection, b, as set forth.

67,969.—APPARATUS FOR SOLDERING EAVES TROUGHS.—Charles and George Fisher, Tecumseh, Mich.

1st, We claim the construction and arrangement of the right angular clasps, D, provided upon the inner end with a flange, b, and pintle pivoted to the lever, o, and adjusted by means of the ratchet bars, F, substantially as described for the purpose specified.

2d, We claim the cam washers, n n n, so as to throw or carry the levers, o o o, and clasps, D D D, out from over the edge of the trough or box, A, when the said levers are raised up so that the gutter can be removed substantially as shown and described and for the purposes set forth.

67,970.—FISH FLAKE.—Joseph Foster, Beverly, Mass.

I claim the arrangement of a sun screen, C, in combination with the frame of a fish flake suspended on posts, a a, and operating substantially as and for the purposes described.

67,971.—CARBURETING APPARATUS.—E. J. Fraser, Erie, Pa

I claim the vessels, A and B, the water cylinder, C, the plate coil, D, and the retarding curtains, D, when the same are constructed, arranged and combined substantially as shown and described for the purposes set forth.

2d, In combination therewith, I claim the air pipe, G, and the space, L, substantially as and for the purposes described.

67,972.—VOLUTE SPRING.—John Freeland and Daniel Ward, New York City.

We claim the improved volute spring formed of a single metal plate slit longitudinally nearly its whole length with both ends uncut and the divided parts spread apart in the middle coiled substantially as herein shown and described.

67,973.—MODE OF TREATING WATER TO PREVENT INCRUSTATIONS OF STEAM BOILERS.—M. A. Glynn, Havana, Cuba.

1st, I claim the process of treating water for steam generators with bark of the rhizophera mangle, in manner and for the purposes substantially as above described.

2d, The process of treating water for steam generators with said bark of the rhizophera mangle in combination with chloride of sodium or its equivalent in manner and for the purposes substantially as above described.

67,974.—OILER.—J. H. Godwin, Scotland Neck, N. C.

I claim an oil can constructed with a shallow cylindrical body and an inclined nozzle in combination with the spring or springs, A, placed within the body of the said oil can, substantially as and for the purpose set forth.

67,975.—MACHINE FOR CUTTING AND GRINDING CORN FODDER.—Alexander Goodhart, Newville, Pa.

I claim the combination and arrangement of the cutters, E E, and teeth, 1 1 1, upon the vertical drum, D, working in an upright cylinder, A, provided with teeth, c c, substantially as and for the purpose specified.

67,976.—PLOW.—C. W. Grant, Iona Island, N. Y.

1st, I claim the supplemental share, G, and land slide, F, when used in connection with or applied to an ordinary tillage plow, substantially in the manner as and for the purpose set forth.

2d, The supplemental or auxiliary share, K, applied to the share and moldboard, substantially as and for the purpose specified.

3d, The two coulters H H, applied to the beam and used in connection with the supplemental share, G, and land side, F, substantially as and for the purpose set forth.

4th, The supplemental strips, L, for the mold board, C, when used in combination with the supplemental share and land side, substantially as and for the purpose specified.

67,977.—TOPS FOR COOKING STOVES.—James Grimes, Portsmouth, O.

I claim the rim, B, constructed in one or more pieces secured to the lugs, b b, of the plate, A, by means of screw bolts passing through the lugs, said holes being enlarged to admit of the expansion and contraction of the plate, A, independently of the rim, B, as herein shown and described.

67,978.—ROTARY ENGINE.—Melancthon Hamford, Boston Mass.

I claim the herein described arrangement of the smaller piston, B', and large piston, B, provided with projections, f, as and for the purposes set forth.

67,979.—SAD IRON.—C. C. Hare, Louisville, Ky.

1st, I claim the handle, B, provided with the curved shank, C, and pivoted brace, D, in combination with the curved socket, E, upon the iron, A, substantially as described for the purpose specified.

2d, The iron, A, and handle, B, fitted together by means of the shank, C, upon the latter fitting into the socket, E, of the former on the shank, C, upon the former fitting into the socket, E, of the latter and retained position or released by means of the pivoted brace, D, substantially as described for the purpose specified.

67,980.—WASHING MACHINE.—G. W. Havermale, La Harpe, Ill.

I claim the combination and arrangement of the crank shaft, F, gear wheel H, pinion, I, upon the shaft, J, and the balance wheel, k, and press board, B, and beater, D, as herein set forth for the purpose specified.

67,981.—PHOTOGRAPHIC APPARATUS.—D. H. Houston, Cambria, Wis.

1st, I claim the securing the ground glass, F, by the spring, G, movable by means of the lever, H, substantially as described.

2d, Securing the sensitive plate, K, in place when exposed in front of the ground glass, F, in the manner and by the means, substantially as described.

3d, The grooved and numbered scale carried on the lid of the camera, substantially as described.

4th, The employment of orange or yellow-covered glass, on which to focus the object in view, in manner and for the purposes substantially as described.

5th, The construction of the diaphragm, D, as herein set forth, for the purpose specified.

6th, The employment of the keys to secure the sensitive plate in place, in the carrying frame, with or without the slips, R, substantially as described.

7th, The application of the spring, G, for securing the sensitive plate in the camera, substantially as described.

8th, The employment of an adjustable spring, at one or both ends of the sensitive plate, whereby the same is secured or loosened at pleasure, in the carrying frame, substantially as described.

9th, The application of the spring, P, and lever, O, as attached to the carrying box, substantially as and for the objects desired.

10th, The carrying frame, B, constructed as described, when combined with the camera, A, as and for the purpose specified.

67,982.—MEANS TO PREVENT ROPES FOULING SHIPS' PROPELLERS.—Richard Harvey Hudson, Glasgow, Scotland.

I claim the disk, D, of steel, or steel sheathed, attached to the stern post or under post of a vessel, in manner and for the purpose substantially as described.

67,983.—BOAT-DETACHING TACKLE.—E. C. Hurlbut, Middle Haddam, and E. H. Snow, Hartford, Ct.

I claim the combination and arrangement upon the bottom of the boat, of the standards, C' C', to which the hooks, F F, are pivoted, the points of the latter passing through the perforations in the projecting lips, G G', thereby securing the looped ends of the chains, c' c', and operated by means of the pivoted rods, E, and lever, D, pivoted to the standard, C, in the centre of the boat, substantially as described, for the purpose specified.

67,984.—MODE OF MANUFACTURING WATER PAILS AND OTHER HOUSEHOLD VESSELS.—John William Jarboe, Greenpoint, N. Y.

I claim the manufacture of pails and other articles of household furniture, for holding water, etc., made of paper, in the manner substantially as herein shown and described.

67,985.—WATCH.—E. Jewell, Louisville, Ky.

I claim the divided spring band, D, encircling the works of a watch situated between the enclosing plates, its ends notched to fit over the main spring bar, C, substantially as described, for the purpose specified.

67,986.—SEEDER CULTIVATOR.—F. B. Johnson, De Witt, Iowa.

1st, I claim operating the slide cut-off, F, by a bent lever, H, pivoted to a support, h', attached to the seed box, D, substantially as herein shown and described, and for the purpose set forth.

2d, Adjusting the movement of the slide cut-off, F, by means of a set or gage screw, P, acting upon the lever, H, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the stirrer, K, constructed as described, with the seed box, D, caps, J, and zigzag or waved wheel, L, attached to one of the wheels, A, substantially as and for the purpose herein set forth.

4th, The combination of the movable inclined seed board, E, with the bottom of the seed box, D, substantially as herein shown and described, and for the purpose set forth.

5th, Attaching the plow beams, m', to each other, and to the clevises, N, bolted to the axle, B, substantially as herein shown and described, and for the purpose set forth.

6th, The combination of the bar, R, and bent lever, U, with the support and guide rod, V, and with the plow beams, m', substantially as herein shown and described, and for the purpose set forth.

7th, The combination of the lifting foot lever, W, with the bent guide lever, U, and with the tongue, C, of the machine, substantially as herein shown and described, and for the purpose set forth.

8th, The combination of the lifting and guide bar, O, with the plow beams, m', substantially as herein shown and described, and for the purpose set forth.

9th, Attaching a catch, P, to the lifting and guide bar, O, substantially as herein shown and described, and for the purpose set forth.

67,987.—WRENCH AND PRUNING SHEARS COMBINED.—John S. Kalb, Fostoria, Ohio.

1st, I claim the jaws, A B, rack, D, in combination with the spring, I, and stirrup, C, combined and operating conjointly, substantially as and for the purpose set forth.

2d, I claim combining the pivoted jaws, A B, and spring, I, with one or movable blades or cutters, arranged as and for the purpose set forth.

67,988.—PETROLEUM STILL.—E. G. Kelley, New York City.

1st, I claim providing a still for petroleum or other hydro-carbon liquids, with two pipes, F and I, for carrying off and separating the products of distillation, substantially as set forth.

2d, The cylindrical boiler, B, in combination with the inclined vessel, C, in which are inclined diaphragms, D, or their equivalents, substantially as and for the purpose herein shown and described.

3d, The above, in combination with the inclined pipe, F, when the same is arranged and set forth, and with the pipe, I, all made and operating substantially as and for the purpose herein shown and described.

67,989.—BOAT DETACHING TACKLE.—George H. Kempton, Hudson, N. J.

I claim the application of the double-weighted hook to the ring and chains, C C D, all combined and operating for the purposes specified.

67,990.—WASHING MACHINE.—D. H. Kranser, and G. N. Bowman, Pottsville, Pa.

1st, We claim the legs, H, attached to the sides of the box, A, in an inclined position, the longer legs having pivoted in their upper ends the curved oscillating arms, B, as herein set forth, for the purpose specified.

2d, The oscillating arms, B, constructed as described, the lower convex side having parallel convex slats, C, and its bottom edge board, D, inclined to form an acute angle with the convex sides, its upper end curved in the arc of a circle, in such a manner that in its oscillations it shall completely fill the slot in the cover, E, preventing the escape of liquid, as herein set forth, for the purpose specified.

3d, The curved false bottom, J, arranged in relation with the inclined board, D, and convex slats, C, upon the oscillating arm, B, as herein set forth, for the purpose specified.

67,991.—MEAT WASHER.—J. Lefeber, Cambridge City, Ind.

I claim the toothed sliding plate, a, in combination with the corrugated roller, C, and the hinged frame, B, arranged and operating substantially as and for the purpose herein described.

67,992.—MODE OF TREATING PRECIPITATED LEAD TO DESTROY ITS CRYSTALLINE CHARACTER.—G. T. Lewis, Philadelphia, Pa.

I claim subjecting the precipitates of lead to the combined action of friction and pressure, substantially as and for the purpose described.

67,993.—EXPANDING DIE.—B. T. Loomis, New York City.

1st, I claim the combination of the dovetailed cutters, B, interior slotted tube, C, and cutter seat, A, with each other, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the band or nut, D, with the cutter seat, A, and interior slotted tube, C, substantially as herein shown and described, and for the purpose set forth.

67,994.—WATER WHEEL.—O. W. Ludlow, Dayton, Ohio.

1st, I claim the construction and arrangement of the arms, b, attached to the pivoted rods, a, of the buckets, G, their inner ends connected by the rods, C, to the sliding collar, H, operated by means of the rods, K, and lever, L, as herein set forth, for the purpose specified.

2d, The vent tube, or ventilating pipe, P, applied to the draft tube, O, and provided with a valve, substantially as and for the purpose set forth.

67,995.—COAL CHUTE.—Ephraim Maguire, Kewanee, Ill.

I claim the hinged bar, E, rod, F, and rope, H, arranged and employed as described, in combination with the doors, B C, notched arms, D2, and catches, G, all arranged and operating in the manner and for the purpose specified.

67,996.—APPARATUS FOR STRETCHING SKINS.—Agustus Marsh, Newark, N. J. assignor to himself and William Hogg, Melrose, N. Y.

I claim the frame, A, with the double sockets, b, screws, c, when constructed and operated substantially as described for the purpose of stretching raw or tanned hides or skins.

Also the nippers and straps in combination with frame, A, for attaching the skins or hides thereto for the purpose of stretching the same.

67,997.—PREPARING VEGETABLE FIBERS FOR TEXTILE AND OTHER FABRICS.—Henri Messmer (assignor to himself and Isaac Hey, Jr.), Newark, N. J.

I claim the process herein described of treating fibrous plants for the purpose of separating or extracting the fiber therefrom, substantially as set forth.

67,998.—ROOFING COMPOUND.—A. H. Mott, Daniel Winer, and Lawrence Brink, Lockport, N. Y.

We claim a roofing or sizing compound substantially as described.

67,999.—HINGE AND BLIND SUPPORTER.—W. W. S. Orbeton, Haverhill, Mass.

I claim the said blind supporter made substantially as described, as a new article of manufacture.

68,000—CHURN DASHER.—J. W. Pettengill, Rockford, Ill.

I claim a dasher for churns etc., consisting of three or more perforated dishes or plates, C D and E, arranged together substantially as and for the purpose described.

I also claim the center piece to the stem or handle carrying angular perforated wings substantially as and for the purpose described and whether used in combination with the three or more disks to such stem or not.

68,001.—PRINTING PRESS—C. Potter, Jr., Westerly, R. I.

I claim the hook projections, E E, at the under side of form bed, C, in combination with the levers, G G, when the latter are arranged in such a manner as to admit of being adjusted relatively with the former by the screws or pins, c, or their equivalents for the purpose specified.

2d, The pivoted nuts, e, in the lower parts of the levers, G G, in connection with the screws, f, arranged as shown or in an equivalent way, for the purpose of regulating the tension of the springs, I, as set forth.

68,002.—WHEEL FOR VEHICLES.—H. A. Potter, Providence, R. I.

1st, I claim the beveled felloes, A, in combination with the plate, C, tire, B, bolt, D, provided with cam, E, substantially herein shown and described and for the purpose specified.

2d, The sliding blocks, F H, in combination with the tire, B, plate, C, and bolts, D, substantially as herein set forth and for the purpose specified.

68,003.—WAGON JACK.—R. B. Prindle, Norwich N. Y.

I claim the arrangement and combination of the slotted post, A, sliding gate, B, with its hooks, e e, connecting rod, E, and crooked fulcrum lever, D, whereby the weight is raised and held by the lever without the aid of other fixtures as herein described.

I also claim the adjustable slide frame, h h, attached to the gate, B, in the manner described operating substantially as and for the purposes herein set forth.

68,004.—ANTI-DYSPEPTIC BITTERS.—C. T. Provost, N.Y.City.

1st, I claim the combination of hard cider with other ingredients for anti-dyspeptic compounds.

2d, An anti-dyspeptic stomach bitters, composed of the ingredients in the manner set forth

68,005.—CONDENSED LEATHER PEG.—Chas. and Jos. G. Rowland, Quincy, Ill.

We claim a peg made of condensed leather whether the same is made in the form of single pegs or in the form of a corrugated or plain strip from which the pegs may be cut, substantially as described.

68,006.—MACHINE FOR MAKING CONDENSED LEATHER PEGS. Charles and Joseph G. Rowland, Quincy, Ill.

1st, We claim the process of making pegs, by compressing or condensing leather substantially as described whether the pegs be severed at the time of compression or the strips be first condensed and then cut into separate pegs.

2d, We claim two or more rolls having recesses or dies formed on their periphery and arranged to operate as described for the purpose of compressing leather or other material to form pegs substantially as set forth.

68,007.—WIND MILL.—Jos. Schenker, Brownsville, Minn.

I claim the self-acting shut-off of the bellows, G, operated by the weighted rod, I, pins, q q', arm, r and r', on rod, S, and rod, L, and by the aid of the spring, f, and weighted lever, u, all substantially as and for the purpose herein shown and described.

68,008.—REVOLVING CYLINDER ENGINE.—Chalmers Scott and William H. Morton, Hamilton, Ohio.

We claim the arrangement of the hollow revolving shaft, D, having the stationary bar passing through it, to which is secured the arm, a, cylinder, A, fly wheel, E, and stand, C', substantially as described, for the purpose specified.

68,009.—SEWING MACHINES.—C. Stebbins, Pike, N. Y.

1st, I claim the combination of the cloth-presser, Q, the thread-lifting lever, C, the tension device, B, the catch, A, the cast-off, D, and the lever, E, the said combination being organized substantially as described, so that by its mode of operation slack shall be given to the thread according to the thickness of the work when the eye of the needle reaches the surface of the cloth, as and for the purposes specified.

2d, Interlocking the shuttle thread with itself in its passage from the bobbin to the work, after passing in and out through the holes, 1, 2, 3, in the shell, substantially as and for the purposes herein described.

3d, The curved passage formed by the lip, h, in the needle throat, substantially as and for the purpose specified.

4th, The combination of the eccentric, n, sliding rod, m, stirrup, p, and dog, k, substantially as herein shown and described, for the purpose specified.

68,010.—LEACHING TAN BARK.—Abraham Steers, New York City, assignor to himself and Henry L. Elder, and S. H. Kennedy, Philadelphia, Pa.

1st, I claim passing the menstrum through the bark contained in the leach or leaches in an upward instead of a downward direction, substantially as and for the purpose described.

2d, Heating the bark with live or exhaust steam after the same has been partially extracted by the cold menstruum, and then washing it out with water or weak tan liquor, substantially as and for the purpose set forth.

3d, The use of the perforated false top or perforated guard channel, h, in combination with the still, to prevent the bark from passing into the pipes with the liquor, substantially as described.

4th, The use of a forced current of liquid or fluid through the matter operated on, and the adjustment of the second connecting pipes and valves for that purpose, whereby the force of the pump can be used to clear out obstructions in the piping, as set forth.

5th, Forcing the liquor through a series of leaches by the action of a pump or by means of steam, or both combined.

68,011.—FRUIT STEM CUTTER.—Albert Strong and James A. Dadmun, South Boston, Mass.

We claim said fruit stem cutter, constructed substantially in manner as represented, and to be used as described, viz.: of the blade and tube connected and arranged as set forth, and the notch formed in the latter, the whole being as and for the purpose specified.

68,012.—MANUFACTURE OF AUGERS.—J. Swan, Seymour, Ct.

I claim the method of constructing auger bits by means substantially as herein shown and described.

68,013.—SEWING MACHINES.—Esau Tarrant, Muskegon, Mich.

I claim the roller, E, hung in the pivoted frame, S, made adjustable by means of the elastic, H, in combination with the rollers, D, having sharp points or teeth, d', substantially as described, for the purpose specified.

68,014.—PUMPS—C. Verniand and D. J. Lucie, Quincy, Ill.

I claim the cylinder heads, D, constructed as described, provided with the projecting inclined flange, g, upon their upper sides, fitting over the upper side of the cylinder, A, the latter provided with corresponding inclined projecting inclined flange, f, upon its lower side, fitting into the lower part of the heads, D, all arranged as described, whereby the heads, D, are prevented from having any vertical movement independent of the cylinders, as herein shown and described.

68,015.—MACHINERY FOR PROPELING STEAM CARRIAGES.—Elijah Ware, Bayonne, N. J.

I claim, 1st, The combination of gear wheels, C E Y G, arranged substantially as herein described, for the purpose specified.

2d, I claim the running wheel, D, the brake wheel, K, the pulley, B, and the double ratchet, P, in combination with the gear wheels, substantially as described.

3d, The brake wheel, K, in combination with the gear wheels, as described.

68,016.—APPARATUS FOR PREPARING PEAT FOR FUEL.—Joshua Webster, Malden, Mass.

I claim in combination with the incline and its system of feeding scrapers and presser rolls, the filling, compressing, and discharging plungers arranged to operate substantially as set forth.

Also, the arrangement of the mechanism for intermittently bringing the respective filled and empty molds into position under the respective filling, compressing, and discharging plungers, substantially as shown and described

68,017.—WAGON WHEEL.—S. B. Welton, Waterbury, Conn.

I claim the box, B, provided with a spiral groove upon the outer side and adjustably secured in place in the hub, E, by the set screws, C and D, substantially as herein shown and described and for the purposes set forth.

68,018.—MUSKETO AND FLY NET.—Nathan Weston, Jr., West Newton, Mass.

I claim the combination and arrangement of the cord and the series of buttons or knobs, or their equivalents, with the window frame and the curtain applied thereto, substantially as specified.

68,019.—FRUIT BOX.—James White, Cleveland, O.

I claim the movable bottom, B, in combination with the strips, D, and box, substantially as and for the purpose set forth.

68,020.—WOOD TURNING LATHE.—John Wilson and R. Hughes, Boston, Mass.

We claim feeding the stock automatically and intermittently forward into position for the action of the cutter or cutters and holding the same stationary during the cutting operation, by mechanism substantially as set forth.

We also claim in combination with automatic intermittent feed mechanism substantially as described, mechanism substantially as described for automatically bringing up the cutters into operation upon the stock and for carrying them back after each operation.

Also the feed mechanism, cutting mechanism and sawing-off mechanism, when arranged substantially as set forth, to operate automatically and in succession.

68,021.—ROCKING CHAIR.—Daniel Witt, Hubbardston, Mass.

1st, I claim the arrangement of the seat, B, the side pieces, b b, pivoted on the base, A, and the spiral springs, c c, to give the seat a regular rocking or oscillating motion, substantially as herein described.

2d, The segment racks, e e, and spring dogs, g g, in combination with the back, C, seat, B, shifting lever, K, and block, H, substantially as described for the purpose specified.

3d, The shifting lever, K, and block, h, in combination with the seat, B, arranged and operating as and for the purpose specified.

68,022.—SASH BRUSH.—John B. Wood, Lansingburg, N. Y.

I claim the metallic packing, C, in combination with the ferrule, B, bristles A, tapering metallic handle, D, with its open end, E, resting upon back, C, in the ferrule, B, as herein set forth for the purpose specified.

68,023.—BEDSTEAD.—B. F. Woodside, Atlanta, Ga.

I claim, 1st, The slat frames, G, hinged to the end rails, F, in such a manner as to be each folded vertically against the head and foot boards, and when turned to rest upon the pins, H, in the hinged side rails, E, thereby holding them spread and the bedstead in position, as herein set forth for the purpose specified.

2d, The sections e1 and e1, of the side rails, E, provided with holes for the reception of the pins, H, upon the sections, e2 e3, when folded together, whereby the bedstead is folded more compactly and vertical movement of the sections permitted, as herein set forth for the purpose specified.

68,024.—FLATIRON HEATER.—John H. Yates, Batavia, N. Y.

I claim, 1st, the construction and arrangement of the base, A, with or without the grate, B, upper pyramidal section, C, resting upon the base, A, and provided with slotted swinging doors, b, and partition, a, the hollow deflector, D, within the base, A, and section, C, forming flues between the ribs, a a, and inclined bottoms of the flat iron compartments, as herein set forth for the purpose specified.

2d, The close flat iron heater when constructed as described for being adapted to fit into the pot holes of a stove, substantially as described for the purpose specified.

3d, The combination and arrangement of the base, A, whose upper edge is adapted to support the flat iron in combination with the inclined flat iron compartments formed in the section, C, and provided with the slotted swinging cover, b, as herein set forth for the purpose specified.

68,025.—LIQUID METER.—R. W. Young, Richmond, Va.

I claim, 1st, The weighted rod, I, and arm, K, in combination with the valve, C, beam, E, and floats, G G, substantially as and for the purposes set forth.

2d, The connections, h h', between the valves, H H', and float rods, F F' to actuate the former by the latter but permit independent motion.

68,026.—COMBINED PLANTER AND CULTIVATOR.—Jesse Adams, Clarksville, Texas.

I claim, 1st, The agitating and distributing attachment above described consisting of the perforated bottom of the box, G, in combination with the valve, s, lever, c, and pins, t t, on the wheel, W, all constructed and operat-

ing in combination with each other, substantially in the manner and for the purpose specified.

3d, The combined planter and cultivator above described, constructed and operated, substantially as set forth.

REISSUES.

2,735.—FIRE ESCAPE.—American Fire Escape & Fireman's Ladder Company, New York City, assignees of Robert Watt. Patented June 20, 1865.

1st, I claim the apparatus composed of a divided case, A and g, composed of two sides of the ladder and hinged together by a series of rounds or steps, h h, and secured substantially as, and for the purposes herein set forth, the whole forming a fire escape ladder.

2d, The fastening substantially as herein described whereby the two segments forming the sides of the ladder are held securely together and locked against improper interference for the purposes set forth.

2,736.—BED BOTTOM.—A. S. Babbit, Keeseville, N. Y. Patented June 9, 1867.

I claim the block, A, with its ears, a a, and shoulders, x x, when constructed substantially as described and used for the purposes set forth.

2,737.—MACHINE FOR AFFIXING POST OFFICE STAMPS TO LETTERS.—R. Hoe & Company, New York City, assignees by mesne assignments of George K. Snow. Patented May 18, 1858.

1st, We claim the combination of the following elements, namely, a feeding mechanism to advance the strip of stamps or labels, a shearing or cutting mechanism to separate the stamps or labels, a platen to affix the stamps or labels, and a bed or equivalent therefor to support the article being stamped or labeled, constructed and operating substantially as described and for the purpose specified.

2d, The feeding mechanism, the platen, the shear or shears arranged with respect to the lever, and the bed or equivalent therefor substantially as specified, whereby by the reciprocating motion of the lever results will take place substantially as set forth.

3d, The combination and arrangement in a single instrument of the lever, C, the platen, H, and a shear or cutting edge, d, substantially as described and for the purposes set forth.

2,738.—METHOD OF HANGING DOORS.—George W. Holly, Low Moor, Iowa. Patented Oct. 16, 1860.

I claim the arms, f f, and rods, e e, arranged and operating relatively with the bars, C F, and door or gate, A, substantially as described and for the purpose specified.

2,739.—OPERATING ORDNANCE.—Charles Perley, New York City. Patented Dec. 12, 1865.

1st, I claim the mode herein specified of elevating a gun or mortar from behind a breastwork or protection previous to its discharge and the lowering of the same previous to loading by a hydraulic ram and cylinder as specified.

2d, I claim a plunger and chamber from which there is an opening to form a gradual recoil check for ordnance by the escape of the fluid or liquid contained in such chamber.

3d, I claim projecting the gun forward by the pressure of a liquid upon a ram or plunger, substantially as specified.

4th, I claim adjusting or sighting a gun by means of pressure upon a ram or plunger in a chamber, substantially as specified.

5th, I claim elevating the charge or projectile by pressure acting upon a ram or plunger substantially as specified.

6th, I claim connecting the chamber in which the recoil plunger acts with the cylinder sustaining the gun, substantially as specified, so that the pressure in the latter shall force the gun forward as set forth.

7th, I claim supplying through the sustaining ram, d, the liquid or fluid that acts by its pressure to project the ram or to adjust or sight the same substantially as set forth.

2,740.—FIRE PLACE.—Albert J. Redway, Cincinnati, Ohio. Patented May 7, 1867.

1st, I claim in the described combination with an open front stove or fire place, I claim the crown, C, (whether flat, truncated or arched) having the side flues, D D', and dividing strip or strips, G G', substantially as set forth.

2d, Surrounding the fire chamber of a grate or stove with the arched crown, C, which extends from the back of the fire chamber, and is provided with side flues, D D', all arranged and operating in the manner herein described and set forth.

3d, In combination with the crown, C, and side flues, D D', I claim the flue strips, G G,' and abutment, H H, for the purpose specified.

2,741.—PREPARATION OF ROOFING FABRIC.—Alfred Robinson, New York City. Patented June 20, 1865.

1st, I claim the method of coating a sheet or sheets of felt or other material with asphalt or other cement in a soft or plastic state, by applying such material to one side of the sheet while the other side is supported by a roller or moving surface, substantially as set forth.

2d, Uniting two or more thicknesses of felt or paper to form a roofing material by means of asphalt or other cement introduced between such thicknesses while supported and moved by a roller, substantially as set forth.

2,742.—SPRING MATTRESS.—R. Stilwell and A. D. Farrell, New York City, assignee of R. Stilwell. Patented September 20, 1864.

1st, We claim hinging together the sections containing the springs substantially as herein shown and described, so that the folded horizontal sections thereof shall have a separation of about twice the thickness of the mattress, all as set forth.

2d, The combination with the mattress at the folds thereof, and with the horizontal section substantially as and for the purpose herein shown and described.

3d, The catching lips, l, in combination with the hinges substantially as herein shown and and described.

2,743.—HARVESTER REELS.—William N. Whiteley, Springfield, Ohio, assignee of John S. Troxel. Patented May 11, 1858. Division B.

1st, I claim supporting the blades of overhanging reels from the head or plate on the end of the short shaft at the inner end of the reel by means of the straight arms, I, and oblique arms, K, substantially as set forth.

2d, The head or plate, J, or equivalent for the purpose of connecting the arms, K K, which supports the blades to the short shaft, at the inner end of the reel, substantially as and for the purpose set forth.

3d, The adjustable head or plate, J, substantially as and for the purpose specified.

4th, The head, J, constructed with the slots, N, in combination with the clamping bolt, M, and permanent arm, I, substantially for the purpose set forth.

2,744.—CLOTHES HOOK.—H. M. Whitmarsh, Abington, and Silas, S. Putnam, Dorchester, Mass. Patented Jan. 29, 1867.

We claim a pivoted hook, C, with its slot or opening, e, arranged that it may be closed up and thus occupy less space substantially as described.

We also claim in combination with the above, a plate or bracket, A, substantially as and for the purpose set forth.

2,745.—SEWING MACHINE.—Christopher Hodgkins, Marlboro, N. H. Patented Aug. 20, 1861. Division A.

1st, I claim the combination of the jointed arcs, K L, fitted between the feed ring, J, and the supporting block, M, the lever, N, and its cam, f, and the screw, i, the whole arranged substantially as described in relation to each other and to the cam, O, on the feed shaft, G, and operating as set forth.

2d, So arranging and applying the rotary looper in combination with an eye pointed needle for working the chain stitch, that the point of the looper enters the loop of needle thread while below the axis of rotation, substantially as herein described, or in other words, while on the opposite side of said axis to that in which the cloth is situated.

2,746.—SEWING MACLINE.—Christopher Hodgkins, Marlboro, N. H. Patented Aug. 20, 1861. Division B.

I claim the internal gear, H, in combination with the pinion, E, and actuating a reciprocating needle, and the pinion, G', for operating a looper or instrument for forming stitches in a sewing machine, substantially as described and for the purposes specified.

2,747.—RAILROAD CAR BRAKE.—J. W. Latcher and Wm. J. Powell, Amsterdam, N. Y. Patented Dec. 27, 1864.

We claim suspending or hanging railroad car brakes by means of suitable sleeves secured to the cross beams of the brake, and so fitted as to slide forward and backward on appropriate guide ways secured to the truck, substantially as and for the purposes set forth.

2,748.—WOODEN PAVEMENT.—Samuel Nicolson, Boston, Mass. Patented Aug. 8, 1854. Reissued Dec. 1, 1863.

1st, I claim placing a continuous foundation or support as above described directly upon the roadway, then arranging thereon a series of blocks having parallel sides, endwise in rows, so as to leave a continuous narrow groove or channelway between each row, and then filling said grooves or channelways with broken stone, gravel, and tar, or other like materials.

2d, I claim the formation of a pavement by laying a foundation directly upon the roadway, substantially as described, and then employing two sets of blocks, one a principal set of blocks, that shall form the wooden surface of the pavement when completed, and an auxiliary set of blocks or strips of board, which shall form no part of the surface of the pavement, but determine the width of the grooves between the principal blocks, and also the filling of said groove, when so formed between the principal blocks, with broken stone, gravel, and tar, or other like material.

3d, Placing a continuous foundation or support as above described, directly upon the roadway, and then arranging thereon a series of blocks having parallel sides, endwise in a checkered manner, so as to leave a series of checkered spaces or cavities between said blocks, and then filling said checkered cavities with broken stone, gravel, and tar, or other like material.

4th, I claim the production of a pavement by laying a foundation directly upon the roadway, substantially as above described, and then employing two sets of blocks, viz., one a principal set of block, that shall form the wooden surface of the pavement, and an auxiliary set of blocks that shall form no part of the wooden surface of the pavement, but determine the dimensions of the tesselated cavities between the principal blocks, and then filling said tesselated cavities with broken stone, gravel, and tar, or other like material.

2,749.—PICKER STAFF MOTION FOR LOOMS.—The Amoskeag Manufacturing Company of Manchester, N. H., assignees of Nehemiah S. Bean. Patented Jan. 22, 1861. Reissued May 28, 1867.

We claim the improved arrangement of the rocker, b, within the link, c, and on the support piece, e.

Also the arrangement of the spring, f, with the support piece, e, the link, c, and the rocker, b.

Also the arrangement of the ears, g, with the link, c, and the rocker, b, the whole being substantially as specified.

2,750.—BRUSH HOLDER.—Bernard Morahan, Brooklyn, N. Y. Patented July 9, 1867.

I claim the frame, A, or its equivalent, in combination with a hinged or pivoted jaw, or the equivalent thereof, so arranged as to expand or contract as the size of the brush may require, for the purpose herein shown and described.

2,751.—ELEVATOR.—N. D. Hinman, Stepney Depot, Conn. Patented Nov. 29, 1864.

I claim the bars, J J L L, pivoted in the car, A, as shown, and the bars, J J, connected at one end by a cross piece, k, in combination with the button, G, on the chain, F, and the pins, e, on the inclined ways, M, all arranged substantially as and for the purpose herein set forth.

I further claim the bent pawl, H, arranged to operate in connection with the chain, F, and pulley, D, substantially as and for the purpose set forth.

2,752.—MODE OF TRAINING HOPS, ETC.—Levi H. Whitney, Vallejo, Cal. Patented Dec. 4, 1866.

1st, I claim the herein-described mode of training hop vines, etc., in such manner as to lead them up wires diverging from each hill, and then horizontally across the space to the next row opposite, upon wires retained separate at any desirable width or distance from each other over the whole surface of the plantation, substantially as set forth.

2d, The shackles or device herein described for securing the strings or cords, when constructed and used in the manner described.

3d, Constructing the shackles, b b b, with longer arms than those of c c c, to allow them to drop lower than the latter, to which the upper ends of the cords are attached.

4th, The device constructed and arranged as described, for securing the lower ends of the cords over the hills of vines, for the purpose described.

DESIGNS.

2,751.—TRADE MARK.—George Brett, North Easton, Mass.

2,752.—PLATES OF A STOVE.—David Hathaway (assignor to Fuller, Warren & Co.), Troy, N. Y.

2,753.—INK BOTTLE.—B. P. Holmes, Philadelphia, Pa.

2,754 to 2,765, inclusive.—CARPET PATTERN.—E. J. Ney (assignor to Lowell Manufacturing Company), Lowell, Mass. Twelve Patents.

2,766.—HORSE BRUSH.—A. H. Smith, Wm. W. Clark, and Geo. F. Starbuck, New York city.

2,767.—PAPER BAG.—Samuel W. Valentine, Bristol, Conn.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., *37 Park Row, N. Y.*

46,075.—TOOL FOR PAINTING PAILS.—Jonathan Carter, Winchendon, Mass. Patented Jan. 31, 1865. Application for reissue received and filed Aug. 1, 1867

1st, I claim an elastic printing surface adapted and corresponding to the surface and taper of the pail, tub, or other similar articles to be printed or otherwise ornamented, and operating in the manner and for the purpose set forth and described.

2d, Constructing said bed of elastic material in the curved form shown, to be applied as describe, whether said bed be arranged in a series of distinct designs or in one general design, for the purpose set forth.

3d, The conical die or print roll when constructed in the manner and for the purpose substantially as above set forth and described.

14,201.—LANTERN.—Francis Morandi, Boston, Mass. Patented Feb. 5, 1856. Application for reissue received and filed Aug. 2, 1867.

1st, The funnel, D, applied to the lantern in the manner and for the purpose substantially as herein set forth.

2d, I further claim the opening in the side of the lantern covered by a sliding door, C, substantially as and for the purpose set forth.

26,401.—MODE OF APPLYING SULPHUROUS ACID GAS IN THE DEFECATION OF CANE JUICES.—Nancy Poindexter Brashear, Pattersonville, La. Patented Dec. 6, 1859. Application for reissue received and filed Aug. 3, 1867.

1st, The use of the fumes of burning sulphur, or sulphurous acid gas, in the treatment of juices containing saccharine matter, substantially as described.

2d, Subjecting sugar cane juice, or other saccharine liquid, to the direct action of the fumes of burning sulphur, such liquid being employed in a diffused state, or in such manner treated that it will be thoroughly impregnated with the fumes of sulphur, substantially as described.

34,984.—COAL OIL LAMP.—Joseph Ridge, Richmond, Ind. Division A. Patented April 15, 1862. Application for reissue received and filed Aug. 3, 1867.

1st, The use of transparent material between the base of the deflector and base of the burner, by which the advantages are obtained as herein described.

2d, The combination and arrangement of the base, B, of the burner, the transparent inclosure, M, the deflector, D, and chimney, C, substantially as set forth and for the purposes described.

34,984.—COAL OIL LAMP.—Joseph Ridge, Richmond, Ind. Division B. Patented April 15, 1862. Application for reissue received and filed Aug. 3, 1867.

The within described arrangement of the deflector having an enlarged slot, with reference to and in combination with a chimney constructed as described.

22,436.—FRUIT CAN.—Wm. W. Lyman, West Meriden, Conn. Patented Dec. 28, 1858. Application for reissue received and filed Aug. 5, 1867.

I claim compressing the cover and jar together against the packing ring, when said packing ring is arranged between the lower edge of the flange of the cover and a properly formed seat on the neck or body of a jar, substantially as and for the purpose described.

41,097.—PUTTING UP POWDERS, ETC.—Henry Sawyer, Roxbury, Mass. Patented Jan. 5, 1864. Application for reissue received and filed Aug. 7, 1867.

What I claim as a new article of manufacture is a package or case which, when made with distributing holes and filled, is cemented by the wax or wafer, e, as set forth.

41,070.—STRAW CUTTER.—F. B. Hunt, Richmond, Ind. Patented Jan. 5, 1864. Reissue No. 2,368, dated Oct. 2, 1866. Application for reissue received and filed Aug. 8, 1867

1st, I claim the bar, x, cast in one piece with the bearings, b b, of cutter shaft, c, and extending across from one to the other, substantially as shown.

2d, I claim a horizontally sliding adjustable bar, against which a rotary knife cuts, in combination with vertical screws or bolts attached to or passing through it, by which it is held down upon its bearings.

3d, I claim a rigid supporting bar, when used as a support for the horizontally sliding adjustable cutter bar, E, as and for the purpose shown and described.

4th, I claim the bearings, b b, when made in halves in combination with a horizontally sliding adjustable bar against which a rotary knife cuts.

5th, I claim attaching the plates, w, and the bearings, b b, to the bar, x, for the purpose of forming a framing to support and attach the working parts of the machine, whether the bar, x, is cast in one piece with the bearings, b b, or whether the bar, x, is otherwise attached.

6th, I claim connecting the feed rollers, G and H, by means of the pinions, a' b' d' and e', the pinions, b' and d', being placed on studs on the swinging plate, c', attached to the shaft, n; the pinions, d' and e', being kept in gear by the link, f, or its equivalent.

7th, I claim the swinging plate, c', connected to the shaft, n, and carrying the pinions, b' and d', substantially as and for the purpose shown and set forth.

8th, I claim mounting the upper feed roller, H, in a frame with slings extending below the lower feed roller, and acted upon by a spring or its equivalent, substantially as shown and for the purpose set forth.

9th, I claim the hooked slings, q q, in combination with the yielding feed roller, H, and spring, I, or its equivalent, whereby the said feed roller, H, is limited in its upward movement, as set forth.

10th, I claim hanging the upper feed roller, H, in slings attached to a spring or its equivalent, said roller moving in slots, v v, in combination with a revolving knife and a horizontally adjustable bar against which the knife cuts.

11th, I claim the hubs or bearing, u' u', attached to the slings, q q, and surrounding the shaft, p, of the feed roller, H, said hubs moving in slots, v v, in plate, w, and relieving the shaft from friction against the plates, as set forth.

12th, I claim the guide board or plate, u, connected to and moving with the frame, t, of the upper feed roller, H, and extending downward at the back of the said roller to near a level with its axis, substantially as and for purpose set forth.

13th, I claim the slots, v v, in plates, w, when combined with a rotary knife D, and a horizontally sliding adjustable bar against which the knife cuts, for the purpose shown and set forth.

14th, I claim the slots, v v, in the plates, w, when made concentric with shaft, c, in combination with pinions, a b d and e, said pinions connecting feed rollers, H and G, so that the adjustable roller can move up and down concentric with shaft, C, and the pinions remain in gear, substantially as set forth.

15th, I claim a feed roller whose shaft moves up and down in combination with a horizontally sliding adjustable bar against which the knife cuts.

16th, In combination with the bar, x, and adjustable bar, E, I claim a revolving knife, D, with its axis placed above the plane of the adjustable cutter bar, E, to act with a slanting and shearing cut, substantially as set forth.

17th, I claim the counterbalances' e'' e'', when combined with arms, e e, and a single rotary knife, for the purpose shown and described.

18th, I claim combining and revolving cutter knife, D, with the fly wheel, E', in such manner that when the knife is in rapid motion and meets with an obstruction, the knife may be suddenly arrested, and the fly wheel continue to revolve for a limited period of time and expend its momentum independently of the knife, thereby preserving the knife and other parts of the machine from injury by the sudden stoppage of the knife.

119, whole No. 31,123.—SEEDING MACHINE.—Adam R. Reese, Phillipsburg, N. J., assignee of George W. Lee and Adam R. Reese. Patented Jan. 15, 1861. Application for reissue received and filed Aug. 8, 1867.

1st, I claim the lifter handle that raises the seed tubes out of the ground, in combination with a mechanism or device that throws the feed out of gear by the one movement of the said lifter handle.

2d, In combination with a grain drill tube and draw bar, a brace to support the tube, fastened at its lower end to the tube, and its upper end embracing the draw bar, and a wooden pin which holds the upper end in proper position, and which will allow the brace to slide back on the bar when the tube strikes an obstruction, for the purpose set forth.

3d, In combination with a grain drill tube, a brace for maintaining the tube in its proper working position, supported and kept in place at its upper end by means of a wooden pin, for the purpose set forth.

4th, The feed slide of a grain drill made of two bars, the one sliding in recesses of the grain stirrups while the other is adjustable in relation thereto in such manner as to maintain the parallelism of said bars, for the purpose set forth.

11,967.—SEED PLANTER.—Adam R. Reese, Phillipsburg, N. J., assignee of George W Lee. Patented Nov. 21, 1854. Application for reissue received and filed Aug. 8, 1867.

1st, I claim in combination with the seed box of a grain drill, cast iron ends for closing and supporting the ends of said box.

2d, The cast iron ends of the seed box of a grain drill, provided with flanges formed thereon fitting and supporting the ends of the front and rear boards, as described.

3d, In combination with the seed box of a grain drill, cast iron ends provided with feet for supporting the box on the main frame.

4th, The scores, o o, or their equivalent, at the extremities of the holes, C, in the disks, M, in combination with the gradual narrowing of the holes toward their extremities, so as to save the grain from being cut, substantially as described.

52,130.—SPOKE MACHINE.—R. H. Boynton, Oshkosh, Wis. Patented Jan. 23, 1866. Application for reissue received and filed Aug. 9, 1867.

1st, I claim the feed pulley, D, feed lever, v', friction pinion, g, friction pulley, E, pinion, e', and gear wheel, f, or their equivalents, when arranged relatively to each other and to the pulley or drum, H, and revolving pattern, S, and triper pin, C, as and for the purposes set forth.

2d, I claim the taper adjusting connection, n, and auxiliary lever, m'', when arranged relatively to each other and to the lever, m', and arms, t t, as described, or in any manner equivalent, as and for the purposes set forth.

3d, I claim the revolving pattern, S, lever, m', bent arms, t t, spring, 6, or their equivalents in effect, when arranged relatively to each other and to the cutter heads, u u, and rotating feed carriage beds, as and for the purposes set forth.

4th, I claim the revolving wiper pin, C, lever, h, and jointed standard, 12, or their mechanical equivalents in effect, when arranged relatively to each other and to the cutter heads, u u, and rotating feed carriage beds, as and for the purposes set forth.

5th, I claim an adjustable automatic actuating of the revolving cutter heads provided with suitable cutter knives in a perpendicular, together with a reciprocating lateral motion in combination with the revolving motion thereof, and arranged relatively to variformed patterns, as and for the purposes set forth

6th, I claim the employment of a number of feed carriage beds, connected together to rotate and form a continuous feed, when arranged relatively to and used in combination with reciprocating revolving cutters, substantially as described, or in any manner equivalent in effect, for the purposes set forth.

58,327.—ENVELOPE MACHINE.—H. E. Berlin and George H. Jones, New York city, assignees of Thomas V. Waymoth. Patented Sept. 25, 1866. Application for reissue received and filed Aug. 12, 1867.

1st, We claim gumming the seal flaps of the blanks for envelopes at or about the same time with the lower or end flaps, after the blanks are placed in the machine and before they are folded, by mechanism substantially such as described, or any other suitable mechanism to produce the same effect, for the purposes set forth.

2d, The arrangement of a curved guide, T, in combination with the table supporting the blanks, substantially as and for the purposes set forth.

3d, Causing the seal flap, while being folded, to bear on one or more of the other folding wings, or on parts or projections of said wings, or any device or mechanism interposed between the seal and other flaps and producing the same effect, substantially as and for the purposes set forth.

4th, The combination with mechanism adapted to gum the seal and other flaps of envelope blanks, of a folding mechanism so arranged and operating as to prevent the seal flap being brought in contact with the other flaps or parts of the blank and adhering thereto.

5th, The protecting lips, f', in combination with the folding wings, constructed and operating substantially as and for the purposes set forth.

6th, The raised or projecting surface at or near the edge of the wing which folds the lower flap of the blank, substantially as and for the purposes set forth.

7th, The endless apron, Q, with its radiating arms, in combination with a suitable gumming and folding mechanism, constructed and operating substantially as and for the purposes set forth.

8th, Passing the endless apron, Q, at its receiving end, over a square or polygonal shaft, substantially as and for the purposes set forth.

9th, In combination with the endless apron, Q, the rail, o', or its equivalent, substantially as and for the purposes set forth.

10th, The combination with a suitable mechanism for gumming the flaps of envelopes, and folding the envelope blanks, of an endless apron as described, or any equivalent device or mechanism for receiving the envelopes after they are folded, and moving or supporting the same without compression until the gum on the seal flaps is dried.

11th, In combination with the endless apron, Q, or its equivalent, the receiving box, R, and follower, S, constructed and operating substantially as and for the purpose set forth.

12th, The lower arm, O, in combination with the carrying platform, N, and a suitable die inserted in or attached to said lever, or to the platform, or to both, substantially as and for the purposes set forth.

13th, The arrangement of dies, S, on the creasing plunger, and on the folding table, or on either, substantially as and for the purpose set forth.

14th, The types, u, arranged in an arm and operating in combination with the folding table and creasing plunger, substantially as and for the purposes set forth.

61,576.—HAY KNIFE.—Philo O. Soper, San Francisco, Cal. Patented Jan. 29, 1867. Application for reissue received and filed Aug. 13, 1867.

1st, I claim the construction of the blade, B, substantially as described.

2d, The bearing of the shank, C, in connection with the angle given to the edge of the blade, B, substantially as and for the purpose described.

3d, The point, A, substantially as and for the purposes above described.

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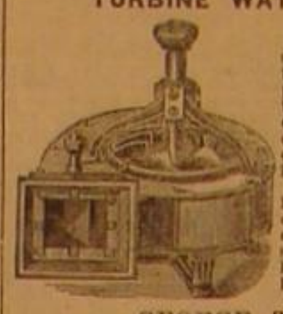
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THE PHRENOLOGICAL JOURNAL for September contains Portraits and Characters of Hon. R. D. Connolly, Rev. Newman Hall, Rev. Thomas Binney, distinguished Orators and Authors; Mrs. Husband and Mrs. Hoge; Studies in Physiognomy: For Gentlemen, by Mrs. Wyllys; True and False Marriages; Memory; Conscientiousness, its Functions; Our religion; Gradations of Intellect; Races of Man, their Origin; Queen Elizabeth; Toggery; A New Steamer, Spirit of the Age; Central Park and the New Boulevard—illustrated. 30 cents, or $3 a year. S. R. WELLS, Editor, 389 Broadway, New York. Newsmen have it. 10 3

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CONTENTS.

RULES FOR DESCRIBING PATTERNS.—An envelope for a cone; a frustrum of a cone; a can top or deck flange; a pattern for, or an envelope for a frustrum of a cone; a tapering oval article to be in four sections; a tapering oval article to be in two sections; a tapering oval article; a tapering oval or oblong article, the sides to be straight, with quarter circle corners, to be in two sections; a tapering oval or oblong article, the sides to be straight, one end to be a semicircle, the other end to be straight, with quarter circle corners, to be in two sections; a tapering oval or oblong article, the sides to be straight, with semicircle ends, to be in two sections; covering of circular roofs; two different principles; to cover a dome by the first method; to cover a dome by the second method; to ascertain the outline of a course of covering to a dome, without reference to a section of the dome; to describe a pattern for a tapering square article; a square tapering article to be in two sections; a tapering article, the base to be square and the top a circle, in two sections; a tapering article, the base to be a rectangle and the top square, in two sections; a tapering article, the base to be a rectangle and the top a circle, in two sections; a tapering article the top and base to be a rectangle, in two sections; tapering octagon top or cover; a miter joint at right angles for a semicircle gutter; a miter joint at any angle for a semicircle gutter; a miter joint for an O G gutter at right angles; a miter joint for O G cornice at right angles; also an offset; an octagon O G lamp top or cover; a T pipe at right angles; a T pipe at any angle; a T pipe, the collar to be smaller than the main pipe; a T pipe at any angle, the collar to set on one side of the main pipe; a pipe to fit a flat surface at any angle, as the side of the roof of a building; a pipe to fit two flat surfaces, as the roof of a building; an elbow at right angles; an elbow pattern at any angle; an elbow in three sections; an elbow in four sections; an elbow in five sections; a tapering elbow; an oval boiler cover; a flange for a pipe that goes on the roof of a building; octagon or square top or cover; steamer cover; an ellipse or oval having two diameters given; an ellipse with the rule and compasses, the transverse and conjugate diameters being given, that is, the length and width; to find the centre and the two arcs of ellipse; to find the radius and versed sine for a given frustrum of a cone; practical geometry; decimal equivalents to fractional parts of lineal measurement; definitions of arithmetical signs; mensuration of surfaces; mensuration of solids and capacities of bodies; tables of weights of iron, copper and lead; tables of the circumferences and areas of circles; sizes and capacity of tinware in form of frustrum of a cone, such as pans, dish kettles, pails, coffee pots, wash bowls, dippers, measures, druggists' and liquor-dealers' measures; American lap-wheeled iron boiler flues; table of effects upon bodies by heat; weight of water; effects produced by water in an aeriform state; practical properties of water; effects produced by water in its natural state; effects of heat at certain temperatures; tempering; effects produced by air in its natural and in a rarefied state; table of the expansion of atmospheric air by heat; size, length, breadth and weight of tin plates; crystallized tin plate; list of caliber and weights of lead pipe; caliber and weights of fountain or aqueduct pipes; to ascertain the weights of pipes of various metals, and any diameter required; weight of a square foot of sheet iron, copper and brass, as per Birmingham wire gage; recapitulation of weights of various substances. PRACTICAL RECEIPTS.—Japanning and varnishing; varnishes, miscellaneous; lackers; cements; miscellaneous receipts; Britannia; solders, etc.; strength of materials.

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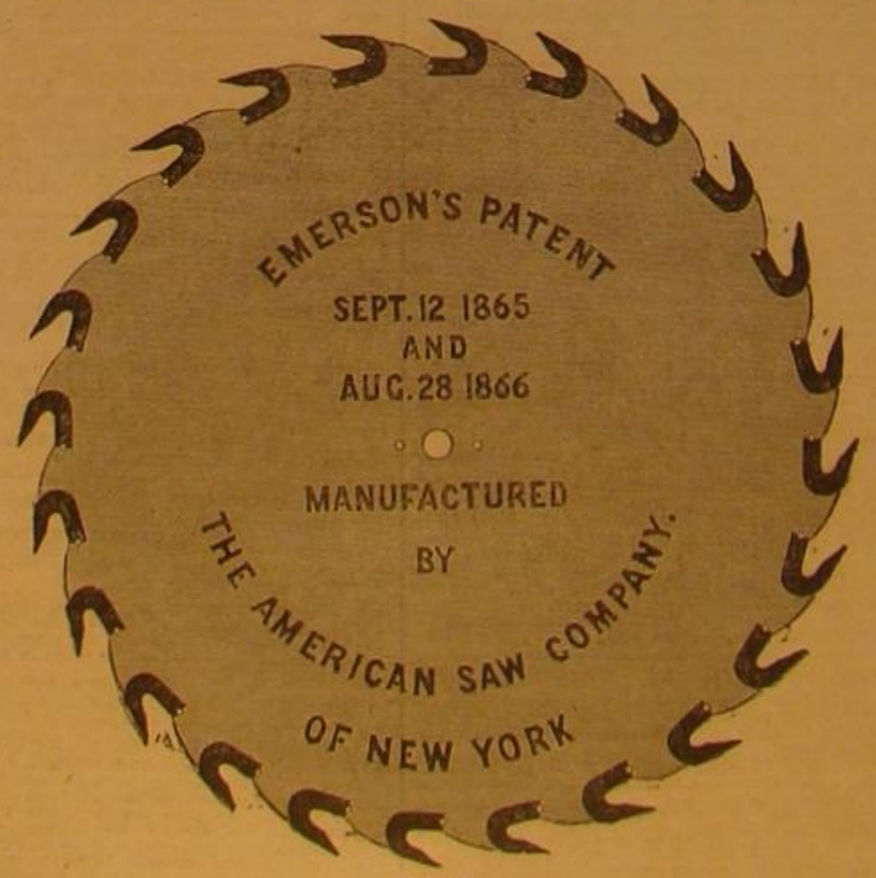
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Vol. XVII.—No. 11. [NEW SERIES.] NEW YORK, SEPTEMBER 14, 1867. $3 per Annum. [IN ADVANCE.]

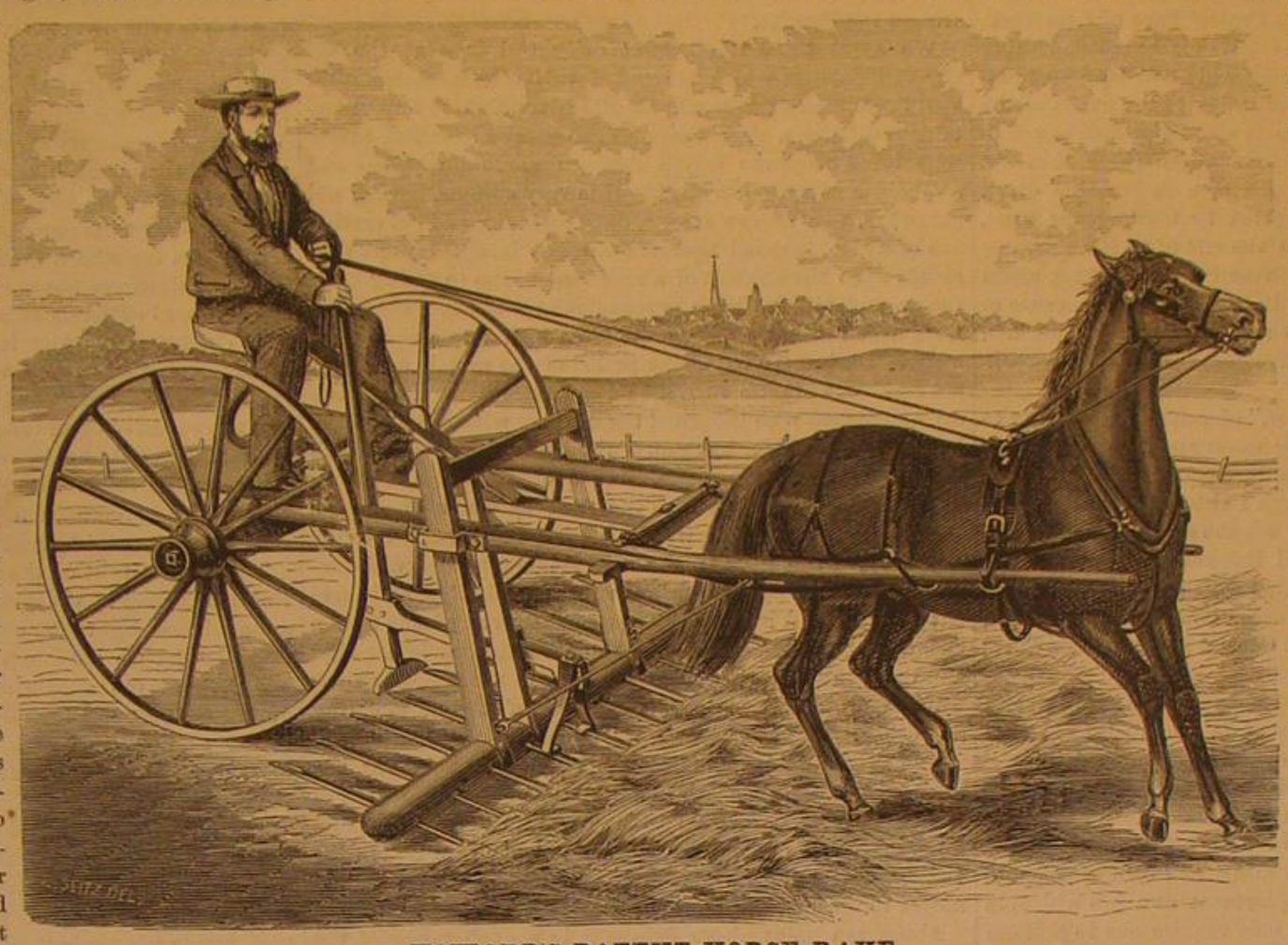
Improved Revolving Horse Rake.

A perfect horse rake should be one that can be used under all circumstances, whether the ground is even or uneven, stony or smooth, and be adapted to grain where the stubble is left standing at a considerable hight, as well as to hay where the grass is closely cut. These requirements appear to be met in the rake shown in the accompanying engraving. Its simplicity of construction and ease and handiness of operation are also arguments in its favor. They would seem to leave hardly anything further to be desired. The main points of this machine can be readily described without recourse to letters of reference.

The machine consists of an axle, on which are mounted two wheels, and which carries a frame consisting of a pair of thills connected at the rear by a platform, from which rises the driver's seat, and in front, just behind the horse, by a cross bar, to which is attached the whiffletree. From this bar to the axle is a central longitudinal bar, which serves as a base for supporting an upright and lever, used for raising the rake and its appurtenances from the ground when the rake is not in use and which is controlled by the foot of the driver. Sliding in guides attached to the thills are two uprights, connected at the top by a cross bar and sustaining at the lower end the rake head. A third upright connects with a handle, seen in the engraving as held by the driver, having a cross foot at its bottom which ordinarily holds the rake teeth to prevent them from turning. A forked spring on a horizontal bar rigidly attached to the upright handle holds the teeth down until the time for their rotation arrives.

The operation is simple. While working, the upright or hand lever is held back and the horizontal or foot lever is allowed to govern itself, as in the engraving. If the rake, being loaded, is to be rotated, the upright lever is pushed forward, which releases the teeth and they perform a half revolution, which completed, the rake is again in position and locked by the forked spring. If the rake is to be lifted so the machine can be used as a vehicle merely, as when going along the road, the foot lever is depressed and held in that position by a catch under the driver's seat. This movement raises the rake bodily from the ground. Also, if stones or stumps, or inequalities of the ground are to be avoided, the rake or only the front of it may be raised by the use of these two levers. For grain which has been cut high this machine will prove just what is needed as the rake can be held at any position desired. The woodwork can be constructed by any ordinary wood worker, and the iron work is so simple and plain as not to tax the resources of any country blacksmith.

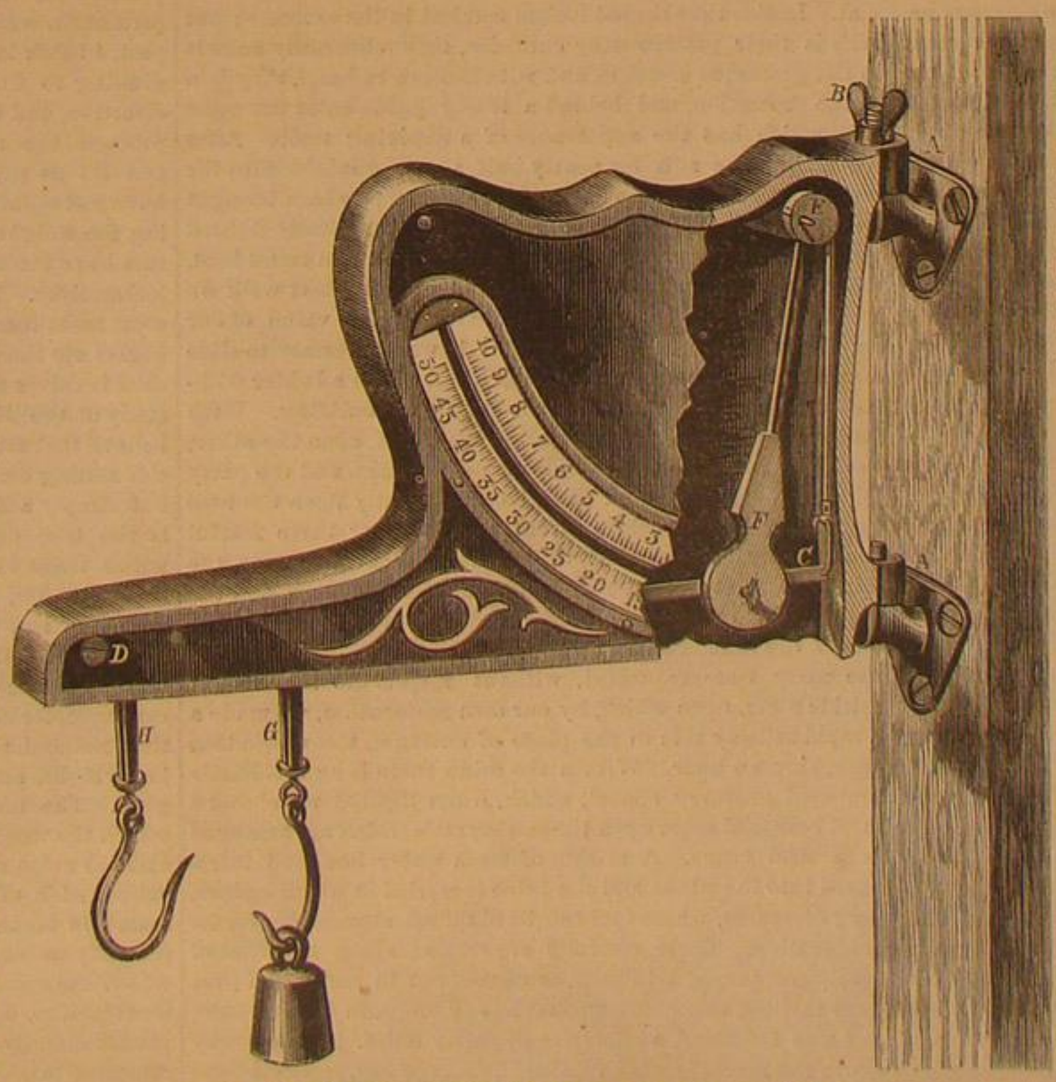
Letters patent were granted through the Scientific American Patent Agency, July 30, 1867, to Charles Howard, Bearsville, Ulster county, New York, who may be addressed relative thereto.



HOWARD'S PATENT HORSE RAKE.

Improved Suspended Lever Scale.

Practical mechanics prefer the action of the lever to that of the spring when its effects are repeatedly and frequently required, because that of the lever is always constant while that of the spring varies with its tension, which may be affected by atmospheric temperature, sudden strains, or continued use. Still, as applied to weighing apparatus for ordinary traffic the spring balance has proved very reliable. The weighing scale represented in the engraving works altogether by lever power and is sufficiently accurate under all circumstances. It is secured to a post, wall, or casing by the pivoted feet, A, by which it may be swung out of the way when not in use, and it can be held in any position by the thumb screw, B, which binds the scale to the foot, A. The lever, C, is pivoted at D, and connected by a vertical strap at its other end to an eccentric E, on a fixed stud. To this eccentric is attached the weighted pendulum, F, which carries a pointer that traverses the segmental slot having on both sides a scale, one for light and the other for heavy weights. On the size shown in the engraving any body placed on the hook, G, will show its weight in ounces and pounds, up to ten pounds, on the inner scale, while the outer, when the article to be weighed is placed upon the hook, H, denotes the weight up to fifty pounds. For the use of butchers, grocerymen, and other retailers a platform or scoop can be attached to the hooks. It is one of the best improvements in weighing apparatus for the ordinary purposes of retail trade yet presented. A patent was obtained for this scale through the Scientific American Patent Agency, July 16, 1867. It is manufactured by B. A. Drayton of Utica, N. Y., and each one is warranted to weigh correctly. Furthur particulars may be obtained by addressing Franklin & Read, Poland, Herkimer Co., N. Y., who will give any further information that may be desired.



FRANKLIN'S SUSPENDED LEVER SCALE.

Experimental Trial of Safety Lamps.

Some highly important experiments for the purpose of testing the relative value of the different kinds of safety lamps, when exposed to a current of air and explosive gas, lately took place at the Barnsley Gas Works, and were conducted by Mr. Hutchinson, the manager, and Mr. Wilson, steward of Darfield Main Colliery. For the purpose of the experiments a rectangular box, about 12 feet long and 11 inches by 4 inches inside, was attached to the flue of the retort-house chimney, the draft being 3-10ths of an inch, as indicated by the water gage, and by the anemometer was found to travel at the rate of five miles an hour, when regulated by a damper. Inside the box was a glass sight-hole, opposite to which the lamp to be tested was placed. When all was in readiness a stream of gas was allowed to flow into the box sufficient to surround the lamp with an explosive atmosphere. The different lamps were then tested with the following results:—The Davy lamp, with the shield on the outside, exploded in 6 seconds; and with the shield inside the gauze, gas exploded in 9 seconds. The Belgian lamp exploded in 10 seconds; the Mizard in 10 seconds; the small Clany in 7 seconds; the large Clany in 10 seconds; and the Stephenson in 75 seconds. The last is, of course, by far the best, the glass cracking before going off. It will, however, be seen that none of the so-called safety lamps can be depended on when coming in contact with a strong explosive current of fire-damp and air, but are in reality mere indicators of danger, it being clearly demonstrated that all lamps will explode the gas when the mixture is sufficiently strong.—*London Mechanics' Magazine.*

London Underground Railway.

A coroner's jury has condemned the atmosphere of the underground railway. They do not go the length of a verdict of manslaughter, but they say that the atmosphere accelerated the death of a woman named Dobner, who resided at Eton. She traveled from King's Cross to Bishop's road, and on reaching the latter station, was taken ill and died suddenly. One of the surgeons who made the *post-mortem* examination, said she was laboring under disease of the bronchial gland, and undoubtedly the suffocating air of the underground railway had accelerated death. The coroner said he had experienced the depressing effect of that railway, and therefore avoided it as much as possible. The tunnels and stations should be ventilated, but he supposed that would not be done until some shocking loss of life from suffocation had occurred.

The only underground system of railroading by which good fresh air may at all times be enjoyed is the Pneumatic plan. The cars being propelled by atmospheric pressure, it is only necessary to open a ventilating valve in the car in order to admit just the desired quantity of air, which is always pure, as there are no cinders or foul gases present. The air rushes like a hurricane through the pneumatic tunnel, always keeping the interior walls dry and sweet.

The Cuban Telegraphic Cable.

The submarine telegraph connecting the main land of the continent with the Island of Cuba has been successfully laid and is now in operation. The rates of tolls adopted by the Havana Cable Company are as follows:—To Key West, $3·50 for twenty words, $1·75 for ten, and 20 cents for every word over twenty. To England, $53·59 for twenty words: $26·75 for ten, and $2·75 for every word over twenty. To Ceylon, $81 for twenty words and $31·25 for ten. To the United States, to any part, $10 for twenty words, and $5 for ten, and 50 cents for every word over twenty.

EDITORIAL CORRESPONDENCE.

The "Prater of Vienna"—Condition of Austria—Its Mineral Wealth—Linz and its Fortifications—Scenery on the Danube—Salzburg and the Salt Mines—A Novel Visit—A Splendid Lake.

SALZBURG, Aug. 3, 1867.

Some of our Country's people, traveling in Europe, seem to be blessed with a sort of microscopic vision which enables them oftimes to behold wonders in European travel that others less highly favored, never see. The class of which I am speaking esteem it a privilege to annoy a fellow traveler by a very elaborate description of places or things which by chance he failed to see. Wishing to travel as comfortably as possible with such of my countrymen as I might fall in with, I have made it my business to see about all that is ordinarily considered worth seeing, and my experience is, that many of these wondrous objects dwindle when actually looked upon. I had sometimes heard it said that the "Prater," or great park of Vienna, was finer than the Central Park of New York, and therefore I was prepared in advance to see something very grand. The "Prater" is a large piece of land just outside the city, extending some four miles to the banks of the Danube. At the entrance there is a circular place or hub from which radiate five or six avenues, like the spokes of a wheel. One of these avenues, used as a fashionable drive, is a broad, splendid roadway, covered by umbrageous trees, and as straight as an arrow. At the end of it is a shooting box of the Emperor, around which carriages drive back again to the grand avenue. The park itself has the appearance of a very large field, destitute of engineering and ornaments, unless immense beer gardens, coffee houses, and sausage-cooking shops come under this head.

Everybody goes to the "Prater," of course, but chiefly to sip beer and coffee, eat Würste or sausages, and to listen to tolerably good bands of music that are employed to draw and entertain customers; and although I visited the "Prater" at the fashionable hour, I did not see the splendid equipages, coats of arms, fine liveries, belted Bohemian Jagers, Hungarian lacqueys, and all those things which I supposed to be common to this spot. With the exception of grand old trees, which time alone can perfect, the Central Park, of New York, is the finest in the world.

They have rather of an odd way of sprinkling the streets of Vienna. An immense hogshead is mounted upon four wheels, filled with water, and drawn by a pair of horses. To the rear end of the hogshead there is attached a leather hose provided with a common rose sprinkler. As the cart moves slowly along, a man, walking behind, shakes the sprinkler to the right and left by means of a cord attached to it. However, two men find employment at a job which, in any enterprising country, would only require one to perform it much better. In castles, palaces, fine monuments, and public buildings, vast collections of pictures, and such other things as interest the mere curiosity of travelers, and a gaping, listless multitude, Vienna is a splendid city; but so far as regards the practical arts and sciences, it is everywhere apparent that the Austrians are behind the age.

The Emperor is one of the Hapsburg House who date the commencement of their monarchial rule back six centuries to a Swiss—Rudolph Von Hapsburg. Governed by a sort of blinded religious zeal, they have never been able to win over to their system of government any one of the numerous nationalities that form a part of the Empire. The Government is understood to throw obstacles in the way of inventions, and seems never disposed to foster and encourage those elements which alone can elevate a nation and its people to true greatness. The misfortunes of last year have begun to open the eyes of the people to a realization of the fact that no nation can be truly prosperous when more than one-half of its able bodied inhabitants are soldiers, civil employés, or members of some monastic order, who have for centuries been eating into the vitals of the State, and bringing it nearly into bankruptcy and ruin. Some sovereigns seem to act as if nations were made expressly for them to govern, and the subjects a species of live stock to be transferred from one to the other as so much property.

Austria is really a fine country, and possesses capabilities of becoming one of the most prosperous. The Danube, perhaps the finest river in Europe, drains its rich valleys, and its branches extend far up to the Tyrolean Alps, which are stored with iron, lead, quicksilver, and other valuable minerals, besides an abundance of coal and salt. Nature has lavished her most bountiful treasures upon the the dominions of Austria. Its people are kind hearted, hospitable, and patient, and all they seem to need is a government to assist them in the development of their resources, which seem to lie wasting for lack of enterprise.

Leaving Vienna, we followed the windings of the Danube up to the old city of Linz, which is said to be celebrated for the beauty of its women, the fine views in its vicinity, and for its new fortifications. We saw the views, which were certainly very fine; we also visited the fortifications, and looked sharp to see the beautiful women, but saw none, and were forced to the conclusion that some guide-book publishers had been paid to introduce this feature as one of the attractions of Linz, hoping thereby to induce bachelors, at least to stop and look after them.

The fortifications of Linz differ from any others I have yet seen. They were designed by the Archduke Maximilian, and constructed at his expense. Instead of a continuous wall, with bastions at intervals, there are a series of isolated stone forts, that look like the stone barns of the Shakers—some thirty or more—which encircle the town and are connected by a covered way, forming a circuit of about nine miles, the highest eminence, called Postlingberg, being surmounted by five towers which form a citadel. These towers are all constructed with great engineering skill and are capable of holding a garrison of two hundred men. They are three stories high, the lower stories being used for storage, and powder magazines. A deep ditch surrounds every tower, so that only the upper story, or gun deck is exposed. In case of an assault, however, guns could be employed in each story, and so trained as to cover every approach. It yet remains to be seen how far this system of sunken towers is an improvement upon the ordinary method of fortifying towns, but it appears to me to combine great excellencies for the defence of these important inland towns, which are always liable to attack, whenever the balance of power requires to be readjusted—and owing to faulty construction, this balance seems always to require some tinkering.

From Linz the scenery of the Danube, many miles upward, is exceeding grand and impressive—quite equal to the Rhine, but tourists run after each other, and few, comparatively, ever think it worth while to get off the railway to make a trip on the Danube.

We spent three of our most delightful days at the old city of Salzburg, which is reputed to be the most beautiful spot in Germany. It would be difficult to find, in any mountainous district, a place that offers so many attractions to one who loves romantic drives through mountain passes and splendid scenery. The city itself is very curious, having old gateways, very narrow streets, dark passages, and old castles, one of which, founded upwards of eight hundred years ago, stands upon the summit of a rock that seems to spring from the ground, rising almost perpendicularly 420 feet above the river which rushes through the town with a tremendous velocity. During the turbulent period of the middle ages, this old rock-bound castle furnished a safe retreat for the tyrannical Archbishop who governed the country with a rod of iron. It makes one shudder to think of the awful transactions which have occurred in this castle. In one of its towers is shown the chamber of torture with the rack by which the victim was raised, and a stone weight of 150 lbs. attached to the feet; and the trap door in the floor leading to an awful dungeon below, through which the victim was hurled, and there cut to pieces. A secret under-ground stairway leads from a chamber of the palace down to the old cathedral in the city, and through which, in the sacred name of religion, Christian believers were carried to this chamber of terrible suffering and death.

The Tyrolean Alps stand immediately above Salzburg, one peak rising above the other, until they enter the region of eternal snows. It was a curious sight to me, for the first time, to look upon such a scene—the valleys below rich in the verdure of summer, while above, a few thousand feet, and nearer to the sun, the snows never melt away.

About ten miles above Salzburg, in a deep gorge of the mountains of Bavaria, are the famous salt mines, which have been worked upwards of two hundred years. Wishing to see these mines, a party was made up, and, after a carriage ride of nearly two hours up the valley of the Salza, which winds around between high mountain peaks, we reached the mines, and, without difficulty, obtained permission to enter. Ladies as well as gentlemen are permitted to enter the mines; but before doing so they must put on the breeches. The dress provided consists of trowsers, a coarse blouse, a brigand hat, and a leather apron, strapped about the waist to cover the seat. Ladies thus rigged looked comical in the extreme; but such is their praiseworthy curiosity, they cheerfully submit to the grotesque costume, and with lantern in hand, they join in the procession, and behind a trusty guide enter the main adit, which has the appearance of a receiving tomb. After traversing the adit for nearly half a mile, straight into the mountain, we ascended a flight of 450 stone steps, which brought us to a salt-water lake, forty feet deep, all beautifully lighted up. We were ferried across this gloomy Styx in a small boat, and then again entered the adit, and after a short walk we reached the pithole, where we discovered the value of our leather aprons. To enter this pit it was necessary to slide down upon two smooth bars, which resembled a ladder without rounds when placed up the sides of a building. With lantern in one hand and a leather gauntlet upon the other, to clasp a rope, the guide slides upon the bars, and the party follow his example; and thus, holding tightly upon the rope and riding pick-a-back, we went down two or three fearful descents until we reached the great salt cavern where the miners were at work. The ascent of the 450 steps, and the descent made upon the leather aprons, brought us again to one of the branch adits, on a level with the main adit, where the party were requested, without respect to sex, to get astride a car, upon which, by our own momentum, we made a a rapid railway ride to the place of entrance, the whole tour occupying an hour. Within the mine there is an artificially prepared grotto or chapel, which, when lighted up, shows a most beautiful effect upon the salt crystals, which are arranged in fanciful forms. A stream of fresh water has been introduced into the mines, and the brine is carried in wooden pipes, long distances, where fuel can be obtained abundantly for its evaporation. These conduits are carried along the sides of precipices, through tunnels, or canals, cut in rocks, and over deep ravines, supported upon piles or props, in one instance, as I was informed, a distance of thirty miles. A short way above the mines is a lake called the Kings' Sea, which is most awfully grand. It lies between snow-capped mountains, which rise so precipitously above it that it is scarcely possible to gain a foothold. We were rowed through the lake in a small boat, three men and three women pulling at the oars; a pistol discharged from the boat reechos like a sharp peal of thunder. I have never before looked upon such scenery, but I am going on to Switzerland, where, I suppose, things are done on a grander scale.

S. H. W.

Special Correspondence of the Scientific American.

VARIOUS NOVELTIES IN THE EXPOSITION.

PARIS, August 6, 1867.

The second trial of mowers and reapers, which I mentioned in my account of the first was to be held, has after several postponements, at last taken place. The ground mowed was exactly the same as that appropriated two months ago, the grass having in the mean time grown to a sufficient hight, but a less area was apportioned to each machine. Nearly or quite as many machines took part in the competition as on the previous occasion, and the results were equally favorable for American inventions. The area to be mowed by each machine was one acre. Wood's machine was again first in completing its work, but escaped only by an accident being robbed of its laurels by the Perry mower. The latter had cut all its plot except about thirty seconds work in its last swarth when by some means or other it broke its cutter bar, causing a delay of ten minutes to replace it. Notwithstanding this accident it came in second only, the actual working time being but about twenty-six minutes, and the quality of work done first rate. This machine has received some modifications since the last trial, but perhaps owes some portion of its success to the skillful manner in which it was handled. Wood occupied thirty-three minutes in cutting his field, thus very well sustaining his previous position. McCormick's machine also did well, but Howard's was less fortunate than before, meeting with some serious mishaps and doing its work badly. On the whole, therefore, the relative standing of the best machines was not much changed by this trial, except in the increased efficiency of the Perry mower.

A characteristic American invention is that of separate teeth for circular saws, several forms of which are exhibited, made under Emerson's and Miller's patents. It would be difficult to conceive of an innovation of that class originating in England, though having once seen it they will be quick to appreciate its value. There appears to be no one to give any information in reference to these saws, though there are many who would be glad to hear about their practical operation.

The electric light on the top of the ugly frame work in the English portion of the grounds is now working well, giving a magnificent light. The electricity is derived from a pair of magneto-electric machines running at 400 revolutions per minute, and the apparatus is in motion for several hours during the day, and from 9 to 10 o'clock in the evening, competing at that time with the French oil light. One should properly be several miles away to judge correctly of their relative powers.

Some very fine Fresnel lenses are exhibited by Messrs. Chance, of Birmingham, makers to the Trinity board. They have received a prize medal, and astonished the public a short time since, in proving them, in a photometric trial, nearly ten per cent superior to the French lenses, which have long held the first rank. Their efficiency is attributed to excellence of workmanship, as the quality of the glass does not appear equal to the French, and is said not to be so good as that usually turned out by this firm, owing to some difficulties with their furnaces at the time this was made.

One of the most interesting portions of the Exposition is that of railway carriages, particularly in the French department. We have been accustomed to think our system of long cars with four-wheel swiveling bogies at each end, the best possible for ease of working and economy of repairs to the permanent way. But whatever it may have been in time past, I think it is evident that our railway companies are beginning to find that there has been a growth in the wrong direction, and while builders and patentees have labored to produce the most luxurious accommodation for the public—and let us give them all praise for having done so—they have lost sight of the requirements of the railway in increasing the weight beyond measure, so that our heavy sleeping cars have become almost as destructive of permanent way as locomotives. To reduce the weight per axle, they have in some cases resorted to the use of sixteen wheels, but as these bogies are themselves the heaviest part of the structure, this shift involves a considerable addition to the total weight. A study of the European carriages exhibited, gives reason to believe that after all the system in vogue here, of short vehicles resting on two single axles with no heavy truck frames, but simply a light wrought-iron jaw to receive the axle box, is the true one. Counting up the number of passengers which these carriages will contain and taking the weight of the structure, we find that the dead weight per person is decidedly less than with us. A new feature which has been introduced within the past year or two on some of the railways of France, viz., the addition of a second story to the carriages, for second and third class passengers, has still further reduced the proportion existing between dead and paying weight, and really makes our figures seem quite extravagant. The use of iron framing is another of the means by which the weight is reduced, and despite of all the objections, such as noise, rigidity, etc., that have been raised against the substitution of iron for wood in this case, the use of iron frames is becoming continually more extended and appears perfectly satisfactory. With a view of removing the jarring which has sometimes been complained of with this mode of construction, some of the carriage bodies exhibited are not placed directly on the frame girders, but are supported by cast-iron brackets bolted to the sides of the latter, and having disks of india rubber on their top surface, to act as a cushion and prevent the transmission of vibration from the wheels. This matter of light carriages is one that deserves careful attention from our railway men, for it is evident that the present system is far too expensive both in first cost and in maintenance. The hight of the two-story carriages is not much greater, if any, than that of our "monitor" cars, and as the upper story is not carried quite the full width, the

center of gravity is maintained well within the base. Great numbers of them are now in use here, and it is certain that their adoption will be extended.

While noticing the railway carriages we must not pass over the carriage which is exhibited as one of those intended for the temporary Mont Cenis Railway. As several years must elapse before the completion of the great tunnel which is to establish railway communication between France and Italy, a railway is in course of construction to ascend the mountain itself by a route similar to that now followed by the diligence, working at gradients much steeper than those generally allowed in railways. To render this possible a double-headed rail is laid on its side between the two ordinary ones, and supported so that a set of horizontal wheels on the locomotive can be made to grip this rail and thereby obtain an adhesion independent of the gravity of the engine. The carriage is also provided with two pairs of wheels bearing against this middle rail, but apparently not intended to do much work, as they are not provided with axle boxes. A brake is arranged to seize this rail, beside others applied to the carrying wheels in the usual manner. The seats inside are arranged along each side as in an ordinary omnibus, the gage of the road being considerably less than the standard width, but are comfortably cushioned as in ordinary first-class carriages. The whole is of course arranged with chief regard to lightness, and it is probable that for its purpose the railway will be very successful.

There are quite a variety of devices for establishing communication between the guard of the train and the passengers, exhibited, and some of them are in use on the French railways. They always involve a galvanic battery or some other system of machinery which to Americans seem absolutely elaborate and unnecessary. Europeans think that with their system of close compartments passengers could not be trusted with the simple bell cord as we have it, but they might at least give it a trial, and perhaps they would find their fears groundless, while they would certainly save themselves much expense. But it is contrary to French principles to trust the public, and expense is preferred to such a breach of principle.

SLADE.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

The Chicago Artesian Wells--A Question in Hydraulics.

MESSRS. EDITORS:—On Saturday, August. 17th, the Mayor, Common Council, and Board of Public Works of Chicago visited the artesian wells, for the purpose of testing the head of water, quantity discharged, etc., in order to ascertain whether it would be practicable to apply the water to city uses. There are two wells, one 5 inches in diameter at the surface, contracted to 4⅛ inches at the bottom; this well is 711 feet in depth. The other is full 5 inches from the surface to the bottom; in this latter well is inserted a cast-iron pipe 64 feet in length, which penetrates the rock 42 feet and projects above the surface 22 feet. This pipe is 5¼ inches in diameter and is cemented in and fits the well perfectly tight. From the top of this pipe the water is discharged upon and drives an overshot wheel twenty feet in diameter, used as a power for drilling and enlarging the other well.

In order to test the head of the water, the first well was stopped or plugged forty feet down with an ordinary leather sand bag, so that no water came from this well at the time of the test. Now a cap was fitted on the top of the cast-iron pipe, and a common gas or water pipe 1¼ inches in diameter was inserted in this cap, and carried up until a hight of 45 feet above the surface, and 87 feet above the level of the lake was reached. The water overflowed above the top of the pipe 18 inches in the air, when the fact was exhibited and it was readily seen that the water would rise much higher in the opinion of the City Engineer, as much as forty or fifty feet. The plug in the cast-iron pipe at the level of the top of the wheel was removed, and the water discharged at that point. It was estimated to flow here 300 gallons per minute, or 432,000 gallons per day. Then the plug at the surface was removed, and the water discharged there. This was accurately measured, and found to be 345 gallons per minute, or 496,000 per day. The water at both elevations discharges with great force and power, and we estimate its resisting force in either well at from 600 to 800 pounds, though this fact has never been accurately determined. Now we find that upon closing both of the lower orifices, the one at the surface and the other at the wheel, the water rises to and overflows the top of the pipe only three or four inches, and does not reach its full head of eighteen inches until after the lapse of from twelve to fifteen hours, and during this time it seems, as it were, to creep up by degrees, growing stronger and stronger the longer it is left undisturbed. Now the question is, why does not this water rise at once, and as soon as the lower orifices are closed, to its full head or fountain level? The natural supposition is that it would rise and discharge in less than five seconds, but it does not. At the lower orifices there is not, and has not been for nearly three years, any perceptible diminution or variation in the flow of water, but it comes all the time with the same force and power. Seasons, wet or dry, make no difference. There is no change in the temperature and no change in the quantity.

I can illustrate this by referring to the fountain in the City Hall Park, New York. Suppose the head of this fountain is seventy feet; now screw on a two-inch pipe, say fifty in hight. The water would spout out of this pipe perhaps ten feet in the air. Shut the water off and turn it on again, the discharge would be the same, and the time but momentary. Now, while the discharge from our pipe in the air is fully eighteen inches, yet we cannot obtain that amount except by waiting a given length of time. Can you, Mr. Editor, or any of your readers, solve this question for me?

GEO. A. SHUFELDT, JR.

Chicago, Ill.

Long Range Guns. Vacuum before the Shot.

MESSRS. EDITORS.—The closing paragraph in a communication from E. H. Pardee, in your paper of Aug. 3d, requires a notice from me. It is in regard to firing projectiles *in vacuo*, or from a barrel exhausted of air.

This idea originated with me several years ago, and in 1852 I addressed you a private communication on the subject requesting an opinion. Your reply, in "answers to correspondents," in your paper, will show it, even if the original letter be not preserved. The rapid retardation of shot by the atmosphere has been long well understood, but the powerful effect of this resistance on the shot, before it emerges from the barrel, has not been sufficiently well considered. One would hardly suspect, unless he had made the calculation, that, in the thirty-two pounder, the resistance is more than four hundred and fifty pounds. And this is far more difficult to surmount than that offered by the inertia of a solid body of that weight. Because, the latter is susceptible of accelerated velocity, and of increasing force, while the other, being due to elasticity and not to weight, is incapable of absorbing force. Thus in the case of atmospheric resistance, when the charge shall have traversed half the length of the chamber, it is still wholly inert. It has acquired no inherent velocity, no independent force, and offers quite as much opposition to the driving power, at that point, as at the start. Now, when it is considered that this resistance, to some extent, increases, while the propelling power decreases with tremendous rapidity, it will be seen, that a point is very soon reached, where acceleration ceases, and, beyond which, any additional length of barrel tends to diminish the force of projectiles.

It has been estimated that powder, transformed to gas, expands to two thousand times its bulk, and, that this expansion takes place, *in vacuo*, with a velocity of five thousand feet per second. If this be so, then, a charge of powder occupying one linear foot, in an exhausted chamber two thousand feet long, would fill it, less the amount of explosion due to the quantity of heat absorbed by the barrel; and it would fill it in two fifths of a second. It is evident, also, that a shot placed before this charge, would soon acquire its maximum velocity, and plunge into the external air with terrific force, but at what point acceleration would cease, could be determined only by experiment. In a gun of six inches caliber, perhaps fifty feet might be necessary, and, if so much, it would limit the practical application of this principle, for pieces of so great length, could be used only on fortifications or in sieges, and, possibly also, on large steam ships. Such pieces would have to be made in sections, screwed or bolted together; but the sections could be made extremely light without danger, provided the breech section was of usual strength.

To produce the requisite vacuum at the proper moment, would require the aid of steam, applied as in the Gifford Injector. Let the muzzle of the gun be gently tapered almost to an edge, and surrounded by a second muzzle or rim, extending back ten or twelve inches, with a roomy cavity between, but narrowed down at the point, so that a thin cylindrical sheet of steam would jet forward from it around the bore. A pipe running from this cavity along the barrel to a point central between the trunnions, and these connecting with one from the boiler, would admit the steam, which could be turned on the instant before firing. It would at once almost perfectly exhaust the chamber and relieve the shot, as it advanced, of all opposing pressure.

I am not certain about it, but I think that in my communication, above alluded to, I suggested, in connection with this principle, the idea of accelerating charges, located in recesses along the barrel of the gun. This idea was original with me at the time, but has also been suggested by others. I have seen it, either in the SCIENTIFIC AMERICAN, or elsewhere long before the description of Lyman's Accelerator appeared. Nor, have I any doubt, that it was original with that gentleman also, who deserves all the merit of it for having first practically applied it.

But, I had concluded, that this thing of acceleration, could be accomplished in another way, much more simple and quite as effectual, by a re-enforcing cartridge, used in the ordinary guns. I think it practicable to make a cartridge, with partitions, each partition containing a full charge of powder and so divided, that when fired from the front, they will explode in succession, thus affording all the advantages of accelerating charges placed in recesses along the chamber.

This cartridge, fired *in vacuo* with sufficient length of barrel, would bring us at one step, to the utmost limit of improvement in the range of projectiles by giving an initial velocity equal to that with which the gasses of powder rush through a vacuum.

Such a projectile, moving with such velocity, like some headlong body, falling from the empty regions of space, into our dense atmosphere, with the heat evolved by its violent compression, added to the high temperature acquired, in so long a barrel, by contact with the burning gases, might become incandescent and flash through the air, like some gleaming meteor, thundering on its way.

These speculations unsustained by any practical proof, will have to be taken for what they are worth, as mere fancies, until some one, with ampler means than I, shall test their value by a course of well directed experiments.

H. S. WHITFIELD.

Tuscaloosa, Ala.

The Shipment of Crude Petroleum.

MESSRS. EDITORS:—I have read the article in your valuable journal of Aug. 17 issue, in relation to the sad and fatal accident which happened to the ship *Meteor*, on board of which was stowed upward of two thousand barrels of crude petroleum bound for London. The fearful nature of the accident, which in one minute rendered the noble ship a burning wreck, killing by the explosion of the vapors, one half the crew, and destroying thousands of dollars worth of valuable property, calls for more than a passing remark from the journals of the day. I am gratified and personally thankful that you have so ably criticized the practise of shipping, so inflammable an article as crude petroleum at all, and putting it in the poorest class of barrels, often very leaky and imperfect, always selecting the best glued packages for the finished illuminating oil, which latter article is not dangerous to life or property, owing to the volatile naptha being removed by distillation from it. I have had for the last twelve years much experience in the manufacture of coal and petroleum oils, having had the entire charge of the Downer Kerosene Oil Works from their earliest commencement, and oil, either crude or refined, with the naptha honestly removed from it, is as safe as most articles of commerce in the line of oils. All that is necessary is to distill off the naptha, which is easily and cheaply accomplished, and the last of such frightful accidents as the loss of the *Meteor* would be recorded. Naptha, however, is very largely consumed in Europe for many uses in the arts, such as varnish-making, painting, carbureting gas, etc. If it is all removed from the crude oil, it must be shipped either in tin or metalic vessels, at a large cost for packages, or some suitable vessel must be employed that is, and will remain, perfectly tight, allowing no escape of naptha or gas from it to pervade the vessel. Ordinary barrels do not hold the naptha, the leakage being often from ten to twenty per cent. of the entire cargo; but I do claim that the new tongued and grooved and cemented joint barrel, as illustrated in your paper of July 20, 1867, will carry without leakage, to any European port, the most volatile naphtha, as well as either crude or refined petroleum. The company I represent have shipped largely to Europe, and also to tropical climates, oils and whole cargoes of naphthas without a particle of loss, and when the means of transportation of these valuable products of our country, is within the reach of every shipper of oil, it seems to me the careful merchant and refiner will avail themselves of it and by the use of this improved package render the transportation and storage of these products safe and profitable. You are in error when you state there is no use for naphtha either in New York or Europe, and that it is only of value at the wells where it is produced, as several hundred thousands of barrels of naphtha are consumed per year in this country and Europe; our company, alone, make and sell yearly at least $400,000 worth of naptha.

JOSHUA MERRILL.

Boston, Mass.

Acceleration of Shot.

MESSRS. EDITORS.—Having seen an interesting account of Lyman's Accelerating Cannon in your valuable journal, I thought my experiment to increase the velocity of shot for fowling might be interesting. I first constructed a tube to communicate fire to the center of the charge of powder; this sudden expansion bruised the shot in overcoming their inertia. This objection led to a mode of putting the shot in motion before the powder was all burned. I constructed a long narrow chamber in the breach of the gun and communicated fire to the top, or end next the shot. This had the desired effect; the shot were put in motion before any considerable quantity of the powder was burned and were followed up by the powder burning back, increasing their velocity, and I could use double the quantity of powder with ease and safety and with greatly increased effect. If the length and diameter of the chamber were proportioned to the required capacity of a cannon, I think it would be preferable to having the powder in chambers, along the bore of the gun.

SETH BOYDEN.

Newark, N. J.

Screeching of Steam Whistles.

MESSRS. EDITORS.—A steam whistle can be varied in tone by raising or lowering the bell on the standard supporting it, the same being provided with a thread and jam nut for that purpose, but different notes, or discords, are often made by whistles without changing the position of the bells; in other words they screech. This is caused by the vibrations occurring in unequal times so that the waves interfere with one another. The inequality in the vibration is occasioned by suddenly opening the valve so as to start the edges of the bell before the mass has time to respond, by water upon it, and by disproportion in the bell itself. Some whistles are never satisfactory in their operation. These hints may lead to a remedy.

E. P. WATSON.

New York city.

The Willow and the Levees.

MESSRS. EDITORS.—Your correspondent, G. W. R. B., in your issue of Aug. 17, labors under an erroneous impression in regard to the willow. No tree is more tenacious of life in any soil, wet or dry. Of its applicability to strengthening the Mississippi levees there is no reasonable ground for doubt. A line of willow posts or stakes thrust not less than three feet into any soil, will take root and grow vigorously. The only object should be to put them to such a depth that the bottom may be constantly moist. They may be set upright, or take the direction of any embankment with one end below the water line and the other at the top of the

levee, being careful to cover with earth to the point intended to grow. In a few months they will become as fixed as roots can make them. The white, or osier willow, should be used as it cannot be broken off by passing timber or by any other ordinary means. I have never seen the Mississippi, and know little of the manner of forming the levees, but I suppose them to be simply an embankment, parallel with the river. With this form in mind I will say that were the duty of preserving this embankment to devolve upon myself, I would insert three lines of willows—one on the water side at the base and sloping with the bank to a point near the top—another along the center of the top, and the other about half way down the embankment upon the land side, the last two to be inserted perpendicularly, to the depth of not less than three feet. In a few years these willows would send a net work of roots through every part of the embankment sufficient to resist the wear of any amount of water, and be far more durable than any piling of timber. While on this subject I will say a word in regard to the size of material to be used. The object desired is roots. Now these may as well be obtained from a twig the size of a rake handle, and even smaller, as from a stick of timber a foot in diameter. When once rooted they are safe, and sure to grow from five to fifteen feet in length the second year. They should be set in rows, say two feet apart in the row, and pretty soon the Mississippi will be hedged in with a living fence that may endure for centuries to come T. F. C. H.

Lawrence, Mass.

There can be no doubt of the strengthening influences of the willow when planted on the slopes of river embankments. Whether there may be peculiar influences in the Mississippi to neutralize this benefit we do not know. But the embankments built by Col. Colt at Hartford, Conn., by which he redeemed hundreds of acres from overflow and procured a site for his extensive works and for two villages, are protected by means of osiers thickly planted on both the land and river slopes. These send their roots for a number of feet into the bank and furnish a valuable crop of superior basket twigs, the manufacture of which into articles of use or ornament gives employment to several hundred hands.—Eds.

TECHNICAL WRITING IN THE DAILY PRESS.

It is quite safe to assert that there is but one thing that is likely to cause a writer to commit great errors in writing on a subject he does not understand, and that is, to be inspired by those who supply him with erroneous information either through ignorance or design, or both. The writers on the daily press are for the most part accomplished and scholarly men and treat scientific subjects with judgment when they take the trouble to read up; an important item which we are sorry to say, is but too frequently neglected.

The case in point is the report of the Special Correspondent of the N. Y. *Times* on the voyage of the French ironclad *Dunderberg* from New York to Cherbourg, and it is to be hoped that a few words spent in pointing out some of his errors may not be thrown away. Hence no apology is necessary for what follows.

The writer on the *Dunderberg* says "our ponderous engines (the largest that have ever been made in the United States) driving us through the water at a speed of 8½ knots,"—as there are no less than eight pairs of screw engines already built in this country, each larger than the *Dunderberg's*, the nonsense of this opinion is apparent. His directions for the treatment of a new engine are too unique to be omitted. "A new engine must be as carefully watched as a new babe .... each of its many members must gradually feel the strain Here a little bracing is necessary, and there the tension (of the diaper pin?) must be relaxed. In this manner the various parts are at last brought into nice adjustment and perform their functions "harmoniously." The simplicity of that description is worthy of Homer or Walt Whitman!

In order to exhibit the tempestous (?) character of the voyage old Neptune is agitated, "thusly"—"In all my experience however I never knew anything to approach the *Dunderberg* in the quiet dignity of her behavior in a high sea." ..."It was not necessary at any time to put racks on the dining table, our crockery and glass ware keeping in position as securely as if we were on dry land."

The immense force of the huge waves is further shown as follows: "It was only when the sea was running high (?) that it washed over this low part of the vessel." This low part is the deck abaft the casemate and is but a little higher out of water than the monitors' decks; those who made the voyage in the *Miantonomah* will understand the hight of the sea necessary to wash over such a deck!

"I do not," he says," intend to convey the impression that the seas did not break over the main deck at all. On the contrary, they did *at times* curl over in considerable volume, making it necessary to batten down the hatches (over the officers' quarters) and vitiating to some extent the air in the wardroom below, but not to a degree that was *remarkably* uncomfortable." Query? How about ventilation, if they had encountered a gale when it would have been necessary to keep these hatches battened down? A little further on this marine observes: "Her superior ventilation," etc., "are all matters of record!" And, again, the weather was so fine that, as he justly remarks, "It was simply a prolonged excursion at sea, where no drawbacks to comfort existed except the single one—the absence of ladies."

Respecting models our marine architect thus discourses: "It cannot be long before the principles which have governed the construction of the *Dunderberg*, making her so easy and comfortable, are applied to ships generally. Such vessels, being relieved of the jacket of 1,000 tuns of iron, which encases the experimental ships, may indeed place sea sickness, and the minor discomforts at present inseparable from a voyage, in the catalogue of the things that are past." The readers of the Scientific American are, doubtless, aware that the cross sections of this vessel are almost precisely like those of a scow, the bottom being dead flat and the bilges nearly square—no curved futtocks are used, the side frames being joined to the floors like the gable of the ship-house in the navy-yard. A rudimentary acquaintance with the mechanics and hydro-dynamics of naval architecture is sufficient to point out to any one familiar with them that not only is such a construction about the worst possible for strength, but also for ease of motion in a sea-way. The latter for reasons which will be found demonstrated geometrically, practically, and mathematically, in any standard treatise on naval architecture. And if the object sought is to make such an immersed form positively unfit for ocean navigation, it can readily be attained by lowering the center of gravity of the ship; in the present case, this would be accomplished by "relieving" her, as this writer suggests, "of the jacket of 1,000 tuns of iron," which alone renders her motions tolerably easy; the log states the rolling was "deep and quick," but without "jerk.' Now, to produce as pretty a "jerk" as ever frightened the captain of an improperly stowed ship by seeing his masts cracking like whipstalks, it is only necessary to remove the armor. It would simply be another demonstration of the laws that must be regarded in relation to the form and disposition of weight necessary in order to have a vessel intended to navigate the ocean, properly balanced.

The injury to the national cause during the rebellion by the delay in the completion of "The Union-saving Ram," is thus alluded to by this naval critic:—

"Very few persons have forgotten the high hopes which were entertained during the dark days of 1863–4, when the rebels were receiving aid from England by way of Charleston and Wilmington, of the effective service which this mysterious engine of naval warfare was to render the cause of the Union, by the reduction of the forts which guarded the approaches to the harbors of the enemy. "Happily the war was ended before the formidable powers of the vessel could be tested." The idea of this "mysterious engine" reducing the forts in Charleston harbor and Fort Fisher, is decidedly rich under any circumstances, but it becomes richer still when it is borne in mind that her great draft of water (over twenty feet) would prevent her from approaching within anything like gunshot of the one, or within effective range of the other. The *New Ironsides*, with between fifteen and sixteen feet draft, had to be handled with the utmost skill to keep her from grounding while on service before Charleston. "While she was in progress of construction," so states this correspondent, "Mr. Webb was directed to enlarge the hull and engines to a size considerably larger than was at first proposed," and then, that his application to the Secretary of the Navy "for increased compensation was unsuccessful." Now this may be so, but it does not seem at all likely that the Government first ordered the vessel to be enlarged, and then refused payment for the additional cost, because it "would be compelled to modify the contracts between the Government and the builders of other iron-clads!"

Of course the question of armor and invulnerability receives more than a passing notice; the following extracts will suffice: "It is asserted in some quarters that the *Dunderberg's* good points are more than counterbalanced by the single fact that her armor is not as heavy as recent inventions in gunnery have proved that it ought to be to render her invulnerable. . . . I do not concede the justness or soundness of the objection." This refusal to "concede" to the "soundness of the objection" that projectiles from ordinary naval guns can riddle the armor of this vessel will no doubt cause those "foolish virgins" to pause and reflect, who put on iron to keep them out! But our vulnerable friend complicates his position by stating that "invulnerability is an excellent quality, and in a purely defensive warfare is doubtless the most valuable to possess. But in aggressive warfare there must be other qualities quite as essential." In other words, in "defensive warfare," as he terms it, the cuirass must be strong enough to keep out the enemy's missiles, but in "aggressive warfare" this is not important. No doubt a definition of these terms would be welcome to most of our readers, but what he really means it is impossible to say. In other words victory is important in one sort of warfare but not in the other! It is usually held that the duty of armor is to keep out shot and shells; if like the *Dunderberg's* as is admitted, it will do neither, what useful purpose does it fulfil as armor?

The "aggressive" qualities of the *Dunderberg* are thus set forth: "Speed and the ability to carry a heavy armament are as necessary as impervious armor," as she is utterly deficient in the latter, it is asserted that the former 'essentials obtain in the *Dunderberg* to a degree which is approached by no other iron-clad in existence. I say this in full knowledge that it cannot truthfully be contradicted."

This is what may be termed "doing the thing up Brown" As for speed, it is known that the *Dunderberg* is excelled by all the first-class iron-clads in either the French or English navies, and this opinion, founded originally on the result of the measured mile trial, receives a marked corroboration from the log of her Atlantic voyage. According to the log 82 tuns of coal per day were consumed, and the average speed was only 9 knots per hour; hence, as the consumption of coal increases as the cube of the speed, it will be seen that in order to maintain a speed of 13 knots, some 250 tuns per day must be used, and for a speed of 15 knots, no less than 378 tuns. Of course neither of these enormous amounts can be burned, and the wonderful speed claimed for this absurd shape is seen to be moonshine. This again suggests the subject of models, and a comparison will show that the orthodox forms were not designed by tyros or foolishly adhered to by the most successful constructors. The *Warrior* is a ship of about 3,000 tuns more displacement than the *Dunderberg*, and with a clean bottom can always be driven—as abundant trials prove—14½ knots in smooth water, and she is driven by a set of boilers of one third less area of grate and capacity than those of the *Dunderberg*. This shows how much easier the *Warrior*, with her regularly curved bottom, can be driven than the *Dunderberg* with her scow-formed bottom and straight sides.

The *Dunderberg's* machinery can doubtless develop as much power as that of the *Warrior*, and with the same economy of fuel. The *Dunderberg's* burning 82 tuns per day, or 7,649 pounds per hour, indicates some 2,200 horse-power, and as the speed increases as cube of power, it will be observed that to propel her during the voyage, 13 knots (according to the figures of the log), nearly 7,000 horse-power would be registered. The *Warrior*, deep loaded, runs 14½ knots with 5,500 horse-power.

Those interested in models will now have some idea of the power necessary to achieve high speed with the scow form, after making proper allowance for the conditions.

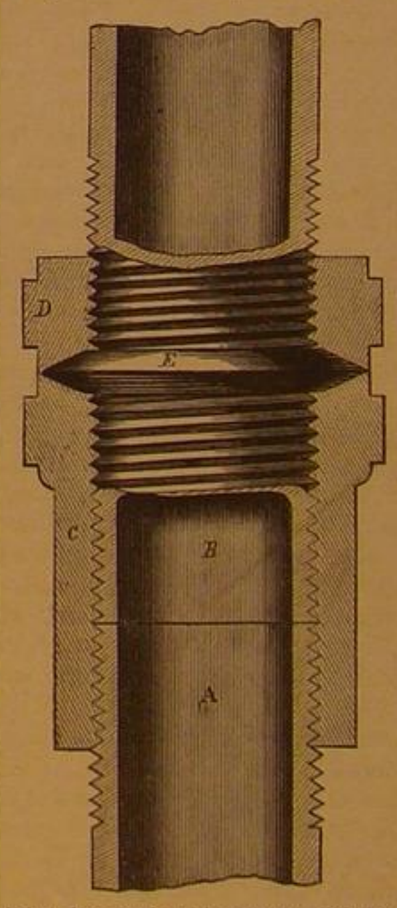
The following comparison it is not likely will be recognized by those who have had a look at the French ram: "The *Dunderberg* was floating like a swan, the outlines of the hull conforming more nearly to the shape of that bird than to any thing else." It is suggested that as she may be more formidable than she looks, a "singed cat" would be more appropriate as a comparison.

With regard to the ability of this vessel to carry a heavier armament than any iron-clad afloat, it is enough to say that there is not a large iron-clad in either the English or French navies but what can carry at least as heavy, and most of them a heavier, battery. The fact is that the gun deck of the *Dunderberg* is much too weak for the manipulation of twenty-tun ordnance. It is unnecessary to say that the same gun carriages on any other ship will work as well, and better with a deck of proper strength.

The following passages from hence to Europe made while the *Dunderberg* was at sea, will give to those familiar with North Atlantic navigation a pretty good idea of the character of the weather she was so fortunate as to enjoy. The *Scotia* left New York at noon, July 24th, arrived at Queenstown at noon, Aug. 2d. *City of Baltimore*, from New York to Liverpool, passage inside of ten days. *St. Laurent*, Brest July 20th, arrived at New York at noon, July 31st. *China*, Queenstown *via* Halifax, July 20th, arrived at Boston July 30th. ***

YOUNG'S PACKED PIPE JOINT.

The connection of metal pipes for steam, gas and water under pressure is always more or less difficult. It is seldom that the threads, either on the pipe or the couplings, fit so accurately as not to leak, and it is somewhat difficult to pack the parts so they shall be entirely tight under all circumstances. Of course, some method of packing these joints is desirable. One is shown in the engraving. A and B, represent two pieces of pipe joined together; C is the fitting or socket covering the joint between the pipes; D, is the lock nut, all shown in section. The approaching ends of the socket and nut are turned concave, and in the cavity thus formed, packing, designated by the letter, E, of some elastic substance or of soft metal, is introduced, and by the inclining sides of the cavity is forced firmly against the threads of the pipe and of the nuts. The result is a perfect joint, impervious to steam, gas, or water.



The patent is dated July 16, 1867, Wm. Young patentee, who may be addressed at Easton, Pa.

Grand Industrial Exhibition.

A workingman's fair on a large scale is to be held in this city next spring, the exhibitors being journeymen mechanics only. The projectors of this enterprise claim that hitherto all the industrial exhibitions held in this country have been under the control of parties having but little interest in the laboring classes, and as the products of labor exhibited by them were the property of capitalists, the honors and profits went to the credit of proprietors rather than the workmen. The fair next spring is to reverse this order of things, in the manner above mentioned. A circular has been issued to the journeymen mechanics of the United States inviting their co-operation in this movement.

Breech loading Arms.—The board appointed by this State for examining breech-loading fire arms, re assemble on September 17th. Patentees and exhibitors of guns of this class, desirous of presenting the merits of their respective weapons, will have an opportunity on that, or the four succeeding days, of testing their guns in accordance with the regulations adopted.

Steam Fire Engines.

Although hand engines for extinguishing fires are still largely employed in this country, the cities and large towns have very generally adopted the much more effective steamer, with its muscles of iron and steel, which never tire. Our engraving is a very accurate representation of a first class steamer on its way to a fire, and will give a correct idea of these powerful machines to our country and foreign readers, who may never have seen one. But the sheen and glow of the polished steel, iron, and brass, and the volumes of rolling smoke, the rapid rush of the horses, and the coolness and self possession of the men must be left mainly to the imagination. New York—the city proper, without reckoning the suburban cities and villages comprehended in the "Metropolitan Fire Department"—has no less than thirty-four steam fire engines. About one third are from the Amoskeag Manufacturing Company, Manchester N. H., the subject of our engraving being one of them. We append a description of "Metropolitan No. 1:"

The boiler of the steamer is 36 inches in diameter and 65 inches in length; it contains 313 copper tubes 24 inches long and one and a quarter inches in diameter. The boiler is of the best boiler plate cased in wood and covered with Russian iron, with brass bands, and with a brass dome and chimney casing.

There are two double-acting pumps lined with brass, four and a quarter inches in diameter, and 12-inch stroke, with rubber valves and brass valve seats.

The steam cylinders are eight inches in diameter and 12-inch stroke, working in the same piston rods with the pumps.

The engine is supplied with two lengths of best rubber suction hose, made upon copper rings four and a half inches in diameter inside. The suction pipe of the pumps is fitted on each side with a brass cup to close the openings if desired, and with a vacuum chamber made of burnished copper.

There are two discharge pipes for the leading hose, with a complete set of "nozzles" for change, from one and a half inches to seven eighths of an inch diameter.



THE METROPOLITAN STEAM FIRE ENGINE, NO. 1., EMPLOYED BY THE NEW YORK FIRE DEPARTMENT.

TRIAL OF ENGLISH AND AMERICAN BURGLAR-PROOF SAFES IN THE PARIS EXHIBITION--AN EXCITING SCENE.

Correspondence of Engineering.

PARIS, August 13, 1867.

The trial of the burglar-proof safes of Mr. Chatwood, of Bolton, and of Mr. S. F. Herring, of New York, or as our American friends like to call it, "the great contest of American *vs.* English safes," has commenced at last in the British testing-house at the International Exhibition. The terms and history of the challenge we have already published, but it may be as well to refer to them in a few words before proceeding to report upon the trial itself. Mr. Herring exhibitted a safe upon which he posted a challenge offering to test it against any other safe in the Exhibition. Mr. Chatwood accepted this challenge, and an agreement was drawn up to that effect. Mr. Herring then declared that his safe was not really burglar-proof at all, but simply fireproof; but that there was a burglar-proof box inside the safe, which was the article meant, if not named in the challenge. The appearance of these after declarations created a somewhat unfavorable impression against the American safe-maker, if not against his safe, which occasionally manifested itself during the trial; but the jury certainly tried to do all in their power to maintain the balance as even as circumstances would allow. The jury was chosen by the two competitors; Mr. R. Mallet and Mr. R. F. Fairlie having been proposed by Mr. Chatwood, and and Mr. Holmes and Mr. Pickering representing Mr. Herring's interest. These four gentlemen had chosen M. Paul Douliot, engineer of the firm of Cail & Co., of Paris, as their fifth member, and as their president; and Mr. W. T. Hoyle, secretary of the Whitworth Company, acted as secretary to this jury. The jury met at 11 A. M. to-day, after the preliminary arrangements had been completed, then the sham burglars were introduced, three in number on either side. They were some of the best workmen that could be mustered in England, America, and Germany. Mr. Chatwood had brought one of his foremen and a workman from his shop; the third man, a foreman at Messrs. W. and J. Galloway and Sons, in Manchester, had volunteered his services on the day of the trial. Mr. Herring had sent expressly to America for a celebrated safe-breaker, who was assisted by a man described as particularly expert at picking locks; and the third also a volunteer, who was the foreman of an Austrian exhibitor of safes, who had a very intimate acquaintance with the construction of Chatwood's safes, having been in the Exhibition ever since its opening, and repeatedly examined Mr. Chatwood's drawings and details of construction, which are exhibited without reserve. These six men, combined in two respective groups, were an interesting match, although the unequal nature of their capabilities somewhat lessened the interest of the trial. Mr. Chatwood had in his favor the calm and business-like method of his foreman, and an extraordinary amount of skill on the part of Messrs. Galloway's man in the use of his hammer, which attracted the just admiration of every one present. On the other hand Mr. Herring's man showed much judgement and experience, assisted, as it was, by the correct knowledge of the Austrian foreman. The *personnel* having been mustered on both sides, the tools were brought forward. Mr. Chatwood's men had their tools packed in a neat small leather portmanteau. The contents were the well-known serrated wedges used by expert burglars, some levers screwed together in short lengths so as to pack up easily, a small hand hammer and a block-tin hammer which gives no ringing noise in striking. Against this the Americans brought in a sledge hammer, the exact weight of which has not yet been ascertained, but which may have been somewhere about 28 lbs. There were several levers and crowbars 5 or 6 feet long, and a complete drilling-frame large enough to enclose the entire safe, and to insert the ratchet brace for drilling. Last but not least, came some steel wedges of an enormous size. Call these burglars' implements! The jury immediatrly objected to the employment of this portable blacksmith's shop, and the sensible suggestion was made to allow equal weight, and the sensible suggestion was made to allow equal weight, and a maximum size of implements only on each side. This, however, could not be adheared to, since the American tools were not prepared for such a condition, and all parties, anxious to see the trial through, agreed to allow the heavy American tools to be used, with the exception only of some of the very large wedges. The jury allowed the sledge hammer to the Americans, reserving to Mr. Chatwood the right to use a similar one if he thought necessary. This, although it changed the entire nature of the trial, was wise on the part of the jury, since it has been proved by the trial itself, that without sledge-hammers the trials would have lasted much longer than anybody would have cared to witness the operations, except perhaps Mr. Chatwood and Mr. Herring. The operations commenced at 2.45 P. M. There was a clear space all around each safe reserved for the workmen and the two sets were divided by a screen. In front of the latter, Mr. Walker, the well-known watchmaker of Cornhill and Regent street placed one of his beautiful chronometers for taking the time occupied by the different operations. A piece of wood sufficiently small to be enclosed in the little box inside Mr. Herring's safe, was put into this latter box, and a piece of similar size was put into Mr. Chatwood's safe; but Mr. Chatwood would not put his block into the small box inside his safe, as he declared that the contest was between the two safes, and not between a series of boxes hidden one within the other. Mr. Chatwood's workmen commenced by applying their small wedges to Mr. Herring's safe, while Mr. Herring's men tried their chance in drilling through the door in front of Chatwood's lock. The wedges did their work expeditiously, although the want of acquaintance with the details of Mr. Herring's construction caused some loss of time, the workmen attempting to drive in wedges at a place where the outer plate of the door overlaped the other part, and could have been removed by a cross-cutting chisel, so as to allow the immediate insertion of the wedge. In spite of this drawback, however, Mr. Herring's safe was completely thrown open in 29 minutes. The audience cheered, and Mr. Herring called out that this was only the fire-proof part of his safe, to which the English workmen replied by knocking out all the drawers and shelves of the safe and throwing them out on the floor. Meanwhile the workmen on the other side had erected their drilling frame, and worked the ratchet-brace, but without success. The drill touching the spiegeleisen which is behind the outer plate of Chatwood's safes, refused to cut, and the work had to be given up as impracticable. They also tried to pick the lock and to apply steel screws and punches to the door, but they made no progress in that direction, and had to give up all idea of forcing the door. As far as the trial had gone on with real burglars' tools, it had lasted till 3:45 P. M. After that the sledge-hammer came into request. Mr. Herring's men commenced the attack upon the dovetailing at the corners of Chatwood's safe by driving in chisels with the sledge. Mr. Chatwood then requested that his men should also be provided with a sledge-hammer for breaking the small box which contained the wood block, and this was at once agreed to by the jury. The hammer was brought in at 4 P. M., and then an amount of battering began at each of the two safes, which will be remembered for some time by every one present. The fragments of chisels and wedges were flying about the room, and the din was so terrific that crowds of spectators collected outside. "This is not burglar's work," somebody remarked; "the police would soon stop such a proceeding." But the police in the Exhibition had quite enough to do to keep off the people attracted by the noise, and, as usual, they were courteous enough to hear nothing. The work went on for about half an hour. The English workmen had the disadvantage of working upon a very small surface, as afforded by the door of the small box, enclosed as it was inside a large chest, which prevented a fair blow from being struck in any direction. Here the unusual skill of the striker proved of great value; his blows very rarely missed, although they were sometimes applied in the most trying positions. At Chatwood's safe the manual skill was less; but the men, knowing every joint and every pin, made steady progress, step by step, all parts being perfectly accessible for their operations. The attack was made upon the side of the safe next to the lock of the door; the dovetails were wedged open singly, and each of the connecting studs binding the outer plate to the inner structure was cut through by itself with large chisels. At 4.35 P. M. the outer plate of Chatwood's safe was removed entirely, and the spiegeleisen laid bare. In this form spiegeleisen, as is

well known, has no resisting power, on account of its brittleness, and it therefore took a short time only to knock off this material with the crowbars, so as to arrive at the inner plate of Chatwood's safe. The same operation was repeated on this latter, and at 5.05 P. M. a ridge was opened, through which the ashes and other powdery substances forming the protection against fire, commenced to fall out. It took half an hour more to open up a crevice at the side of the door, through which the paint of the interior could be seen, yet the peculiar construction of the bolts prevented all possibility of widening that breech, and the work had to be re-commenced at the other side. The progress with Mr. Herring's safe was of a different character. The box was fastened inside the safe by an angle-iron girder, which had to be cut through to get access to the front plate of the door. Behind this the box itself consists of a thick front plate, tied to the back plate by a great number of steel bolts, about one inch diameter each, and riveted in with countersunk heads. Behind the front plate there is a construction somewhat resembling the plan of the Chalmers' target, viz., a series of steel plates put on edge, and having their interspaces filled with franklinite iron, which is very nearly the same material as the German spiegel, only made of American ore. The connection between the front and back plate of Herring's box came out to great advantage under these circumstances, since the smallness of the surface exposed to the attack, and the close proximity of the strengthening points, afford no proper working space nor leverage for the tools. This, however, is easy enough with so small a box as that inclosed in Mr. Herring's safe, while it is doubtful whether a larger safe of the same make would allow anything like the proportionate strength of connections. At 5.50 P. M. the workmen on both sides were allowed to rest, and operations were re-commenced at 6.35. At 7.15 the outer plate of Herring's box was thrown off, and wedges were immediately inserted to force open the rest of the door. Daylight was immediately afterwards visible in the small box of Herring's safe and it would have been possible to remove small valuables, such as coins, from this chest through the crevice made. The want of a larger wedge was felt towards the end of this operation, and the suggestion was made to allow Mr. Chatwood's men one wedge similar to those which were used on the other side. This however was not carried out, as Mr. Chatwood's safe had been broken into and the block of wood removed from it at this time, 7.25 P. M., the men having removed the side plate entirely, and cut a hole into the thin sheet-iron plate which forms the inside skin. The hole was just large enough to insert the hand and pull out the small wood block, but there was no access to any one of the drawers in Chatwood's safe, nor would it have been feasible to get at the block if it had been placed in the inside chest without expending a very considerable amount of further time and labor. Mr. Herring's safe being by this time so nearly destroyed that it appeared to be the work of a few minutes only to force the small box open, it was resolved to complete this operation on the following day. The trials were consequently adjourned at 7.40 P. M.

PARIS, August 14.

The jury met at 11 o'clock this morning, and, after deliberation, called upon Mr. Chatwood's men to complete their work, which was done in three minutes. This is only one of a series of tests which these safes are to undergo,and it will be acknowledged by every competent man that it was not of a very scientific character. The *résumé* stands simply as follows: The two safes were both "third-class bankers' safes" according to the maker's catalogues. They had each a small separate compartment inside the safe proper. Mr. Chatwood deposited his wooden block in his safe proper, making no use of the inside chest. Mr. Herring deposited his wooden block in the small chest within his safe. Mr. Chatwood's men were skillful, but unacquainted with the exact construction; Mr. Herring's men showed less manual dexterity, but an intimate acquaintance with the construction of Chatwood's safe. The tools of the English workmen were proper burglar's tools, while the tools of the American workmen were boiler-maker's implements of full size, and incomparably heavier than the others, including even the sledge-hammer given to the English workmen at a later hour. Under these conditions Herring's safe was opened in 29 minutes, and the contents of it thrown out to the public. Chatwood's safe proper had a hole made in its side in 4 hours 35 minutes working time. Herring's small box inside the safe was completely broken open within 4 hours 43 minutes working time. Chatwood's small box inside the safe was not opened at all in this trial.

Editorial Summary.

MONT CENIS RAILROAD.—A cable telegram states that the first train passed safely over this Alpine railway on August 28th. Descriptions of the road and notes of progress made in its construction have appeared from time to time in these columns, and in the present issue our foreign correspondent "Slade," restates these facts. The line over the mountains is forty-eight and a half miles in length. The tunnel, if ever finished, will furnish a route between the termini of the roads—St. Michel on the French side and Susa in Italy—six and a half miles shorter.

FOR THE NORTH POLE.—Preparations for the French expedition in search of the north-west passage are progressing on a most formidable scale. M. Lambert, who heads the expedition, proposes to go into the sea of Polymia, as the French call it, from Behring's Straits, and he has studied out a plan by which he pretends to be sure to attain his object. The Emperer has shown his confidence by heading the list of subscriptions with a sum of $10,000.

THE ANGORA AND CASHMERE GOATS.—We mentioned on page 268, last volume, that Mr. J. S. Diehl had been commissioned by Government to proceed to Europe and Asia, for the purpose of investigating the modes of manufacturing the wool from these goats, and now we have to report his progress. Writing from the Paris Exposition, he believes from all he can learn and see, that the raising of goats and manufacture of their hair and wool may be carried on more successfully in the United States than in Europe. He finds that nearly all the raw material from Asia and Russia is carded, combed, and spun in England, and then sent all over the Continent to be further manufactured. The American specimens of hair were pronounced by judges in Paris, Leeds, Hamburg, and Vienna, fully equal to the best imported. He writes: "I am fully satisfied that we can make the raising of these sheep a success, and their wool more valuable than any hair fleece or fabric now known."

CAOUTCHOUC.—This barbarous appellation is a corruption—it certainly cannot be called an improvement—of the South American Indian name *cahuchu*. Although ill-named, the industrial demands for the substance have become so important that experiments have been made in Brazil for cultivating the tree which furnishes the supply, in the same way as the quinquina has been grown in the Himalaya. For preserving the gum in a liquid form, as it comes from the tree, the liquor is filtered, then mixed with about one-eighteenth its weight of strong ammonia. On being poured out and exposed to a temperature of 70 to 100° Fah. the ammonia which preserved it from the action of the oxygen, evaporates, and leaves the gum shaped to correspond with the containing vessel.

$10,000 REWARD.—An English gentleman, who retains his incognito, but who is guaranteed by the chairman of the London Hospital, promises to bestow two thousand pounds sterling, on any person who before July 1st, 1868, shall have discovered any means by which in all, or nearly all cases, pain can be both permanently and completely annihilated, as it is now extinguished for a short time by anaesthetics. The means must be easy of application, not dangerous, and of moderate cost. In case this discovery is not made by that date, one half the above amount will be awarded for any kindred discoveries of minor importance, but yet of great service in the relief of pain. If the reward is accepted, the process must not be patented but given freely to the medical world at large.

THE EGYPTIAN LOTUS, is a fine aquatic plant sacred to Osiris and Isis, and regarded in Egyptian delineations as signifying the creation of the world. The only place where it is known to grow spontaneously in this country is in a pond in Middlesex county, Conn. The origin of the plant in this spot is not known, but here it flourishes in great perfection. The leaves, slightly resembling those of the pond lily, are nearly round and about two feet in diameter. The flower bud is long and pear shaped, white and slightly resembling the magnolia, when not unfolded.

PACIFIC TELEGRAPH PROJECT.—The Californians are seriously agitating the subject of laying a submarine telegraph from San Francisco to China and Japan, *via* the Sandwich Islands. Soundings made some years ago, prove the existence of a true telegraphic plateau extending from the California coast to Honolulu, quite as marked as the one between New Foundland and Ireland. The San Francisco *Bulletin* thinks the proposed plan is feasible, and is confident that it will be carried out.

FAST TRAVELING.—It is contemplated, on the completion of a new railroad from London to Liverpool, to run express trains which will surpass anything yet realized in railway traveling in any country. The whole distance between these stations—over two hundred miles—will be run without a single stoppage, and the time occupied will be four and a half hours, the speed being at the extraordinary rate of eighty-one miles an hour.

THE BEGINNING OF THE END.—As noted several weeks since in this journal, the Paris Exposition closes Nov. 1st. The materials of the palace and park, it is announced, will be shortly offered for sale, to be delivered as follows: The aquarium, trees, shrubs, and vegetable soil, on the 1st of November, and the iron work of the building by degrees, as the articles are removed, and at the latest on the 1st of January, 1868. A rumor which prevailed some time ago of the building being sold to Russia was erroneous.

THE TELEGRAPH.—It is officially announced that the Prussian government intends to extend the telegraphic system to every town with a population of one thousand five hundred. The extension will first commence in the province of Saxony.

IN noticing the "Victory Kerosene Lamp" last week, we omitted to say that the engraving and description, with the address of the manufacturer, is to be found on page 144, in our paper of Aug. 31, last page of advertisements.

The Mount Cenis Tunnel.

At the beginning of the present year 6,335 meters, a little less than one-fourth of the work, was completed. For the next six months ending June 30th, more work was done than on any half year since the commencement of operations in 1857. The number of meters excavated on the Italian side was 453; on the French side, 321; making the total length of excavations at that date 7,109 meters, or four and two fifths of English miles, leaving three and one-tenth miles yet to be dug. Progress on the French side has been slower than on the Italian, and in all probability nearly five years more will be required before its half will be finished.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The Bessemer steel works at Troy will soon be able to turn out fifty tuns of steel per day. Most of the steel is cast in ingots weighing several hundred pounds each. Small castings in sand are full of blow holes, but are claimed to be twice as strong as similar ones made of cast iron. The company are preparing to make steel railroad rails, and in Vermont, works are being erected for manufacturing steel locomotive tires.

The Ohio and Mississippi company are making arrangements for laying a third rail from St. Louis to Odin, making a narrow gage track, so that by the coming fall, cars will be enabled to run through to Cairo and Chicago without change.

It is said that upwards of five thousand different articles in common use are manufactured of the ordinary willow.

An inclined railway is to be built at Bahia, Brazil, for facilitating travel and the transportation of freight from the lower to the upper city. Heretofore both passengers and freight were carried over the steep bluff of one hundred and eighty feet high, dividing the city, on the backs of negroes.

Years since, black walnut furnished the most available fencing stuff in Ohio, and was generally used for that purpose. This year the shipment of black walnut lumber as a valuable wood from Toledo, from the opening of navigation, amounted to one hundred and twenty-five cargoes, aggregating 19,677,300 feet.

A paragraph has been circulating among our exchanges that a rubber belt thirty-six inches wide, one hundred and eighty-two feet long, and weighing 1,007 pounds, was the largest in the world. In another column we refer to a belt to which this distinction really belongs, this one being of three inches greater width, and three feet longer.

The manufacture of artificial fuel from consolidated coal-dust although commercially unsuccessful in this country has met with a very different result abroad. Twenty establishments in France produce yearly 500,000 tuns. In Belgium seven manufacturers turn out 400,000 tuns, while in other countries the product, though less, is very considerable.

Mining is being prosecuted in New Hampshire with good success. A mine in Lisbon has yielded $4000 in gold since January, and 417 tons of "dressed copper" have been taken from a mine in the same vicinity.

Learning experience from the lesson of last winter, the Pacific Railroad Company have roofed over ten miles of track in the mountain regions of California, as a protection against a blockade of the road by the heavy snows of these elevated regions.

It is reported that nearly all the rolling mills at Pittsburg will be started in the course of the next two weeks, and that the prospect of business in the fall for the manufacture of iron is good. The workmen who were formerly on strike at Pittsburg having compromised their difficulties, are ready to go to work again.

The next great gold field of the West, is believed to be the neighborhood of the Black Hills of Dakota, now known from actual demonstration to possess the precious metal in great profusion. These hills also it is said, contain silver, copper, and coal. The fine timber growing there, is unsurpassed in the world, and will prove of inestimable value when these regions are settled by a mining population.

The largest steel works in this country are located on the Susquehanna river, near Harrisburg. The steel trade is said to be very dull in England, and even the Bessemer Steel works are reported to be in want of new orders.

To the Rhenish Railway company is due the credit of first introducing a rail nine inches high, with the design of doing away entirely with sleepers, which in Europe forms quite an item in railroad repairs. The nine-inch rail rests upon a bed of plates which are covered with five inches of gravel and on top is a two inch layer of earth well stamped down so that the top of the rail projects only an inch above the surface. The two lines of rails are connected every three feet, so that the track resembles a ladder lying on the ground and half buried in it.

The work on the Kansas Pacific railway, west of Fort Hays, has been abandoned, on account of the Indians. The work on the Platte route is still going on rapidly.

It is estimated that in the first five months of 1867, there were imported into this country iron and steel worth $10,495,110—including 53,462 tuns of pig iron, 23,512 of bar, and 62,577 of railroad.

Fourteen cashmere goats have arrived at Mineral Point, Wis., the only ones now in the State. The animals are the property of a company, and have been imported at an expense of $2,500.

California capitalists are taking much interest in a proposed railroad from Marysville in their State, to Portland, Oregon. A survey of the southern end of the line has been begun. The route is through the Sacramento valley over an unbroken plain. The valley is one of the most fertile regions in the state, the first forty-two miles being a succession of harvest fields. The estimated cost of this end of the line for eighty miles, is only $12000, per mile. The serious difficulties will be found further north.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

HORSE HAY FORK.—Charles D. Blinn, Port Huron, Mich.—This invention consists in constructing the prongs with a socket for the reception of the removable handle, and in the combination and arrangement of the loop or ring toggle and ropes, with each other and with the prong.

PORTABLE CRANE FOR LOADING WAGONS, ETC.—Amos Leitner, Hopewell, Ohio.—This invention has for its object to furnish a convenient portable machine for loading wagons, etc.

CORN HUSKER.—Daniel Williams, Saginaw City, Mich.—This invention has for its object to furnish a simple, cheap, convenient, and effective machine for use in husking corn.

WASHING MACHINE.—John Worden, Normal, Ill.—This invention has for its object to furnish an improved washing machine, simple in construction, quick and effective in its operation, which will not wear or injure the clothes and which can be manufactured at a comparatively small expense.

SPRING.—Edward C. Lewis, Auburn, N. Y.—This invention has for its object to furnish an improved manner of centering the leaves of springs and keeping the ends of the outer leaves in place upon the inner ones.

FLOATING FLEXIBLE FENCE.—John Pitcher, Mount Vernon, Ind.—This invention has for its object to furnish an improved floating fence, so constructed and arranged that it will adjust itself to the varying depth of the water and which shall be so flexible as to yield and not offer a rigid resistance to the water, while at the same time maintaining the same general position.

COTTON SEED PLANTER.—J. C. Tobias, Helena, Ark.—This invention relates to a new and improved device for planting cotton seed, and it consists of a revolving toothed wheel and a revolving toothed shaft placed within a suitable hopper, and used in connection with an adjustable slide at the bottom of the hopper, the latter being mounted on wheels and connected with a harrow, furrow opener, and a coverer, all arranged in such a manner as to insure the proper planting of the seed and the covering thereof with earth.

HORSE RAKE.—A. W. Coates, Alliance, Ohio.—This invention relates to a new and improved combination and arrangement of parts, whereby a very simple horse rake is obtained, one which will operate perfectly and be capable of being manipulated with the greatest facility.

COMBINED WASHER, WRINGER, AND TABLE.—James Whitney, Bristol, Vt.—This invention has for its object to furnish an improved machine by which clothes may be washed quickly and thoroughly, without wearing or tearing them, by which they may be conveniently wrung out when washed, and which, when not in use for washing purposes, may be used for a work table

WASHING MACHINE.—Adolph F. Kuhlman, Dubuque, Iowa.—This invention has for its object to improve the construction of the washing machine patented by the same inventor, August, 7, 1866, and numbered 56,955, so as to make it simpler in construction and more effective in operation.

MACHINE FOR CUTTING BERRY BOXES.—Charles Colby, South Pass, Ill.—This invention relates to a new and improved machine for cutting wooden strips for the manufacture of berry boxes. The invention consists of a reciprocating frame placed between suitable guides and provided with a knife for cutting the strips from the bolt and with an adjustable bed containing slitting or grooving cutters, and also provided with supports underneath for sustaining the strips while being cut from the bolt; all being so arranged that the desired work may be performed in a rapid and perfect manner.

TRACE BUCKLE.—R. J. Baker, Madison County, Wis.—This invention relates to an improvement in trace buckles, and consists in a double tongue, hung upon a central crank shaft which drops the two tongues at the same time, vertically into two holes in the trace for holding it fast, and lifts out of the holes at the same time to allow the trace to be adjusted or withdrawn from the buckle.

PUMP.—N. H. Sebby, Charleston, S. C.—This invention relates to the hanging of the wheel and its arrangement or attachment, within the casing of the pump.

MEDICAL COMPOUND.—O. W. Blanchard, Delavan, Wis.—This is a medical compound especially intended for the cure of consumption.

PAD BREAK AND CRIMP.—Hiram H. Beers, Toulon, Ill.—This invention relates to a self-adjusting pad break or crimp, for pad trees employed in the manufacture of harnesses.

GRATER.—Henry Stone, Williamsburgh, N. Y.—This grater is intended more particularly for grating stove blacking or polish, which is manufactured in solid lumps or cakes.

GASOLINE HEATING APPARATUS.—Jacob D. Spang, Dayton, Ohio. Patented August 27, 1867.—In this invention a new form of gasoline burner is used and a new device is employed for utilizing the heat of such burners and concentrating it upon particular points where the apparatus to be heated is situated.

GRUB AND STUMP PULLER.—Isaac H. Palmer, Lodi, Wis.—This invention relates to a new and improved machine for pulling grubs and stumps from the ground and consists in producing a powerful leverage by means of pivoted standards supported upon wheels the lower ends adjusted by means of suitable chains near together or further apart and whereby their upper ends are elevated or depressed.

AMALGAMATOR.—George B. Field, New York City.—In this invention the pulverizing roller has a backward and forward motion through the segment of a circle in an amalgam chamber of the proper form. The amalgam chambers, settling chambers, rollers and agitators, are so constructed and arranged that they will occupy a less space than in any amalgamator now in use. All the parts except the rollers and bottom of the amalgam chambers may be made of wood at a trifling expense, and the rollers and bottoms of the chambers may be made of stone or metal.

ROLL FOR ROLLING STEEL-FACED RAILS.—Samuel S, Potter, Wyandotte, Mich.—The peculiarity of this invention consists in means for making the steel occupy the upper surface and sides of the head of the completed rail as also sufficient of a core to give it stamina. The means employed for this purpose are rolls with peculiar grooves by which a portion of the iron is crowded or pressed back giving the steel a certain prominence or projection from the yet imperfect head or upper surface of the rail or that surface which will eventually occupy that position. The rail is passed through between the rolls in the succession of openings formed by their counterpart grooves. It is modified by each transit and up to a certain point the process does not differ from that in common use.

NURSERY LOUNGE.—S. Buttenheim, New York city.—This invention relates to a lounge, in which everything, almost, is contained which pertains to the comfort of a nursery. Within it are arranged a bureau, a writing desk with shelves, a folding table, an easy chair, and a night chair, of which either can be used at a time, or more at once, as may be desired. All these devices can be concealed, so that only a common lounge will be visible.

WASH-BOARD.—Lucien de Golia, Batchellersville, N. Y.—This invention relates to a new wash-board, which is provided with two corrugated surfaces, the one being formed in wood, the other in zinc. The object of the invention is to make one board answer all requirements, all kinds of garments to be washed, and so all notions as to the best kind of wash-boards; so if there are two parties in a house differing in opinion as to whether the metal or wooden wash-board is the best, this invention will satisfy both.

MATCHES.—Emory Andrews and Wm. Tucker, Fiskdale, Mass.—The object of this invention is to dip the matches before cutting. In order to effect this purpose, cards are prepared equal in width to the length of the matches to be produced, and of any desirable length. One edge of each of these cards is scolloped or notched so as to form a series of points or teeth, which can be dipped in the sulphur vat, in the explosive compound, and after the cards have thus been dipped, they are exposed to the action of suitable cutters, and the matches are ready for use.

WRENCH.—Theodore D, Christopher, Madison, Indiana.—This invention consists in combining a screw and ratchet wrench in such a manner that while the jaw is firmly held by a catch bar working in the ratchet, the jaw can be adjusted with the greatest nicety by the screw and nut.

REFRIGERATOR.—Anthony B. Sweetland, Fitchburg, Mass.—This invention consists in constructing the same with revolving shelves and in providing for the admission and discharge of air in a peculiar manner and in the general construction and combination of parts.

WATER CLOSET RECEIVER.—W. Smith, San Francisco, Cal.—This invention consists in constructing the receiver in two pieces and bolting them together whereby I am able to do away with the waste space behind the pan and to save much expense in carting.

GRIDDLE.—Edwin A. Jeffery, Trappe, Maryland.—This invention relates to a new and improved method of constructing griddles for baking cakes, and it consists in making the griddle in two separate parts one of which parts is reversible and the other stationary.

RINGS FOR RING SPINNING.—Henry G. Hall, Fayetteville, N. C.—This invention relates to an improvement in the construction of rings for ring spinspinning whereby the inside ring may be exactly adjusted or centered so that the spindle shall run perfectly true.

DEVICE FOR CATCHING ANIMALS.—W. L. Hopper, Monmouth, Ill.—The object of this invention is catching hogs and other domestic animals by a device that catches one leg and holds it fast.

COUPLING JOINT FOR THE PITMAN AND SICKLE BAR.—Wm. J. Keeney, Norwalk Co., Ohio.—This invention consists in coupling the pitman to the sickle bar of a reaping machine with an adjustable knuckle joint formed by a movable box fitted against the end of the sickle bar, so that it can work freely and accurately while compensation for wear is fully provided for.

COTTON-BALE TIE.—S. J. Mitchell, St. Louis, Mo.—This invention relates to an improved construction of a fastening for the ends of iron hoops to secure them to a cotton or other bale.

LIFTING JACK.—J. N. Parker, Darlington, Wis.—This invention relates to a new and useful improvement in the construction of a jack for lifting the axles of wagons.

SWINGLETREE.—Martin Ryerson, Huntsville Co., Ala.—This invention relates to an improvement in swingletrees or doubletrees for wagons.

SWIVEL SHIP FENDER.—William Sniffin, Sing Sing, N. Y.—The object of this improvement is to provide a fender for vessels which shall have a rotary motion, by means of swivels or rollers at the end or ends, to which the rope for suspending it is attached.

WAGON JACK.—J. M. Spitler, Clinton, Kansas.—This invention relates to an improved wagon jack.

SMOOTHING IRON.—John Fraser, Dowagiac, Mich.—This invention relates to an improved smoothing iron and consists in having the smoothing surface of copper attached to the body of the iron by rivets cast with the copper plate.

MACHINE FOR CLEANING BRASS TURNINGS AND FILINGS.—Julius Jonson, Baltimore, Md.—This machine was tested by a Board of Engineers at the Washington Navy Yard, August 3, 1867, and the following is an extract from the report made to the Chief of the Bureau of Steam Engineering.

"The machine is strictly correct in principle and very simple in its construction occupying but little space and functioned at a very small cost, about ten cents der diem. The patentee has ingeniously fitted a series of 'electro magnets' in a revolving cylinder, and so arranged the stops as to break the currents and discharge the particles of iron in one box while the brass is received into another, these performing the duty for which the machine was intended, viz.: to separate the iron from the brass trimmings."

WASHING MACHINE.—Dr. E. Beckwith, South Pass, Ill.—This invention relates to a new washing machine which is adapted for washing coarse as well as fine articles in a very effectual and satisfactory manner. The machine is particularly intended to wash the articles when the same are rolled into a cylindrical form and is made in shape of a cylindrical shell within which a roller is eccentrically arranged so that between the corrugated surfaces of the shell and roller the articles to be washed are thoroughly rolled and pressed.

SADIRON.—James Gray, Newark, N. J.—This invention relates to a new manner of securing a solid sadiron to a shield formed on the loose ends of the handle supports so that the handle is always kept cool and so that it can be easily taken off the iron and attached to the same for the purpose of making one handle available for many irons,

BRANDING BARRELS.—George St. George, New York city.—The object of this invention is to prevent fraud being practiced against the government by liquor dealers in the way of refilling whisky barrels which have not had the old brand marks thoroughly erased or cut out. These empty branded whisky barrels are purchased by distillers and wholesale liquor dealers from retail or small dealers and refilled and sold as legitimately branded whisky. The fault lies with the inspectors, who in many cases do not thoroughly erase the old brand marks, the operation being to rapidly performed and the facility for cutting out the marks not being very good. This invention is designed to obviate this difficulty, and it consists in having one of the heads or other part of the barrel constructed with raised or prominent surfaces, formed by grooves or otherwise, on which surfaces the brand is made or cut, and which raised surfaces may be readily chipped off when it is desired to remove the brand mark.

COMPOUND.—J. F. McCafferty, Forest, Ohio.—This compound is intended to be used in beehives to free them from moths and so retain them, without the least danger of injury to the bees.

STRAW CUTTING MACHINE.—Wm. Schreck, Des Moines, Iowa.—This invention relates to an improvement in the construction of machines for cutting straw, hay, etc., for feed for animals.

MASH AND BEER COOLER.—Charles Schenck, Manheim, Baden, Germany.—This invention relates to a new apparatus for cooling mash, beer, and other liquids, in which the liquid is poured upon a revolving disk, from which it is thrown by centrifugal power against the inside of a cylinder which revolves in a direction opposite to that in which the disk is rotated. The liquid thrown from the disk is spread and is deposited upon the inner wall of the cylinder in a thin sheet and flows down in a spiral ring along the cylinder. A current of cool air is, by a fan, which is arranged in the cylinder and which revolves with the disk, thrown against the liquid as the same flows down in the cylinder, and rapidly cools the same.

CLOTHES PIN.—H. T. Bootell, Springfield, Vt.—This invention relates to a new and improved clothes pin of simple and economical construction which admits of being readily adjusted to the line so as to secure the clothes thereon, and effectually prevent the same being casually detached from the line.

SEWING MACHINE.—W. S. Hill, Manchester, N. H.—This invention relates to certain improvements in the single thread or chain stitch sewing machine, and it consists in a novel feed mechanism, the mode of operating the looper and a general arrangement of parts, whereby a very simple and sufficient machine of the kind specified is obtained.

RIDING ATTACHMENT FOR HARROWS.—James M. Freeman, Belleville, N. Y. This invention relates to a new and improved riding attachment for harrows, whereby the driver, instead of walking behind or by the side of the harrow, may ride on a convenient seat and have much better control over the team and implement than heretofore.

BALING PRESS.—J. H. Godwin, Scotland Neck, N. C.—This invention relates to a new and improved press for compressing articles or substances into a small compass for baling. The invention consists in a novel construction and arrangement of the parts composing the press, whereby several advantages are obtained.

DEVICE FOR ELEVATING ICE.—Henry Little, Middletown, N. Y.—This invention relates to a new and improved device for elevating ice from the river, pond, or lake where it is cut, into the ice house contiguous thereto, and is an improvement on a device for the same purpose for which letters patent were granted to this inventor, bearing date of May 21st, 1867. The present improvement consists in the application of a curved platform to the lower end of the screw elevator, and in the employment or use of a sectional raising and falling bearing to the lower part of the frame of the device, whereby the adjusting or placing of the cut or floating ice on the screen is greatly facilitated.

MACHINE FOR FILLING RUTS AND LEVELING ROADS.—John W. Minor and David P. Ward, New Bedford, Mass.—This invention consists in attaching to a suitable frame a pair of coulters or shares, and a pair of scrapers, and a heavy roller, whereby the ridges in the road are cut up and the earth loosenen and scraped with the rut by the scrapers, and the earth is rolled down level by the heavy roller.

BELLS.—Andrew Jusburg, Galva, Ill.—This invention consists in constructing the bells of a metallic composition hereinafter named and so forming the bells that there shall be different tones or sounds from bells of the same size and weight although formed of the same metal.

BED SPRING.—George B, Markham, Plymouth, Mich.—This invention relates to an improved bed spring and consists of several wires having one end of each formed into a loop or eye, each wire is then passed through a spiral spring and the straight end of each passed through the loop in the other. The straight end is then curved round into an eye to receive the loop attached to the slats.

SHEEP RACK.—J. S. Beals, Alabama Center, N. Y.—This invention consists in such an arrangement of the feed board and the board which is hinged thereto, that with a small amount of boards, and with a simple construction of the parts, the same and better results can be obtained, than with other sheep racks now in use.

PLOW.—J. S. Beals, Alabama Center, N. Y.—This invention consists in the construction of a supplemental share, and in the manner of securing the same to the standard, and in securing the colter to the lower end of the same standard on which the supplementary share is arranged.

APPARATUS FOR CARBURETING AIR, GAS, ETC.—George H. Peacock, Fairport, N. Y.—In this apparatus there is so coubined and connected with a supply tank or reservoir for the liquid hydro-carbons, another vessel, into and through which the air or gas, etc., to be carburetted, is passed, that the liquid within the air vessel can be always kept at a uniform and even or given hight, or nearly so, whereby the air, etc., forced or passed into the same, from time to time, whether the apparatus has been running for a longer or shorter time, is always subjected to an equal or corresponding amount of the liquid hydro-carbons, thus producing a gas of uniform density and richness at all times.

BARREL, KEG, ETC.—Christopher S. Provost, New York City.—This invention relates to a barrel, keg, or cask, which is divided into two or more compartments by one or more partitions. The object of this invention is to arrange barrels for holding beer, cider, and other liquids, in such a manner that the said liquids may be kept free from the injurious influences of the air, as long as they are in the barrel.

PAINT CAN, ETC.—George W. Bennett, Brooklyn, N. Y.—This invention has for its object to furnish an improvement in the construction of cans for holding paint, and for other purposes, by means of which the can in which the paint or other substance is packed for storage or transportation, becomes a vessel from which it may be conveniently used.

FOLDING-DOOR BUTT.—B. F. Barker, San Francisco, Cal.—This invention consists in forming a butt in such a manner that it shall be a three-leaf hinge, folding together from a single butt, working alternately as the door swings back and forth from the center.

DUST BRUSH.—Ellis Thayer, Worcester, Mass.—This invention relates to a dust brush in which the bristles or hair are secured to a block, which is reversible on the holder, so that both ends of the brush may be used, and so that the brush need not be useless because one end is used up, while the other is still good.

PLOW.—L. L. Sloss, South Union, Ky.—This invention has for its object to furnish an improved means, simple, durable, and effective, for connecting or coupling shovel or other plows together for convenience in seeding small grain, and in cultivating corn, cotton, etc.

COTTON SCRAPER.—T. T. Fleming, Memphis, Tenn.—This invention relates to a new and improved implement for cultivating cotton, scraping the earth from the standing or growing plants, and it consists in constructing the scraper in such a manner that the blade or share is prevented from penetrating too deep into the earth, and also prevented from sliding laterally out of its proper course.

FENCE.—Benjamin Force, Mount Pleasant, Iowa.—This invention relates to a new and improved fence of that class which are commonly termed "portable," and are designed to be readily put up and taken down. The object of the invention is to obtain a simple, strong, and durable fence of the class specified, one which will be better braced than hitherto, and which will admit of being properly supported without having its stakes sunk into the ground.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at 50 cents a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

A. T., of Kansas, lives at a place 1,800 feet above the ocean level. He says: "We are setting a steam mill on a bank 31 feet above low water and 100 feet from the stream. We purpose setting the suction pump at the mill 8 feet below the surface of the ground which gives it 23 feet to suck the water and 8 feet to lift it to the heater. Will this plan work?" The plan will not work. You gain nothing by setting the pump 8 feet below the surface; you do not in that way lessen the force required to raise the water to the top of the bank 31 feet. We see no escape out of your difficulty but cutting a deep trench over the bank or setting a pumping apparatus at the water. A simple suction pump cannot be depended upon to raise water 31 feet even at the sea level.

E. M., of Tenn.—No solvent of plumbago is known, but you may make a very intimate mixture of it, with mineral substances and viscid liquids. Plumbago is one of the most durable substances known.

S. T. N.—Cotton seed oil is manufactured on a large scale in New Orleans, and is used for lubricating and for soap. . . . Platinum may be deposited on copper without much difficulty by the battery, but the deposited metal is not so dense, nor is it so little affected by corrosive substances as the hammered metal.

A. F., of Va.—Kaolin is simply a very pure species of clay, silicate of alumina. The purest natural silica or silicic acid, is crystallized quartz, but white sand is sometimes found nearly as pure. Kaolin and silica are used for porcelain and pottery, and silica, white sand, in addition, is in demand for glass making. The market for these articles is now pretty well supplied, but there is always room for superior qualities, and in the due progress of manufacture all the good beds of kaolin and sand in the country will be called for.

L. H. P., of Ill.—"What will be the power exerted in each hand while drawing out a spring balance, when it indicates 25 lbs., pulling horizontally, one hand on each end of the scale? Will the resistance be 50 lbs. or 25 lbs., with each hand or, 25 lbs. and 12½ respectively or otherwise?" The resistance on each hand will be 25 lbs. This is a new form of an old question.

L. and C., of Ind.—Solder is never directly used to unite a metal with glass; glass and metallic solders are incompatible. A metallic brilliance is often given to buttons and other small articles of glass by attaching to the back a bright metallic foil. The internal surface of glass ornaments are also sometimes silvered by a fusible amalgam.

S. N., of N. Y.—The black varnish liquid blacking for boots is not to be recommended. When the blacking becomes dull, it is difficult to remove the hard resinous matter from the leather.

J. C. T., of Ark.—It has often been proposed to carry up, with a balloon, hydrogen condensed in a metallic vessel, and to use the hydrogen as a reserve to keep the balloon inflated. But the idea seems impracticable; the weight of the vessel would more than counterbalance the ascensive power of any gas that it could contain.

W. B., of C. W.—The spent acid of the oil refineries is mostly used here for preparing super-phosphate or other manures. The acid does not bear much transportation, and should be used up where it is produced.

R. G. of Conn.—Sea sand is not a special and peculiar mineral formation, but is simply a finer sort of gravel. All the particles of sand and gravel were once undistinguishable parts of the solid rock. The variation of currents, etc., account for the deposition of such materials according to fineness in different localities.

S. C., of O.—We think you are mistaken. There is no alloy of lead and tin which has a higher melting point than lead. . . The ores of mercury which are worked are always solid.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Pattern Letters and Figures to put on patterns for castings, etc., etc., are made by Knight Brothers, Seneca Falls, N. Y.

G.M. Danforth & Co., Inventors' Exchange, see advertisement.

New invention. A potato digger which puts the potatoes in a bag and the small ones apart in a box. The original was made by a blacksmith at very little cost, which will be saved by the work on three acres of potatoes. Patent rights sell: C. G. Grabo. Address care of Schober Bro., Detroit, Mich.

For sale a valuable patent for the State of Pennsylvania. Its equal is seldom offered. A good chance for a live man, for particulars, address Post office Box 230, Mexico, N. Y.

Manufactures of stamped wares and small, fine castings, also manufacturers of dies for stamping sheet iron, will please send catalogues and circulars to Bullard & Co., Geneva, N. Y.

J. B., Ill.—You have the right to continue to use a machine that was invented and publicly worked two years before the application for patent. The issue of a patent for such a machine is invalid.

Patentees of small articles will please address "K.," Room No. 3, 26½ Larned street west, Detroit, Mich.

IMPROVED METHOD OF HANGING SIDE ARMS.

The usual method of slinging sergeant's hangers and the dress swords of Knights Templars is objectionable because of the rigidity with which the sword is confined to the body. Every commissioned officer appreciates the advantages of the long slings by which his sword is attached to the belt and which allows perfect freedom of body. The design seen in the engraving secures this freedom to those who carry the straight sword. Instead of locking the sword in the belt itself, or a short frog attached to it, the sword plate—in the engraving a Maltese cross—is suspended from the belt by a looped chain, or a strap which insures perfect freedom to the motion of the body and adds much to the elegance of the equipment. In the engraving the hook on the scabbard is passed through the hole in the cross, which retains the sword secu-



rely in place. The design is very handsome and the plan convenient.

Patents for this improvement were granted through the Scientific American Patent Agency, Aug. 13, 1867. Rights and samples can be obtained by addressing the Virgil Price Manufacturing Company, 144 Green street, New York city.

PLAN FOR CITY STREETS.

A correspondent from Pittsburgh, Pa., A. R. H., proposes for the relief of crowded streets a series of iron wheel-ways for ordinary vehicles. He proposes rails of about one foot wide, the edges to be somewhat raised to retain the wheels on the rail, yet the lips being so formed that less obstruction would be offered to the turning of the wheels off the track than is presented by crossing the tracks now in use for street cars. Where the streets are wide enough the cars might run next the walk on either side, and ordinary vehicles occupy central tracks. He proposes, also the abolition of curbs, and that the walk and roadway be on the same level, the gutters being a sufficient depth, provided with frequent openings into the sewers, and be covered with movable gratings, so that passengers by the cars or ordinary vehicles need not wade through the mud of the streets in getting on or off.

We think the essential and prominent features of our correspondent's plan were proposed some time ago. This, however, does not detract from their value. We, nevertheless, cannot understand the value of his proposed improvement, especially in streets devoted mainly to business. If vehicles, like pedestrians going one way, held to one side of the street, or one track, and their progress was continual, it might do, but when the loading and unloading of teams compels the vehicle to block the way during the process, the continuous track would suffer many interruptions. Also, if the walk and roadway should be on the same level we cannot see how either those who rode or those who walked could be preserved from the mud and slush of the street.

One of the principal annoyances of passengers through the business streets of a city or town is occasioned by the work of loading and unloading goods. The team occupies a portion of the street and the skids make a bridge across the walk. The only remedy we know is a back or private way to every block or line of buildings as is the case in the modern and newer portions of Boston, Mass. The rear of the buildings has a roadway through which teams carrying coal, wood, milk, produce, merchandise, and goods of all kinds can drive, and unload or deposit in the rear of the building, while the street which fronts the block is kept free for carriages and pedestrians. The planning and arrangements of our city dwellings and business buildings is most disgraceful in this particular.

The Largest Circular Saw.

The largest circular saw on exhibition at Paris is from the United States, exhibited by the American Saw Company, Trenton, N. J. The plate was rolled in the celebrated works of Messrs, Jessop & Sons, Sheffield, England, and they certify that it was the largest circular plate ever rolled. The plate proper was seven feet and two inches in diameter and weighed 590 pounds, and was No. 2 gage in thickness. With Emerson's patent teeth inserted it was seven feet four inches in diameter. The furnace and tank being of sufficient size to heat a saw eight feet in diameter, there was no trouble in hardening and tempering the saw as perfectly as they could one as many inches in diameter. All told, thirty-five days, seven and a half hours were expended in smithing and straightening the saw. It was ground to 5 gage on the rim and 3 in the center, is without a blemish, and is true and in perfect condition to run. Allowing six inches for collars, it will cut a board 41 inches wide. It contains 48 teeth, the saw having been ground and polished with shanks of teeth inserted. These shanks were removed and the new teeth inserted and riveted without making the slightest perceptible difference in the strain of the saw.

On one side there is etched the American Eagle, holding in his beak the motto, *E Pluribus Unum*. Then follow the words, "Manufactured by the American Saw Company, New York, U. S. A. J. E. Emerson's Patent, Sept, 12, 1865, and Aug. 26, 1866. 88 inches in diameter—No. 581.

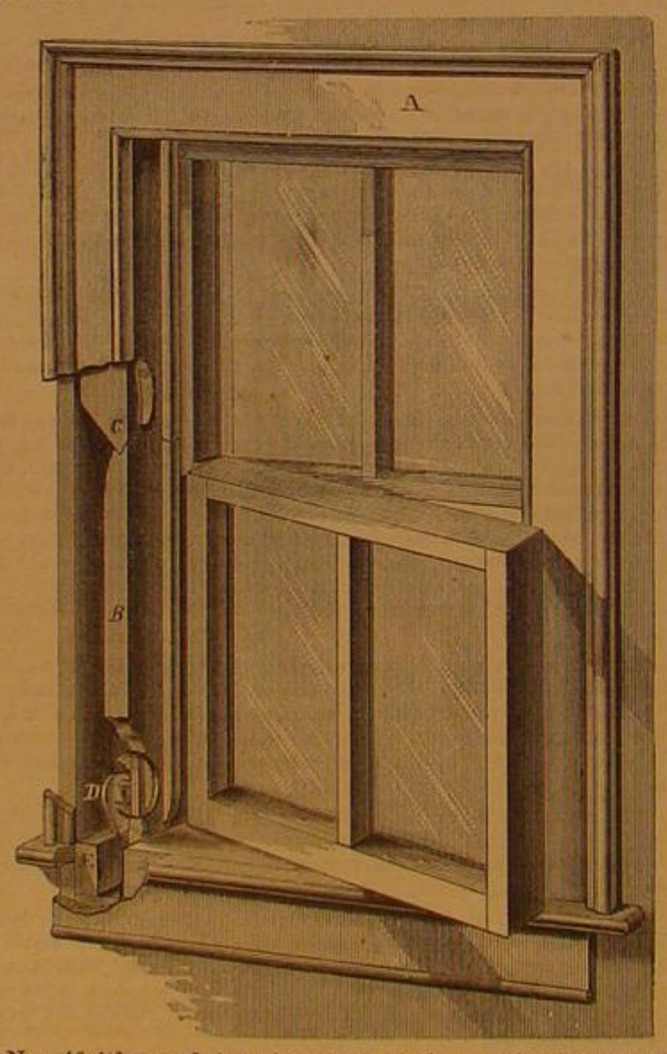
The manufacturers say this saw was so much larger than any that they ever manufactured before, that to get the stranger into the factory, they were in somewhat the same predicament as the man who won the elephant at a raffle, and had to take down and cut away parts of the building. In each room where the monster saw had to be introduced for the purpose of being properly prepared, a way had to be opened with ax and saw.

The mandrel hole is 2½ inches in diameter, and the pin holes ¾ of an inch in diameter and 4 inches apart from center to center. The saw is for a right hand mill. 375 or 400 revolutions per minute will be a proper speed for it to run; it is capable of cutting 6 inches to each revolution, and with fifty horse-power it is capable of sawing 50,000 feet of inch lumber in ten hours.

CROLEY'S IMPROVEMENT IN WINDOW FRAMES.

The object of the device which the engraving illustrates is to provide a ready means for removing the sashes of windows and adjusting the weights without disturbing the moldings, cases, or stops, and defacing the frame. The object is perfectly accomplished in an exceedingly simple manner, with no injury whatever to the window and no detraction from its elegance. The improvement can be made in any window frame already in place as well as in those in process of manufacture.

By reference to the engraving it will be seen that a portion of one of the slides is removable. Let A, represent a window frame, B is a portion of the slide which fits the permanent part at C, by a V-shaped joint, and is held in that fixed position by a cam-latch, D, on the lower end, which engages with the ledge, E. This latch turns on a stud passing through a circular plate of metal let into the slide so that the bar by which the catch is turned is flush with the outer surface of the slide.



Now if either sash is to be taken out the cam-latch is turned part round, which permits the movable piece of the slide to be dropped into the recess, E, when the piece can be withdrawn, leaving a wide, open space sufficiently deep to release the sash, when shoved into it, from the guide. The process of replacing the sashes is similar. After they are in place the movable piece is fitted at the top, the bottom held in place, and the catch turned. The same means of removal apply, of course, to the attachment of weights.

Patent papers for this improvement bear date April 9, 1867. Carpenters, builders, and manufacturers who may be interested can address the patentee, C. Croley, 168 Water street, Dayton, Ohio. Rights for sale and working models furnished if desired.

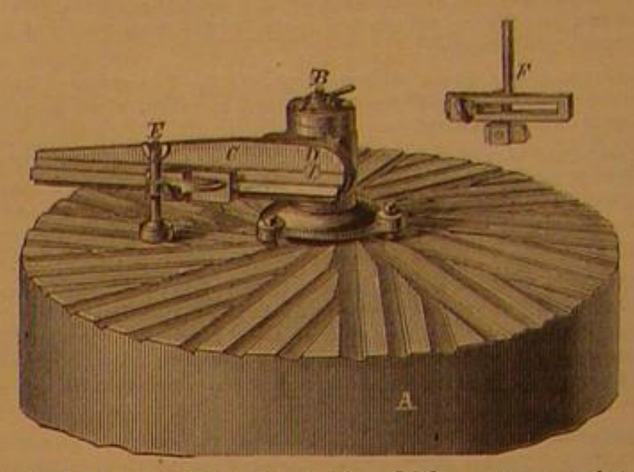
The Preservation of Wood.

Economy is the great source of the people's wealth. So the time and labor-saving machines and material-saving articles that have been and still are being invented in our country, saving time, labor and property, are first among the causes of the rapid increase of wealth, the prosperity, and growth of the United States.

Among the issues of patents noticed this week, in our journal, is one invented by S. G. Harding, of Morrison, Whiteside Co., Ill., under the name of "Harding's Wood Kyanizer," which bids fair to hold a prominent place among inventions in the benefits it is likely to accomplish for mankind. He claims by chemical and experimental knowledge that it will render any kind of wood harder, tougher, less combustible, and more durable, preserving wood from the decaying influences of the atmosphere, water and earth, three or four times longer than if used in its natural state. The principle of its working is to precipitate and coagulate the albumen, a putrifiable substance contained in the sap, and fix the ammonia, thus rendering those decaying elements passive, and harmless, also filling the pores of the wood with minerals that will make the stick almost as solid as stone, resisting the entrance of oxygen—the vegetable-destroying element—and water.

GILMORE'S DEVICE FOR STAFFING MILLSTONES.

The ordinary way of trueing a millstone is by the aid of a staff of wood, made generally of several pieces, and of wood not liable to springing or warping. In the eye of the stone



must be driven a center of wood in which a center point is made that shall govern all the after process. If a mistake is made in the initial process the further the work proceeds the more eccentric or further from truth is every subsequent operation. It is a matter of some delicacy, requiring good judgment and a correct mechanical eye to lay out a stone with these means. It consumes time and entails much labor and careful oversight. In fact, the workman has no permanent and reliable initial point and his labors are necessarily protracted, and when finished, sometimes unreliable.

Also, in making the lands and furrows there is involved a large expenditure of time and much carefulness. It is a continual testing and adjusting, annoying to the workman partly from the incessant labor and repeated trials of the correctness of his work, and partly from the doubt whether, when his work is finished, it will be correct. To aid the miller in these important preliminaries is the object of the device illustrated in the accompanying engraving.

A, represents a millstone having an upright stud secured to the eye of the stone by a bolt, which passes through a plate on the under side of the stone up through the stud, which is hollow, and is secured by the lever nut, B, on the top. The base of the stud is broad and furnished with three set screws, equi-distant from the center, which bear upon the stone and serve to adjust the stud in a position perpendicular to the face of the stone. A box fits the stud and carries a horizontal arm, C, the outer end of which can be raised or depressed turning on the pivot, D, which secures it to the box. The outer face of the arm has a dovetail rib on which slides a block that carries a marker, E.

To true the stone the stud should be secured to its center and adjusted by means of the set screws until the horizontal arm, when, with the marker it is swept around the stone, will shown an average level. The bottom of the marker is then painted and moved back and forth from circumference to center, or, with the arm, swept around the stone. The dressing of the stone follows, of course, the marks. F represents a marker adapted for laying out the furrows. It can be attached to the arm instead of the marker, E. The position of the arm relatively to the center of the stone is calculated so that the arm is parallel to the leading furrow. The operation of staffing the furrows is similar to that of leveling the stone's face. Practical millers will readily perceive the advantage of this staff.

For further particulars address L. Anderson, Painesville, Ohio.

New Water Mat.

Dr. J. L. Prentiss, of the Kansas State Medical Society suggests a very excellent and simple means of applying water dressings to the human body for medical purposes.

It consists of a light rubber tube about seven or eight feet in length, (longer or shorter as necessary), coiled in the form of a lamp mat, to the desired dimensions, and retained in shape by means of light cords extending from the center to the circumference, and tied around each coil, one end of the tube (from the center) being left of sufficient length to introduce into a pail of water, and the other (from the periphery), with a stop cock attached, extending to the waste pail.

By means of a current of water through this coil, any desired temperature may be produced and maintained. The smallest size tubing is the best and costs but little.

WE are indebted to O. B. Kinney, Esq., of the Raritan and Delaware Bay Railroad, for a fine specimen of fossil shark's teeth from the Squankum Marl pits, described in a recent number of our paper. These fossils, according to the calculations of geologists, once belonged to fish that swam around New Jersey in days prior to the Noachian flood.

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VOL. XVII., No. 11....[NEW SERIES.]....*Twenty-first Year.*

NEW YORK, SATURDAY, SEPTEMBER 14, 1867.

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BELTS---THEIR ELECTRICITY---HOW TO LAY OUT BELT HOLES THROUGH FLOORS.

A correspondent asks our opinion as to the danger of fire from the electricity generated by swiftly-moving belts, and another inquires how to lay out the holes for belts running through floors. We will endeavor to give replies to both questions, drawn from our experience and observation. No doubt some of our correspondents—practical men—may furnish valuable additional facts or theories drawn from practice.

We believe that many mysterious fires occurring in factories where belts were used to transmit power, would be no longer mysterious if the facts were known. But there are recorded facts which leave very little room to doubt that buildings have taken fire from this cause. Where fire itself in any form was not used in the building and even matches not introduced, there seems to be no adequate reason for doubt that either spontaneous combustion of fibrous material saturated with oil, or the action of electricity, was the cause of the fire.

As to the former we well remember a case, some thirty years ago, when some boys discovered a fire in a waste house connected with a cotton factory, caused solely by the heaping of oil-saturated cotton waste on the floor of an open-sided building, formerly used as a dry shed, through the sides of which the air had a free passage. A church, also a few years ago was destroyed in a town in Rhode Island by the flying particles of cotton waste which had spontaneously ignited in a storage building for waste. No fire was ever carried into the building, yet the spontaneous combustion of the saturated waste caused a serious loss of property by conflagration.

But extensive fires with great loss of property have been occasioned by the element of electricity generated by the running of belts. It is probable that the destruction of Colt's pistol factory in February, 1864, at Hartford, Conn., which involved the loss of one human life and much valuable property, was caused by the electricity generated by the main belts. The fire was first discovered under the cupola in the center of the building which was the locality where the great or main belt ran. Many a time we have elicited heavy sparks from that belt when the hand was held several inches from it. On a visit to the large machine-building establishment of Pratt, Whitney & Co., in the same city, passing under the main belt, which ran diagonally, we felt the electricity like particles of gravel rattling on the hat. To test the force of this element Mr. Pratt, with one hand presented to a gas burner and the other grasping ours, while we held another near the belt, succeeded in lighting the gas. If the amount of electricity developed by a running belt is sufficient to light a jet of gas it certainly is sufficient to start any other fire under favorable circumstances. Belt holes through floors should present smooth sides to prevent the lodgment of light particles which may act as tinder. It would be well also to place a simple apparatus near the belt, at the ceiling of each floor through which it passes, to convey away the electricity. It may consist of a horizontal comb, or a series of metallic points, arranged across the belt and in close proximity to it, and from this comb lead a wire of sufficient size to a tub or tank of water or any other wet spot. Probably this would convey the dangerous fluid away as fast as generated,

The plan for designating the point where a belt hole should be cut is very simple. Probably it is well understood by mechanics generally, but a brief statement, with directions, may be of interest and value to some of our readers. The shafting and arrangement of a factory is a matter of great importance, and he who undertakes it should thoroughly understand his business. An error committed here will continue to multiply itself and be a source of future annoyance. Cutting belt holes by "guess-work" or the "rule of thumb" is not very creditable to the mechanic. It defaces and injures the building and causes unsightly patching and repairs to the floor.

If a belt is to be carried from a pulley on an overhead shaft to another on the floor above, the distance from the center of the shaft (pulley) to the ceiling (under side of the floor) should be taken and noted. Next, get the distance through the floor; then between the floor itself and the center of the shaft in that story. If one pulley is directly over the other you have all the data, the diameter of pulleys and width of belt being known. But if the belt is to take a diagonal direction the relative positions of the pulleys must be found. A line measured from the side of the wall to a plummet dropped from the shafts on both floors will be generally sufficiently accurate to give the relative positions of the pulleys to be connected. Now from these data make a diagram either on an unoccupied floor, full size, or on a drawing board or sheet of paper, to a scale, and by transferring these measures, as represented on the diagram, an ordinary mechanic may easily bore the holes, and saw and chisel them to size. When the auger holes are bored it is a great assistance to stretch a twine, as a belt from one pulley to the other. It will be of much value as a guide to dressing and trueing the holes.

It is evident that by following or modifying these simple directions, holes for cross belts as well as straight belts, and, in fact belts of all sizes and directions can be laid out so that there will be no annoying and time-occupying alterations to be made.

HOW TO SUCCEED--WHAT CONSTITUTES SUCCESS.

It is well enough to encourage the hard worker, he who is engaged soul and body in his business or labor, to cast aside for a brief period his work and be as though he did not. It is well that the worker should at times lay by his peculiar character and cease to be a worker. "All work and no play makes Jack a dull boy." There must be a time for pleasure as well as a time for distasteful work. But there is a time for work; and that is when there is work to be done. Then we expect to see the man or even the would-be man, work. It is well enough to say to the worn out worker, in the words of the old college song:

"Omne bene
Sine pœne
Tempus est ludendi.'

but for those just harnessed for the race of life their time for playing ought to come after the time of labor. To them it should be "Tempus est labori." Youth and manhood is the time for working.

The young man who thinks he can carry his boyish pranks into the serious business of life is not a man, and defrauds himself and his employer. "After work, play." That should satisfy the most sanguine. "Business before pleasure" is the motto of the prudent man whose guide is experience, and it is sufficient for the novitiate in active life.

But it is despicable to see the young man just starting in life so wedded to his former enjoyments as to place them above present duties. Yet this is often the case. The young man, who to steer his own bark launches forth on the sea of life, too often looks back on the pleasures he leaves behind, and, forgetful of present duties, steers back to past enjoyments.

To leave this figurative style, one of the most serious annoyances of the master mechanic, and the employer in any business, is the unwillingness or want of earnestness in his apprentice or employé. The young man foolishly supposes that he can at the same time do his duty as a learner in his chosen business and fill his place among his fellow playmates. An eye singled to the matter in hand is necessary to success. No looking back after the hand is placed to the plow. Work while the day lasts; these are lessons hard to learn and harder still to practice.

Yet the stern and unpalatable facts are that there is work, hard, and perhaps unpleasant work to be done. Why should not the beginner learn from those who have traveled the road what is required of him? But in this case, at least, the experience of others is worthless. The beginner in any business insists that he is wiser than those who went before. The apprentice performs his task not as though it was a part of his duty and a portion of his honor, but as a "stint" to be got over as quickly as possible, with the least expenditure of mental or physical force, and when it is finished, feels not only a relief from the labor and a joy of the release, but an utter distaste to its certain return, and a hope that the occasion to renew the labor may be by some means delayed.

There is no royal road to success any more than to knowledge. He who would succeed must work, and after all there is more real enjoyment in work, which has a worthy object, than in play or pleasure, intended to kill time. We remarked a few days ago to a business man whose present means are amply sufficient, but who worked really harder than any of his numerous employés, that he ought to "take it easy." Said he, "I am never so happy as when I have more than I can do. I may wear out in working, but I dread to rust out in idling." He was right. His work was a part of himself, a part of his life, and it was always faithfully done. To apprentices especially, this earnestness and interest in their work is necessary if success is ever to be attained. Where the attention is divided between the shop and the base ball grounds it is more than probable the latter will receive the larger share. And is not this so-called "national" game exerting a bad influence on our habits as workers and our welfare as a progressive people? Is it not occupying the time and usurping the place of useful labor? In short, is it not becoming an employment rather than a means of enjoyment? We must confess to but little sympathy with those who continually prate about our utter devotion to labor and business as a people, and who continually urge to pleasure seeking. Good, honest work is exercise as much as hard and exhaustive games. It is more. It is useful and productive and fully as healthy.

MICHAEL FARADAY.

A cable dispatch announces the death of Prof. Michael Faraday on the 27th of August.

Michael Faraday was born Sept. 22d, 1791, at Newington, Surrey. His father was a mechanic in such humble circumstances that young Faraday had little of the advantages of an education at school. At the age of fourteen he was apprenticed to a bookbinder. But he had learned to read and write, and thus the keys of knowledge were in his possession. He spent the leisure of his apprenticeship in reading and studying all the books on natural philosophy and chemistry which were accessible to him; his favorite amusement was to make experiments illustrating the teachings of his books. In the spring of 1812 he attended four lectures on scientific subjects delivered at the Royal Institution by Sir Humphrey Davy, who was then at the hight of his career. Faraday's tastes and aspirations were here confirmed and strengthened, and the character of his future pursuits was determined upon. In the December following he addressed a letter to Sir Humphrey Davy, modestly introducing himself, explaining his love of scientific studies, and offering his services as an assistant. The reply was prompt and favorable. Faraday at once became a favorite pupil, assistant, and friend. He was officially attached to the Royal Institution and took up his residence there. From that time forward the Royal Institution was the scene of all his labors.

The long list of his great scientific achievements begins with the discovery of the chlorides of carbon in 1820. It is an interesting fact that one of these substances has been found during the past year to be a valuable anaesthetic, and it is possible that it will supersede chloroform and ether. In 1821 he made the capital discovery of magneto-electricity, or electricity generated or induced by magnetism. During the last years of his life Faraday had the gratification of witnessing the application of his discovery, on the grandest scale for the practical production of light. His electrical researches were continued for a large portion of his life. His papers, originally published in the "Philosophical Transactions," constituting a complete and faithful record of all his contributions on electricity, were collected and published in 3 volumes, 8 vo. (1839, 1844, 1855,) under the title of "Experimental Researches in Electricity." It is chiefly upon this great work that Faraday owes his world-wide and lasting fame.

Many of Faraday's researches were eminently of a practical character. Thus he rendered important service to the manufacture of steel, glass, and india-rubber. He investigated and discovered new alloys of steel, and invented a new composition for optical glass. He found that carbonic acid and several other gases which had been supposed to be permanent were in fact a species of vapor, which may be condensed into the liquid or solid form by cold and pressure. In 1827 he published his "Chemical Manipulation," a work which has since passed through many editions and which is still a favorite with all chemists.

For nearly half a century Faraday has been one of the most eminent of men devoted to science. Learned societies and sovereigns vied with each other to do him honor. He bore his great eminence with childlike gracefulness. In his intercourse with men his artlessness and his love of truth won the admiration and esteem of all. No one ever felt jealous of his reputation, and no one ever disputed his title to his discoveries. As a lecturer he was charming by his earnest simplicity of action and expression; this is the universal testimony. His weekly lectures were one of the most attractive features of the London winter season.

Faraday has left an impress on human affairs which will endure forever. When our kings and presidents are forgotten, his name may still be a household word, for he has a place in history with Archimedes, Newton, and Franklin.

LARGE RUBBER BELTS.

Where belts are not to be exposed to saturation in animal oil or to frequent abrasion, a combination of rubber and canvas has proved to be fully equal, if not superior to leather, and much cheaper. For large belts rubber is preferable, because the belt, whatever its length or width, is one—not pieces joined by mechanical means or connected temporarily—but solid and to all intents and purposes one continuous fabric.

In front of the office of the New York Belting and Packing company, 38 Park Row, New York city, we noticed, the other day, a belt measuring 39 inches in width by 185 feet long weighing 1,470 pounds, and said to be the largest ever made. It was what is known as a "six-ply" belt, that is a belt composed of alternate layers, six of strong canvas and six of gum. It is intended for a grain elevator at Buffalo, for the Niagara Elevating Company, and now nearly completed. Beside this belt, which is to be their main connection with the prime mover, they have ordered from the same concern one belt nineteen inches wide by one hundred and thirty-three feet long; one of eighteen and a half inches wide by two hundred and thirty-six feet long; six of eighteen inches in width by lengths varying from two hundred and thirty-six feet to only thirty-eight feet; one of seventeen inches, one hundred and fifty-three feet long; beside several others of varying widths and lengths.

OFFICIAL REPORT OF

PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING AUGUST 27, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

68,027.—FISH HOOK.—Francois Angilard, Royan, France.

1st, I claim, in fish hooks, the arrangement of the line, l, and holes, e e, relatively to the two branches, a f, jointed together at the point, b, above the hole, e, substantially as and for the purpose herein specified.

2d, I claim, in connection with the above, the spring catch, c, arranged as specified, adapted to hold up the hinged branch, f, of a double-branched fish hook, and to release it with a very slight pull on the line, l, substantially as and for the purpose herein specified.

68,028.—COMPOUND FOR PURIFYING SPIRITS AND OTHER LIQUIDS.—Pierre Joseph Badoux, New York city.

1st, The composition herein described, for purifying and discoloring spirits and other liquids, substantially as described.

2d, The combination of sulphur, lime, sulphate of zinc or iron, sulphate of baryta, and any acid or acids, as nitric, muriatic, or other mixture.

3d, The combination of bi-sulphate of lime, sulphate of zinc, and sulphate of bismuth or iron, for the purification of spirits.

68,029.—HINGING COVERS TO TOPS OF COOKING STOVES.—Chas. J. Ball, Keokuk, Iowa.

I claim the application to cooking stoves of covers or lids turning or revolving horizontally about a center outside of the apertures, and constructed substantially as specified.

68,030.—FRUIT PICKER.—A. T. Barnes (assignor to himself and N. M. Barnes), Tiffin, Ohio.

1st, The combination of the spring, E, fixed and movable jaws, and sack or fruit receiver, D, all arranged and operating substantially in the manner and or the purpose described.

2d, The use of the spring, E, which is applied to the fixed and movable jaws substantially in the manner and for the purposes described.

3d, The manner, herein shown and described, of guarding the spring, E, when arranged within a recess, formed substantially as explained.

68,031.—METHOD OF PROPELLING SLEDS BY HAND.—J. A. Bartlett and F. Walman, Orfordville, Wis.

I claim a hand-sled when constructed with a system of levers attached thereto to be operated by hand for propelling and steering the same, substantially as set forth.

68,032.—PLOW.—Alfred C. Belt, Goresville, Va.

1st, I claim the moldboard, C, made in the form shown and described, and provided with a cutting edge extending to or nearly to the plow beam, in the manner and for the purpose set forth.

2d, The grooved reversible share, G, constructed and operating substantially as described.

3d, The extension, double-reversible cutter, E, arranged and operating as described.

4th, The round adjustable self-sharpening extension point, H, operating as described.

5th, The false share for securing the removable cutter, share, and point in place, as described.

6th, The combination of the reversible cutter, reversible share, and adjustable extension point with the false share and moldboard, in the manner and for the purpose substantially as described.

68,033.—METHOD OF MAKING CORES FOR PIPE CASTING.—William E. Bird, West Bridgewater, Mass.

1st, I claim the method of forming a sand core by making on a platen a sheet of core material, of the desired shape and size, and then transfering it to the core spindle by causing the said spindle to roll over said sheet of core material, substantially as described and for the purpose set forth.

2d, The combination and arrangement of the platen with the adjustable revolving core spindle and chain, or its mechanical equivalent, made substantially as described and for the purpose set forth.

68,034.—CHURN.—Thomas Bogan, Lacon, Ill.

1st, I claim the combination of the treadle, H, rod, I, and gear wheels, J K, or their equivalent, with the paddle wheel, E, arranged and operating substantially as herein specified and shown.

2d, I claim the combination of the partition, B, provided with openings, a b, the slide, L, paddle wheel, E, and treadle, H, with intermediate gearing, arranged and operating as herein specified and shown.

68,035.—COTTON GIN AND PICKER.—John B. Brackett and W. Dearborn, Boston, Mass.

1st, I claim the employment of shark skin, dog fish skin, or shagreen dressed hides, as a covering for rollers of cotton gins, substantially as and for the purpose described.

2d, The method of adjusting pressure bar, D, by thumb screw, d, and set screw, f, arranged and operating substantially as described.

3d, The arrangement, described and shown, for adjusting and operating clearers, E, consisting of pivot pin, g, fixed in a slot of the frame by screw, n, and slotted side plate, h, of the clearer, and eccentric pin, i, revolved as described, all operating together in the manner set forth.

4th, The doffer, F, consisting of slotted cross bars with their rubber brush, p, sustained by wings, s, and clamping screws, o, upon shaft, m, the whole driven and operating substantially as described, and also when arranged with slotted brackets, g, as and for the purpose described.

5th, The arrangement, as a feed table to a cotton gin, or in combination with the feed table to a cotton gin, of the cleaning and feeding apparatus consisting of sleves, covers, toothed cylinders and fans, as and for the purpose described.

6th, The arrangement of fans, M or N, with toothed cylinders, in a cotton cleaner, all operating substantially as described.

68,036.—WASH BASIN.—William Bradley, Lynn, Mass.

I claim the combination of the wash basin and soap box or receptacle, attached together, as specified.

68,037.—EGG BEATER.—George E. Bridger, Milwaukee, Wis.

I claim cylinder, B, with support, I, and post, K, beater, C, shaft, D, pinion, E, shaft, F, cog wheel, G, and crank, H, arranged and combined substantially as and for the purpose described.

68,038.—STEAM-GENERATOR WATER GAGES.—Augustus P. Brown, New York city. Antedated June 11, 1867.

1st, I claim the arrangement of self-acting valves, F F1, between the ends of the glass tube, B, of a water gage, and the steam boiler to which said gage is attached, substantially as and for the purpose described.

2d, The springs, b b1, in combination with the valves, F F1, seats, a a1, and tube, B, constructed and operating substantially as and for the purpose set forth.

3d, The disks, c c1, on those ends of the valve stems which face the ends of the glass tube, B, substantially as and for the purpose described.

4th, The rod, d, and handle, e, in combination with the valve, F, seat, a, and tube, B, constructed and operating substantially as and for the purpose described.

68,039.—WATER WHEEL.—Wm. F. Browne and A. J. Hoyt, Washington, D. D.

We claim the combination of an inner centrifugal or reaction wheel, H, and outer wheel, I, which discharges downward and below the inner wheel through buckets, s s, that curve downward and backward, and the discharge apertures of which are of such size as to keep the wheel filled with water, substantially as and for the purpose herein specified.

We also claim a valve, N, arranged in the induction pipe, D, between the valve, or gate, and the wheel, and operating substantially as and for the purpose herein set forth.

68,040.—TOOL FOR CLINCHING NAILS IN HORSESHOEING.—David W. Bush, Clarence, Mo.

I claim the combination of the arms, A1, the jaw, B, jaw, C, lip, e, springs, D, and stops, d1, as and for the purpose herein set forth.

68,041.—ELECTRICAL APPARATUS FOR PREVENTING INCRUSTATION OF STEAM BOILERS.—Samuel G. Cabell, Quincy, Ill.

1st, I claim the external chamber, C, attached to the steam boiler, when provided with a stop cock to cut off or regulate its communication therewith, for the purpose specified.

2d, In combination with the said chamber, C, a rod, F, constructed with points, G, arranged within the chamber and insulated therefrom, in the manner substantially as and for the purpose set forth.

3d, In combination with the chamber, C, and rod, F, constructed with points G, arranged within the chamber and insulated therefrom, said rod being a simple conductor, a permanent magnet, or composed of two dissimilar metals, substantially as and for the purpose described.

68,042.—HEMORRHOIDIAN.—R. A. Cameron, Valparaiso, Ind.

I claim the ellipsoidal bulb, A, having the protuberance, B, when constructed and operated substantially as and for the purpose set forth.

68,043.—ATTACHMENT FOR CLOTHES WRINGER.—C. L. Carter, Union City, Ind.

I claim the arrangement of the saturator, a, with the wringer, as herein described for the purpose set forth.

68,044.—KILN FOR DRYING AND PREPARING PEAT.—Samuel Chapman, Newark, N. J.

1st, I claim the mode of desiccating, compressing, and extracting the oleaginous, bituminous, resinous, or other similar constituents, from peat and other substances, by the continued application of heat only in a tight chamber, substantially as set forth.

2d, The combination, within an air-tight chamber, of a heating apparatus, suitable suports for the material to be desiccated, and condenser for collecting and carrying off water evaporated, substantially as and for the purpose set forth.

3d, The combination of the roof, D, troughs, D1, well, E, and pipe, F, substantially as and for the purpose set forth.

4th, The combination of the stove or furnace, H, and pipes, I, arranged in relation to the air-tight chamber and one another, substantially as set forth.

5th, The combination of the stove or furnace, H, and pipes, K, arranged in relation to the air-tight chamber and one another, substantially as set forth.

6th, The combination and arrangement of drying frame, C, troughs, C1, and well, M, substantially as and for the purpose set forth.

7th, The process for drying and compressing peat by the continued application of heat alone, in an air-tight chamber, substantially as set forth.

68,045.—VAPOR BURNER FOR HEATING.—S. Child, Jr., and R. A. Copeland (assignors to Samuel Child, Jr.,) Baltimore, Md.

1st, In apparatus, as herein described, we claim the method of regulating the supply of fluid to the retort, by locating the opening through which the oil enters the retort, so that it shall be above the level, both of the valves for regulating the flow of the oil from the reservoir, and of that portion of the supply pipe between the said valve and the retort, substantially as described.

2d, In combination with one or more supply pipes, communicating with the retorts or vaporizing chambers through openings, arranged as described, we claim a regulating valve or cock, or equivalent device, placed at any point between the said supply pipes and the main or reservoir pipe, but so that it shall be below the level of the said openings whereby the flow of oil to each and every retort may be simultaneously regulated, substantially as shown and set forth.

3d, In combination with the pipes and main valve cock, arranged relatively to each other, as described, we claim the check valves, located in the respective openings through which the oil enters the retorts, so that by the movement of the main valves the said check valves shall operate automatically to open or close the entrances to the retorts, substantially as herein shown and set forth.

4th, We claim enclosing the supply pipe within a tubular jacket which carries the retorts, or itself constitutes the chamber in which the oil is vaporized, the said pipe and jacket being disconnected and separate, so as to form between them a continuous annular space in which the vaporized fluid is held, substantially as and for the purposes shown and set forth.

68,046.—ANIMAL TRAP.—Greville E. Clarke, Racine, Wis.

I claim the combination and arrangement of the pivoted platform, H, the piece, F, the strips or rods, E and D, and the door, B, when constructed and operating substantially as set forth.

68,047.—WEEDING HOE.—Eleazer M. Conkling, Parma, N. Y.

1st, I claim the combination of the coulter and keel, formed in one piece, with the blade, B, all constructed and arranged substantially as described.

2d, The blade, B, having its front edges arranged so as to form, if produced, a salient angle, and its rear edges so as to form re-entrant angle, substantially as described.

68,048.—CUTTER HEADS FOR PLANING MACHINES.—Mathew F. Connett, Ladoga, Ind.

I claim a cutter head for turning plow handles when constructed with the knives, B B, which are so arranged as to have a central space to limit the penetration of the cutters and guides at the edges of the cutter head, as and for the purpose specified.

68,049.—CHURN DASHER.—Jacob J. Cumming, Independence, Mo.

I claim a churn dasher combining in its construction the following elements:—The concave or dished bottom, the vertical openings, D, the diagonal openings, E, the lower flange, G, and the upper downwardly curved flange, F, said parts being arranged substantially as set forth.

68,050.—HAND SEED PLANTER.—H. V. Davis, Amherst, assignor to Benjamin Whiting, Hollis, N. H.

1st, I claim the combination with the wheel, E, and shaft, D, of the staple, C, and pin, d, substantially as set forth.

2d, The combination with the seed box, C, and handle, A, of the grooved guide piece, I, plow, J, lever, K, and covering device, M g g and h h, substantially as and for the purpose set forth.

3d, A hand seed planter, all the parts of which are constructed and combined together for operation, substantially as and for the purpose set forth.

68,051.—MEDICINE.—Jeremiah Dean, Freeport, Ill.

I claim the medicine prepared substantially as herein described.

68,052.—CONSTRUCTION OF RUBBER ROLLERS FOR COTTON GINS.—Wyman Dearborn, Boston, Mass.

I claim the washers, d, fixed on spindle, a, and rotating with it by tongue, l, fitting in groove, f, arranged alternately with elastic disks, c, on said spindle, and clamped together to substantially form a solid roll by clamping plates, b and g, as shown, and further held by wires, e, parallel to said spindle, substantially as described.

68,053.—SHUTTER FASTENING.—Benj. K. Dorwart (assignor to himself and Frank Stahl), Lancaster, Pa

I claim the curved bolt, C, secured within the shutter between lugs, B, on a base plate, A, one end of the bolt to pass through an open slot in the bed plate, and the other end provided with a trigger, D, in combination with the slotted stop plate, F, and shouldered wall staple, H, all arranged and operated in the manner and for the purpose specified.

68,054.—CLOTHES DRYER.—John H. Doughty, N. Y. city.

1st, I claim the metallic thimble, c, in combination with the uprights, a, of a clothes-horse composed of two or more sections, substantially as and for the purpose described.

2d, The caps, e, and screw pivots, f, in combination with the uprights, a, of a clothes horse, constructed and operating substantially as and for the purpose set forth.

68,055.—APPARATUS FOR EXPLODING BY ELECTRICITY.—Jabez B. Dowse, Lockport, Ill.

1st, I claim the mode of fixing simultaneously, by electricity, two or more charges of explosive material by the application of two or more inductors, so arranged that one shock or current of electricity in passing simultaneously through the primary coils of such inductors, induces in the secondary coils of such inductors, simultaneously, separate secondary shocks or currents of electricity, each of which said secondary shocks or currents is made to fire separate charges of explosive materials simultaneously.

2d, The explosive compound, copper amalgam, consisting of finely divided copper and fulminate of mercury intimately mixed together with a liquid such as water.

68,056.—CULTIVATOR.—Reuben A. Eby, Upper Leacock Township, Pa.

1st, I claim the combined levers, R r r, as constructed and arranged for shifting two cultivators in unison, for the purpose and substantially in the manner specified.

2d, In combination with my combined shifting levers, R r r, I also claim the application of two separate cultivators attached to adjustable brackets, D, beneath a two-wheeled truck, substantially in the manner and for the purpose specified.

3d, In combination with adjustable brackets, D, I claim the arrangement of the combined adjustable scorers, x x, on the frame, z i, when constructed and applied in the manner and for the purpose specified, together with the use of the hoppers, crank and pulleys, all combined, substantially in the manner shown and set forth.

68,057.—LUBRICATOR FOR SHAFTING.—James G. Edgell, Brooklyn, N. Y.

1st, I claim the plug, C, provided with an opening in its end to communicate with pipe, F, and a cup, a, to receive and discharge oil as and for the purpose specified.

2d, The arrangement of the shaft, G, with its screw thread, E, and pulley, F, with the wheel, D, upon plug, C, substantially as and for the purpose set forth.

68,058.—ORE ROASTING FURNACE.—G. B. Field, N. Y. City.

1st, I claim the plate, or shelf, B, made hollow for the admission of water or steam, and composed of two parts, b b', connected by the pipes, c c', when constructed and used, substantially as and for the purpose specified.

2d, The orifices, E E, in hollow shelves used in the inside of revolving ore roasting furnaces, for the purpose of cleaning the internal chambers of the shelves, substantially as described.

68,059.—SHOE FASTENER.—John U. Fiester, Winchester, O.

I claim the double revolving concave hinge, A A', and B, constructed and operating as described, and for the purposes set forth.

68,060.—CHURN.—G. W. Fowler, Jenner's Cross Roads, Pa.

1st, I claim a churn, having two horizontal parallel dasher shafts, provided with radial arms arranged to strike in pairs alternately in the same plane, said shafts being provided with pinions, operated by the gear wheel, G, having teeth arranged on it, both internally and externally.

68,061.—BELT SHIFTING DEVICE.—A. M. Freeland, N.Y.City.

I claim the two belt shifting forks, connected and pivoted to a swinging arm, or sector, for simultaneous joint operation, substantially as described, whereby while the one belt is being moved on or off the fast pully, the belt controlled by the other fork has but a slight motion, and is retained to its run on the loose pulley, essentially as herein set forth.

68,062.—BALING PRESS.—George B. Garlinghouse, North Madison, Ind.

1st, I claim the abutment, F, capable of being set forward in the box, and supported by strut, X, in the desired combination, with the beater, E, and its described or equivalent accessories.

2d, The arrangement of gravitating toggle, H H, I I' 1, J K, with the windlass, Q U V W, and horizontally or nearly horizontally moving beater, F, substantially as set forth.

3d, In combination with the elements of the 2d clause, I claim the auxiliary toggle, H'' 1 J K L L', and sheaves, M N, for the purpose explained.

4th, Constructing the pressing heads of a baling press, with passages, e f, of size large enough to admit either or both hands and arms to the bottom of said "passages," for the object stated.

5th, The provision of the beam, 4, in combination with the hinged doors, 1 and 2, and catch, 5, and spring latch, 7.

68,063.—LIME KILN.—Luther Gibbs, Tremont, Ohio.

I claim a kiln for burning lime, when constructed with two furnaces, B B, and a central fire chamber, D, in continuous line across the kiln, and with flues, D, in the corners of the fire chamber, and with a kettle, F, of greater longitudinal measurement than the diameter of the cupola, E, and furnished with three draw flues, G G G2, said parts being constructed and arranged for use in the manner set forth.

68,064.—MILLING TOOL.—A. W. Gifford (assignor to E. A. Bayley and Moses Bayley), Worcester, Mass.

1st, I claim a milling tool, constructed and operating substantially as set forth.

2d, The combination with the hollow shank, A, and head, B, of the gage plate, D, substantially as and for the purposes described.

3d, The combination with the head, B, of the swivel arm, F, and cutter, E, substantially as and for the purpose set forth.

4th, The combination with the cutter, E, of the adjusting screw, 4, arranged substantially as and for the purposes set forth.

5th, The combination with the cutter, E, and projections H' and J, of the head, B, of the adjusting screws, H and I 1, substantially as and for the purposes set forth.

68,065.—GANG PLOW.—S. I. and G. M. Gillham, Carlisle, Ill.

We claim the bars, H H, embracing the beams, D D, and operated by the lever, G, arranged in combination with the frame, A, in the manner substantially as and for the purposes set forth.

68,066.—PAINT BRUSH.—H. B. Gillman, and H. S. Beamish, Milford Mass.

We claim the combination and arrangement of the conical case, a, with the head, b, fastened in it, and handle, A, screwing through it, and carrying the cone c, fastened to the handle, all as herein described.

68,067.—CHURN DASER.—Henry Grass, Olney, Ill.

1st, I claim the combination of the foraminous conical dasher, A, with the tubes, C C, substantially as and for the purpose specified.

2d, The tubes, C C, extending from the bottom of the dasher to the socket, B, and connected with the latter through the passages, c c, substantially as described.

68,068.—MEAT CUTTER.—John C. Haefele, N. Y. City.

1st, I claim in a meat cutter, such as described, the method of pivoting or hinging the system of levers to the knives, at a point vertically above the said knives, and equidistant or thereabouts from the ends of the same, as and for the purposes described.

2d, The combination with one or more segmental knives, of a system of levers pivoted to the said knives, at a central point vertically above the same, and hung in the frame of the machine in such manner that the levers immediately connected with the knives shall be parallel, or nearly so, with the surface of the block over which they move, as and for the purposes herein shown and set forth.

3d, The combination with the vibratory and rocking cutters of the lateral guides for maintaining the said cutters in the said plane, while in operation, as herein shown and described.

4th, The combination with the vibratory cutters, their actuating mechanism and lateral guides, arranged and operating as herein described, of a tub or block, revolving on its center, substantially in the manner and for the purposes shown and specified.

5th, The combination with the vibratory cutters of the guides provided with recesses forming the pivotal points upon which the cutters turn at the end of each stroke, as and for the purposes set forth.

6th, In a meat cutter in which the cutters are of segmental form, and operate as described, I claim the combination with the cutters and tub, or block, of mechanism, for vibrating the said cutters, and rotating the said block, in the manner described, so that the tub shall be rotated during the interval between the vibrations or strokes of the cutters, as and for the purposes set forth.

7th, The combination of the jawed reciprocating plate, and vibrating arm upon which it is mounted, with the shaft and cam for actuating the said plate, substantially in the manner and for the purposes specified.

8th, The combination of the reciprocating plate and pawls, and the ratchet and pinion operating together as described, with the meat tub or block, under the arrangement herein shown and specified.

68,069.—COMPOUND FOR PRESERVING WOOD.—Smith T. Harding, Morrison, Ill.

I claim a compound composed of the within-named ingredients, in or about the proportions as set forth, for the purpose of kyanizing wood, substantially as herein described.

68,070.—CORN PLANTER.—Samuel Harpster, Center Hall, Pa.

I claim, in combination with the brushes and flanged brush head, the slide, H, having a central and side holes counter sunk to prevent the grains from wedging therein, substantially as described.

I also claim, in combination with the brush head, and seed slide as described, the furrow openers, M N N, and seed duct, K, and coverers, O O, arranged and operating as and for the purpose described and represented.

68,071.—BOW DRILL STOCK.—D. Frank Hartford (assignor to himself and Edmund Tarbell), South Boston, Mass.

I claim the combination of the cord pulleys, A A', pawls, B B, ratchet, C, with the mandrel, D, and handle, H, when the whole is constructed as described, and for the purpose set forth.

68,072.—COOKING STOVE.—L. W. Harwood (assignor to Fuller Warren and Co.), Troy, N. Y.

I claim the suspended fire box, having an open front space, and with the oven space extending and up behind it, in combination with the dumping grate and ash pit, the whole arranged to operate as specified, for the purpose set forth.

68,073.—MEDICINE CASE.—J. R. Haynes, Newport, Ky., and A. F. Worthington (assignors to Smith & Worthington), Cincinnati, O.

1st, I claim the provision in a medicine case of one or more sliding, and folding vial racks, substantially as set forth.

2d, The provision upon such racks of the ledges, F F', for the purpose set forth.

68,074.—MECHANICAL MOVEMENT FOR WORKING SAWS, ETC.—Edward Healy, Chicago, Ill.

1st, I claim the combination of a system of levers, H, with a flexible connection, J, substantially as and for the purpose set forth.

2d, The arrangement of the levers, H, rock shaft, I, flexible connections, J, and springs, K, substantially as and for the purpose set forth.

68,075.—HORSE RAKE.—Josiah D. Heebner (assignor to himself, D. S. Keebner, and I. S. Keebner), Nonittonville, Pa.

1st, I claim the combination and arrangement of the tripping-pole, F, pivoted between its extremities, with the arm, G, and horizontal rod, I, substantially as herein shown and described.

2d, The lever, M, having a shoulder engaging at the proper time, with the carriage, K, or the rod, I, substantially as and for the purpose specified.

68,076.—WINDOW BLIND.—W. P. Hoffman, San Francisco, Cal.

I claim the window blind and anti-duster, composed of frame, A, V-shaped troughs, B B, with straight or concave sides, and having the openings, a a, the partitions, b b, and tubes, E G, the latter for the purpose of filling and emptying the troughs, substantially as and for the purpose set forth.

68,077.—DISTRIBUTING FERTILIZER.—Samuel Hoke, Mount Pleasant, Township, Md.

I claim the shape and construction of the stirrers, H, with their lower wheels, G, operating in eccentric apertures B, when arranged and operated as herein described, and for the purposes set forth.

68,078.—BED BOTTOM.—Zadok Howe, Lowell, Mich.

I claim suspending the slats, C C, at each end, in the swings, e e, which are secured to the foot and head rails of the bed, as and for the purpose set forth.

68,079.—KNIFE AND FORK CLEANER.—Benjamin F. Hughson, Cold Spring, N. Y.

1st, I claim the several series of transverse holes, d, formed in the disks, D, for the reception of the scouring material, substantially as herein set forth.

2d, The two central disks, g g, having their peripheries extended beyond the circumference of the main portion of the scouring wheel, substantially as herein set forth, for the purpose specified.

3d, The combination with the scouring wheel constructed as set forth, of the trough, A, substantially as and for the purpose specified.

68,080.—CHECK VALVE FOR LIQUID METERS.—Elias S. Hutchinson, Baltimore, Md.

I claim the application to a pump pipe of a thermo-dynamic valve, substantially as described.

68,081.—LIQUID AND SPIRIT METER.—Elias S. Hutchinson, Baltimore, Md.

1st, I claim the provision in a liquid meter of the plate, H3, and disk, I', or their equivalents, the same forming a means for compensating for variations in density, substantially as described.

2d, The provision in a liquid meter, of the plate, H2, and expansible rod, H9, or their equivalents, the same forming a means for compensations for variations in temperature, substantially as set forth.

3d, The combination of the oscillating valve, A, support, J, H H', compensating plate, H2, and disk, I', plate, h3, pin, j, wheels or disks, J J', shaft, J2, and clutch, K, or their equivalent, all substantially as herein described and represented.

4th, The combination with the valve, B2 B3, of the levers, b b, and oscillating arm, A', substantially as described, and for the purpose specified.

5th, The combination with the oscillating valve, A, and chambers, B B', of the tilting trough, F F, arranged and operating substantially as described.

6th, In spirit meters, a filter or screen to permit the passage of mash, beer, or solid matter, into the meter, substantially as described.

68,082.—HAND CATCH.—J. P. R. James, Pepin, Minn.

I claim the body, A, constructed as described, and provided with the catches, B B, and spring, C, substantially as and for the purpose specified.

68,083.—LEVER FOR WINDLASSES.—F. A. Jameson, and Cyrus W. Ripley, Kingston, Mass.

1st, We claim the combination of the curved beam, D, adjustable or sliding saddles, F, and screw, G, having right and left hand threads, all for operation together, substantially as and for the purpose specified.

2d, The combination with the beam, D, sliding saddle, F, and screw, G, of the wheel, K, crank, m, and double pawl, l, with its reversible tail, n, or the equivalent of these devices, for operation of the saddles, without unshipping the brakes, essentially as specified.

3d, In combination with the beam, D, and sliding saddles, F, the traveler H or H', and upper and lower rods, f g, substantially as herein set forth.

68,084.—GATE.—Cornelius Kark, Huntington, Ohio.

1st, I claim the carriers, E E', provided with cams, G G', and shoulders, H H', in combination with the rope, J, and pulley, I, as and for the purpose set forth.

2d, The pulley, I, arm, K, and link, K', as arranged in combination with the gate, B, for the purpose and in the manner as described.

3d, The levers, L' and M, weighted lever, N', and rod, a, arranged in combination with the carrier, E E', and pulley, I, when operated in the manner and for the purpose set forth.

68,085.—MACHINE FOR PICKING AND HUSKING CORN.—Silas R. Kenyon, Greenville, R. I., assignor to himself and Wilson C. Jeffers, New York City.

1st, I claim forming the hopper with an inclined bottom, having a central elevated portion that forms two troughs, on line with the pairs of husking rollers, f and z, h and i, so as to insure the delivery of the ears endwise, to such pairs of husking rollers, as specified.

2d, I claim placing the rollers, f and h, higher than the rollers, g and i, so as to insure the rotation of the ears as they pass endwise along such pairs of rollers as set forth.

3d, I claim the revolving bar, K, applied above the rollers, f, and h, to prevent ears of corn passing down the space between these rollers, and escaping unhusked, as set forth.

4th, I claim a series of inclined husking rollers, arranged substantially as shown and formed, with elastic grooved surfaces, to one or both rollers, of each pair, for the purposes set forth.

5th, I claim the adjustable, detaining strips, n, applied in the manner specified, in combination with the pairs of inclined husking rollers, for the purposes set forth.

6th, I claim the stripping bars or knives, q, fitted adjustably as set forth, in combination with the pairs of husking rollers, as set forth.

7th, I claim the combination of the guards, o, inclined husking rollers, hopper boards, m, and bar, k, to inclose the proper position of the ear in passing endwise down upon the inclined husking rollers, as set forth.

68,086.—FOOT REST FOR STOVES.—J. H. Keyser, N. Y. City.

1st, I claim an open work foot rest, which is constructed with annular tapering flanges, as a new and improved article of manufacture.

68,087.—UNITING EDGES OF HOSIERY GOODS.—Edward E. Kilbown, New Brunswick, N. J.

I claim the improved connection of hosiery goods, consisting of the combination of the loops of the adjacent abutting edges of the article, by means of the chain stitch hereinbefore described.

68,088.—TRANSMITTING PLANS OF BATTLE-FIELDS BY TELEGRAPH.—Thomas W. Knox, New York City.

I claim transmitting or giving plans of battle-fields, positions of troops, and topographical and other features of a country, by means of rectangular or other divisions, marked on blanks of paper or other material, and numbered in any agreed order only, as above set forth.

68,089.—WOODEN PAVEMENT.—P. Koch, New Haven, Conn.

I claim the construction and arrangement of wooden paving blocks, in the manner and for the purpose described and set forth.

68,090.—STEP AND EXTENSION LADDER.—C. J. Komar, Willoughby, Ohio.

1st, I claim the side rails, A, of the lower section, provided with longitudinal grooves, B B', pulleys, D D', opening, C, and tongue, T', and the side rails, K, of the upper section, provided with longitudinal grooves, L L', roller, N, openings, M, tongue, T, and hole, O, all arranged and operating in combination with the cord, S, and windlass, F, in the manner and for the purpose specified.

2d, The bars, H H', located and secured in the braces, G, in combination with the notches, P, of the side rails, K, operating as and for the purpose set forth.

68,091.—CORN PLANTER.—Lewis Larchar, Utica, N. Y.

1st, I claim the tooth, I, constructed and operating substantially as described, for the uses and purposes mentioned.

2d, The said tooth, I, and the teeth, K K, one or more, in combination, for the uses and purposes mentioned.

3d, The adjustment of the wheels, C C, and the hoppers, D D, relative to each other as described, by means of which the rows will be at equal distances apart, as described.

4th, The slide, D4, and the lever, E, and spring, D6, and cam lever, F, constructed and operating in combination, substantially as described, and for the uses and purposes mentioned.

5th, The lever, H, in combination with the pin or pins, H2, on the drum, C2, substantially as described, and for the uses and purposes mentioned.

68,092.—CORD TIGHTENER FOR CURTAINS.—Thomas C. Lippincott, Philadelphia, Pa.

I claim the combination of the sliding bar, A, constructed substantially as described, with the rack, B, by means of the tooth, b, of the bar, and the recessed teeth, c, of the rack, substantially as described, and for the purpose specified.

68,093.—CORK PRESS.—C. L. Lochman, Carlisle, Pa.

I claim a cork press, with one or both jaws made to vibrate, either straight or curved, so that a rotary and squeezing effect is given to a bottle cork at the same time, substantially as specified.

68,094.—CHANNELING AND BEVELING MACHINE.—Ira Manning, Philadelphia, Pa.

1st, I claim the combination and arrangement of a channeling knife and a beveling knife in the same machine, whereby a sole is channeled and beveled at the same time, as shown.

2d, Arranging the channeling and beveling knives so that either can be removed, whereby a sole can either be channeled or beveled, as shown.

3d, The barrel, I, when constructed, arranged, and operating substantially as shown and described.

4th, The adjusting plate, C, the friction roller, B, and the guide, c, as shown and described.

5th, The knife holder, D, and the arc G, as shown and described.

68,095.—THRASHING MACHINE AND SEPARATOR.—Hugh W. Mathews, Chicago, Ill.

I claim the combination of the rack, G G G, rakes, E, and conveyor, I, when constructed substantially as and for the purpose set forth.

68,096.—VAGINAL INVIGORATOR.—Morris Mattson, N. Y. city.

I claim an instrument for washing and cleaning the vagina and for treating diseases of that organ and of the womb, having an outlet perforated or open cylinder, and within such cylinder an injecting tube for a spray or jet, substantially as and for the purposes set forth.

68,097.—CHURN.—John McKenzie, Portland, Me.

1st, I claim the dasher when composed of the hollow drum, m, inclined fingers, n, and adjustable washing roller, o, all operated by the removable shaft, a, as and for the purposes specified.

2d, The curved ventilating cover, E, constructed with the parts and applied as herein described and for the purposes set forth.

68,098.—BED BOTTOM SPRING.—E. D. Merrian and S. Aldrich, La Grange, O.

We claim the clamp, B, attached to the slat, A, and inclosing the rod, C, in combination with the looped hinge, D, elastic band, E, rod, H, and staples, G, fastened to the rail, F, when said several parts are respectively constructed and the whole arranged for use substantially as and for the purpose set forth

68,099.—CARTRIDGE EJECTOR FOR BREECH-LOADING FIREARMS.—Wm. H. and Geo. W. Miller, West Meriden, Conn.

We claim in combination with a hinged and swinging breech block, the accelerating lever, m, on said breech block, and the ejector, d, on the pivot pin of the hinge, for the purpose of giving a quick impulse to the ejector, and through it to the cartridge case, to throw the latter out of the gun, substantially as described.

68,100.—CHURN.—Mortimore B. Mills, East Mendon, N. Y.

I claim the dashers, D E, Fig. 2, when made so as to be actuated by the levers, C C, Fig. 1, and connections, E E, when arranged within the box, A, as and for the purpose set forth.

68,101.—MACHINE FOR GRINDING PEAT.—Simeon Mills,

1st, I claim the spirally-fluted cylinders of rollers, E, whether conical or straight, so constructed and arranged that both are propelled in rotatory manner by the application of power to one without gearing, substantially as described and for the purposes set forth.

2d, The grooved feed roller, a b, in combination with the fluted rollers, E, when constructed and arranged to operate as described and for the purposes set forth.

3d, The spirally-fluted rollers, E, in combination with each other and with the grooved feed rollers, a b, and mandrel, d, when arranged to operate in a close-fitting case substantially as described and for the purposes set forth.

68,102.—PLOW.—Gilpin Moore (assignor to himself and Deere & Co.), Moline, Ill.

1st, I claim the plan or method herein described of constructing the mold boards of plows.

2d, A plow having its mold board constructed of a form corresponding with the form of the under surface of the furrow slice at the instant it is severed from the earth, substantially as described.

68,103.—FRAME FOR WINDOW SCREEN.—Willim H. Nash, Reading, Mass.

I claim as a new article of manufacture a frame for a window screen when constructed of the bars, D D' D'' D''', and the corner pieces, A, made substantially as described.

68,104.—CULTIVATOR.—Edward Newlon, Monmouth, Ill.

I claim the vertical adjustment of beams y y, in combination with the frame, constructed as described and for the purpose set forth, in connection with the mode of attaching the draft.

68,105.—CAR COUPLING.—Geo. W. Noyes, Norwich, Conn.

I claim the adjustable head, C, and pin, E, with its devices, L and M, for operating the same, all constructed and arranged as herein described and for the purposes set forth.

68,106.—CEMENT FOR ROOFING.—J. D. Numan, J. T. Wilkinson, and E. W. Cook, Lockport, N. Y., assignors to J. D. Numan, Jas. T. Wilkinson, Jas. T. Wilkinson, Jr., W. B. Chase, and J. L. Ashley.

We claim the aforesaid cement for roofing or other purposes composed of the aforesaid substances or materials, or substantially the same, and which will produce the same intended effect.

68,107.—KNITTING MACHINE.—John Pepper, Lake Village, N. H.

1st, I claim in combination with an interior pivoted cam or switch, a slide or its mechanical equivalent, for raising or lowering said cam or switch, and thus changing the cam groove and lowering or raising the needles, for changing the machine from common ribbed to plaited ribbed work, or vice versa, substantially as described.

2d, I also claim the revolving pin wheel, m, in combination with a stationary pin or pins, for the purpose of moving an interior cam or switch, and changing the traverse of the needles at that point for changing the machine from tighter to looser knitting or vice versa, substantially as herein described.

68,108.—CLUTCH SHIPPERS.—Frank J. Plummer (assignor to R. Ball & Co.), Worcester, Mass.

1st, I claim the combination with the projection, E, of box, B, and tongue, c, of the slotted slide, F, and cap, I, substantially as and for the purposes as set forth.

2d, The combination with frame, A, double slotted or grooved slide piece, F, clasp, G, and clutch hub, L, of the box, B, having a flange, D, and projections, E and 4 4, arranged and combined together for use substantially as set forth.

68,109.—PRUNING KNIFE, HOOK, AND SAW.—Roger W. Porter, Nashua, N. H.

I claim pruning hook, knife, chisel, and saw, constructed and arranged as shown, in combination.

68,110.—MACHINE FOR PULVERIZING THE EARTH PREPARATORY TO PLANTING.—John Prutzman, Hancock, Ill.

I claim the comoination of knives, shovels, and teeth, substantially as set forth, and secured in an inner frame which can be raised or depressed, together with a large shovel or marker for laying off the ground, and detent, D, substantially as and for the purpose set forth.

68,111.—FEEDING RACK FOR STOCK.—J. C. Ramsey (assignor to himself and S. M. England), Le Roy, O.

I claim the combination and arrangement of the box, A, rack, B, springs E, slide, I, adjustable bottom, D', and loop or staple, H, for the purpose and in the manner herein set forth.

68,112.—ADJUSTABLE PIPE JOINTS.—J. H. Rhodes, Brooklyn, N. Y.

I claim a pipe joint constructed of a hard-metal spigot, B, and hard-metal bell, D, both of shape corresponding to the segment of a sphere, in combination with the soft metal packing, E, arranged as a fixture in the mouth of the bell and resting at its inner end or edge against a projection or stop, S, substantially as and for the purpose or purposes as herein set forth.

68,113.—MAKING THE EYE OF ELLIPTIC SPRINGS.—W. T. Richards, Bridgeport, Conn.

1st, I claim the combination of the dies, g i and j, with the lever, D, or its equivalent, when they are constructed, arranged, and fitted to scarf the end and partially form the eye, substantially as herein described.

2d, I claim the combination of the dies, n and r, with the head of the ram, p, when the head is provided with a tongue, o, and the die, n, has a slot or recess, m, to receive the tongue and the whole is fitted to produce the result of finishing the eye, substantially as herein described,

68,114.—COMBINED PLOW AND CULTIVATOR.—Anton Romann and John Peterka, Wilton, Iowa.

We claim the form and construction of the cultivator and harrow combined, when arranged, adjusted, and operated with the bolt, F, beam, C, and axle, M, as attached to the frame or bars, G, with the regulating wheels, L, as herein described and for the purposes set forth.

68,115.—STEAM SLED.—John S. Rose, Hamilton Co., Iowa.

I claim the arrangement and combination of the adjustable knives, I, with the runners, A, when operated by the wheel, P, as herein described and for the purposes set forth.

68,116.—SHEATHING OF SHIPS' BOTTOMS.—François Louis Roux, Toulon, France. Patented in France Jan. 23, 1866.

I claim the application of copper sheathing to ships or vessels constructed or plated with iron, in combination with interposed layers of insulating material, in manner and for the purposes substantially as herein set forth and represented in Figs. 17 to 21, of the annexed drawings.

68,117.—PRESS.—Christopher E. Rymes, Somerville, Mass.

1st, I claim the improved hydraulic press constructed with the plunger so affixed to its frame as to be capable of being moved laterally with respect to its drum and piston, substantially as and for the purpose specified.

2d, I also claim the combination of the centralizing pin and cavity, or the equivalent thereof, with the piston and discharging pan of the hydraulic press.

3d, I also claim the discharging pan as made with the abutments arranged within it, as and for the purpose specified.

68,118.—CONVERTING IRON INTO STEEL.—S. C. Salisbury, New York city.

I claim converting iron into steel, while the former is in a liquid state and it is delivered from the furnace in which the ores are reduced by the use and application to or passing through such liquid iron a blast of steam or hydrogen and oxygen heated to a temperature of from 700° to 800° Fah., or thereabout, in combination first with an air blast and afterward with carbon gas free from or obtained from hydrocarbons free from sulphur, phosphorus, etc., and either with or without manganese.

68,119.—APPARATUS FOR SUPPLYING GASES TO FURNACES.—S. C. Salisbury, New York city.

I claim the combination of the generator, A, and exhaust chamber or mixer, C, with the tweer, E, or its equivalent, for generating and heating, mixing, and supplying to blast or other furnaces, hydrogen and oxygen gases or their equivalent, and carbon gas or other gases in connection with the air blast, for the purposes set forth.

68,120.—CAR COUPLING.—P. H. Schuyler, Lyme, O.

1st, I claim the lever, C, dog, E, spring, a, and shaft, D', arranged and operating as and for the purpose set forth.

2d, The arm, I, shaft, D', spring, a, in combination with the link, F, as and for the purpose set forth.

68,121.—CARRIAGES HINGE.—C. E. Schwind, New York city.

I claim the detachable piece or slide, B, in combination with the two parts, A C, substantially as and for the purpose specified.

68,122.—RAILROAD RAIL JOINT.—Benjamin Scott, New Brighton, Pa

1st, I claim the combination of the two rigid parts, B B, of a divided clamp joint, constructed with jaws, b b, fitting closely around the base and neck of the rails and downwardly projecting flanges, a a, meeting at their lower edges, D, and beveled upward to form a space, i, between them, when used in connection with bolts, g, passed through the flanges, a a, above the fulcrum point, D, all as herein shown and described and for the purposes specified.

2d, I further claim in combination with the above, the block of hard wood, E, fitting the angle between the flange and body of the clamps to facilitate the working of the nuts from above, and to obviate the jar and thereby prevent the unscrewing of the nuts.

68,123.—SWINGNOSE BASIN FAUCETS.—N. Scraunage, W. Scraunage, and W. H. Bate, Boston, Mass.

We claim a swingnose basin faucet when the several parts, A B E O F and H, thereof are constructed and arranged substantially as described and for the purpose set forth.

68,124.—WHEEL CULTIVATOR.—W. A. Sisson, Sheffield, Ill.

I claim a wheel cultivator constructed so that the draft power shall be applied direct to the shovel frame, and the driver's seat mounted upon the carriage frame, which is attached to the shovel frame at its forward end by a loose connection which permits said carriage frame to rise and fall with the undulations of the ground in any direction without affecting the operation of the shovel frame.

2d, The friction rollers, x x, at the forward ends of the carriage frame, in combination with the loops, H H, substantially as and for the purpose set forth.

3d, The perforated plates, P P, in combination with the legs, k k, of the driver's seat fitted so as to be inserted into said perforations for the purpose of adjustment as set forth.

4th, The handles, O O, at the sides of the shovel frame to enable the driver to raise said frame and free the shovels from the ground.

68,125.—SORGHUM SUGAR EVAPORATOR.—A. B. Smith, Clinton, Pa.

1st, I claim the arrangement of the transferring pipes, a b c, in connection with the evaporating pans, so as to draw the sirup from the middle thereof, or where the greater ebullition takes place therein, for the purpose herein specified.

2d, I also claim the adjustable transferring pipe, b, arranged substantially as and for the purpose herein set forth.

3d, I also claim the valves, f h, applied to the pipes, a c, for the purpose herein set forth.

4th, I also claim the combination and arrangement of the filtering pan, E, and pipe, b, substantially as herein specified.

68,126.—CHIMNEY TOP.—John Snively, Williamsburg, Pa.

I claim the combination of the slightly convex cover, A, when fixed within the top of a chimney, with the vertical shaft or spindle, G, the arm, D, vane, F, and the screen, E, all constructed, combined, and arranged substantially as and for the purpose specified.

68,127.—COMBINED WATER METER AND FORCE PUMP.—Elihu Spencer, Elizabeth, N. J.

I claim the attachment of the force pumps, a a, to the water meter, acting and operating in combination with each other, substantially as and for the purpose specified and set forth.

68,128.—WRENCH.—Joseph A. Talpey, Somerville, assignor to himself and Mellen Bray, Boston, Mass.

I claim the wrench herein described, provided with two sets of jaws, the one rectangular with respect to the shank of the said wrench, the other sloping or at an inclination to the same, as and for the purpose herein shown and set forth.

68,129.—INDICATOR FOR WATER CLOSETS.—Henry K. Taylor, London, Eng. Patented in England April 20, 1865.

I claim the combination with the latch bolt or fastening to the door, of an indicator made visible from the exterior by the action of the fastening, substantially as and for the purpose or purposes herein set forth.

68,130.—AXLE.—Henry T. Tichenor, Fort Branch, Ind.

I claim the combination of the skeins, a a, plate, z, bands, b b, collar, E, and cap, D, with pin, d, when arranged and used with axle and hub in the manner and for the purposes specified.

68,131.—SNOUT RING FOR SWINE.—Miron G. Tousley, Fulton, assignor to Andrew and John P. Chaiser, Cardova, Ill.

I claim the hook or angle combining the lever, C, with its means of attachment, A, when constructed and used substantially in the manner and for the purposes set forth.

68,132.—MACHINE FOR PULLING FLAX.—Samuel W. Tyler, Troy, N. Y.

I claim for harvesting flax and other crops which require pulling from the ground, pullers which have traveling movement of their own and are made elastic and pliable or yielding on their impinging or grasping surfaces, by the use of india rubber, gutta percha, or other suitably elastic material, for the purposes substantially as set forth.

68,133.—CAR SPRING.—Richard Vose, New York city.

I claim a volute or spirally coiled spring formed of a metallic bar or strip, transversely crimped or corrugated, substantially in the manner herein set forth.

68,134.—CAR SPRING.—Richard Vose, New York City.

1st, I claim a volute spring so constructed as that its top and base shall be in horizontal or parallel planes, and its inner coil be uniform in width with those succeeding it substantially as herein described.

2d, I claim also a volute spring constructed of a metallic bar gradually increasing in thickness outwardly from its center to its edges throughout its length, substantially in the manner herein set forth.

68,135.—PROCESS OE REFINING LEAD.—Oscar Wassermann, Cali, Prussia.

1st, I claim treating work lead which has been desilvered by the aid of zinc with chloride of lead, substantially as and for the purpose described.

2d, Treating work lead which has been desolved by the aid of zinc with chloride of lead and alkalies such as soda or potash, substantially as and for the purpose set forth.

68,136.—LAMP.—H. Weston, Towanda, Pa.

I claim forming a recess or groove in the top of the lamp body around the opening which receives the lamp top with its wick tube, said groove having perforations from its bottom into the lamp substantially as and for the purpose set forth.

68,137.—CIRCULAR SAWING MACHINE.—Ralph V. Whiting, (assignor to D. B. Garney,) Abington, Mass.

I claim so arranging the weights which draw back the slide or carriage of a board sawing machine that when the carriage first starts to return the combined weights pull in one direction and in aid of each other, but when the carriage has passed a certain distance and has with its load acquired quite a momentum, the weights will act in opposition to each other and thus cease to give additional velocity to the carriage substantially as described and for the purpose set forth.

68,138.—LOCK CLASP FOR UMBRELLA.—Andrew H. Whitney, Portland Maine.

I claim the lock clasp for umbrellas combining the chamber band and spring as described.

68,139.—GRATE FOR FURNACE.—Wm. A. Wilson and James Smith, Liverpool, Eng.

1st, We claim causing two or more of the bars of which a furnace fire grate is composed, to move together in one direction and then causing them to move back a less number at a time, substantially as and for the purpose herein set forth.

2d, We claim in connection with the above the combination of parts herein described, consisting of bars, a, drums, n r, and their attachments and operating mechanism, i j k m, or their respective equivalents, adapted for causing bars to move in the manner substantially as herein set forth.

68,140.—HORSE RAKE.—John Zimmerman, Powhatan, Md.

I claim the reversible head, A, provided with the teeth, C, handle, h, and socket, e, journaled to the curved shafts, B, and having the runners, s, attached all constructed and arranged to operate as set forth.

68,141.—BEEHIVE.—Davis L. Adair, Hawesville, Ky.

I claim the honey box constructed as described consisting of the sections, D, provided with the projecting top and bottom pieces, F G, fitting the tops and bottoms of the vertical pieces secured together by the strips, E, whereby vertical movement of separate sections is avoided, as herein set forth for the purpose specified.

2d, The sections of the brood chamber constructed as described consisting of the removable frames, P P, blind frames, N N P, sides, Z, and sections, Y, all arranged and described and sliding over the bottom guides, S, and between the triangular side strips, R, as herein set forth for the purpose specified.

68,142.—DEVICE FOR ATTACHING CHIMNEYS TO LAMPS.—Joseph B. Alexander, Washington, D. C.

I claim the S shaped lever, A, with its circular head working eccentrically upon the axle, D, and fitting exactly into the contraction of the chimney above the base rim, I, substantially as described, and for the purpose set forth.

68,143.—CAR SPRING.—T. F. Allyn, Nyack, N. Y.

I claim a car spring constructed of wood and rubber combined as described and set forth in my specification.

68,144.—MACHINE FOR MAKING MATCH SPLINTS.—Emery Andrews and William Tucker, Portland, Maine.

1st, We claim the compensating feed which is so constructed that the rack is fed down by the thickness of the card, the wave or feed bar being slotted so that the rack slides through it, the slats, b, being opened by the wedges, k, which are secured to the reciprocating head, E, substantially as described.

2d, The combination and arrangement upon the reciprocating head, E, of the feed plate, D, whose forward end pushes the cards through between the knives, C, and between the slats, b, of the rack, F, as herein set forth for the purpose specified.

3d, So arranging the knives, C, on the bars, a, that their cutting edges will be in a zig zag line for the purpose of decreasing the compression of the splint substantially as set forth.

4th, Providing the knives with concave cutting edges substantially as and for the purpose set forth.

68,145.—CIDER-MILL.—Robert C. Archibald, La Fayette, Ind.

I claim the double endless apron, L L, in combination with the rollers, K K', constructed and arranged to operate substantially as set forth.

68,146.—CARD BOARD DRIER.—E. F. Baily, Holdemess, N. H.

I claim the arrangement of the foraminous chamber or channels, the heating pipe or pipes, the carrier supporting frame or frame provided with inclined guides with each other and the air chamber at either end, and the box, A, constructed and provided with doors and a ventilator and valve thereto substantially as described and for the purpose specified.

68,147.—TRACE BUCKLE.—R. J. Baker, Madison, Wis.

I claim the trace buckle when constructed and arranged as described consisting of the curved sides, a a, having pivoted at their centers upon the upper side by means of the crank arm, i, the bar, k, to the under side of which the pins, n n, are secured, said bar, k, adjusted to be raised or lowered by means of the crank arm, and when placed in the trace securely held in position by its rear end catching under the bar, h, and the pin, n, against the bars, e, as herein shown and described.

68,148.—BALE TIE.—Arthur Barbarin, New Orleans, La.

I claim the ball, A, when provided with the two encircling grooves, a and b, substantially as herein described for the purpose set forth.

68,149.—BALE TIE.—Arthur Barbarin, New Orleans, La.

I claim the ring, A, when constructed as herein described and shown upon the drawings, and used to fasten the end of wire rope, or wire, in banding cotton or other bales, substantially in the manner herein set forth.

68,150.—BUTT HINGE.—B. F. Barker, San Francisco, Cal.

1st, I claim the three leaf folding butt constructed substantially as herein shown and described the two forming a reversible hinge and acting alternately, substantially as set forth.

2d, I claim the plate, A, in combination with the butt, substantially as described.

3d, I claim the muffer substantially as described in combination with the butt as and for the purposes specified.

68,151.—SHEEP RACK.—J. S. Beals, Alabama Center, N. Y.

1st, I claim so binging the boards, D and E, together and combining them with hinged cleats, d d, that a sheep rack can be formed with either an open or covered hopper, or one that is provided with a cover for the sheep and with an open feed rack, or which can be closed for the sheep if desired, as set forth.

2d, Extending the cleats, d d, so as to form supports for the boards, E E, and connecting the boards, D and E, at their edges, substantially as set forth.

3d, The boards, D and E, cleats, d d, revolving standards, B, and pieces, A, rails, a, and pins, c, in combination with each other, all made and operating substantially as herein shown and described.

68,152.—PLOW.—J. S. Beals, Alabama Center, N. Y.

1st, I claim making the opposite ends of the share, D, equal to each other, so as to provide the same with double cutting edges, a a, substantially as and for the purpose herein shown and described.

2d, Securing the share, D, to the lower portion of a bar, E, which is adjustable on standard, F, by means of set screw, c, substantially as and for the purpose herein shown and described.

3d, Securing the coulter, G, on the lower end of the same standard on which the supplementary share, D, is arranged, substantially as and for the purpose herein shown and described.

68,153.—COMBINED PEN AND ERASER.—W. F. Beaton, Philadelphia, Pa.

I claim a combined reversible or invertible pen and eraser, constructed substantially as described.

I also claim the combination, substantially as described, of a combined pen and eraser, with a reversible holder.

I also claim the combination, substantially as described, of a combined pen and eraser, a reversible holder, and a shield, for the purposes set forth.

68,154.—FRAME FOR THE GLASSES OF CARRIAGE CURTAINS.—William F. Beaton, Philadelphia, Pa.

1st, I claim, as a new article of manufacture, the glass and curtain holder, consisting of the concave convex plate, A, washer, D, and clips, B, constructed and arranged as described for the purpose set forth.

3d, Fastening glass in carriage curtains by clips secured to the frame and bent upon a washer, substantially in the manner described.

68,155.—WASHING MACHINE.—E. Beckwith, South Pass, Ill.

1st, I claim the manner herein shown and described of hanging the roller, E, in sliding bearings, a, between which it is held by the thimbles, e e, and rubber washers, f f, substantially as herein shown and described.

2d, The cylindrical or partly cylindrical wash tub, A, when provided with slotted head piece, C, and perforated partitions, F, in combination with the up and down adjustable oscillating or revolving roller, E, all made and operating substantially as herein shown and described.

68,156.—PAD CRIMP PRESS.—H. H. Beers, Toulon, Ill.

I claim a crimp or break for pads having an adjustable die, B, all made substantially as described.

68,157.—FILTER FOR REFINING SUGAR.—R. W. Bender, N. Y. City.

I claim the arrangement herein described for forcing the liquid through the animal coal by means of live steam, acting on the said liquid in a montejus, connected and combined with the filter or filters, substantially as set forth.

68,158.—PAINT CAN.—G. W. Bennet, New York City, assignor to himself, Geo. W. Peck and Chas. S. Bird.

1st, I claim the combination of the cross bar, B, having a screw hole formed through its central part with the upper part of the can, A, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the cover, C, having a groove formed in its lower side near its edge and having a screw, D, attached to its central part with the cross bar, B, and can, A, substantially as herein shown and described and for the purpose set forth.

68,159.—MEDICAL COMPOUND.—O. W. Blanchard, Delavan, Wis.

I claim the medical compound made of the ingredients and mixed together in or about the proportions substantially as and for the purpose described.

68,160.—HORSE HAY FORK.—C. D. Blinn, Port Huron, Mich.

1st, I claim the prong, A, constructed with a socket for the reception of the removable handle, B, substantially herein shown and described and for the purpose set forth.

2d, The combination and arrangement of the loop or ring, F, toggle, D, and ropes, C E G H, with each other and with the prong, A, substantially as herein shown and described and for the purpose set forth.

68,161.—CLOTHES PIN.—H. T. Boutell, Springfield, Vt.

I claim the two clamps, B, and the spring, C a, arranged and operating in the stock, A, as herein set forth for the purpose specified.

68,162.—MODE OF CLOSING BOTTLES.—T. S. Bowman, St. Louis, Mo.

1st, I claim the method of stopping bottles, substantially as described.

2d, The special constructing and combination of the bottle neck and stopple B, substantially as and for the purpose specified.

68,163.—BRUSH AND TOP OF MUCILAGE BOTTLE.—William Burnet, New York City,

1st, I claim the use of a spring collar or washer on the handle of a mucilage brush.

2d, The use of the same in combination with a spring and the cap of a mucilage bottle.

3d, The use of a tubular rubber spring in combination with a mucilage bottle all made and operating as described, or their mechanical equivalents.

68,164.—NURSERY LOUNGE.—S. Buttenheim, New York City.

1st, I claim a combined lounge and night chair when made and operating substantially as herein specified and described.

2d, A combined lounge, night chair, and folding table when made and operating substantially as herein specified and described.

3d, A combined lounge, night chair, folding table and bureau, when made and operating substantially as herein specified and described.

4th, A combined lounge, night chair, folding table, bureau and writing desk when made and operating substantially as herein specified and described,

5th, A combined lounge, night chair, folding table, bureau and mirror, when made and operating substantially as herein specified and described.

6th, A combined lounge, and folding table, the latter being so arranged as to be concealed in a drawer, E, expanded or altogether removed from the lounge, as set forth.

7th, A combined lounge and mirror when made and operating substantially as herein specified and described.

8th, A combined lounge and writing desk, when made and operating substantially as herein specified and described.

9th, A nursery loubge when made and operating substantially as herein specified and described.

68,165.—CORN CULTIVATOR.—Andrew Canfield, Lyons' City, Iowa.

1st, I claim the adjustable extension guard to regulate the amount of earth applied to young corn.

2d, The raising levers, G G, in combination with the double stirrups, a a, for the purpose above set forth.

3d, The principle of raising and lowering a seat by means of a joint in the support of the seat when used substantially as and for the purposes above set forth.

68,166.—PORTABLE FENCE.—Peter Chandler, Olney, Ill.

I claim the combination of the keys or gibs, C, constructed as described

with the slotted posts, A A, and doubled battened panels, B B', of a portable fence as and for the purpose described.

68,167.—COTTON BALE TIE.—M. D. Cheek, Clarendon, Ark.

1st, I claim a cotton bale tie constructed in two parts with lapping ends provided with perforations in the one side and hooks on the other substantially as shown and described.

2d, The bars, G H, cylindrical upon the surface around with the hoop passes, in combination with the parts of a cotton bale tie as shown and described.

3d, A cotton bale tie constructed with lapping ends fitted as shown and provided with bars, G H, slits, I I, perforations, F F, and hoops, E E, for the purpose set forth.

68,168.—WRENCH.—T. D. Christopher, Madison, Ind.

1st, I claim the combination of the sliding thimble, D, the plate, E, the catch bar, F, and the spring, a, with a ratchet wrench substantially as and for the purposes set forth.

2d, I claim the same in combination with the screw, G, and nut, H, arranged substantially as shown and described on bar, e, of a ratchet wrench for the purposes set forth.

68,169.—HARROW.—Jacob Click, Springfield, Ohio.

1st, I claim constructing a harrow with a series of long curved and sharp-edged teeth or knives secured to a rotating shaft, so that they may be depressed to cut deeply into the ground, when desired substantially as and for the purpose set forth.

2d, A harrow constructed with the curved sharp-edged teeth, D D, and a series of long knife-shaped teeth, E, secured to the rotating shaft, F, provided with the levers, G G, by which said knives, E, may be depressed to cut deeply into the ground when desired substantially as set forth

3d, In combination with the shaft, F, and levers, G G, the pawls, J J, and ratchets, I I, substantially as and for the purpose set forth.

4th, In combination with the harrow, A, and the long seat, M, mounted thereon; the levers, G G, joined at their upper ends by the long connecting rod, N, as and for the purpose set forth.

5th, In combination with the harrow, A, the adjustable wheels, O O P, for the purpose of limiting the depth to which the teeth or knives may cut.

68,170.—FILTER FAUCET.—R. B. Coar, Jersey City, N. J.

I claim the handle, f, attached directly to one side of the larger end of the tapering hollow plug, d, in combination with the removable cap, e, and filtering diaphragm, h, all arranged as and for the purposes set forth.

68,171.—MACHINE FOR CUTTING BERRY BOXES.—Chas. Colby, South Pass, Ill. Antedated Aug. 18, 1867.

1st, I claim the cutting of strips for berry boxes by means of reciprocating frame, B, provided with the knife, C, the slitting or grooving cutters, c, bed, the frame, A, in which the frame, B, works all combined and arranged to operate substantially as and for the purpose set forth.

2d, I claim the bars, G G, fitting loosely on the shaft, F, and spiral springs, c, when constructed and arranged in such a manner that the said bars, G G, shall press the strips being cut against the under side of the knife as herein set forth.

68,172.—CHECK REIN HOLDER.—McDowell Darrow, (assignor to himself and O. W. Hart,) Gates, N. Y.

I claim in connection with the ordinary check rein and hook of harness, the rein holder, constructed and operating substantially in the manner and for the purpose herein shown and described.

68,173.—SEED DRILL.—H. V. Davis, (assignor to Chas. Richardson,) Amherst, N. H.

I claim the several parts marked, a b e f g n k, when the several parts are connected, arranged and operated as specified.

68,174.—WASH BOARD.—L. De Golia, Batchellerville, N. Y.

I claim a wash board provided with a wooden and a metallic corrugated surface, substantially as and for the purpose herein shown and described.

68,175.—AMALGAMATOR.—Geo. B. Field, New York City.

1st, I claim the arrangement and combination of the rollers, H H, with the segment amalgam chambers, A A, so that the former shall work back and forth in the latter to produce at the same time a crushing and grinding of the ores in the manner and for the purpose substantially as above set forth.

2d, The combination and arrangement of the vertical shaft, D, arms, G G, and hoppers, K K, and rollers, H H, working in chambers, A A, substantially as and for the purposes described.

3d, The arrangement of the amalgam chambers, A A, and setting chambers, B B, connected by the conduits, C C, substantially as described.

4th, The arrangement of the chambers, A A, with the chambers, B B, shaft, D, arms, G G, agitators, F F, hoppers, K K, and rollers, H H, substantially as specified.

68,176.—WASHING MACHINE.—T. G. U. Fisk, Macon City, Mo

I claim the piston, C', lever, D, and spring, E, in combination with the vessels A B, the whole being arranged and operated as described and set forth.

68,177.—FENCE.—Benj. Force, Mount Pleasant, Iowa.

I claim the diagonal braces, F, in combination with the stakes, A, riders, C, parallel bars, E and B, all arranged substantially as set forth.

2d, I further claim the battens, H, in cambination with the stakes riders and bars, all arranged as shown and described.

68,178.—SMOOTHING IRON.—John Frasr, Dowagiac, Mich.

I claim the copper plate, B, in combination with a smoothing iron in manner and for the purposes substantially as described.

68,179.—RIDING ATTACHMENT FOR HARROWS.—Jas. M. Freeman, Bellville, N. Y.

I claim the connecting of a riding attachment to a harrow through the medium of the elastic bar, B, bolt, b, chain, d, and draft hook, c, all arranged substantially as and for the purpose specified.

68,180.—WINDOW SHADE.—F. Gesswein, Fond du Lac, Wis.

I claim, a blind or shade composed of slats with beveled edges arranged substantially as above described with notches in the edges of each slat where crossed by threads thereby weaving the slats closely together and narrowing the opening between them, and allowing the bevels of the edges to connect closely.

68,181.—DRYING BARRELS—Samuel Gibbons (assignor to himself and G. E. Palmer), Binghamton, N. Y.

1st, I claim the within-described method of drying barrels by the heat radiating from pipes or equivalent means introduced into the barrels, substantially in the manner set forth.

2d, An apparatus for drying barrels composed of a series of pipes, A, with branch pipes, C, substantially as and for the purpose described.

68,182.—BALING PRESS.—J. H. Godwin, Scotland Neck, N. C.

1st, I claim the levers, E G, connected with the shoulders, f, and platen, H, in combination with the drop doors, I, springs, J, and buttons, k, substantially as described for the purpose specified.

2d, The sides, h h' h'', hung to one post and door, m, in combination with the bar, g, cross bars, o o, drop catches, h, bars, n n, guide bars, r r, hinged bars, I I, and head block, c, substantially as described for the purpose specified.

3d, The screw nut in combination with the upper hinge to prevent the dragging of the doors, as herein set forth.

4th, The combination of the head block, C, supplemental door, s, and button, t, substantially as described for the purpose specified.

5th, The combination and arrangement of the frame, A, having stout plates, b, levers, E G, connected by shoulders, f, doors, h h' h'' and m, and supplemental door, s, catches, h, cross bars, O O, bars, n n c, button, t, head block, C, drop doors, I, springs, J, and buttons, K, bar, g, guide bars, r r, and hinged bars, I I, substantially as described for the purpose specified.

68,183.—SADIRON.—James Gray, Newark, N. J.

1st, I claim the solid iron, A, when provided with a lug or lugs, a, in combination with the shield, B, having a bolt or bolts, C, and fitted to the handle supports, D, as described.

2d, The flanges, b and c, or either formed respectively on the surface of the solid iron, A, and on the underside of the shield, B, form an air chamber, as set forth.

68,184.—VEGETABLE CUTTER.—Victor Hagmann, Washington, D. C.

1st, I claim a device for cutting vegetables, etc., having one or more knives attached to a screw adapted to receive a rotary and progressive motion, substantially as described.

2d, The combination with a screw, A, bearing one or more knives of the spring jaw, D, for holding said screw to its threaded bearing and permitting its ready retraction, substantially as described.

68,185.—RING FOR SPINNING.—H. G. Hall, Fayetteville, N. C.

I claim the rings, B C, constructed as described, the former provided with the eccentric flange, a, fitting into the rail and the latter with a similar eccentric flange fitting within the ring, B, when both are constructed to operate as set forth and held in position by means of the set screws, b c, substantially as described for the purpose specified.

68,186.—ROTARY STEAM ENGINE.—S. G. Hall, Norwich, Ct.

I claim the L-shaped pieces of the piston, B, provided with grooves, d, and tongues, c, operating in combination with the piston, B', provided with recesses, b, when applied to the piston wheel, C, and irregular cylinder, A, all constructed as and for the purpose described.

68,187.—DIE FOR FORMING THE EYES OF PICKS.—Henry M. Hamilton, New York City.

I claim the combination of the improved jaws, A A', a divided cutter ring, G (either at the upper or lower side), and shouldered punch, E, operating substantially as described.

68,188.—FUMIGATOR FOR DESTROYING VERMIN.—Jonathan R. Hamilton, M. D., Portland, Oregon.

1st, I claim the cup or bowl, A, with its insulated chamber, H, and pipe, D, as constructed with stopper, E, in combination with the apparatus E, or its equivalent, for operating substantially as and for the purposes herein specified.

2d, I claim the pipe, D, as constructed with the end closed and side openings, e e, for the escape of the fumes when said pipe is constructed with a chamber having an inside coating of calcined plaster or other suitable material as a non-conductor of heat as described and for the purposes herein set forth.

68,189.—CURTAIN FIXTURE.—Oscar Hanks, Cincinnati, Ohio.

I claim the elastic adjustable grooved pulley, E, in combination with elastic collar, F, as applied to certain rollers, C, substantially as described.

68,190.—GRAPE PLOW.—Richard Hardenbrook, Bath, N. Y.

I claim the clevis, H, provided with the elongated slot, h, perforated arms or fork, h' h', and lip, c, when connected to the notched beam, A, by means of the single pivotal bolt, substantially as and for the purpose described.

I also claim the curved form of the slot, h, or the equivalent thereof, whereby a forward inclination is given to the draft-bearing surface of the clevis from the center to the ends thereof, substantially as described.

I also claim the flanged extension or tail piece, A', formed on the beam, A, as a means of attachment of the handles, B B, as described.

68,191.—SHEEP RACK AND MOW COMBINED.—John Harman, McConnellsville, Ohio.

I claim the construction and combination of the rack, A, and mow, B, and opening, C, as herein described and for the purposes set forth.

68,192.—SASH WEIGHT.—Sandy Harris (assignor to himself and David Bevan), Philadelphia, Pa.

I claim the mode or modes, substantially as herein described, of attaching the sash cord to the weight.

68,193.—ELEVATING BLOCK.—Wm. H. Hawley, Utica, N. Y.

I claim the pulley, D, substantially as described, in combination with the chain, E, and stop, G for the uses and purposes mentioned.

68,194.—BUCK-SAW FRAME.—H. M. Hawyard, Boston, Mass.

I claim the improved saw straining mechanism as described or in other words the combination and arrangement of the teeth, a b, with the cam, E, and its bearing plate, C, when combined with the lever, F, and its connecting rods, or the equivalent thereof, the whole to be applied together and to a saw frame, as specified.

68,195.—HORSE HAY FORK.—J. S. Henry and A. H. Rust, Manheim, Pa.

We claim the arrangement of the notched lever, G, in combination with the spring bolt, K H, for operating the point, E, by a connecting lever, D, between the parallel bars, A A', all combined and operating in the manner and for the purpose specified.

68,196.—SEWING MACHINE.—W. S. Hill, Manchester, N. H.

1st, I claim the combination of the needle arm, E, constructed as described with the sliding pin, d', and cam, k, substantially as and for the purpose specified.

2d, The needle rod, E, and its grooved cam plate, J, for operating the looper, substantially as described.

68,197.—DEVICE FOR CATCHING ANIMALS.—W. L. Hopper, Monmouth, Ill.

I claim the sliding bar, C, in combination with the parts, A B, and spiral spring, s, substantially as described for the purpose specified.

68,198.—APPARATUS FOR AGITATION OF MILK IN CHEESE VATS.—J. Carroll House, Lowville, N. Y.

I claim the use of the compound vibrating rotary dasher, D b F C E, with the pulley, G, crank, e, together with the crank pulley, H, and their connections, as and for the object herein specified.

68,199.—CARRIAGE CURTAIN FIXTURE.—Edward Howell, Ashtabula, Ohio.

I claim the cam, c, and thumb piece, E, pivoted to the cam and arranged in relation to the rib, d, and curtain, substantially as and for the purpose set forth.

68,200.—PLOW CLEVIS.—Hanford Ingraham, Naples, N. Y

I claim the clevis as constructed substantially in the manner and for the purpose as herein set forth.

68,201.—COMBINED CORN PLANTER AND CULTIVATOR.—D. W. Jacoby, Shelbyville, Ill.

1st, I claim the stationary plate, P, substantially as described.

2d, The combination of the stationary plate, P, having a mortise or groove in which a sliding plate, O, is made to operate by means of a spring, n, rods, m, and crooked lever, n, in combination with pipe, R, substantially as set forth.

3d, The combination of the shovels, F' F, pipe, R, plates, O P, spring, h, lever, n, rods, m v, arranged to operate substantially as and for the purpose set forth.

68,202.—GRIDDLE.—Edwin A. Jeffery (assignor to himself and George M. Clark), Trappe, Md.

I claim the combination of the rim, C, fixed plate, B, hinged plate, A, having recesses, D, constructed substantially as described for the purpose specified.

68,203.—VENEER CUTTER.—Edward Jewett, Rindge, N. H.

I claim the face beveled knife, C, when combined with the head block, B, and arranged with relation to the friction plate, D, as and for the purposes set forth.

68,204.—BUCKLE.—W. B. Johnson, Bowling Green, Ky.

I claim an improved buckle having its tongue held by means of a spring, substantially as and for the purpose described.

68,205.—MAGNETIC MACHINE FOR SEPARATING IRON FROM BRASS TURNINGS AND FILINGS.—Julius Jonson (assignor to Gustavus Jonson and H. L. Frank), Baltimore, Md.

1st, I claim the arrangement of the helices, G G, magnets, H H, wires g g, and rods, i k, in connection with the plate, O, and the plate, P, substantially as and for the purpose described.

2d, I claim the arrangement of the magnets, H H, with their faces in a position inclined obliquely across their direction of revolution, substantially as and for the purpose specified.

68,206.—CASTING BELLS.—Andrew Jusberg, Galva, Ill.

I claim forming bells of copper, tin and silver, in the proportion substantially as described.

68,207.—HARVESTER PITMAN.—W. J. Keeney, Florence, Ind.

I claim the dotted adjustable box, C, constructed as described, its outer concave end fitting and working against the outer convex side of the hook, b, of the sickle bar its inner end secured to the pitman, A, as herein set forth for the purpose specified.

68,208.—WATCH KEY.—O. P. Kingman, Bridgeport, Conn.

1st, I claim a watch key rotating axially in a collar oscillating on trunnions, substantially in the manner described for the purposes set forth.

2d, The combination of the axially rotating key, the swinging collar, the half link or loop, and the swivel, C, for the purpose of winding up the watch with a key attached to the watch itself by a short link and of protecting the key when not in use.

3d, The notch, i, in the barrel for the removal of obstructions, as set forth.

68,209.—BROOM HEAD.—Isaac Kohn, Edgerton, Ohio.

I claim the leaf, A, flange, C, and loop, c', arranged in relation to the hooks, D, teeth, E, and case, as and for the purpose substantially as specified.

68,210.—STEAM HEATING APPARATUS FOR BREWERS AND OTHERS.—A. Komp, New York City.

I claim the arrangement of a series of small nozzles, a, in combination with the steam heating drum or pipe, A, substantially as and for the purpose described.

68,211.—WASHING MACHINE.—A. F. Kuhlman, Dubuque, Iowa.

I claim, 1st, The combination of the smooth rubbers, D, and inclined rubbing and feed boards, E, with the vibrating arms or plates, C, and shaft, B substantially as herein shown and described and for the purpose set forth.

2d, The pivoted stuffers, F, in combination with the inclined feed boards E, vibrating arms or plates, C, and tub, A, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the pivoted guard board, G, or equivalent, with the stuffers, F, and vibrating arms or plates, C, substantially as herein shown and described and for the purpose set forth.

68,212.—MODE OF DRIVING PRINTING PRESSES.—Clark M. Langley, Lowell, Mass.

I claim the spring, B, which retains the shipper bar and driving belt in any required position in combination with the cord, L, the shipper box, O P, and the double cones, substantially as herein described.

68,213.—COAL HOD.—James A. Lawson, Troy, N. Y.

I claim a coal hod or scuttle having its body in the general form of a frustrum of a cone and provided with a hopper, all substantially as and for the purpose specified.

And I also claim the bale when combined with the body of the scuttle by means of hinged joints and stops, substantially as and for the purpose specified.

68,214.—CENTRIFUGAL PUMP.—N. H. Libby, Charleston, S. C.

I claim the head plate, B, provided with lugs, D, in combination with the catches, E, shaft, C, drum, F, and clutches, H I, substantially as described for the purpose specified.

68,215.—VISE.—John Lee (assignor to Isaac C. Tate), New London, Conn.

I claim, 1st, The stationary jaw, A, when provided with a flange, a, as and for the purpose specified.

2d, In combination with the above a sliding jaw when the same has a tongued shank fitting in grooves arranged on the arms of the stationary jaw, said arms being fitted to the under side of the bench, substantially as described for the purpose specified.

68,216.—PORTABLE CRANE FOR LOADING WAGONS.—Amos Leitner, Hopewell Township, Ohio.

I claim, 1st, The combination of the lever, R, connecting bars, O and N, and sliding bar, P, with each other and with the hinged bearing, M, of the pinion shaft or axle, G, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the lever, S, connecting bars, T, and cross bar, U, with each other, with the sliding bar, P, and with the slotted end of the arm or beam, a2, substantially as herein shown and described.

3d, Attaching the tines v1, to the cross bar, v2, of the fork head, substantially in the manner herein shown and described.

4th, The combination of the scoop, W, with the lines, v1, and cross bar, v2, of the fork, V, substanially in the manner herein shown and described and for the purpose set forth.

68,217.—ELLIPTIC SPRING.—E. C. Lewis, Auburn, N. Y.

I claim the nibs formed upon the inner sides of the ends of the leaf, B, fitting into the grooves upon the upper side of the leaf, A, in such a manner as to keep the leaves in line with each other and preventing their lateral displacement, said nibs and grooves formed without having any corresponding depression or projection upon their opposite sides of the leaves, as herein described for the purpose specified.

68,218.—DEVICE FOR ELEVATING ICE.—Henry Little, Middletown, N. Y.

I claim, 1st, The curved platform, E, applied to the screw elevator, substantially as and for the purpose set forth.

2d, The movable bar, G, applied to the frame of the device when used in connection with the screw elevator, substantially as and for the purpose specified.

68,219.—PERMUTATION LOCKS.—Calvin L. Lucas, Plymouth, Mass.

I claim in combination with the tumbler and the superposed bolt plate, when guided by the arbors of the permutation gear as described of the crank or locking pin, k, under the arrangement and for operation as herein shown and specified.

68,220.—BED SPRING.—Geo. B. Markham, Plymouth, Mich.

I claim the spring composed of two wires, A A, having springs, B, coiled upon their length each passing through an eye, a, in the other and finished off by the loop or eye C, in manner and for the purpose substantially as above set forth and described.

68,221.—COMPOUND TO BE USED IN BEEHIVES.—T. F. McCafferty, Forest, Ohio.

I claim the compound made of the ingredients substantially as and for the purpose specified.

68,222.—MACHINE FOR MAKING SPIKES.—R. G. McKay, Cleveland, Ohio.

1st, I claim the cutting pointing and griping die, D, bed die, D', header, K, and spring, f', all constructed and arranged as and for the purpose set forth.

2d, The sliding cam, H, header, J, and springs, P e, in combination with the dies as and for the purpose described.

3d, The described arrangement of the rollers, R, lever, W, cam, V, spring, s, pawl and ratchet for the purpose specified.

68,223.—SNAP HOOK.—C. H. Miller (assignor to himself and T. W. Toye, and E. L. Cook), Buffalo, N. Y.

I claim the tongue, C, extended below its fulcrum bearing to form the buckle tongue, D, in combination with the loop, B, thereby forming a snap hook and buckle substantially as described.

2d, Hinging the tongue of a snap hook to the shank thereof by means of the pin c', and the brace or bearing a2 both constructed and combined substantially as herein set forth.

68,224.—MACHINE FOR FILLING RUTS AND LEVELING ROADS.—J. W. Minor, and D. P. Ward, New Bedford, Mass.

1st, We claim the combination and arrangement substantially as described of the guide wheel, B, the counters or shares, a a, the scrapers, b b, the lever, I and the roller, F, substantially as and for the purpose herein shown and described.

2d, We claim the scrapers, b b, in combination with the roller, F, arranged substantially as described with or without the guide wheel, B, and the coulters, or shares, a a.

68,225.—COTTON BALE TIE.—S. J. Mitchell, St. Louis, Mo.

I claim a cotton bale tie formed of a metal plate, A, having a slot, a, nearly across it and the pins, c c', on the wings, d d', constructed and operating as herein specified.

68,226.—SLEIGH BRAKES.—H. F. Morton, West Sumner, Me.

I claim the guides, D, mounted upon a suring on either side of the sled having both ends free, the lower arm being sufficiently long to reach the ground and kept off it by the elasticity of a spring, C, substantially as shown and described.

68,227.—GRAIN RAKE.—Earl Palmer, Solon, N. Y.

I claim the axle, B, constructed as destribed in combination with the clasp, H, and spring, K, substantially as and for the purpose set forth.

2d, The clasp or binder, H, with the spring, K, and hasp, L, attached to the axle and working in conjunction therewith and the fingers, f f f, as described.

3d, The axle, B, bent at its center as described in combination with the rake sections, D D, independent of each other and arranged to operate substantially as and for the purpose set forth.

68,228.—STUMP EXTRACTOR.—Isaac H. Palmer, Lodi, Wis.

1st, I claim the combination of the pivoted standards, A C, wheels, D, E, arranged and operating substantially as herein described.

2d, The pivoted standards, A C, wheels, B E, and chains, G e, arranged substantially as described for the purpose specified.

68,229.—PLATE WARMER.—J. C. Palmer, New York City.

I claim a plate warmer so constrrcted and operating as to present the plate edgewise to the heater register substantially as and for the purposes described.

I also claim so constructing a plate warmer that it can be applied either to a register in the floor or one in the wall by merely shifting its position, substantially as described.

68,230.—LIFTING JACKS.—J. N. Parker, Darlington, Wis.

I claim the standard, A, to which the lever, B, provided with the head, B', covered with a roughened iron band, d, is pivoted by a knuckle joint, a, all constructed and arranged as described and adapted to be supported upon the graduated block, C, as herein shown and represented.

68,231.—CARBURETING APPARATUS.—G. H. Peacock, Fairport, N. Y.

1st, I claim a reservoir or tank for liquid hydro carbons in combination with a vessel through which air or gas etc., is forced or passed in any suitable manner when the two are so connected as to enable a uniform or even hight or nearly so of liquid to be maintained in the latter or air or gas vessel substantially as described for the purpose specified.

2d, In combination with the above, so arranging the supply tank or reservoir that it can be adjusted for maintaining a greater or less hight, or nearly so, of liquid, within the generator vessel, substantially as and for the purpose described.

3d, So arranging a pipe or tube, or tubes, within the supply tank, which pipe or pipes connect with the tube or other combination between the said tank and the generator vessel, as to take the liquid in the tank, both from a point at or near its surface, and at or near its bottom, substantially as and for the purpose specified.

4th, The combination of the tank, A, vessel, H, and coil of pipe, G, connecting the two, substantially as and for the purpose described.

5th, The arrangement of the air pipe within the generator, H, in combination with the chamber communicating with such generator, substantially as and for the purpose specified.

62,232.—FLOATING FENCE.—J. Pitcher, Mount Vernon, Ind.

I claim, 1st, The combination of the panels, A, hoops, B, and stakes, C, or their equivalents with each other, substantially as herein shown and described, and for the purpose set forth.

2d, In combination with the above I claim the cables, E, posts, D, substantially as described, for the purpose specified.

68,233.—ROLLS FOR ROLLING RAILROAD RAILS.—Samuel L. Potter, Wyandotte, Mich.

I claim the fillets, or shoulders, h h, formed in one or more of the rolls, and in any desired number of grooves therein, so as by pressure upon the rail to cause the steel to become prominent, substantially as and for the purpose described.

68,234.—BARREL OR CASK.—C. T. Provost, N. Y. City.

I claim dividing the interior of a barrel, keg, or cask, into two or more compartments, by means of partitions arranged within the barrel, substantially as and for the purpose herein shown and described.

68,235.—WATER GAGE FOR STEAM GENERATORS.—Emmett Quinn, Washington, D. C. Antedated July 1, 1867.

I claim, as a new article of manufacture, a water gage, consisting of the metal frame, with the glass plates, B, secured thereto on opposite sides, as herein shown and described.

68,236.—PAPER BINDING.—W. P. Read, Longmeadow, Mass

I claim a paper-fastener, composed of the strip, A, arranged and constructed substantially as and for the purpose described.

68,237.—SWINGLE-TREE.—Martin Ryerson, Huntsville, Ala.

I claim a swingle, tree, constructed of iron rods, a a, in a barrel form, bound together and supported by disks, b, and b1, b1, and arranged and applied substantially as herein described.

68,238.—HOOP SKIRT.—Wm. S. Ryerson, Philadelphia, Pa.

I claim a hoop or skeleton skirt, having its tapes secured to the waist band or belt, in combination with buckles at such point of attachment through which the said tapes pass, substantially as and for the purpose described.

68,239.—STEAM DRYING APPARATUS.—William Ryner, Philadelphia, Pa., assignor to himself and J. C. Hopewell, Flemington, N. J.

I claim, 1st, The center pipe, C P, steam cocks, S C, and openings, H, the whole constructed and operating in the manner and for the purpose above set forth and described.

2d, The sets of steam pipes, U S, and U' S', with escape steam pipe, T T, and discharge holes, H H H H, connected with fire house, A, by pipe, P M, the whole constructed and operating in the manner and for the purpose above set forth and described.

68,240.—WOOL PACKERS.—Absalom Saeger, Meadville, Pa.

I claim the construction of the rack cylinder, fig. 5, in combination with the hoop, W, constructed with its outer end leveled, and larger than its inner end, in combination with the packing cylinder, A, the follower, K, the pin, S, the racks, B, and the gear wheels, D and E, the rollers, 6 7 8 9, when the same are constructed as described in the aforesaid combination, and for the purposes set forth.

68,241.—JACK SCREW.—Charles H. Sawyer, Saco, Me.

I claim the jack screw, combining the different parts herein described, arranged and to operate as set forth.

68,242.—MASH AND BEER COOLER.—C. Schenck, Manheim, Grand Duchy of Baden.

1st, I claim a liquid cooler, so constructed that, by centrifugal power, the liquid is thrown from a revolving disk against the inside of a revolving cylinder, where it is cooled by a current of air created by a fan on the inside of the cylinder, substaantilly as herein shown and described.

2d, The cylinder, F, in combination with the disk, L, on the shaft, J, and with the fan, M, all made and operating substantially as herein shown and described.

3d, The above, in combination with the annular vessel, P, the same being made as set forth.

68,243.—STRAW CUTTER.—W. Schreck, Des Moines, Iowa.

Antedated Aug. 23, 1867.

1st, I claim the sliding frame, F, working in the vertical standards, C C, in combination with the pitman, f, the reciprocating feed box, H, the spring rod, p, and the feeder, s, arranged and operating as and for the purposes herein described.

2d, The flap, m, in the bottom of the feed box, H, in combination with the spring, n, arranged and operating as and for the purpose specified.

68,244.—PRESSING BRICK.—Oran W. Seely, Buffalo, N. Y.

I claim the pressing of bricks, by means of two perforated pistons, acting simultaneously on both sides, substantially as described.

68,245.—INSTRUMENT FOR MEASURING DRY GOODS.—Thornton, A. Shrim, Baden, Pa.

I claim the large wheel, with the fractions of the yard or foot marked thereon, in combination with the ratchet wheel, L, carrying the hand, N, which registers the number of yards or feet on the dial, M, together with the spring and slide, carrying the small friction wheel, F, constructed substantially as and for the purpose set forth.

68,246.—CIDER MILL.—Thornton A. Shrim, Baden, Pa.

I claim the disk, E, constructed and arranged substantially as described, in combination with the rollers, J K L and M, when arranged and operating as described, and for the purpose set forth.

68,247.—DOUBLE SHOVEL PLOW.—L. L. Sloss, near South Union, Ky.

I claim connecting the plow frames to each other, by the three adjustable bars, D E F, not in the same horizontal plane, and pivoted or connected at end to the plow frames, by double jointed, hinged or equivalent connections, so as to have both a lateral and vertical movement, substantially as herein shown and described, and for the purpose set forth.

68,248.—CRUSHING AND WASHING SAND.—John R. Smith, Connellsville, Pa., assignor to himself and W. H. Denniston, Pittsburg, Pa.

1st, I claim the introduction of a stream or flow of water, into the crushing pan of a revolving sand, rock, or sand stone crusher, to aid the crusher or crushers in disintegrating the rock, and to cleanse and discharge the pulverized sand, substantially in the manner and for the purposes hereinbefore set forth.

2d, The rotating and revolving crushing wheels, b, in a sand rock crusher, in combination with a crushing pan, a, provided with a discharge gate, s, and a water supply pipe, h, or its equivalent, all constructed and operated substantially as and for the purposes above set forth.

68,249.—VALVE FOR WATER CLOSET.—W. Smith, San Francisco, Cal.

I claim the vale, H, working through the annular elastic washer, I, whereby in opening the valve the water in the chamber is allowed to pass freely, said washer preventing the return of the water, excepting through the channel, h, as herein set forth, for the purpose specified.

68,250.—CARTRIDGE RETRACTOR FOR BREECH-LOADING FIRE-ARMS.—William S. Smoot, Washington, D. C., assignor to Windsor Manufacturing Company, Windsor, Vt.

I claim a cartridge extractor swinging loosely on a common center, with that of the carrier or breech block, when said extractor, after being gradu

ally operated by swinging the said block, is made to take on, by any means, a suddenly accelerated movement to extract the shell, without accelerating the movement of the block itself, by which the extractor is operated.

68,251.—SWIVEL SHIP FENDER.—W. Sniffin, Sing Sing, N. Y.

I claim the combination of the swivel, a, with the fenders, A, substantially as and for the purpose herein shown and described.

68,252.—WAGON JACK.—J. M. Spitler, Clinton, Kansas.

I claim the lifting bar, B, provided with ratchet teeth, a a, in combination with the forked handle, C, and catch loops, c c, the springs, d d, and the slide, D, arranged and operating as and for the purpose described.

68,253.—PLOW.—Wm. T. Sprouse, Chandlerville, Ill.

I claim the landside, b, when constructed in the manner herein shown and described.

78,254.—PROCESS TO BE USED IN THE MANUFACTURE OF GLASS, SOLUBLE SILICATES, HYDROCHLORIC ACID, AND BLEACHING POWDERS.—Wm. R. Stace and H. M. Baker, Rochester, N. Y., assignors to themselves, John A. Morrison, Seward F. Gould, and Joseph Eastwood.

What we claim is the application to the manufacture of glass, soluble silicate of soda, bleaching powders, and hydrochloric acid, of the processes herein described, for the decomposition of chloride of sodium with silicic acid and oxygen gas, at elevated temperatures, whether said oxygen gas be furnished in the manner herein described (from steam or air), or from chlorate of potash, peroxyde of manganese, caustic baryta, or any other of the usual modes.

68,255.—BEDSTEAD.—W. B. Stewart, Brooklyn, N. Y.

What I claim is the bars, f and g, fitted as specified, in combination with the rollers, d d i and k, carrying the racking or webbing, e and m', as and for the purposes set forth.

68,256.—GRATER.—Henry Stone, Williamsburgh, N. Y.

I claim a grater consisting of box, A, grating cylinder and drawer, all constructed and combined together substantially as described.

68,257.—APPARATUS FOR DISTILLING AND RECTIFYING PETROLEUM.—Charles Stoll, San Francisco, Cal. Antedated Aug. 19, 1867.

1st, I claim an apparatus for distilling and rectifying petroleum, in which steam is used in the still or retort and rectifier, substantially as and for the purpose described.

2d, The rectifier, E, together with the endless coil, G, the coils, H and M, and the returning pipe, T, substantially as and for the purpose described.

68,258.—REFRIGERATOR.—Anthony B. Sweetland (assignor to himself and J. Daley), Fitchburg, Mass.

1st, I claim the ice bottom, D, when provided with legs, d', projecting through the inclined lining, C, and resting upon the bottom of the case, A, as herein set forth for the purpose specified.

2d, The air passages, a, formed upon the sides of the metallic lining, B, whereby the air entering the bottom at o passes through the perforations, d, to the revolving shelves, g, as herein shown and described.

3d, The construction and arrangement of the perforated metallic lining, B, having inclined bottom, C, and provided with side air tubes, a, and central cross bar, f, supporting the movable shelves, g g, and removable perforated bottom, D, all incased by the wooden casing, A, as herein set forth for the purpose specified.

68,259.—DUST BRUSH.—Ellis Thayer (assignor to himself and George W. Thayer), Worcester, Mass.

1st, I claim the reversible sliding block, B, of a dust brush, when arranged on the grooved or tongued handle, A, in the manner set forth, and when itself tongued or grooved, substantially as herein shown and described.

2d, The reversible sliding block, B, of a dust brush, in combination with the handle, A, and spring, D, all made and operating substantially as and for the purpose herein shown and described.

68,260.—REMEDY FOR SPAVIN IN HORSES.—Stephen E. Thayer, Manchester, Vt.

I claim a medicine compounded of the ingredients in the manner and for the purposes herein specified.

68,261.—PROCESS OF PREPARING PAPER PULP FROM STRAW AND OTHER MATERIALS.—Joel Tiffany, Albany, N. Y.

1st, I claim the above described process consisting in preparing the stock, charging the boiler, exhausting the air therefrom, jetting in the boiling liquor, using pneumatic pressure, and boiling the stock, in combination with the use of any caustic boiling liquor, substantially in the manner and for the purpose above described.

2d, I also claim the use of the within described bleaching process, in combination with the above described process of preparing the stock for bleaching, substantially in the manner and for the above described purpose.

68,262.—COTTON SEED PLANTER.—J. C. Tobias, Helena, Ark.

1st, I claim the revolving toothed wheel, D, and revolving toothed shaft, F', placed within the hopper, A, in combination with the adjustable elastic plate, F, underneath the base plate of the hopper, substantially as and for the purpose set forth.

2d, I further claim the beam, G, in combination with the hopper, A, mounted on wheels, B B, and connected together substantially as and for the purpose specified.

3d, I also claim the pressure or covering bar, I, in combination with the harrow, G, and the hopper, A, provided with the seed distributing device, all constructed and arranged to operate in the manner substantially as and for the purpose set forth.

68,263.—GRINDING MILL.—Chas. T. Umfried, Stuttgart, Würtemburg.

1st, I claim the adjustable standards, s, to which the open bed stones are secured, having channels, t, and funnels, g, supporting the traverse, h, for the purpose described, substantially as specified.

2d, Conveying the grain to the stones by means of the channels, t, in the adjustable standards, s, substantially as described.

3d, The grinding mill the parts of which consist of the bed stones, a, runner, b, adjustable standards, s, traverse, h, and vibrating conveyor, k, when constructed, arranged, and operating substantially as represented and described.

68,264.—ROOFING COMPOSITION.—Wm. Van Dyke and W. W. Eastwick, Keokuk, Iowa.

I claim a fire and water proof paint which is composed of the several substances mixed together in about the proportions described.

68,265.—SHIP VIAMETER.—Jas. C. Walker, Waco Village Texas.

I claim the combination in a viameter of the pipes, A and C, wheel, B, circular box or sheath, D, and indicating apparatus, substantially as and for the purpose described.

68,266.—PILE FOR WROUGHT IRON BEAMS OR GIRDERS.—George Walters and Thomas Shaffer, Phœnixville, Pa.

We claim a pile or fagot for wrought iron beams or girders, composed of one or more bars for the nib, and any appropriate number of bars for the flange or flanges, when the said bars are arranged and permanently secured together by bolts or rivets, as and for the purpose herein set forth.

68,267.—PILE FOR WROUGHT IRON BEAMS OR GIRDERS.—G. Walters and T. Shaffer, Phœnixville, Pa.

I claim a pile or fagot for wrought iron beams or girders, etc., composed of one or more bars for the web, and three or more bars for each flange, when the said bars are arranged and permanently secured together by bolts or rivets, as and for the purpose described.

68,268.—SPRING BED BOTTOM.—Otis H. Weed, Charlestown, Mass.

I claim the slats, C, so lengthened as to rest upon the springs, b or c, and extending the whole length of the bedstead, in combination with the springs, b or c, passing over the rail and supported by the same, to which they are attached by means of the removable and detached plates, a, all substantially as described and for the purpose set forth.

I also claim attaching the springs of the bed bottoms to the rails by means of the removable and detached plates, a, substantially as described.

68,269.—REFRIGERATOR.—John De W. Wemple, Albany, N. Y.

I claim the combination and arrangement of reservoir, W, filter, H, ice chest, I, trough, O, and faucet, F, as and for the purpose specified.

68,270.—WASHING AND WRINGING MACHINE.—James Whitney, Bristol, Vt.

I claim the combination of the tub, A, sliding frame, E, rubber springs, F, fluted cylinders, B C, wringer, G, constructed as described, and the table leaf, N R O and P, as herein set forth for the purpose specified.

68,271.—STRAWBERRY TRELLIS.—Wm. W. Wilcox, Middletown, Conn.

I claim the strawberry trellis, a, made substantially as above described, with an upright post or posts, e, and branching arms, c.

68,272.—CORN HUSKER.—Daniel Williams, Saginaw City, Mich.

I claim the construction and arrangement of the cutting plate, G, upon the pivoted bar, C, notched and flanged plate, H, upon the interior stationary frame, D E A, constructed and operating as herein shown and described.

68,273.—CHURN.—Samuel C. Wilson, Olney, Ill.

1st, I claim the arrangement of the dash rod, B', cross bar, E, shaft, J, crank wheels, H H, connecting rods, I I, pulleys, L M, and band, K, substantially as and for the purpose explained.

2d, The dasher consisting of the annulus, N', and convex-concave deflector, N, substantially as described.

68,274.—SHAFT COUPLING.—Thos. H. Wood, Monroeville, O.

I claim the spring, D1, section of the reach, D, and pivots, C, pivoted with nibs, E, as arranged in combination with the lugs, B, and clip, A, for the purpose and in the manner set forth.

68,275.—WASHING MACHINE.—John Worden, Normal, Ill.

I claim the combination of the beater, G, having the bars, g1 g2, lever, F, tub, A, with vertical ends, a1, inclined sides, a2, curved bottom, a3, and discharge orifice, I, sliding, wedge-shaped gate, D, having rubber or equivalent plate attached to its inner side, all constructed and operating substantially as herein set forth for the purpose specified.

68,276.—MILK HOUSE.—Henry Yerty, Covington, O.

I claim the within described milk house, constructed substantially as and for the purpose specified.

68,277.—GANG PLOW.—G. C. Avery, Conn's Creek, Ind.

I claim the hinged levers, D D, vertical bars, G G, loops, a a, cords, g g, and lever, H, the whole combined and operated substantially as and for the purpose herein set forth and described.

68,278.—LAMP SHADE.—D. W. Bashore, Palmyra, Pa.

I claim the narrow shade, B, with reflecting inner surface so constructed as to rest upon and closely surround the bulb of a lamp chimney with its upper opening large enough to not materially obstruct the ascending rays of light.

68,279.—CHEESE-CURD CUTTER.—William A. Bemis, Spencer, Mass.

1st, I claim the employment of the double-edged knife, G, in combination with the sliding frame, A, as and for the purpose set forth.

2d, The employment of the boards, E E, in combination with frame, D, and knife, G, all arranged to operate in connection with box, A, as and for the purpose specified.

68,280.—HEDGE TRIMMER.—Friederich Binder (assignor to himself and William Richardson), Baltimore, Md.

I claim the straight-edged single blade, A, operating in combination with the straight-edged double or slotted blade, B, substantially as and for the purpose described.

68,281.—PERMUTATION LOCK.—Ed. W. Bretell, Newark, N. J.

1st, I claim the wheel, W, the stumps, s1 and s5, the recess, R1, and cap, K, with its stumps, s1 and s2, as shown in fig. 1, pl. 2, and fig. 3, pl. 1, when arranged in the manner and for the purpose herein set forth.

2d, I claim the lever, L, with recess, R3, and check, c1, as shown in figs. 1 7, pl. 2, substantially in the manner and for the purpose herein set forth.

3d, I claim the cross bar, I, with its stump, s3, also the tumbler, T, as shown in figs. 1 and 2, pl. 1, in the manner and for the purpose herein set forth.

4th, I claim the swiveling dog, G, and the claw socket, L, as shown in figs. 1 and 2, pl. 1, and figs. 5 and 6, pl. 2, when arranged in the manner and for the purpose herein set forth.

68,282.—BALING SHORT CUT HAY, ETC.—Charles Brown, Buffalo, N. Y.

1st, I claim pressing and binding short cut hay and straw into compact bales as a new article of manufacture, trade, and commerce, substantially as described.

2d, The application and use of straw or hay as a binder on the top and bottom of the bale, substantially as set forth.

68,283.—HORSE RAKE.—E. W. Bullard (assignor to himself and J. W. Jenkins, Jr.,) Barre, Mass.

1st, I claim the combination with the arms, I and p, of the guide piece, J, hook, K, and holding and revolving piece, 9, substantially as and for the purpose set forth.

2d, The combination with the arm, J, and flanged hub, M, of one or more forks, 10, substantially as and for the purposes set forth.

3d, The combination with the hooks, K, and suitable mechanism for operating the same, of the flanged hub, M, and the folding piece, 9, mounted upon the axle or rake head, substantially as set forth.

4th, The combination with the arms, J and p, of lever, H, with one or two forks, m, and one or two arms, 5, under the arrangement and for operation substantially as and for the purposes set forth.

5th, The combination with lever, H, and arms, I and p, of the spring, L, arranged and operating substantially as and for the purposes set forth.

6th, The combination with the axle or rake head of one or more rake teeth, G, attached to the rake head, as described, and provided each with a rear curve from c to d, a front curve from e to c, and a shank, f substantially as and for the purposes herein shown and set forth.

68,284.—CONCRETE AND TILE PAVING.—Cornelius Burlew, Lockhaven, Pa., assignor to himself and Thornton Smith, Washington, D. C.

1st, I claim the mode, substantially as set forth, of compounding and prepairing concrete blocks for paving.

2d, The mode of laying pavements by the use of concrete blocks imbedded and united substantially as set forth.

68,285.—NURSING BOTTLE.—Milo S. Burr, Boston, Mass.

I claim the mouth guard, the tube and nipple connection combined or made of one piece of wood or other material, as set forth.

I also claim the tube and nipple, connection, E, provided with the auxiliary shoulder, d, as and for the purpose set forth.

68,286.—WASHING MACHINE.—C. M. Carleton, Forester, Mich.

1st, I claim the combination of the rubber, F, and rollers, C C and d d, and belt, E, with the bars, G I and y, with their set screws and springs, as and for the purpose set forth.

2d, Arrangement of clutch pulley, R, band F, and shaft, W, with its pulley, with the endless belt, E, or its equivalent, and rubber, F, as and for the purpose set forth.

68,287.—MUSICAL SCALE.—William E. Catlin, Wayne Township, Pa.

I claim the construction and use of my transposition teacher, as and for the purpose set forth.

68,288.—HORSE RAKE.—A. W. Coates, Alharice, Ohio.

I claim the toggle, H, constructed as described, whereby the rake teeth are held down, when the arms, d d, are in line, or nearly so, with each other, and lifted by drawing up the handle, e, which raises the inner end of the arms, d d, the weight of the driver assisting, substantially as herein shown and described.

68,289.—SHEEP-SHEARING TABLE.—Charles, J. Corlett, Warren D. Sherman, Nicholas A. Wolfe, and Chas. Huston, Clarkston, Mich.

We claim the combination and arrangement of the revolving wheel, A, the cords, B B, the snap, C, the cord, D, the eye bolts, E F, the hook, E, the hooked lever, H, with the adjustable table, K, all arranged substantially as described and for the purpose designed.

68,290.—CULTIVATOR.—Charles C. Creek, Liberty, Ind.

1st, I claim the provision, in a corn plow or cultivator, of a lifter wheel, D, constructed and attached substantially as shown and described.

2d, I claim the plow irons, B B', having the element, b b' b'', arranged as shown and described.

3d, I claim the arrangement in a corn plow or cultivator of the adjustable bar, G, with its bolt and nuts, F f, substantially as set forth and for the purpose specified.

4th, In combination with the adjusting bar, G F, I claim the adjusting arrangement, W Y y, of the tongue on the beam.

5th, I claim the frame, R, consisting of the elements, S s t, in combination with the racks, U U, and chains, V V, admitting of a slight forward or retrograde movement in the plows, B B', in respect to each other and the beam, H.

68,291.—CURING AND PRESERVING GRAIN.—Folsom Dorselt, Chicago, Ill.

1st, I claim a system of ventilating frames, A A, used in stacks of hay, grain, etc., said frames being adjustably closed by doors, B, and arranged to operate substantially as set forth.

2d, The combination of such a system of adjustable ventilating frames and an adjustable sectional roof in stacks, etc., of hay, grain, etc., substantially as set forth.

68,292.—HAMMER FOR BREECH-LOADING FIRE-ARMS.—Wm. H. Elliot, New York city.

1st, I claim, in those arms in which the hammer receives the force of the charge as a breech-plate, and is pivoted to the arm in a rearward direction from the chamber, projecting the lower portion of the face forward, substantially as and for the purpose herein described.

2d, So arranging and constructing the face of such hammer and the firing point and hammer-pivot in relation to each other that the cartridge will be adjusted to its place in the chamber, as herein set forth.

68,293.—CORN ELEVATOR.—Andrew Erkenbrecher, Cincinnati, Ohio.

I claim the arrangement of adjustable carrier, C, having an endless apron, I, and having its driving shaft, D, inclosed within the hollow trunnion, B, which upholds the said carrier, and about which it oscillates, substantially as set forth.

68,294.—APPARATUS FOR DRYING STARCH.—Andrew Erkenbrecher, Cincinnati, Ohio.

1st, I claim the provision, in a starch drying apparatus, of a series of racks, K, formed to run on tracks, F and J, within and without the drying room, and which communicate, by a similar track, upon a truck, H, which occupies a depressed track or railway, J, substantially as set forth.

2d, The arrangement of drying room or rooms, A B, ventilators, C D, steam heating pipes, E, elevated tracks, F and J, depressed track, I, truck, H, and racks, K, for the the purpose set forth.

68,295.—TRIP HAMMER.—Jos. Tandler, Grand Rapids, Mich.

1st, I claim the combination of the hammer, C, with its several parts, with the adjustable spreader, F, substantially as described for the purpose specified.

2d, The adjustable spreader, f, arranged and connected as described.

3d, The griping arrangement, substantially as shown in fig. 3, combined with the hammer, as and for the purposes set forth.

4th, The upsetting wheel, J, and the pulley, e, connected to the frame, A, and operated in the manner described.

68,296.—COTTON SCRAPER.—T. T. Fleming, Memphis, Tenn.

1st, I claim the combination of the blade or share, a, standard, B, bar, D, and plate or shoulder, C, all arranged substantially as and for the purpose set forth.

2d, I further claim the knife, E, applied to the rear of the blade or share, substantially as and for the purpose specified.

68,297.—CORN MARKER FOR PLANTING.—David A. Freeman, Bellville, Mich.

I claim the combination and arrangement of the axle, A, provided with joints, B B, the frame, C, the seat, D, the wheels, E E E E, collars, a a a, and the set screws, g g g and c, and the beveled lugs, H H H, etc., all arranged substantially as described for the purpose designed.

68,298.—MORTISING MACHINE.—D. L. Gibbs (assignor to R. Ball & Co.,) Worcester, Mass.

1st, I claim the combination with the sliding frame, 18, and rod, L, of levers, K' L', and weight, L'', said parts being arranged to operate in relation to each other, substantially as and for the purposes set forth.

2d, The combination with the sliding frame, 18, of the adjustable pieces, M M, slotted cross pieces, N N, adjusting bolts, 29, as and for the purposes set forth.

3d, The combination with the weighted sliding frame and levers and connecting rod for actuating the same, of a spring attached to said connecting rod, under the arrangement and for operation as herein described.

4th, The combination of stand, d, stationary screw, e, gears, a b, shaft, D, with the sliding piece, B, substantially as and for the purpose set forth.

5th, The combination with the sliding plate, B, of the bed, E, carrying the bearing, C, and stay brace, 7, in the manner and for the purpose herein described.

6th, The combination with the table of a mortising machine of the vertical sliding pieces, j, and lever, G, substantially as and for the purposes set forth.

7th, The combination with the table, F, of the vertically sliding pieces, j, provided with projections, k, and screws, m', and the lever, G, or its equivalent and perforated plate or stand, s, under the arrangement and for operation as herein shown and described.

8th, The combination in a machine as described, with the sliding pieces, j, and lever, G, of the stationary screw, m, and adjusting or stop nuts, e e', the whole being arranged and operated as herein specified so that mortises may be cut either in or out of line as desired.

9th, The combination with the catch wheel, H'', provided with beveled recesses of the spring lever, A, and beveled pin, o, arranged for operation in a hub mortising machine, as and for the purposes stated.

10th, The combination with the sliding piece, B, and bed, E, of the lever, I', in the manner herein described, so that the lever will be raised and lowered with the bed, substantially as and for the purpose set forth.

11th, The combination with the bed, E, and the lever, I, of the flat half twisted spring, I''', substantially as and for the purposes set forth.

12th, The combination of slotted stop pieces, Q Q, or their equivalent with slotted piece, K, substantially as and for the purposes set forth.

13th, The combination of the slotted piece, K, and adjustable catch pieces, 22, with frame, A, and lever, I', for the purposes set forth.

68,299.—HEATING STOVE.—John Grossius, Cincinnati, Ohio.

I claim the arrangement in a heating stove of the plates, C D E F, apertures, e g, and exit pipe, J, as and for the purpose herein described and illustrated.

68,300.—COVER FOR COOKING STOVE BOILER.—T. F. Hall and George Eckel, Richmond, Ind.

In combination with the cover, A A', we claim the water chamber formed over the plate, A', and constructed with two funnels one, C, opening through the upper chamber into the boiler below the cover, the other, D, opening into the upper chamber and with the induction pipes, E, substantially as and for the purpose set forth.

68,301.—POWER HAMMER.—Martin Hunkley, Rochester, N. Y., assignor to himself and M. R. Ballantine.

1st, I claim the set screw, s, adjustable hammer bar, B, in combination with the straight indented hammer shaft, S, all constructed and arranged as and for the purposes set forth.

2d, In connection with the hammer shaft, S, the arrangement herein described of the convolute spring, C, screw coupling, c, connecting rod, f, and lever, b, as and for the purposes specified.

3d, The arrangement of the adjustable stop, r, and guide plate, n, in connection with the coupling plate, w, as and for the purposes specified.

68,302.—PLAYING CARD BOARD.—Ralph S. Jennings, (assignor to himself and Chas. D. Macqueer, Philadelphia, Pa.

I claim a playing card board constructed in sections as described and having compartments, E, with finger holes therein for taking up the cards and disks and pointers, G G and H H, all arranged and combined substantially as and for the purposes set forth.

68,303.—HARNESS MOTION FOR LOOMS.—L. J. Knowles, Warren, Mass.

I claim the combination with the heddle levers of a loom, the arrangement of disk or plate cams in pairs with respect to each heddle lever and the pins thereof so that both disks may act continuously upon the pins substantially as described.

68,304.—LINE HOLDER.—William Morse, Boston, Mass.

1st, I claim in combination with the piece, a, serpentine or corrugated holding pieces, b d, substantially as and for the purpose set forth.

2d, Also in combination with such holding pieces and with the piece a, a movable device arranged to operate substantially as described.

68,305.—BILL HOLDER.—Gilman Moulton, Cambridge, Mass.

I claim the hinged and spring connection of the two parts of a bill holder cover, substantially as described.

Also in combination with the two covers, a and b, of a bill holder of pockets and a flap, K, substantially as described.

68,306.—GATE FOR RAILROAD CROSSINGS.—J. Mason and F. M. Wilson, Boston, Mass.

We claim the combination of the rotary gates supporting shafts or sleeves and their pulleys and connecting band or chain with reference to the stationary posts and relatively to each other the pulleys and their operating mechanism being arranged below the track or road bed and operating together to simultaneously open or close the gates, substantially as set forth.

68,307.—TABLE KNIFE.—Peter Neff, Cincinnati, Ohio.

I claim the combination of the blade, a, and tang, B, cut out of a single piece of steel and having shoulders, a a', the handle, C, having a slot or recess, c, and the slotted bolster, E c, secured upon the tang, B, between the shoulders, a a', and the end of the handle, all as herein described.

68,308.—HITCHING POST FOR ANIMALS.—Daniel Newton, Southington, Ct.

I claim the several parts shown at, A B C D and E, when constructed and arranged as set forth.

68,309.—POTATO DIGGER.—N. S. Noyes, Plymouth, Mich.

1st, I claim the perpendicular motive given to the grating, C, for the purpose described.

2d, The combination and arrangement of the frame, a, seat, B, grating, C, endless belt, D, connecting rod, E, pulley, F, eccentric wheel, H, plow, K, collar, I, shaft, L, driving wheel, M, drum, N, spring, O, wheels, P P, wheel, R, lever, S, ball, J, frame, U, belts, V W, arranged substantially as described for the purpose designed.

68,310.—STEAM PLOW.—H. E. Paine, Milwaukie, Wis.

1st, I claim the device for operating a gang plow spader or digger, with or without an accompanying harrow or seeder by means of two stationary engines, located on opposite sides of the section to be plowed and connected by by ropes passing around drums and wound upon and from them in the manner and to the effect set forth.

2d, The construction and combination of the drums, L M L M, actuated by separate engines but connected and co-operating in the manner set forth.

3d, The arrangement on one shaft of the winding drums, L M, and the hoisting drum, N, substantially in the manner and for the purpose set forth.

4th, The arrangement substantially as set forth and described of the gear wheels, J and K, and their shafts so that power to move the engine from place to place may be transmitted to the bearing wheels through the same mechanism which operates the plow.

5th, The derrick, R, with its fall rope, Q, constructed substantially in the manner and for the purpose set forth.

6th, The anchor, J, constructed and operating as set forth and described.

7th, The rectangular gang of plows used to plow without ridging, and constructed and operating as shown and described.

8th, The triangular gang of plows used for ridging, and constructed and operating as shown and described.

68,311.—BARREL WASHING MACHINE.—Jonathan Peacock, Rockford, Ill.

1st, I claim the combination with the reservoir or trough of the discharge valves, the rocking lever and the catch all arranged and operating as described.

2d, The combination with the trough of the pipes, the lifting frame, and the catch, all constructed, arranged, and operating as described.

3d, The combination with the water trough, of the balance valve, P, constructed and arranged as described.

4th, The combination with the clamping rails, c', of the serrated, fixed clamps, G, for holding the barrel at an angle to the plane of rotation as described.

5th, The combination with the clamping rails, c', of the vibrating clamps, h, arranged and operating as described.

6th, The combination, substantially as described, of the holding rails, the vibrating clamps, the slide bars, and the balance lever.

7th, The combination of the latch lever, or detent, t, with the driving shaft, as described.

68,312.—STEAM ENGINE SLIDE VALVE.—E. J. Piper, and J. C. Marshall, Springfield, Mass.

I claim, in combination with the valve, B, the gib, a, arranged substantially as described, and adjustable from the outside of the valve, as herein set forth.

68,313.—PLOW.—Burdet C. Rouse, Morris, Ill.

I claim the rotary landside cutter, in combination with the shear bar at its point, and arranged in the manner and for the purpose above set forth.

68,314.—MECHANICAL POWER APPLIED TO SEWING MACHINES.—L. W. Sapp, M.D., Cleveland, Ohio.

I claim the driving mechanism provided with controlling and regulating devices, constructed, arranged and combined with a sewing machine, substantially as and for the purpose set forth.

68,315.—RAILWAY SWITCH.—W. F. Serjeant, St. Louis, Mo.

1st, I claim a double locking automatic railroad switch, which is constructed in the manner and upon the principles substantially as herein set forth.

2d, The longitudinal levers, D D, arranged on both sides of the track, and extended alongside of the siding or turn out, said levers being provided with segment levers, H, and constructed so as to be acted upon by keys, G2, upon a moving train, and caused to change the switch at the pleasure of the engineer, substantially as described.

3d, The expansible keys, G2, constructed substantially as and for the purposes described.

4th, The anti-friction roller, f', applied to the key, G2, substantially as and for the purpose described.

5th, The combination of segment levers, H, the switch levers, D D, and the connection of such segment levers, with locking devices, so that the switch rails shall be automatically locked and unlocked, as well as changed from right to left, by means substantially as described.

6th, The locking levers, N N, applied to a rock shaft, K', and connected by means of chains and rods with devices applied to the switch rail levers, substantially as described.

68,316.—APPARATUS FOR COOLING MILK.—C. L. Sheldon, Lowville, N. Y.

I claim the use of a water receiver, a d, so constructed that it shall receive the water at one extremity, and, when wholly or partly filled, empty its contents at its opposite extremity, and in this act of descent and discharging impart motion to the plunger, k, also the use of the plunger, k, when the same is used as an attachment for agitating milk in cheese vats.

68,317.—CLOTHES DRYER.—G. P. Sisson, Florence, Mass.

I claim a clothes' drying reel, in which the arms are operated by means of a screw arranged in the center.

68,318.—GAS HEATING APPARATUS FOR SAD IRONS.—Jacob D. Spang, Dayton, Ohio.

1st, I claim the burners, C, having the slits, c c, and the central button, x, combined and arranged together, substantially as and for the purpose described.

2d, The screen, D, having clusters of apertures, d d d, as and for the purpose described.

3d, The arrangement and combination of the burner, C, screen, D, and chamber, E, having the heating compartments, e e e, substantially as and for the purpose specified.

68,319.—FRUIT JAR.—C. F. Spencer, Rochester, N. Y.

I claim a ready-formed cover or stopper for fruit, jelly and other jars or cans made of paper, cloth or other easy penetrable material prepared so as to be air-tight and having its surface provided with gum or other adhesive substance so as to be self-attaching, self-sealing, and self-retaining, substantially as and for the purpose herein specified.

68,320.—SHEEP RACK.—David Stapleton, Iowa City, Iowa.

1st, I claim the loose rack, G H I, and its bearings, b and c, in a sheep rack, substantially as and for the purpose described.

2d, The sheep rack, constructed with the loose rack, the vertical pieces, I, of which fit between its vertical pieces or boards, D, substantially in the manner and for the purposes described.

68,321.—PRODUCTION AND MANUFACTURE OF CARBONIC ACID AND IN THE APPLICATION OF THE SAME FOR VARIOUS USEFUL PURPOSES.—Simon Stevens, New York City.

1st, I claim the process of preparing carbonic acid herein described.

2d, The use of carbonic acid prepared in the manner herein described for the improvement of the several processes and manufactures herein specified.

3d, The compound formed by mixing hydro carbon spray with air or air and steam for producing motive power in gas and other engines, substantially as herein set forth.

68,322.—CONSTRUCTION OF BARRELS.—George St. George, New York City.

I claim constructing a barrel with raised surfaces made on the head or heads or other suitable part thereof, substantially as and for the purpose herein set forth.

68,323.—TRACE ATTACHMENT.—Andrew Thompson, Ottumwa, Wis.

I claim a metal harness trace point, B, having ratchet teeth, b b, or their equivalents, in combination with a spring clamp, a, for fastening the trace, constructed, arranged, and operating substantially as and for the purpose herein described.

68,324.—WATCH REGULATOR.—W. B. Tucker, Hillsboro, O.

I claim operating the regulator of a watch or other time keeper by means

of an attachment thereto composed of the scale base plate, a, supporting knobs, b b', horizontal screw shaft, b, toothed wheels, d and e, winding arbor, f, and the attaching and indicating nut, g, all arranged and operating substantially in the manner herein set forth.

68,325.—WATER WHEEL.—Thomas Welham, Philadelphia, Pa.

1st, I claim the friction water wheel, constructed as shown and inclosed in a case, as herein described.

2d, I also claim the flanges, A, of the water-tight casting, B, said flanges forming a passage entirely around the circumference of the wheel, C, as herein shown and described.

68,326.—MUSKETO BAR AND WINDOW SCREEN.—Alcibiades J. Whittier, Roxbury, Mass.

I claim the hook, d, and the bolts, a, or their equivalent, when applied and arranged for operation substantially as and for the purpose set forth.

68,327.—CAR PLATFORM.—H. S. Wilcox, West Meriden, Ct.

I claim the car platform constructed with plates, a a', railing, f f, supported by the posts, e e, and secured to the cars by bolts or screws, all constructed and arranged substantially as described and for the purpose set forth.

68,328.—REFINING SUGAR AND SIRUPS.—Henry A. Williams (assignor to himself and Benj. H. Chadbourne), St. Louis, Mo.

I claim a combination of the ingredients used in preparing said compound, in about the proportions herein named and for the purposes set forth.

68,329.—CORN COVERER.—A. J. Combs, Olney, Ill.

I claim the combination of the frames, A and E, handles, C, roller, F, and shovels, B, all arranged and operating in the manner and for the purposes set forth.

68,330.—MANUFACTURE OF BOOTS AND SHOES.—Wm. Duchemin and Albert Jeffers, Lynn, Mass.

We claim the peculiar construction of the tool for forming the above mentioned channel and turning its edges, consisting of the bar, A, formed at its lower end into the cutter, A, the beak or plowshare, b, and the mold board, substantially in the manner and for the purpose as specified.

68,331.—SHEET COPPER PLATES FOR CULINARY VESSELS.—Andrew O'Neill, Portsmouth, O.

I claim as a new article of manufacture a sheet of copper tinned, varnished, and cold rolled, in the manner set forth.

68,332.—ILLUMINATING ROOFS AND ROOF PAVEMENTS.—Thaddeus Hyatt (assignor to Elizabeth Adelaide Lake), New York city.

I claim, 1st, Forming the approaches over an areaway to the doorways of a building from the sidewalk by means of a solid translucent bridging of iron and glass, which serves the double purpose of stoop and roof, substantially as herein described.

2d, Uniting the "areaway" to the basement of a building by a water-tight roof of iron and glass so combined as to form a generally flush surface fit for walking upon and laid in the plane of the sidewalk, substantially as described.

3d, Uniting the basement of a building to the space under the street by means of a translucent water-tight roofed airy way when the glass and iron which compose the roof are so combined as to form a generally flush surface fit for walking upon and are laid in or nearly in the plane of the sidewalk, substantially as herein set forth.

4th, Combining an area light with the sidewalk and a building by means of a double cemented joint made with putty, or its equivalent, and fusible cement, substantially as herein set forth.

5th, Combining the glass of a roof light with the iron framing of the same by means of a double cemented joint, substantially as herein described.

6th, I claim broadly as my invention an illuminating roof of iron and glass where the iron which supports the glasses in position forms the general strength of the roof, the combination being such as to secure the two-fold object of equalizing and distributing the strength of the iron while distributing and equalizing the light of the glasses.

7th, I also claim broadly as my invention an illuminating step roof, composed of glass and iron that is to say where the iron and glass are composed into illuminating sills and illuminating risers, and these are again combined to form an illuminating roof, substantially in the manner and for the purposes herein set forth.

68,333.—VAGINAL SYRINGE.—A. W. Washburn, Yazoo City, Miss.

I claim the enlargement of the immediate entering head of a syringe to such an extent as to produce an annular flange radiating the desired distance beyond the barrel or conducting tube of the same and thereby producing the improved vagina syringe herein represented and described or any other which shall be substantially the same.

REISSUES.

2,753.—GOVERNOR FOR STEAM ENGINES.—Augustus Brown, N. Y. City. Patented Nov. 7th, 1865.

I claim, the swivel arm, C, subjected to the action of a spring or weight in combination with the throttle or governor valve of a steam engine and with the belt which serves to impart motion to the governor, substantially as and for the purpose described.

2,754.—VALVE GEAR FOR STEAM ENGINE.—Putnam Machine Company, Fitchburgh, N. Y. Assignees of Charles H. Brown and Charles Burleigh. Patented January 15, 1856.

1st, We claim the cam shaft, S, when so arranged with reference to the main shaft, K, of the engine as to revolve at a rate of speed less than that of the said main shaft of the engine, substantially as, and for the purpose described.

2d, We claim the described arrangement of two or more cams, h, upon the shaft, S, and with reference to the induction valves substantially as and for the purpose described.

3d, The shoulder and levers, d, having adjustable fulcrums, e, in combination with a cam or cams, h, for operating the valves and varying the point of cut-off substantially as set forth.

4th, Arranging the governor with reference to the shouldered levers, d, so that it will control the position of their fulcrum, e, and thereby regulate the velocity of the engine substantially as described.

5th, The manner of arranging the steam and exhaust valves with relation to the cylinder, H, and shaft, S, as and for the purpose set forth.

2,755.—HARVESTER.—Robert Bryson, Schenectady, N. Y. Patented April 8, 1862.

1st, I claim a main frame of a harvester which is adapted for carrying the drivers seat and the gearing that operates the cutters and also for having the draft tongue attached to it, said frame being carried by two driving and supporting wheels both of which are furnished with a ratchet and pawl having a finger bar, carrying a platform, hinged to it, at one side thereof, in combination with a circularly moving sweep rake which is sustained by the hinged connection of the finger bar and platform and moves over the platform at intervals and discharges the cut crop at one side thereof, in rear of the driving wheels, such rake being driven automatically from the draft frame.

2d, A fulcrum or pivot for a circularly moving sweep rake, a guide for such rake and a finger beam carrying a platform, all so connected to each other and hinged to the draft frame at one side thereof that while the rake has no other support upon the draft frame than is derived from the hinge connection of the finger beam, and is driven automatically from the draft frame, it with its pivot and guide will work in unison with the platform and finger beam through all the vibrations of the same without affecting the draft frame or changing the angle of the pivot or fulcrum with the platform.

3d, Arranging the crank or its equivalent which communicates motion to a rake which is on a hinged platform nearly in line with the joint of the finger bar, so that the movements of this finger bar will not cause the joint to bind, nor materially affect the motion of the crank which works the rake.

4th, In harvester with a two wheel draft frame, a finger bar carrying a platform and a rake, the finger bar platform and rake being connected to each other and hinged to the draft frame at one side thereof, I claim communicating motion to said rake from the main axle when the latter is connected to both driving wheels by pawls and ratchets.

5th, The combination of a finger beam carrying a platform and a circularly moving sweep rake, an inner and outer supporting wheel for the finger beam, platform and rake, a hinge connection which is parallel or nearly so to the line of draft for the finger beam and platform, and a two wheel draft frame.

6th, A sweep rake mounted upon a platform connected to a finger beam which is hinged to the inner side of the draft frame in such manner that the inner edge of the platform does not extend beyond the said inner side of the draft frame.

7th, A sweep rake, a platform and a finger beam, connected together and hinged to the draft frame by means of a hinge connection which allows both the outer and inner ends of the finger beam and platform to accommodate themselves to the undulations of the ground, so that the rake is allowed unchangingly to follow the motions of the platform and cutting apparatus or finger beam.

8th, A sweep rake mounted on a hinged platform and driven from the main frame, the pivot of said rake being between the center of the draft frame, and the outer divider of the platform, and the platform upon which the grain falls terminating near the inner side of the draft frame.

2,756.—SHADE FIXTURE.—Stewart Hartshorn, New York City. Patented Oct. 11, 1864.

I claim the application to a shade roller provided with a spiral spring for automatically raising or rolling up the shade of a pawl and a ratchet, or notched hub, so arranged that the former will engage with the latter at any point or height of the shade by simply checking the rotation of the roller and the upward movement of the shade under the influence of the spring, substantially as set forth.

2,757.—SOFA BEDSTEAD.—Charles F. Martine, Boston, Mass. Patented June 6, 1854. Reissued Dec. 25, 1855.

1st, I claim the single spring mattress so constructed and arranged with a sofa having a hinged back as to form, when the back is dropped from an upright to a horizontal position for forming a bed, an even surface without joint or center depression substantially as and for the purpose specified.

2d, So constructing and arranging the single spring mattress with a sofa having a hinged back that when the back is raised from a horizontal to an upright position for forming a sofa, said mattress shall be drawn in or depressed longitudinally at or near its center by means of cords or their equivalents and will have the appearance and effect of two separate cushions one for the seat and the other for the back of the sofa, substantially as specified.

3d, The arms separated in the center when used in combination with the sofa and mattress constructed in the manner and for the purpose described.

DESIGNS.

2,768.—SPOON.—Charles T. Marchand, Deleware City, Del., assignor to Higgins, Marchand & Co., Philadelphia, Pa.

2,769.—STATUETTE.—J. S. McKaye and H. G. McKay, New York City.

2,770.—CARPET OR OIL CLOTH PATTERN.—Charles T. Meyer, Bergen, N. J., assignor to Edward C. Sampson, New York City.

2,771.—TRADE MARK.—H. J. and J. T. Monsch, Louisville, Ky.

3,772.—FORK OR SPOON HANDLE.—John Polhamus, New York City.

2,773.—FENCE.—W. E. Smith, Hartleton, Pa.

2,774.—TRADE MARK.—William Ziock, St. Louis, Mo.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., 37 *Park Row, N. Y.*

26,527.—WORKING BUTTER.—J. P. Corbin, Whitney's Point, assignee by mesne assignment of Josiah Seymour. Dated Dec. 20, 1859. Application for reissue received and filed Dec. 22, 1866.

1st, A vibrating rod, F, handle, G, and butter worker, H, combined and arranged to operate as shown, or in an equivalent manner, for the purpose set forth.

2d, The combination of the tray, B, with the butter working apparatus, arranged for joint operation, substantially as shown and described.

3d, The manner of tipping the tray or bowl to drain off the fluids, also of securing it to the table or frame, for the purpose set forth.

65,003.—STEAM ENGINE.—Horatio C. Perry, and John L. Lay, Buffalo, N. Y. Dated May 21, 1867. Application for reissue received and filed Aug. 19, 1867.

The combination and arrangement of the high and low pressure cylinders, A and B, of a vertical compound engine, having a continuous piston rod, with a space or chamber intervening between their proximate heads, substantially as and for the purpose set forth.

The combination and arrangement of the shell or frame constituting the intervening chamber, K, with the two cylinders, A and B, and continuous piston rod, F, its bottom plate forming the cover of the cylinder, B, constructed substantially as and for the purposes herein set forth.

We also claim the stuffing box, consisting of the sleeve, h, and packing box L, in combination with the chamber, K, and piston, F, and cylinders, A B, arranged and operating substantially as and for the purposes set forth.

We further claim the combination and arrangement of the man-hole, I, with the bottom plate of chamber, K, forming the head of the cylinder, B, whereby the adjustable ring, M, and sectional pack rings, r s, of the piston, E, may be removed, substantially in the manner and for the purposes herein set forth.

47,647.—WALL BUILDER AND STUMP EXTRACTOR.—George W. Packer, Jr., Mystic River, Ct. Dated Aug. 29, 1865. Application for reissue received and filed, Aug. 21, 1867.

1st, I claim the within-described mode of laying masses in a wall or equivalent work, that is to say, partially turning the vehicle so as to bring the mass over the point desired, without moving the wheels across the same substantially as herein specified.

2d, I claim the within-described combination and arrangement of the pyramidal frame, M M1, M2, and curved reaches, E1 E2, with the four wheels and their accessories, substantially as and for the purposes set forth.

3d, I claim the employment of braces, P1 P2, or their equivalents, in combination with the struts, M, etc., and the curved reaches, P, etc., and arranged to be supported on wheels, substantially in the manner described, so that the braces shall aid in maintaining the curvature, or arching condition of the reaches, by connecting each to the struts above, at one or more points, as and for the purpose herein set forth.

4th, I claim the spherical based rocker, C, having the king bolt, D, connected thereto by a loose joint, as represented, in combination with a trussed frame, M, etc., and with the wheels, substantially as and for the purposes herein set forth.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of 30 days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application to* MUNN & CO., *Solicitors of Patents, 37 Park Row, N. Y.*

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

924.—AIR ENGINE.—Philander Shaw, Boston, Mass. March 29, 1867.

2,110.—HEATING AND COOKING APPARATUS.—Oscar F. Morrill, Chelsea, Mass. July 18, 1867.

2,137.—BREWING, AND APPARATUS EMPLOYED THEREIN.—Wm. S. Haight, Waterford, N. Y. July 22, 1867.

2,140.—NETS AND NETTING.—Benj. Arnold, East Greenwich, R. I., and Wm. J. Hooper, Baltimore, Md. July 23, 1867.

2,145.—SPRING BED BOTTOM.—Sterling Bonsall, Philadelphia, Pa. July 23, 1867.

2,146.—TANNING, AND APPARATUS EMPLOYED THEREIN.—Sterling Bonsall, Philadelphia, Pa. July 23, 1867.

2,155.—RECIPROCATING MOTION.—John B. Page, New York city. July 24, 1867.

2,169.—MOLD BOARD FOR PLOWS.—Leman P. Rider, Munson, O. July 25, 1867.

2,178.—MODE OF CONSTRUCTING AND PROPELLING STEAM VESSELS.—Stephen J. Gold, Cornwall, Conn., and Henry J. Weston, Brooklyn, N. Y. July 27, 1867.

2,179.—WATER AND GAS METER.—Joshua Mason, Paterson, N. J. July 27, 1867.

2,191.—MACHINERY FOR HULLING RICE, ETC.—Simon G. Cheever, Boston, Mass. July 29, 1867.

2,192.—INSULATORS FOR TELEGRAPHIC WIRES.—David Brooks, Philadelphia, Pa. July 29, 1867.

2,214.—MACHINE FOR MANUFACTURING WEAVERS' HARNESS.—Joseph S. Winsor and Wm. W. Fletcher, Providence, R. I. July 31, 1867.

2,226.—POCKET KNIFE.—L. B. Morris, Hopkinsville, Ky. Aug. 1, 1867.

2,227.—BREECH-LOADING FIRE-ARM.—Theodore Yates, Milwaukee, Wis. Aug. 1, 1867.

EXTENSION NOTICES.

Joseph Goldmark, of Brooklyn, N. Y., having petitioned for the extension of a patent granted to him the 22d day of November, 1853, for an improvement in facing ends of percussion caps, for seven years from the expiration of said patent, which takes place on the 22d day of November, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 4th day of November next.

Charles J. Woolson, of Cleveland, Ohio, having petitioned for the extension of a patent granted to him on the 4th day of December, 1860, for an improvement in design for stove plate, for seven years from the expiration of said patent, which takes place on the 4th day of December, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 18th day of November next.

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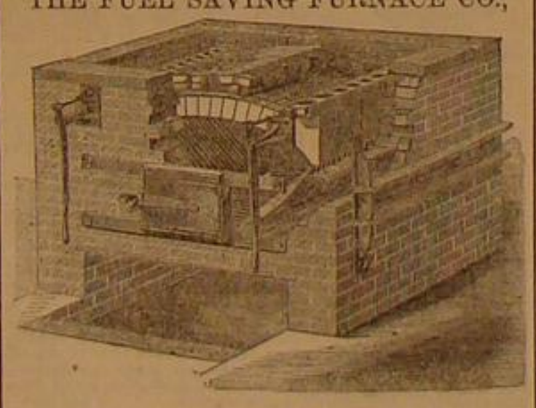
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