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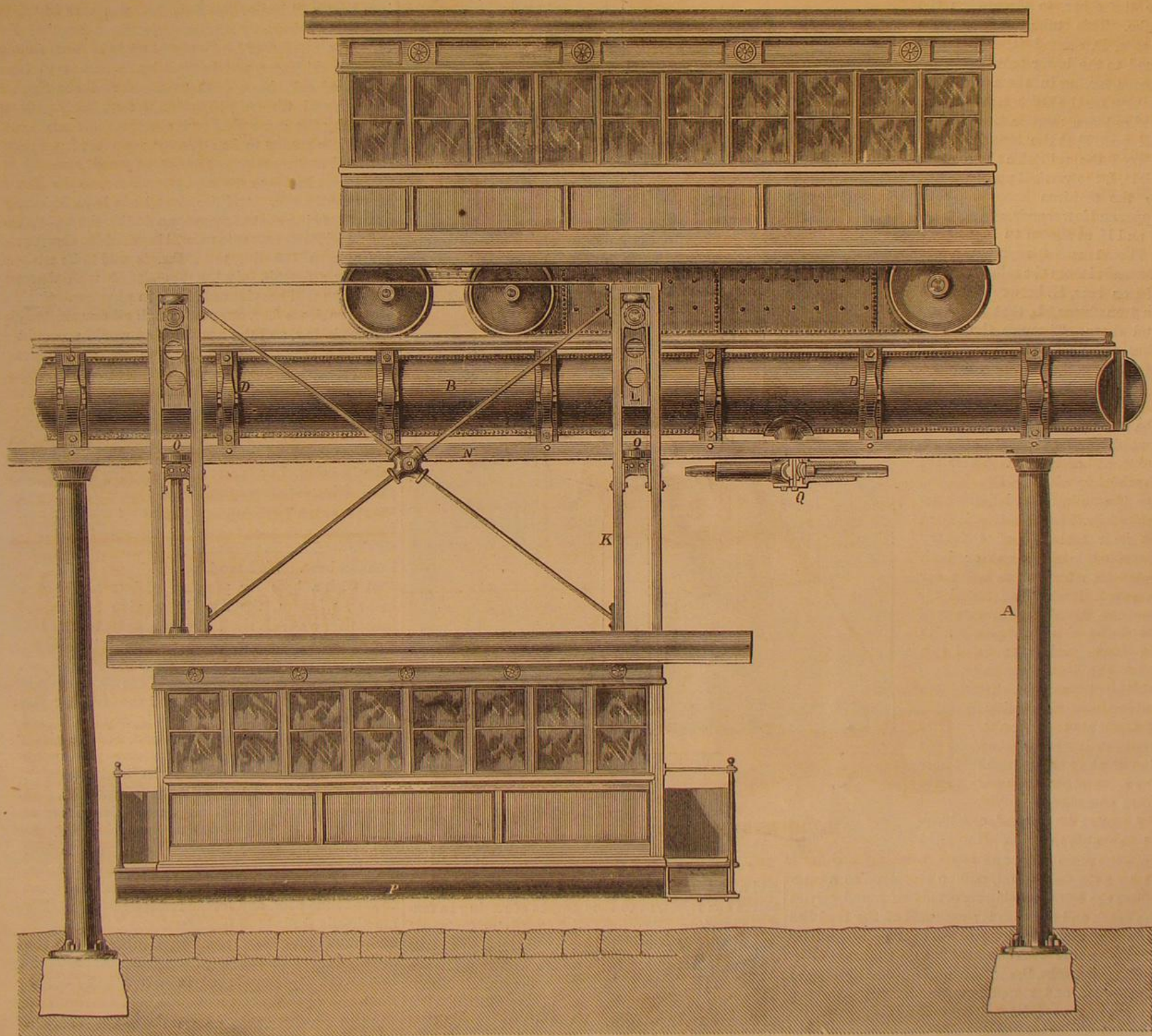
## Improved Elevated Atmospheric Railway.

How shall we get in and out of this great city? As it extends its limits far into the adjoining country, business streets become yearly more difficult of access, and it is a matter for serious consideration to suggest some plan for improvement that shall be practicable and popular; for whatever degree of in-

cars on elevated tracks, and many plans have been published for this purpose. Herewith we illustrate the latest, which is operated by compressed air.

Compressed air has been used as a motive power on railroads, but a supply had to be taken into a tank at a station sufficient to drive the car or train to the next one. This involved the necessity of car-

compressed air is required. It is designed that this railway be built entirely of iron except the stone blocks on which the iron columns stand and to which they are firmly bolted. Being entirely of iron, and out of reach of wear and tear by being driven upon by carts and carriages, it may be set down as indestructible.



CARYL'S ELEVATED ATMOSPHERIC RAILWAY.

geny and energy is applied to overcome natural obstacles, if the people conceive a dislike for it the enterprise will fail.

All who see the city cars daily know well that they are not only disgusting to those who possess the senses of sight and smell, but inadequate to the work demanded of them.

Underground railroads have been proposed, but unless they be well ventilated they will be extremely injurious to health. It has been proposed to run

rying an immense reservoir, which made it, so far as explosion is concerned, more dangerous than steam as ordinarily used.

In the annexed illustration it will be seen that the objection above mentioned is avoided. In this case the supply of compressed air is carried the entire length of the road; and the reservoir of the car may be filled as often as the car is stopped to set down or take up passengers, without delaying the car. By this arrangement neither a large quantity nor highly

Before describing its several parts, we will mention the advantages claimed by Mr. Caryl that this road possesses over street railroads as now in use:— It would not be obstructed by snow. Its two systems of roads, or four tracks, would occupy no more room in a street than is now occupied by a double-track road. While the lower or accommodation car would take up or set down passengers the same as street cars now do, the express on the upper tracks, not being liable to meet with obstructions, would be run

## A NEW NAVY.

at high speed, stopping at regular stations. A road, ten miles long, having on its several tracks 300 cars, constantly moving for eighteen hours, would be supplied with its motive power for \$300, while the same road would require 3,000 horses to perform the same duty, at a cost of at least \$1,500. Cleanliness of the street incident upon the disuse of that number of animals; reduction of the wear and tear of pavements and lessening of the noise, etc. All these are of small value as compared with that of the increased comfort and facility which would be afforded to citizens.

The details are as follows:—The columns, A, are firmly secured to stone sleepers beneath the pavement, and to the tops of them is secured the wrought-iron tube, B, extending the entire length of the road, filled with compressed air by means of steam engines at the ends of the road. A vertical wrought-iron plate, C, extends internally from one column to the other, to strengthen the tube. This tube has cast-iron hoops, D, around it, firmly fastened to the lower part of it, the hoops having in them a mortise or step for the brace, E; the upper end enters a mortise in the vertical post, F, at the top of which is affixed the rail. To the bottom plate, I, the vertical posts are tied to the cast-iron hoops at both upper and lower ends, by iron rods, G and H, as shown in Fig. 2.

Figs. 1 and 2 represent a car suspended from the rails by means of iron bars, K, between which is an iron frame, L, that slides up and down. Through the frame pass axles on which the wheels, M, that carry the car, revolve. The plate, N, is clamped by the wheels, O—one on either side—the shafts being geared together and driven by engines in the forward end of the car. These are the driving wheels. Beneath the car is a tank, P, for holding compressed air. The main tube is filled with air by means of stationary steam engines at one or both ends. The tank beneath the car as supplied with compressed air from the main tube by means of horizontal pipes, R, attached to a revolving collar, Q, fitted to a casting on the main tube, and containing air passages. These pipes are provided with suitable valves to admit air to the tanks, and are fixed at proper distances along the line of the road, at points where the car stops to take up or set down passengers.

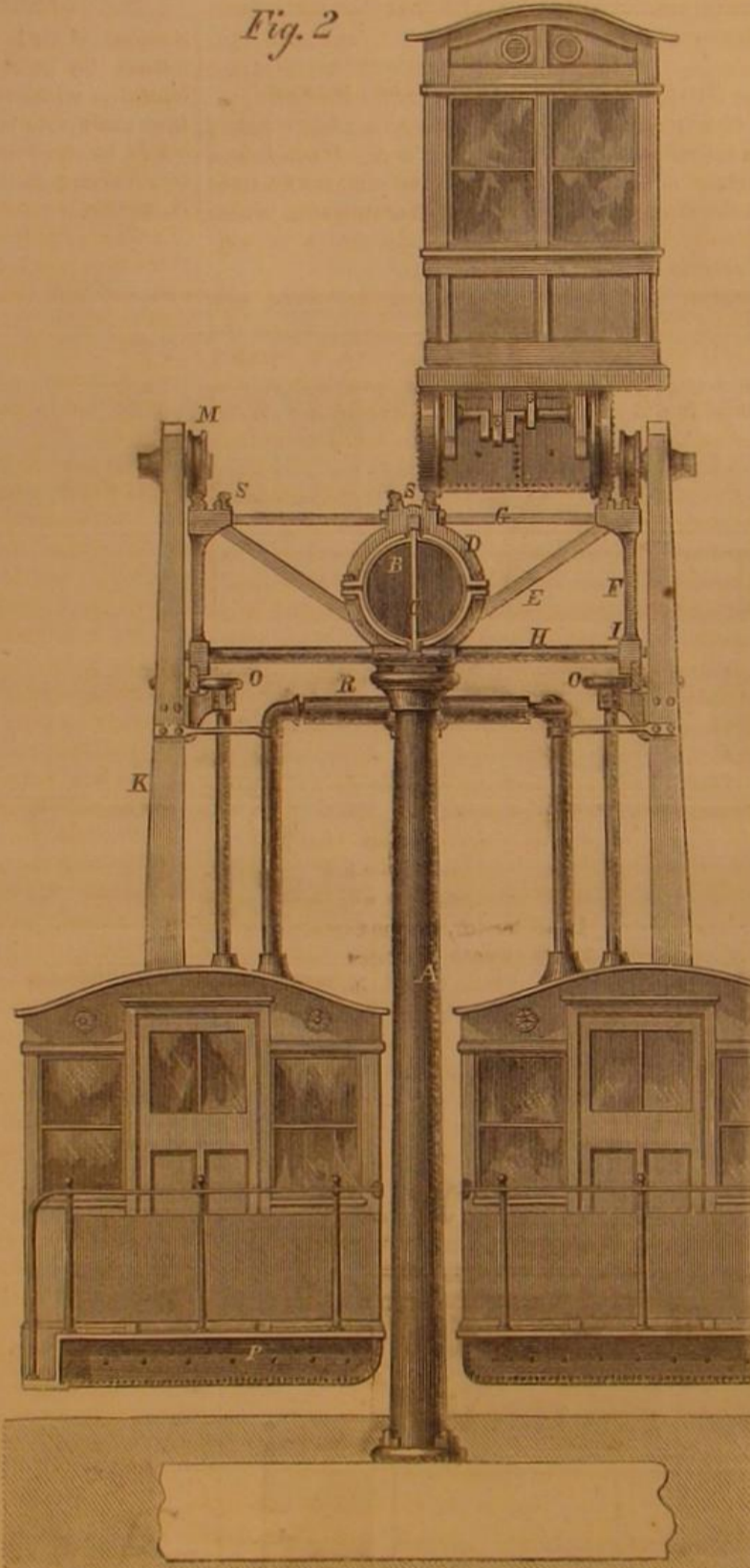
A section of the road, constructed as above, but disconnected from the main road, and supported by a single column, will be employed as a turn-table; the column, being revolved half round, carries the track and car with it; each end of the road has such a turn-table, which is to be operated by the stationary engine that pumps air into the main tube. The upper tracks, S, are intended for cars moving at high speed and stopping only at regular stations. Each car will carry its own engine and air tank, which is supplied with compressed air in the same manner as the accommodation or suspended car. At stations stairs will be required to ascend to the level of the track, and bridges to pass to the cars. The fare being paid at the stairs, conductors will not be needed, and a large saving will be made in that item.

The inventor of this plan of atmospheric railway is A. H. Caryl, of Forgeville, Groton, Mass.

LUCK is ever waiting for something to turn up. Labor, with keen eyes and strong will, will turn up something.

An idea is spreading that we have no navy fit to cope with vessels throwing shot of from 460 lbs. to 1,000 lbs. weight, of which one vessel has just paid us a friendly visit. Eight years ago, we began the reconstruction of our navy, and there is now a prospect that we shall have to reconstruct it again. Never, we believe, were the Admiralty so much in need of the best engineering—as distinguished from nautical—advice as now. Although the defeat of Austrian power has not happened at sea, we have

Fig. 2



had a lesson, which none who can think for themselves can reject, as to the dangers of resting in fancied security while other nations are doing their best to surpass us in the efficiency of their instruments and engines of war. While we are wondering at the size of the Rodman 15-inch guns, the Americans are preparing to make ordnance to throw 25-inch shot of nearly a ton weight. We are standing still or retrograding, and have not a 13-inch gun we dare take into action. We have failed, with our very best service gun, to destroy even the *Royal Sovereign's* turret, and we know that other nations which have adopted the turret system are now making them of a strength very far indeed beyond that of the *Royal Sovereign's*. We may make what allowances we like for Yankee brag, but we are told that Mr. Fox, the Assistant Secretary of the United States Navy, was ready to let our whole fleet hammer at the *Miantonomoh* for two days, provided we would afterward allow that vessel to work ten hours' havoc upon our

ships in return. Let another *Trent* affair arise, and we may have scores of monitors upon us.

For our own part we are bound by no professional prejudices in this matter. We have, before now, criticised the turret ships adversely, but we could only go by such evidence as we had before us. Capt. Powell's experiments upon the Coles shield of 1861 had not been published in detail, nor had the *Royal Sovereign* been under fire, nor had the *Monadnock* doubled Cape Horn, or the *Miantonomoh* crossed the Atlantic. And we have not even yet data from which we can draw conclusions with certainty as to the effect of any other guns or the resistance of any other armor than that we have tried. We have been told that cast-iron shot break up and lose half their energy on striking armor; but we have the testimony of the Americans that they have fired 400-lbs. spherical cast-iron shot, with 60 lbs. of powder, right through a target formed of a large 6-inch plate, made by Messrs. Petin, Gaudet & Co., and backed with 30 inches of oak. The shot was 15-inches in diameter, and had an initial velocity of 1,480 feet per second. "A target, composed of six 1-inch plates, backed by iron beams 10 inches by 10 inches, was torn in two and thrown down by similar projectiles. Laminated targets, composed of 1-inch plates up to 13 inches aggregate thickness, and backed by 24 inches to 30 inches of oak, have been ruptured and shattered through and through, though not completely penetrated, by the same shot and charges." If we believe these results to be correctly reported, it would be a fatal venture to expose our ships, except, possibly, those most heavily armored by Mr. Reed, to the fire of such ordnance. And the Americans have 20-inch guns, throwing shot of more than double the weight, and which, they repeat to us, will bear 100-lb. charges, while even 120 lbs. to 140 lbs. is said to be within their strength. And not satisfied with these, they have still heavier ordnance in progress. Such shot would, we fear, smash through all our ordinary armor-plating, and the heavier shot would no doubt penetrate any thing we have to set up against them.

Upon these points, we admit, we are greatly in want of further information, but it is time that we set to work in earnest to test the destructive powers of large smooth-bore guns, firing cast or wrought-iron spherical shot. In our attempt to employ large rifled guns, firing elongated projectiles at high velocities, where, in the short-range actions of naval warfare, round shot would be exactly as good if not better, we are working to pressures of powder-gas which no iron can bear. We have been seeking to fire 600-lb. shot with a base for pressure of but 139 square inches, whereas the Americans give 176 square inches for a 400-lb. shot, the consequent pressures per square inch necessary for a given initial velocity being nearly as two in our guns to one in theirs. Now, indeed, the 13.3 inch bore of the 600-lb. gun is to be diminished to 12 inches, and the area for the powder pressure thereby reduced from 139 to 113 square inches. In the new American 25-inch guns, firing, say, 2,100-lb. shot, the pressure per square inch, requisite to generate a given initial velocity, will be less than in our so-called 600-pounder, the weights and areas of shot being respectively, for the American 2,100 lbs. and 490 square inches, and for the 13.3-inch gun, 600 lbs. and 139 square inches. Let our ordnance authorities at once instruct Mr. Fraser to make two or three 20-inch or 25-inch guns to fire round shot, and let the result be known. We are already far behind the Americans in the power and endurance of heavy ordnance, and they have plainly told us that their policy is to always maintain an advantage over us in this respect, if possible.

As for our ships, we fear we shall have to begin again. We can have and must have ships safe against even the 25-inch gun, but we believe that, setting preconceived notions aside, these must of necessity be turret ships. We can plate them for seven feet under water, and four feet above, with even 18 inches solid plates, if these can be rolled, and it is time we should try. We can as easily carry 18-inch plates on a 5-foot backing over a height of 11 feet, as plates and backing of half the thickness over twice the height. We are still at the beginning of the art of building invulnerable ships of war.—*Engineering.*

**The First Boring for Oil in Pennsylvania.**

The Titusville (Pa.) *Herald* has an interesting article on Col. E. L. Drake's first attempt to bore for oil, which was the precursor of a vast business that, in 1864 and '65, yielded a larger revenue than that derived from coal and iron. Col. Drake went to Titusville in 1857, at which time it contained a population of about 125, two hotels, no church, and only two stores. The petroleum was then collected from the surface of springs on Watson's Flats by means of blankets, and bottled for medicinal uses. He conceived the idea that there was a basin or reservoir of oil below the surface, and determined to test it by boring. Having induced some men of capital to assist him, he entered upon his experiments in the spring of 1858.

His first step was to visit the salt wells on the Alleghany and observe the *modus operandi*. Finally, he selected a spot near Ames's Mill, below Watson's Flats, but was delayed till the spring of '59, before he had secured a competent driller and the necessary tools. His supposition was that he would have to sink his well to the depth of 1,000 feet. The same kind of tools were used then as now. The driller charged one dollar and a-half per foot for boring. The enterprise was the subject of a good deal of ridicule in these parts, and many persons made themselves merry at the expense of the pioneer. An instance will prove this. Mr. D. made several contracts with a number of practical drillers, which were successively broken. He at last ascertained that the cause of it was, that his scheme for boring for oil was looked upon as entirely visionary, and that he was regarded as a monomaniac on the subject. He finally resorted to an innocent deception to secure an operator, giving out that he intended to bore for a salt well. A series of annoyances and delays, as we before remarked, intervened to prevent operations till the month of June, '59.

Mr. Drake's assistant proposed to crib to the rock, which was the invariable practice in those days. Mr. Drake advocated the driving an iron tube to the rock—an idea which the miner scouted, but having failed to crib, owing to the water, the tubing was tried and proved a success. This was an entirely new feature then, but is now the universal practice. Indeed, it is now applied to putting down fresh-water wells. Had Mr. D. procured a patent, to which he was justly entitled, for the invention, he would have realized a fortune from it.

The pipe was driven thirty-two feet to the rock, and then the well bored thirty-seven feet and six inches in the first sand rock. Not having any pipe, Mr. D. commenced pumping before he had tubed the well, using a common iron water pump for the purpose, fastening the handle of the pump to the walking beam. Satisfied by this process of the presence of oil in considerable quantities in this well, he then went to Erie and Cleveland for tubing, could obtain none there, nor at Buffalo, and finally ordered it from Philadelphia. After tubing the well it turned out a complete success, pumping twenty-five barrels a day, and continuing, when in operation, to yield about this quantity for about two years.

Mr. D. was then in the position of the man who drew the elephant at the raffle, and did not know what to do with it after he got it, oil being comparatively good for nothing. Then there was no home or foreign demand for it, no refineries in existence, and its illuminating and lubricating properties were not then discovered. The parties engaged in the manufacture of coal oil were slow to acknowledge or discover that petroleum possessed equal illuminating qualities. The first refiners who commenced refining petroleum were James McKeown and Samuel Kier, of Pittsburgh.

From this period it came rapidly into commercial use, stimulated development, and rose in value in a corresponding degree. Few can appreciate the delays and difficulties incident to this discovery. It was necessary to go to Erie, and more frequently to Pittsburgh, for everything in the way of machinery. The few stores here were only supplied with tools for lumbering and farming purposes. On one occasion, Mr. D. wanted a pick, two shovels, a chain and some spikes. There were only two stores in Titusville at the time, but their assortment did not contain the articles needed. Mr. D. went to Hydetown, and bought his pick of Charles Hyde (now an oil million-

aire), who kept a country store in a tumble-down log cabin in that place; bought his spikes of Samuel Q. Brown (another oil millionaire), at his store in Pleasantville; procured his chain of David Mitchel (another oil millionaire), at his store in Enterprise; but was obliged to send to Erie, a distance of fifty miles for two shovels. Mr. D. engaged in putting down other wells, but failing health compelled him to abandon his undertakings here and return East, before the era of speculation set in, and before petroleum had produced such a revolution in the commercial world, and become the most fruitful source of individual and national wealth that has ever been discovered.

**Sweet Corn all the Year Round.**

Nearly all the dried corn that one buys has a flavor, when boiled, resembling soda or pearlash—certainly it has but little sweetness and much toughness. Now, there is a way of preserving corn which entirely avoids these results, and which is warranted to give "entire satisfaction."

Select, in their season, fresh, medium-sized ears of corn, strip off silk and husks, then plunge the ears in boiling hot water, leaving them in for only three minutes. Next cut the corn kernels from the cob with a sharp knife and spread them out on flat dishes, taking care not to have the layer more than two kernels thick.

The dishes must then be placed either in a moderate oven (left open) or over the kitchen range on a board shelf which can be arranged over it for the purpose (say 2½ or 3 feet above the top of the range). The contents of each dish must be disturbed occasionally, so as to insure their becoming thoroughly dried. It is well to spread lace or mosquito-netting over the dishes to protect them from flies, dust, etc., for sometimes the corn will be two or three days in drying.

When the corn is perfectly dry, tie it up in bags and put it away in a cool, dry place.

In winter, when you wish to enjoy the fruit of this little painstaking, you take out a few handfuls of the corn, wash it well, soak it all night, and the next day boil it till tender, in the same water it was soaked in. About twenty minutes before you take it from the fire, add milk to the liquid in proportion to your taste, and when nearly done, add butter, pepper, and salt. A little corn-starch, added as thickening, ten or fifteen minutes before taking the corn from the fire, improves it very much. The corn should not be dry when served, but floating thickly in its own stiff broth, and, my word for it, it will taste as fresh and sweet as any corn fresh grown.

I need not say, that by soaking corn thus dried all night, and also soaking the preserved beans for the same length of time, a delicious winter succotash can be made the next day, as good as any ever eaten in summer.—*Working Farmer.*

**Profits on Sleeping Cars.**

A correspondent of the *Cleveland Leader* thus advert to the sleeping-car monopoly:—

"Many of your readers know that Woodruff, Knight, Myers and others, consolidated their patents some years since, and organized the Central Transportation Company, whose cars are found on the Pittsburgh, Fort Wayne and Chicago, Pennsylvania Central, Northern Central, New York and Washington, and other much traveled routes.

"But it is not generally known that their enterprising company have been quietly buying up every patent that could be bought, until now they are able to control the entire sleeping-car interest in the country. A wealthy corporation in Southern Ohio got its master mechanic at work to build a couple of coaches, with instructions to put in nothing that would be claimed by this overshadowing company. He employed experts, and after a thorough ascertainment of all the facts in the case, as he supposed, completed his work. The directors were gratified, and the cars had been on the road perhaps a week, when the Superintendent was waited upon by a very gentlemanly person who introduced himself as an agent of the Central Transportation Company. He was received with courtesy and invited to a seat. After the necessary discussion of the weather and the crops, the polite visitor intimated that he was

authorized to contract for the purchase of the new sleeping coaches.

"The Superintendent grew a bit reticent, and responded somewhat curtly that the Company which he had the honor to represent was under no necessity of parting with any of its rolling stock, having a comfortable balance in the bank.

"Whereupon the gentlemanly agent proceeded to intimate, in the most delicate manner, that other contingencies than a reduced bank balance sometimes operated to make transfers of property profitable to the seller.

"This brought the Superintendent to the issue without further skirmishing, and he bluntly informed the gentlemanly agent that the cars belonged exclusively to the railway company, had been built without infringing anybody's patent, and would be run without asking anybody's leave.

"Whereupon the gentlemanly agent smiled coldly, bit his lower lip slightly, and responded frankly: 'Perhaps your Company had better sell its cars while there is a market. We will pay you what they cost and run them for you; but you can neither own them nor run them another day, sir!'

"The Superintendent grew tractable, and in fifteen minutes was satisfied from documents exhibited that it was well to sell 'while there was a market.'

"Suit has even been commenced in the United States Courts against Mr. Pullman, the party who, a few weeks since, gave so grand an excursion to celebrate the completion of nine elegant coaches built for the Michigan Central, Burlington and Quincy, and Northwestern Railways, costing from \$15,000 to \$21,000 each.

"The public have occasion to regret this combination for one good reason, if for none other; and that reason arises out of the fact that the Central Transportation Company seem to buy the best patents for the sole purpose of suppressing them.

"The railway companies, as we have already seen, have for once found a greater than themselves, and are as helpless as children in the hands of the 'sleepers.' They must have 'sleeping cars on all night trains,' or they might almost as well not run night trains. The patentees control the cars and dictate the terms upon which cars can be had, which are these: The patentees will supply the cars, and keep the upholstery and bedding in repair and in order for use. The railway company shall furnish the motive power and keep the car in repair. And the agent of the patentee shall collect such fees for the use of berths as the owner of the car may decree.

"The railway company is thus saved the cost of an ordinary car, which the passengers would require, and the Central Transportation Company, or whoever else may own the sleeping car, makes money at a somewhat comfortable rate.

"Take, for example, the route of the Pennsylvania Central:—

Prime cost of a car.....	\$5,000
Annual salary of a conductor.....	600
Annual salary of porter.....	300
Washing.....	1,500
Incidentals.....	500
<b>Total.....</b>	<b>\$7,900</b>

"An average of rentals would be, in six sections and three state rooms per night, for 300 nights in the year:

Six sections at \$3.....	\$18 00
Four state rooms at \$3.....	12 00
<b>Total.....</b>	<b>\$30 00</b>

"Three hundred nights, at \$30, make \$9,000. Deduct running expenses, \$2,900, and the dividend is \$6,100, upon a capital of \$5,000, or more than one hundred and twenty per cent. On some routes, however, the profits are much greater, amounting in some instances to over 300 per cent per annum."

A USEFUL CHART.—Mr. Charles Kinkel, of this city, has published a diagram for ascertaining the width of belts to drive any given machine. This diagram is accurately drawn and is accompanied by an explanation of its use. From it any one can tell by simple arithmetic what size of belt he requires to do his work.

**American Cast Steel.**

The manufacture of American cast steel has, within the last five or six years, assumed a rank and importance among the great manufacturing industries of our country, that its just claims to be considered as an element of national wealth cannot be reasonably ignored, and it should therefore receive its full share of the fostering care of the Government for its support.

That we possess all the appliances, and the ability to produce in this country steel of every description, from the lowest grade to the very finest quality imported, made exclusively from American stock, is now an established fact; demonstrated beyond the possibility of dispute, upon testimony from which there can be no appeal, and which we are prepared to furnish in overwhelming variety and quantity.

Among the severest tests of the comparative quality of English and American cast steel, it may be stated, that the celebrated fifteen and twenty-inch guns manufactured by Messrs. Knap & Co., at the Fort Pitt Works, are all bored and turned with tools made exclusively from American cast steel. These gentlemen inform us that its strength is so much greater, that much heavier cuts are taken upon large ordnance than any English steel will stand. The sabers which have been furnished to our armies by the great establishment of C. Roby & Co., West Chelmsford, and of the Ames Manufacturing Co., at Chicopee Falls, Mass., and others, are likewise made of Pittsburgh steel, in preference to all imported steel.

American cast steel is extensively used in our public and private armories, for the manufacture of bayonets, pistols, carbines, etc. In short, there is no use to which steel can be applied, in which it does not compete successfully as to the quality of the best imported brands.—*Report of Revenue Commission.*

**Cutting Garments by Machinery.**

There is in operation, at the establishment of Bernheimer & Newman, No. 87 Chambers street, a machine for cutting all kinds of woven fabrics into garments. The machine consists of an endless cutter revolving on two wheels placed above a table, and a large fly-wheel placed below, worked by hand, and by which it is set in motion. The pattern to be cut out is drawn on the top garment, all being placed in a clamp to keep them in position, and are pressed against the cutter and moved according to the desired pattern.

The number of garments cut out at one time is regulated by the height of the two wheels from the table. The cutter is sharpened by setting the machine in motion and placing a grindstone turned by hand in contiguity to it. This machine is extremely simple, being at the same time very effective.

**Smelting of Lake Superior Copper Ore.**

The ore of the Lake Superior copper mines is called "copper rock," and consists of pure copper, with stone, earth, and other adventitious substances, mechanically united. It is usually broken either by hand, or stone crushers driven by hand, to fragments about four or five inches in diameter. Then it is passed through the stamping mill and pulverized to fine sand. A current of water directed through the powdered mass washes out the extraneous matter, which is specifically only one-third as heavy as the metal. This "dressed mineral" contains from sixty-five to ninety per cent of copper, and is smelted in a reverberatory furnace, with lime or other suitable flux. The lighter minerals rise to the top and the copper sinks to the bottom, whence it is drawn and cast into ingots or pigs.

**Obtaining Soda from Common Salt.**

Mr. Weldon of England has taken out a patent for a process for the above purpose, as follows:—

The new process consists in placing within a vessel capable of resisting the required pressure an equivalent of common salt, and another of carbonate of magnesia, with a small quantity of water, and then pumping into the vessel the carbonic acid formed by causing atmospheric air to traverse coal in a state of ignition. The carbonate thus becomes bicarbonate of magnesia, which dissolves in the water, and then decomposes the chloride of sodium,

chloride of magnesium, which remains in solution, and bicarbonate of soda, which precipitates, being formed. The whole process lasts but a quarter of an hour at most, and the cost is only that of the coal used in forming the carbonic acid. A moderate heat drives off the second atom of carbonic acid from the bicarbonate of soda, changing it into carbonate; and the magnesia may be recovered from the chloride by evaporating the solution containing it to dryness, and raising the residue to a temperature below redness.

**Necrosis Produced by Tobacco.**

A case has recently occurred to Mr. Paget (*Lancet*) in which death of a portion of the bone of the lower jaw was occasioned by the introduction of the oil of tobacco into the cavity of a carious tooth, for the purpose of curing the toothache. The patient was an Italian sailor who used the oil from the stem of his pipe. Mr. Paget, in remarking upon the case after having removed several sequestra, said:—"The case well illustrates a source of danger which is not generally recognized. The practice of smoking is very widespread, and foul pipes and carious teeth are very common. Every smoker of a pipe has been disgusted now and then by sucking into his mouth a few drops of the highly pungent and nauseous product of the combustion of tobacco. In the action of smoking the tip of the tongue ordinarily receives this deleterious fluid, and is very much blistered in consequence. Were it not for the tongue one can readily imagine that hollow teeth would often receive this fluid; with what amount of risk the case before us well shows. It is well known that, for phosphorus to excite the inflammatory action which so often affects the lucifer-match workers, the fumes must be applied to a raw vascular surface in immediate connection with the nutrition of bone. This almost always happens through the medium of a carious tooth. There is no reason to suppose that tobacco oil would set up inflammation except under similar circumstances. It is, however, very probable that some cases of acute necrosis of the lower jaw of obscure origin may have really originated from the accidental poisoning of the tooth-pulp by this liquid, and the possibility of this source of disease should be borne in mind.—*Medical Record.*"

**A Disinfecting Filter.**

It is known to physiologists that the most suddenly fatal of all poisons are those of organic origin. The presence of this matter in water is frequently imperceptible to taste and sight. In the year 1854, a pump from which large supplies of water were drawn, yielded perfectly clear water, which yet killed 500 people in the first three nights of September. Stimulated by this experience, researches were entered upon to ascertain whether all the organic matter in water could be filtered out. More recently a curious property of magnetic oxide of iron has been demonstrated in the preparation of filters. This magnetic carbide is asserted to possess the power of converting oxygen into ozone. The inventor says its purifying property is "due to its power of attracting oxygen to its surface," which there becomes changed into ozone, or at least a body having its properties. But whatever may be the theory of its action, its effects in removing oxidizable and other organic matter from water are undoubted.

[We find the above in one of our exchanges. There is no doubt that impure water is a prolific source of disease, and that it would be much better to filter much of the water now used, especially that which is liable to receive vegetable matter from surface drainage. But we do not quite understand the theory of this inventor, who proposes to attract oxygen to the surface of water. The explanation is mixed with some mud.—Eds.]

**Foreign Cotton.**

The report of the Cotton Supply Association, presented at Manchester, England, on the 29th ult., presents some interesting facts relative to this subject. Failing to receive from America the usual supply of cotton after the war, efforts were made to grow cotton elsewhere, and in answer to numerous applications American seed was forwarded to many places, no less than 230 tuns being sent to the Ottoman Empire. The quality and quantity of cotton grown in Turkey induced the supposition that

the supply would be very valuable. The efforts of the committee in India made them believe that they would not be disappointed.

Favorable accounts were received from Italy and Brazil, and large numbers of gins and plows had been forwarded in order to better prepare the cotton for market. The chairman stated that owing to the use of better implements and the introduction of larger capital, their prospects in India were better now than at any previous time. He considered that the renewal of cotton planting in America was an important item in estimating the supply, but the duties imposed in the United States left an opening for successful competition from the rest of the world.

**Pine's Toning Process.**

A correspondent of *Humphrey's Journal* has the following:—

Having had numerous inquiries referring to the bright and clear tone of my prints, and as many suppose I use a peculiar toning bath, I send you herewith the secret of their brightness, which is owing to the prints being thoroughly freed from the nitrate of silver before toning. To accomplish this object, I have recourse to the following method:—

I take the prints just as they come from the printing frames, and immerse them in a solution composed of water, one pailful, common salt, one ounce. The prints are immediately covered with a white powder (chloride of silver), which gives them a foggy appearance. I then lay them, one at a time, on a glass, face upward, and remove the powder by means of cotton flannel, wrapped round a wooden roller, a little longer than the width of the print. By passing this roller over the print once, with moderate pressure, the chloride of silver is entirely removed, and the print looks bright and clean. The print is then placed in a dish of clean water, and the operation is continued until all the prints are in the second dish, from which they are placed in the toning bath. I can wash thoroughly five hundred 6½ by 8½ prints in an hour without difficulty.

The advantages of this plan of washing are—

1. Three-quarters of the silver used in printing can be saved, as all of it that is washed off remains in the first dish.
2. The prints are washed thoroughly, which cannot be done by placing them in running water.
3. The prints can be toned with one-third less gold than was formerly used.
4. The prints, being clean, tone quickly, and do not change color in the fixing bath.
5. The fixing is accomplished in less time, and is more thorough, than when the prints are imperfectly washed.
6. Great economy of water: six pailfuls being ample in which to wash five hundred 6½ by 8½ prints.
8. Mealiness in the prints is entirely avoided.

I use an 80-grain silver bath, and float the paper one minute in summer, and two minutes in winter, and tone with a simple solution of chloride of gold and water, neutralized with chalk. I fix the prints in a bath composed of water, 16 ounces, hypo. soda, 4 ounces. If the hypo. soda be acid, I neutralize the solution with carb. soda. Some may suppose the surface of the paper is injured by rubbing it with the flannel, but such is not the case.

**A Unique Specimen.**

Mons. Valiant, a gentleman who has collected a very fine cabinet of minerals on this coast, a few days since exhibited to us the most unique specimen we ever saw, though we have spent many weeks examining the cabinets of minerals at Paris, London, and Washington. It consists of a mass of calc spar, a crystallized variety of carbonate of lime, about six inches long, by three wide, and two thick, in which are dark layers of malachite, or carbonate of copper, while all over its surface, are masses of native copper, gold and silver in crystals. The gold by assay is found to contain a slight alloy of silver. The silver is very rich in gold, while the copper is absolutely pure. There is not a particle of quartz in the specimen, which altogether is invaluable as a mineral curiosity. If any person in California knows where such specimens may be found, they are more valuable than the same weight in gold. Mons. Valiant has refused \$150 for that to which we refer.—*San Francisco Miner.*



### Heating of Guns in Firing.

MESSRS. EDITORS:—On page 16, current volume of the SCIENTIFIC AMERICAN, is an article entitled "Why a Gun Becomes Hot on Firing," in which the writer expresses his opinion that the greatest quantity of heat in a gun is not so much the result of the combustion of the charge as that of its percussion, which is supposed to affect the molecules of the iron in the same manner as a blow of a heavy hammer would do. Now, notwithstanding my deference for your learned correspondent, I beg leave to give him one or two of my reasons for not being of his opinion.

About a year ago I made several experiments in gunnery, to compare an explosive compound I had discovered in my chemical experiments. This compound was made of chlorate of potash, 50 parts; prussiate of potash, 23 parts; white sugar, 30 parts; red lead, 5 parts. Its power, compared with ordinary gunpowder, is enormous; its action very sudden. To ascertain its heating property against that of ordinary Hazard powder, I attached on the breech of a heavy rifle one end of a double blade of steel and brass riveted together, and caused the other end to slide—when influenced by a difference of temperature—upon a graduated arc; and all was surrounded by a wooden case, blackened inside and white outside. I fired as rapidly as I could ten rounds of accurately-weighed charges of Hazard powder, and noticed the temperature of the rifle as well as that of the atmosphere. Then I fired charges of my compound, under the same circumstances, and, although every explosion was a great deal more instant—which I had ascertained by its destructive effect upon other heavy rifles—I had fired thirty-seven rounds when the thermometric blade reached the reading of the Hazard powder of ten rounds.

I will offer this other reflection. When a piece of iron is struck with a hammer, the molecules of the iron are disturbed and are made to occupy less space, and that change is permanent, and the heat is known to be then only latent heat, not mechanical. Although I have ample proof that a gun expands enormously at the instant it is discharged, still its expansion is not permanent, and I cannot believe that it gives out a single unit of its latent heat.

Again, I have found that the powder that burns the slowest is the one that heats the gun most; and if the greater quantity of the heat of a gun comes from percussion, then an ounce of the fulminate of silver discharged in a gun sufficiently strong, would instantly make it red hot, or even melt it. Now, to my certain knowledge, it does not heat the gun so much as coarse powder.

The heating of a gun is not sudden, but greater after the explosion; that resulting from percussion is instant, and is less after the blow.

FRANÇOIS SULIRE.

Watertown, N. Y.

### Measuring and Regulating Temperature.

MESSRS. EDITORS:—Will one of you assist an old subscriber to the following information:—For the last six months I have been making experiments, and to facilitate my progress I desire to obtain a regulator of temperature. I find it necessary to maintain a uniform heat of 110 deg. Fah., and it must not vary more than two degrees either above or below this temperature. My room is heated by the circulation of hot water through pipes, and I have introduced levers to work the stop-cock, in such a manner that if I can get a power sufficient to lift twelve ounces one-eighth of an inch in two degrees of temperature, my present object will have been accomplished.

I wish the thermometer to get to 112 deg. by the time the valve is closed, and to descend to 108 deg. by the time it opens. I thought of making a mercurial thermometer, but I am afraid I cannot get one strong enough for the work and sufficiently sensitive. In Ure's Dictionary I find an account of a heat regulator, called a "thermostat," patented by him in 1831. This I have tried in two ways, and

although I made one that would move itself one-sixteenth of an inch for every degree of variation, it would not move a single ounce beside.

I give a brief description: I took a bar of hard-hammered brass and one of untempered steel, each seven feet long by three inches wide, and one-eighth of an inch thick, and riveted them together, face to face, with brass rivets two inches apart. The compound bar I bolted to a stationary block at one end, the other being free to move by the unequal expansion of the two metals. Can you advise a more efficient regulator?

W. M. BROWN.

San Francisco, Cal.

[It seems to us that a movement of one-sixteenth of an inch for every degree of variation might be sufficient to operate mechanism capable of opening or closing a valve in a pipe. It would undoubtedly require a nicely-adjusted medium, but that does not seem to be without the limits of mechanical ingenuity. We can see no reason why a mercurial, water, or air thermometer, if of sufficient capacity, might not be made to give motion enough to a float on the surface of the fluid to answer the end proposed. The attention of our correspondents is called to this case. A regulator sufficiently sensitive might have many useful applications.—Eds.]

### The California Target.

MESSRS. EDITORS:—The target, represented in your last number, is a very interesting one to those who know the facts concerning it, without which, as you justly state, its value is very uncertain.

As I happen to be in possession of these facts, I send them to you, rather than leave them till you can hear from your correspondent in San Francisco.

In the first place, the distance shot was 40 rods (220 yards) instead of 40 yards, as you stated. The gun was manufactured by Hiram W. Smith, of Boston, and its character is well known in this section, where it has won many matches. It was sent to Dr. Pardee, of San Francisco, last fall. The target represented by you was shot in a match for \$1,000, and I believe is the shortest string on record of an equal number of shots at that distance. The weight of the rifle, I believe, is 30 lbs.; the shooting was from a rest and with telescope sights.

H. W. S. CLEVELAND.

Danvers, Mass., July 31, 1866.

### Cement for Millstones.

From a correspondent, J. A., we have the following:—

MESSRS. EDITORS:—Having noticed in your issue of July 14th, a solicitation from millers for a recipe for a cement for open millstones, I send you the following, which I can vouch for being *the thing*: Melt as much alum as is thought necessary for the work; while hot add a little white lead, say, one ounce to one pound of alum. Let it get well mixed and pour into the stones while hot. Plaster of Paris is most commonly used, but is much inferior to the above. I never heard of any one using lead until I saw it in your paper.

[It seems to us that the white lead would be anything but what is needed for millstones. White lead is noxious and entirely unfit to be used in conjunction with any mechanical means of preparing animal food. It is an oxide of lead, and is deadly when brought in contact with human or other animal organisms. It is but a short time since a large number of persons were poisoned by flour ground in mills, the stones of which were repaired with lead. The white oxide of lead, commonly called white lead, is scarcely less obnoxious to organic life than the metal in its natural state.—Eds.]

### Old Rubber Car Springs.

MESSRS. EDITORS:—Please inform me through your valuable paper to what use old "rubber car springs" can be put. Can they be re-manufactured into springs, or can they be made into a paint suitable for freight cars? Any information in regard to the above will be thankfully received.

J. B. HOXSIE, Supt. East Tenn. & Va. R. R.

Knoxville, Tenn., July 21, 1866.

[Many companies have large stocks of old springs on hand, and they, in common with our correspondent, will doubtless be interested in knowing that, free from iron fittings, they are worth 8 cents per pound in this city. Regarding the paint, it is

cheaper to buy it of parties in the trade than to attempt the manufacture on a comparatively small scale.—Eds.]

### Pyrophorus.

MESSRS. EDITORS:—The "*poudre de feu*," which I find mentioned in your paper of July 28th, is made as follows:—Take equal parts of alum and brown sugar; dry out the moisture in an earthen dish over a slow fire, and pulverize; then put the mixture into a glass vial, and lute the mouth with clay, leaving a pin-hole for the escape of gas. Next, place the vial, surrounded with dry sand, in a crucible. Place the crucible on the fire, and as the heat increases, try the pin-hole occasionally with a lighted match, and you will discover the gas take fire and burn with a small blue flame. Continue a red heat about ten minutes after the gas ceases to burn, and then cool down; after which the contents of the vial may be again reduced to a powder by shaking, and transferred to pocket cases. When poured out in the open air from the elevated hand, it forms a shower of red sparks. It may be made the source of a hundred amusing tricks and experiments. I used to prepare it, however, for a purpose entirely distinct from its peculiar property of becoming red hot when exposed to the air. ARGENT.

Indiana, July 3, 1866.

### The Piston of a Steam Engine.

MESSRS. EDITORS:—Where is the piston of a horizontal engine when the connecting rod is at right angles with the crank? It may be rather a silly question to ask, but no one can answer us as yet. By answering it you will greatly oblige two young men who sign themselves

GEO. G. AND IRA N.

New York, July 28, 1866.

[The piston is in the cylinder and at a point determined by the length of the connecting rod and length of the stroke. It is not midway between the ports, but with a very long rod and a very short stroke it comes pretty near it. The connecting rod is not "at right angles with the crank," but at an acute angle when the crank is vertical.—Eds.]

### Bridge Walls in Boiler Setting.

MESSRS. EDITORS:—I notice your correspondent, F. W. B., says a vicious habit in setting boilers is in contracting the opening over the bridge wall. Perhaps I am in danger on account of doing the same thing.

I have a boiler 48 inches in diameter, 22 feet long, the bridge wall back of the grate bars is made in a circular form, 4 inches at the center of the boiler, and increases on either side to 8 inches at the water line. I find the small space—four inches—causes the flame to wrap the boiler instead of running back in a column, as is the case when twelve to eighteen inches space is made under the center of the boiler, and square across to the walls. I find the greatest economy in fuel with this circular hearth made back to the stand pipe. If there is danger from this style of setting boilers the public ought to know it. Is F. W. B.'s theory correct, or mine, as described?

M. R. LEMMAN

Columbus, Miss., Aug. 2, 1866.

[There is no doubt but our correspondent finds economy in setting his boiler in this way, as it is a sort of regenerative furnace, wherein the egress of the products of combustion is delayed until they ignite. At the bridge wall, and for a few inches each side of it, the most intense heat should be found. It is not desirable that one part of the boiler should be heated more than the other, or that such extreme heat should be found. Four inches is too narrow an outlet for a boiler forty-eight inches in diameter, and although it may accelerate the draught and promote combustion, there is danger that the flame may reach portions of the shell above the water line and over-heat it. We recommend that the opening be made eight inches all around, at least; very little difference will be found in the fuel.—Eds.]

THE Custom House at Portland, Me., built of granite, and as thoroughly fire-proof as any building in the city of New York, penetrated by the all-searching heat, still stands a scarred and crumbling wreck amid surrounding ruins.

## Modern Methods of Business.

A great change is taking place in our times in respect to the methods of business. Company concerns are superseding individuals, and great capitalists are taking the place of small. Manufactures are being systematized and concentrated, and the forces of water and steam made to supersede and supplement, as far as possible, human and animal labor. All our small and rapid rivers are at work, and most available water powers improved to relieve and aid human toil. Great manufacturing establishments and cities are constantly springing up, and going rapidly ahead.

We take the liberty to suggest connecting with the Niagara ship canal a Niagara water-power canal, that shall be able to drive the looms and spindles, and all the other machines and implements, of a large manufacturing city. The expense would be comparatively slight, of connecting this second improvement with the first, and the two would constitute works of great magnitude and value.

The vast power of Niagara Falls is there to be utilized, and ought, after so long a period, to begin to answer its beneficent purposes. Buffalo would then be one day eclipsed by Niagara city, and the heaviest manufactures of the continent be concentrated in the vicinity of its greatest natural curiosity. Manufactures would be distributed easily to the east, but would probably go mainly to the west.

Niagara Falls are very much in the way of navigation, but they may yet furnish vast powers for work, and prove an invaluable auxiliary to human labor.

The attraction of manufacturers to the localities of great water power is seen in New England on a great scale. Every thing possible is going into cities, and manufacturers are being rapidly concentrated both in great cities and in great establishments.

Business is also being wonderfully divided up. The beautiful city of Lynn makes women's shoes. No shoes for men or boys, and no boots are made in the city. Its own supply comes from abroad. But all the makers of women's shoes have for some years been flocking into Lynn, from surrounding districts. Lawrence, Manchester, and Fall River, are largely engaged in the cotton and woolen manufactures, and their establishments are constantly multiplying and being enlarged.

In several departments of production the private methods and small establishments of past years are entirely abandoned. Clocks and watches used to be made in Europe, and the former in this country, by men with small capitals. Both are now large company concerns, with which small capitalists cannot possibly compete. Cotton, woolen, and linen goods used to be home manufactures; they are now the products of great company concerns, and the wool-grower can as little afford to manufacture his wool in small parcels by hand, as to throw it away. The manufacture of boots, shoes, and clothing are following in the same way.

Great establishments are doing immense business in these articles, and are superseding small concerns entirely by ruinous competitions. Great establishments, with ample machinery and other facilities, cheapen products till small concerns cannot afford to produce them. At the same time that products are cheapened, wages are raised by new and profitable demands. One great company prospers. Another enters the field and builds, and works along side of it. If the two prosper, a third goes into the business, and so on, till it is filled to its utmost capacity, when profits decline. Company competition operates on the same principle as that of individuals. Companies compete for the best help and the quickest sales, and thus perpetually drive labor up and products down by natural laws.

Many are troubled with this inevitable progress of affairs, and anticipate from it the oppression and injury of the poor. But this trouble may be spared. Great corporations are the friends of labor and drive it up by competition with each other. Their interest is to sell quick, and to extend and multiply their concerns as long as they can do business profitably. The public is not only thus secured from harm, but made the recipient of great benefits in the very particulars in respect to which great corporations are feared, that of enhanced prices and cheapened products.—*Utica Telegraph.*

## The Opium Trade.

The *East Indian Budget*, just laid before the British Parliament by Lord Cranborne, presents some curious facts relating to the opium trade as a source of revenue. The gross revenue of the Government for the years 1864-5 amounted to £47,041,000, showing a small surplus beyond expenditures, owing to the unexpected receipts from the customs tax on opium. In this item there is a large gain over the previous year, which yielded £7,361,000, the increase being £1,277,000.

These amounts are paid wholly by the Chinese, by whom the drug is consumed. The estimated receipts for the current year are put at a still higher figure—larger than were ever before realized, with rare exceptions. The importance attached to opium as a source of revenue may be inferred from the remark of Lord Cranborne, that "it is evident that the perfection of our Indian budget, the attainment of a good balance sheet, depends upon our accurately estimating the yield of opium."

Formerly this source of relief was regarded as precarious, but it is now believed that the demand of the Chinese for opium can be depended upon as safely as English chancellors of the exchequer can rely upon the demand for gin and beer. It is thought probable that the former will continue to be as passionately fond of their favorite drug, as the latter are of their indispensable beverage. "It is on the opium revenue," we are told, "that Indian finance ministers are saved or lost."

The chief danger is that the Chinese may be enabled to satisfy their taste from some other market, should the cultivation of opium be attempted elsewhere with success. The Indian Government derives little direct profit from the vices of native subjects, with whom abstinence from intoxicating liquids is a religious duty. Nor do they show a propensity for poppy juice. They are hopelessly temperate. England can derive no profit from pandering to their vices.

## MISCELLANEOUS SUMMARY.

THE indications are that the yield of coal this season from the mines will be so large as to prevent a further advance in prices, and may even cause a material reduction.

The Cape Ann (Gloucester) *Advertiser* says:—"There never before was such a scarcity of mackerel in our market at this season. At this time last year from thirty to forty sail of baymen had arrived home, and business was quite lively on the wharves. The fish speculators find it rather dull pickings at the present time, and there is quite a lively competition among them when a ship arrives. Prices are daily advancing."

THE CUNARD CONTRACT.—The Cunard mail contract expires next year, and it is anticipated that the postage of the letters will alone be sufficient to maintain the service, the shilling rate being reduced to sixpence, and all the letters being sent to New York. One half of the letters now go to Boston.—*Engineering.*

CLEANSING HAIR BRUSHES.—Soda, dissolved in cold water, is better than soap and hot water. The latter very soon softens the hairs, and the rubbing completes their destruction. Soda, having an affinity for grease, cleanses the brush with very little friction.

THE Fair of the New England and Vermont State Agricultural Societies will be held on the grounds of the Windham County Park Association, at Brattleboro, Vermont, September 4th, 5th, 6th and 7th, 1866. Premiums amounting to over \$6,000 will be offered in the various departments. Arrangements have been made with nearly all the New England railroads for the transportation of stock and articles free, and conveyance of passengers, attending and returning, for fare one way.

THE manufacture of menhaden oil has got to be a very large business, and it is estimated that about 100,000 bbls. will be secured the present season. It takes the place, to a large extent, of dark whale oil for carriers' use, etc. An establishment for the manufacture of fish oil is being erected in West Yarmouth. Schools of porgies are now, and have been this season, numerous off that place.

THE population of St. Louis, according to a recent census, is 207,000. In 1860 there were twelve manufacturing establishments in that city, with a capital of \$100,000; in 1865 there were sixty-two establishments, employing two millions and a half of capital, being more than a million and a half in excess of the capital invested in the entire State in 1860. The manufacture of india-rubber goods has also just been commenced by a well-known firm.

AN artesian well in process of sinking, at the Union Stock Yards, in Chicago, Ill., has reached a depth of 446 feet. The last ninety feet have been bored through the solid rock. There were at one time indications of oil, but these have disappeared.

A LITERARY gentleman in Washington is afflicted with what is called the "pen palsy," an affection which is supposed to be caused by the use of French copying ink, which, it is said, contains arsenic. Both his hands and feet are badly swollen, and his health is in a precarious condition.

A MAN named Jones, and his little son, were killed at Piqua, Ohio, the other day, by a stroke of lightning. Perfect photographs of the trees under which they were standing at the time were imprinted upon their bodies.

THE American Silver Steel Co. have purchased Mather's Point, in Bridgeport, Conn., and are about to erect a large rolling mill for the manufacture of bar iron and steel. The company own the celebrated "Mine Hill," in New Milford, and will make their iron and steel from the ore obtained at that hill.

ARTESIAN WELL.—The new artesian well at St. Louis, for the Insane Asylum, was commenced April 1st last, and has now been bored to a depth of over 1,000 feet. It is to be carried down 3,000 feet, unless a good supply of water is obtained at a less depth. Mr. Wm. Rumbold is the chief engineer, and Chas. W. Atkeson has charge of the work.

WE learn from Jamaica that the experiments in crushing bamboo by machinery have entirely succeeded, and by that means a much larger trade can be done in the fiber. It is intended to establish several mills to crush the bamboo in different parts of the island. Very little bamboo fiber is sent to England, the United States importing nearly all that is manufactured. The value of the bamboo grown on the island is estimated at nearly one million dollars.

BAIRD'S PUBLICATIONS.—The attention of our readers is directed to the advertisement of Henry Carey Baird, Industrial Publisher, in the present number, which will be continued in future numbers, giving a list of the most popular and useful of his scientific and industrial publications. Every week we receive inquiries for treatises on practical subjects, and are obliged to refer correspondents to Mr. Baird. The publication of this catalogue will, therefore, be of great service to our readers who desire to know where works on scientific and practical matters are to be obtained. Catalogues of his publications will be sent on application to Henry C. Baird, 406-Walnut street, Philadelphia.

COAL OIL FOR FUEL.—The London correspondent of the *New York Times* gives an account of the use of coal oil for the production of steam. It was found by experiments that American coal oil would evaporate water at the rate of one pound of oil to thirteen of water, while oil produced from English shales would evaporate eighteen pounds of water, or double the power of coal—the economy both of space and weight being very great. The fires are under the entire control of the engineer; no stokers are required, and the furnace doors are never opened nor are the plates ever burned out. The oil produced from North Carolina shales ought to be as good as the best English.

## Supplement.

Our readers will observe that we have been compelled to issue a supplement with this number. This is in consequence of the large increase in our advertisements and our Patent Office business. We would recommend that these supplementary pages be as carefully preserved for filing and binding as the body of the paper. They may be found valuable hereafter for reference.

THE Pittsburgh *Republican* states that at Rising Sun, Ind., on the Ohio river, on the 14th of July, while the sky was perfectly clear so far as the eye could reach, and the sun was shining brightly, a vivid flash of lightning appeared, followed by a long and sharp peal of thunder. The electric fluid struck a church and three dwelling houses. At the same instant a little girl was killed outright, and a little boy had his clothing stripped completely off his body, not excepting his shoes, all of which had the appearance of having been cut with a sharp knife. The boy was only stunned and slightly injured in one of his legs. Another boy in the same vicinity was also struck at the same time, but was more seriously, although not fatally, injured than the boy who had his clothes torn off.

AN interesting experiment has been made on Mont Cenis, in presence of the Minister of Public Works, in France; who accompanied the chief director and several engineers. The part of the railroad already completed, which ascends by a winding inclined plane, was traveled over by a train composed of several carriages at a speed of about 11 miles an hour ascending, and 15 descending. The highest gradient was  $8\frac{1}{2}$  per cent, and several curves were at an angle of only 40 degrees. The works on the Italian side are to be finished by the end of next October, so that it is expected that by next November Italy and France will be united by an unbroken line of iron.

SOME French *savant* has been writing about plants having green and white blood. When he gets through with these important researches we hope he will be able to find out whether or not the moon is made of green cheese or *Schweitzer kase*. He may be able to prove the fact that the moon is the Dutchman's heaven.

RECENTLY an eruption of an artesian well took place in a garden adjoining the church of St. Agnes, in Venice. The walls of the church were cracked in all directions. The substance vomited consisted of black ashes and a suffocating gas, the expansion of which is supposed to have caused the outbreak. The water which was thrown up reached as high as the top of the church.

THE body of an Australian native, which was found in a state of petrification, has been sent to England. This singular specimen was found in one of the limestone caverns which abound in the plains of Mosquito, in the south of Australia. The body was discovered in the natural position of a sleeping person.

FALL RIVER is growing rapidly from the great increase in manufacturing. When the mills now in process of erection are completed, it will have more spindles than Lowell, and be the first city in America in the amount of cotton and woolen goods manufactured. A large part of the machinery is moved by steam.

ON Tuesday, the 7th inst., ninety-two patents were ordered to issue to inventors whose applications were prepared at the SCIENTIFIC AMERICAN Patent Agency.

#### NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees:—

**CHILDREN'S BED-CLOTHES RETAINER.**—M. L. THOMPSON (assignor to himself and E. L. CHILDS, 189 President-street, Brooklyn, N. Y. Patented November 28th, 1865).—Much annoyance and trouble is given to mothers and nurses by children constantly getting uncovered at night, owing to their restlessness. Their feet or hands are almost constantly in motion, and it is impossible to keep children covered unless they are continually watched, and if neglected they become uncovered, and serious colds are often the result, especially in the spring and winter seasons, which often develop into some ailment fatal to the child. The object of this invention is to produce a simple means for retaining the bed-clothes in place over the child, no matter what position it may assume, and for this purpose a ring or collar of suitable construction is employed, which is to be placed around the child's neck, and to which the bed-clothes are attached.

**COFFEE ROASTER.**—H. B. MASSER, Sunbury, Pa.—The object of this invention is to obtain a simple, portable, and economical device for roasting coffee, one which may be manipulated with the greatest facility, both as regards the stirring of the coffee while being roasted and the removal of the same, when roasted, from the device.

**FAN MILL.**—CHARLES K. EHLE, Greenbush, Wis.—By means of this fan mill, which is simple in construction, strong and durable, the wheat may be easily and rapidly freed from oats, straw, and

chaff, and, at the same time, it answers every purpose for cleaning all other kinds of grain.

**GRAIN CLEANER.**—C. F. BAYLER, Clinton, N. J.—This invention relates to a device for clearing grain which consists in the use of a reciprocating screen operated in a novel way, whereby cockle and shrunken grain are separated from the sound grain in a thorough manner.

**DEVICE FOR HOLDING STAPLES WHILE BEING DRIVEN.**—ALBERT C. BETTS, Troy, N. Y.—This useful device is for holding staples and is designed to facilitate driving them, and it is more particularly applicable to the making of wire fences where the wires are secured to the posts by means of staples.

**GANG PLOW.**—WILLIAM BATTILL, Quincy Ill.—This invention consists in a peculiar construction and arrangement of parts whereby lightness of draught is obtained, and the plows rendered capable of being manipulated with the greatest facility, while simplicity of construction prevents any of the parts getting out of repair or working order.

**PROPELLER SCREW.**—WM. E. DAVIS, Jersey City, N. J.—This invention consists in an improved mode of constructing screw propellers for steamships, by forming them of separate blades of boiler iron, fastened with screw bolts on the shaft, making the propellers much stronger, lighter, and cheaper than when cast, connected in one piece, as usual. If a blade is broken, even at sea, it is easily replaced.

**FORGING PISTOL AND RIFLE FRAMES.**—CHARLES E. BILLINGS, Windsor, Vt.—This invention relates to the forging of pistol frames, and consists in subjecting the blanks to a series of dies of suitable shape therefor.

**TWEED FOR BLAST FURNACE.**—JOHN BAYLISS, New York City.—This invention consists in a novel arrangement of the air blast, whereby combustion is increased and also the amount of heat generated.

**TRAVELING BAG.**—NICHOLAS GROEL, Newark, Essex County, N. J.—This invention particularly relates to the traveling bag frames, and its object is to strengthen the two jaws of the frames at the points where they are hinged together.

**PICKER MOTION FOR LOOMS.**—HOSEA ELLIOTT, Globe Village, Mass.—This invention relates more especially to power looms, and it consists principally in throwing the shuttle independent of the cam shaft, so as to secure a uniform pick motion whatever the speed of the shaft may be.

**FENCE.**—WM. H. BROWN, Stockwell, Ind.—This invention consists of the combination of connecting blocks and inclined corner stakes or braces with the panels of the fence, and in the combination of long poles or rails and stakes with each other, and with the panels of the fence.

**FLOUR BOLT.**—J. C. BLYTHE, Perry, N. Y.—By means of this invention flour may be bolted faster and more evenly than with the bolts now in common use. It consists in combining round hoops with the arms, ribs, and cloth of a flour bolt, in such a way that a space may be left between the ribs and cloth between each pair of hoops, so that the flour may be in contact with the cloth all around the bolt.

**SAW SET.**—JOHN LYLE, Newark, N. J.—By means of this improvement a saw may be set much or little, without the possibility of warping the blade or setting the teeth untrue.

**GANG PLOW.**—SAMUEL HUTCHINSON, Griggsville, Ill.—This invention relates to an improved means for regulating the depth of the penetration of the plows, and also to a means for raising and lowering the plows and retaining them in the ground when the device is at work.

**SPOKE TENONING MACHINE.**—OLIVER VANORMAN, Ripon, Wis.—This invention has for its object to furnish an improved machine for thinning and tapering the tenons of carriage wheel spokes.

**FRUIT GATHERER.**—S. MELLINGER, Jr., Mount Pleasant, Pa.—By this invention a fruit gatherer is produced, which can be used with the utmost ease and rapidity, and without injuring the fruit.

**WOOD-SAWING MACHINE.**—JAMES D. MATTHEWS, Bowling Green, Ohio.—With the wood-sawing machine embraced in this invention a great economy both of time and labor is effected, the machine being simple in construction and effective in operation.

**SIDE SADDLE.**—CLARA A. BARTLETT, Oakland, Cal.—This invention consists in so attaching one of the horns of the side saddle to its tree or frame that it can be dropped down into such a position as to allow to rider to mount or dismount with the greatest facility and ease.

**WASHING MACHINE.**—ALBERT JOYNER, Elton, Wis.—This invention consists in a removable fluted or grooved concave, having perforations through it for permitting the water to rise underneath the clothes which are being washed.

**MACHINE FOR DRILLING ROCK.**—R. A. THOMAS, Damascus, Cal.—This invention consists in an improved machine for drilling rock, being especially adapted for tunneling through slate-bed and other similar descriptions of rock.

**CALORIMETER.**—C. W. COPELAND, New York City.—When the size of the boiler tubes is too large, an unnecessary amount of fuel is consumed, and it is common to insert thimbles in the ends of the tubes to reduce the draft. These thimbles prevent the convenient cleaning of the tubes, and also arrest the ashes. In the present improvement the thimble or calorimeter is made in the form of a half moon, and occupies the upper portion of the tube end, thus reducing the draft, and holding the heated gases in the upper part of the tubes, but presenting no obstruction to arrest ashes or interfere with the cleaning of the tubes. An excellent improvement.

**DEVICE FOR MARKING GROUND FOR PLANTING CORN.**—PRESTON MCQUAID, Wenona, Ill.—This device is for marking off ground for planting corn in check rows, and it consists of three wheels placed at a suitable distance apart, within a proper frame, and the central wheel arranged or applied in such a manner that it may rise and fall to admit of the several wheels accommodating themselves to the inequalities of the ground over which they may pass.

**LOG-SETTING DEVICE FOR CIRCULAR SAW MILLS.**—J. A. GREGG, Charleston, Ill.—By this device logs may be set to a cir-

cular saw, by the sawyer himself, without the aid of an assistant. It consists in setting the log by means of a bar or handle passing over the log and saw, and within convenient reach of the sawyer.

**HYDRAULIC MAINS FOR GAS WORKS.**—J. N. STANLEY, Brooklyn, N. Y.—The object of this invention is to cast the upper parts of the tubes leading to the hydraulic main with one side of the latter so as to communicate with the main below the level of the fluid therein, whereby the gas, when it escapes up through the fluid in the main, has a free, unobstructed passage in the latter above the fluid.

**HOT AIR FURNACE.**—HENRY WHITTINGHAM, New York City.—This inventor has three different patents on hot-air furnaces. One relates to a hot-air furnace, the combustion chamber of which is surrounded by an air chamber, to which air is admitted from below, and through which extend a series of vertical and horizontal flues, the vertical flues to conduct the cold air to the horizontal flues, where the same is heated, and whence it passes into a hot-air chamber to be distributed to the various rooms or compartments in a building.

**TYPE-SETTING MACHINE.**—CHARLES BAER, New York City.—This invention relates to a machine in which one type after the other, as indicated by the pressure of the hand on suitable keys, is taken from a series of radiating type cases by a receiver, which is secured to a vertical shaft, on which it revolves, and which is so arranged that its end sweeps past the inner ends of the radiating type cases. The line of types in each case is subjected to the action of a pusher, which has a tendency to force the same toward the center of the axis on which the receiver revolves, and said columns are retained by spring hooks, which catch over the edge of the first type in each type case, and which connect with the key in such a manner that by depressing the inner end of one of the keys the corresponding spring hook is raised and a type passed out of the appropriate type case into a small chamber, from which it is taken by the revolving receiver. Suitable cams on the inner ends of the type cases serve to push the type into the revolving receiver far enough to enable a spring hook to catch hold of them and retain them, and similar cams on the end of the revolving receiver retain the line of types in the type cases, while that type which, by the pressure on the key, has been allowed to detach itself, is taken off by the revolving receiver.

**NECK-TIE HOLDER.**—THEODORE ROSENTHAL, New York City.—This invention relates to a device intended to fasten scarfs, butterflies, and neck-ties in general, to the upper shirt button, by means of two curved spring jaws, which project from a spring or plate to which the neck-tie is secured, the curved jaws being so shaped that they can be sprung over the shank of the button, and that they clamp the same tightly, so as to prevent the neck-tie becoming disengaged spontaneously.

**WASHING MACHINE.**—ADOLPH T. KULHMANN, Glenhaven, Wis.—This invention relates to a washing machine which is so constructed that it soaps the clothes, boils them, washes them, and wrings them; and which, after the washing has been finished, can be used as a table.

**BOX FOR COLLECTING FARES IN OMNIBUSES, ETC.**—J. B. SLAWSON, New Orleans, La.—The principal object of this invention is to arrange a box for collecting fares, so that it is adapted for currency as well as for coin, that the fare deposited in the box can be seen by the driver as well as by the passengers; and furthermore, that the possibility of withdrawing from the box a portion of the fares deposited therein is absolutely prevented.

**COMPOUND FOR GRINDING AND POLISHING.**—N. A. BURLE, New York City.—This invention relates to a compound which, when formed in rollers or bars, can be used with great advantage for grinding and polishing articles of metal of any desired description.

**WASHING MACHINE.**—WILLIAM M. DOTY, E. P. DOTY, AND ELLIS DOTY, Janesville, Wis.—This invention consists in the use of a spring wound on each of the fulcrum pins of the oscillating washboard, with its ends extending from the fulcrum pins in opposite directions, one to bear on the edge of the tub, and the other under a pin projecting from the bracket which forms the bearing for the appropriate fulcrum pin, so that in depressing the handle each spring is wound up and the pressure on each fulcrum pin is balanced, one end of the spring pressing up and the other down, and said pins are prevented from wearing out. It consists also in combining with the washboard, flanged segmental cheek pieces, which are grooved to receive the handle, and so formed that they prevent the water from splashing out over the ends of the tub; and also in the arrangement of cleats on the ends of the tub, in combination with the upper ends of the legs, which are secured to the tub, each by one screw, in such a manner that the end pieces of the tub are free to expand and contract without being liable to crack, and at the same time the legs are firmly held in position.

#### NEW PUBLICATIONS.

**THE TURNER'S COMPANION.**—Containing Instructions in Concentric, Elliptic, and Eccentric Turning, with illustrations. Henry Carey Baird, 406 Walnut street, Philadelphia.

There is much in this volume of interest to amateurs, and some of value to practical workers. The suggestion of the author, in his preface, that the foot lathe is a proper machine for the use of "the sex," we regard as timely and felicitous. There is no adequate reason why women should not use the lathe as a means of exercise, and, at the same time, an agent for the production of beautiful geometric forms, pleasing to the eye, and of practical utility. For some of the plates we have not much that is commendatory. The representation of circles in perspective, by well-defined lozenges, violates all rules of art, and the handles of tools, made in accordance with the illustrations, would be anything but "handy" and convenient. Despite these drawbacks, however, the volume will be found to be a useful adjunct to the *repertoire* of the amateur, and of value to beginners, and some of the recipes are just what is needed, furnished in a convenient form.

**Improved Corn Cultivator.**

Quite recently we ran up through the valley of the Mohawk River, where vast fields of corn are grown, and side by side, scarce twenty rods apart, were two men at work; yes, two men and one woman. One man had a cultivator, and as he drove he turned over the shining soil against the growing crops, and rode as he drove. The man and woman bent to their work, he earnestly, she in a stiff, ungainly way, as might be expected of a woman in an employment unsuited to the sex. The contrast between the two methods was too marked not to be noticed, and we wondered how any man could be so short-sighted as to use manual labor where machines are provided which will do better work than he can, in half the time.

In this engraving we illustrate a simple and efficient cultivator, which has met with much popularity at the West. There is no machinery about it, and any one that can drive can manage it. In brief, the axle has a triangular frame fixed to it, on one end of which is the draft pole, and on the other two vertical beams, A, which carry the plows, B; the cultivators attached to the plow beams are of any desired shape. The plow beams are so fixed as to be readily moved in any direction, and are capable of being easily guided between the rows.

This is accomplished either by grasping the handles, as seen in the engraving, or by placing the feet on stirrups on the plow beams. In this way a vast amount of work can be done in a satisfactory manner, and the cost will be much less than by hand labor.

It was patented February 27, 1866, by Andrew T. Stover, of Sandyville, Iowa.

**RAIN GAGES AND RAIN FALL.**

Scarcely a day passes in this section of the country but that cooling showers descend during the night, refreshing the earth, parched during the day by the glaring sun. This moisture, returned in the form of rain more rapidly than it was abstracted, is generally the result of the union of two or more volumes of humid air, differing from each other in temperature. When mingled in the mass, or rather cloud, it is incapable of retaining the same amount of moisture that each did separately. If the moisture is over-abundant it descends in showers; if but slight, it floats in the air as a cloud, and long before showers fall we see masses of vapor skurrying before the wind until all are mingled in one.

The average yearly rain fall varies greatly, being the most in the tropics. As a general rule, the higher the average temperature of a country, the greater will be the rain fall.

In tropical countries the average amount is 95 inches, in the temperate zone but 35. In hot countries the heaviest rain storms occur when the sun is at its greatest altitude, but the reverse is the case in the temperate zone, where dry summers are by no means exceptional, and long wet winters hold sway.

In many parts of the world it never rains, and the arrowy sheets of water, driving before the wind, are unknown; in others there are certain rainy seasons when the heavens open and the floods descend and cover the earth as of old.

The Island of Chiloe, and the country about the straits of Magellan are said to be the wettest places on the face of the globe. There it rains incessantly. In the northern part of the United States there are, on an average, 134 rainy days in the year; in the South not so many numerically, but the average rain fall is greater.

At San Luis, in the island of Marañon, the

average rain fall is 280 inches, which is the greatest on the continent.

The quantity falling in a given time is measured by a gage. A common form of this instrument is a can with a floating piston and rod; as the rain falls it raises the piston, and the quantity is known by observing the graduations on the rod.

A better instrument is made by attaching a small tube to the side of a larger one, the two communicating at the bottom; the lesser being graduated shows the quantity which falls in any given time very clearly. Experiments made by the Smith-

trivance can be obtained by addressing J. M. Thompson, 2d, or G. L. Holt, Box 1,058, Springfield, Mass.

**PROTECTING BUILDINGS AGAINST LIGHTNING.**

In our last issue we had an article on this subject but it did not exhaust the topic. We desire to say a few words additional in relation to ordinary protection against lightning.

Many buildings are now constructed, both in the city and in the country, with metallic-covered roofs, and very few are erected without metallic eaves troughs and conductors. In all such cases the efficiency of lightning protectors is impaired by the preponderance of conducting surface on the roof and down the sides of the building. This metallic covering, and these rain conductors, whether of tin, zinc, or lead, are better conductors of electricity than the building of stone, brick, or wood, and should be utilized as a means of protection against lightning. For this purpose strips of iron, zinc, or copper should connect the lower extremities of the water spouts with the damp earth, a well, or a running stream of water, and the eaves troughs should have a connection with the metal roofing and with the vertical conductors. Water is a good conductor of electricity, and when, in

a thunder storm, the rain is pouring down the conduits of a building, their conducting properties are largely increased. Properly connected, these useful appliances can be made doubly valuable as harmless conductors of electricity.

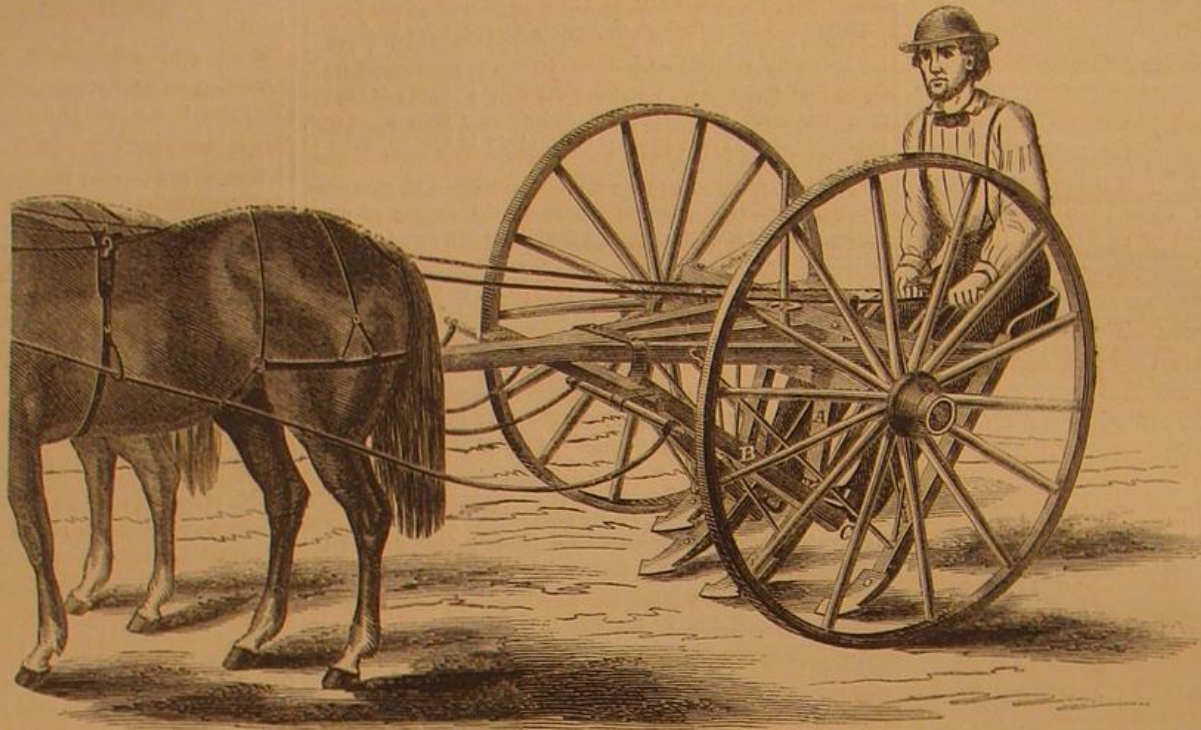
In cities and enterprising towns there are systems of water pipes and gas conductors, of metal, ramifying in the interior of dwellings and other structures. Such buildings should be carefully protected outside. If the conducting medium, whether of water or gas pipes, preponderates in the interior of the building, the electric fluid may leave the external conductor and through a thick wall seek that which facilitates its passage to the earth. In such cases it seems that nothing but a rod, having numerous points for collecting the electricity and adequate means of conveying it innocuously to the earth, would be an effectual protection. Some authorities recommend a connection to be made between the system of water and gas pipes inside a building and the external conductor.

The question of insulation seems to be a disputed one, some insisting on thorough insulation of the rod, by means of a non-conducting substance interposed between it and the building, and others as strenuously maintaining its uselessness. It would seem to be unnecessary, if the conducting capacity of the protecting rod is greater than that of the building itself; and this, after all, is the most important requisite for a protector against the ravages of lightning.

THE *Mahroussee*, built by Samuda, designed by Lang; oscillating engines by Penn; obtained the greatest speed on trial trip ever known, viz., 21½ statute miles an hour. Length, 360ft.; breadth, 42ft.; depth, 29ft.; wheels, 33ft. diameter; tonnage, 3,141; horse-power, 800.—*Engineer*.

[This is in England. Our North River boats have frequently made 26 miles an hour. The *Chauncey Vibbard* ran from New York to Albany, 160 miles, in six hours and forty minutes. In deep water she averaged 24 miles an hour.—Eds.]

A SINGLE establishment in Waterbury, Conn., uses 1,500 tons of copper annually in the manufacture of pins, hooks and eyes, and other similar articles.

**STOVER'S CORN CULTIVATOR.**

sonian Institute show that a tube 6 inches long and 2 inches in diameter, connected with one half the diameter, gave the best results; a funnel-shaped plate inserted at the top improves it.

**HOLT AND THOMPSON'S IMPROVED OILER.**

In our issue of July 28th we illustrated a device, patented April 24, 1866, for preventing the oil from smearing the outside of the oiling can. We here-with present another form of the oiler, intended to maintain always an upright position. It can be used either with or without the globe-valve attachment, shown at A, which was fully described in the number referred to. The can is made of sheet brass,



silver plated, for the sewing machine, and weighted at the bottom, as at B, to bring it to an upright position when accidentally overturned. This is further assured by the form of the can. For common purposes the oiler can be cheaply made by constructing the lower section, from the line, C, of cast iron, thick as seen at D and B, which would further insure steadiness of position by increased weight.

Further information in regard to this neat con-

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SUBDIVISION OF LABOR.

It is claimed by some that the mechanics of twenty years ago were superior workmen to those who have graduated of late years. It is boldly asserted that mechanics, as a class, have deteriorated. We do not subscribe to this opinion, but we will point out briefly some of the reasons why the opinion is entertained.

Twenty years ago the apprentice to an industrial trade was taught all its mysteries, from the preparation of the crude material to the finish and ornamentation of the completed structure. The carpenter took the rough tree bole, and, by chalk line and broad-ax, marked out and hewed it to a square timber. With the common auger, mortising chisel, and mallet, he cut mortises and formed tenons. He framed and erected the skeleton of the building, covered it with boards, made the window-frames, the sashes, laid the floors, worked out the moldings, and finished the whole interior, even to lathing.

The blacksmith forged iron and steel, tempered tools, tired wheels, shod horses, ironed carriages, and repaired agricultural implements. The machinist sometimes chalked out designs, made patterns, and, perhaps, molded them, filed, chipped, planed, turned, bored, polished, estimated on work, built and repaired every sort of machinery, from a steam engine to a wheelbarrow, from a loom to a ship's pump.

All this is changed. No more do carpenters hew their timber; one machine mortises and another forms tenons. Houses are often erected without a single mortise or tenon. Joiners finish the interior. The doors, window-frames, and sashes are made at a factory. Even the glazing is done in large establishments devoted exclusively to that one branch. Lathers are an industrial community by themselves. The farrier shoes horses, the carriage smith irons carriages, the forger hammers away on a special class of work. He may manage the heavy jobs for marine and stationary engines, restrict himself to forging and tempering steel, or form the thousand and one shapes intended for cotton, flax, or woolen machinery; or he may confine himself to the business of forging and fitting tools for working the metals, and in this specialty he becomes an expert, as much above the man who forges and tempers stone drills and chisels as the machine forger is above the country blacksmith. The machinist is a "bench workman," a "planer" or a "turner." He may be

an excellent man in a manufactory of cotton machinery, and comparatively worthless as a builder of locomotives. He may understand thoroughly the construction of looms or the process of making a good spindle for spinning, and be unable to set a valve on a steam engine. The valuable man in a marine engine establishment would be almost worthless in a gun shop.

So there is no parallel by which the workman of twenty years ago can be gaged with the workman of to-day. The whole trouble of comparing the past with the present consists in the necessity which our mechanical progress has compelled of subdividing the departments of labor. It cannot reasonably be expected that those who have been educated to perform a certain work, or do a certain department of work, can be thoroughly booked up in other departments, which, perhaps, may be closely allied to their chosen specialty. In versatility of talent, undoubtedly, the men who learned their trade when the arts were comparatively young, have an advantage. They were compelled to prepare their work, and consequently are the sort of men who are invaluable in a crisis. They are fertile in expedients. They understand what should be done under trying circumstances. They can devise "make-shifts," but not always can they produce a good job.

But our mechanics have not deteriorated. Those who confine themselves to one branch are usually better workmen than those who have spent fifteen or twenty years in practicing at a dozen differing processes. The lather, who makes that his specialty, excels the carpenter who turns from hewing timber to lathing rooms. The forger of tools can work and temper steel better than the blacksmith, who, in one day, forges the crank for a saw mill, tires a wheel, and tempers a knife blade. The machinist who has spent years in the construction of engines, knows more about steam and its agents for transmitting power than he who never repaired an engine.

We look upon this subdivision of labor as a direct means in the improvement of mechanics, as well as a sure method of progressing in the value of our products. Let a man—an apprentice—after learning the general principles of his business, devote his time and energies exclusively to that branch of his trade for which he is best fitted by education and natural taste, and there will in time be no means of drawing a comparison between the mechanics of twenty years ago and those of to-day, to the damage of the latter.

ELEVATED RAILWAY FOR NEW YORK CITY.

The increasing business of this city, year by year, makes locomotion, on the level of the streets, either by public or private conveyances in the roadway, or pedestrianism on the sidewalks, a difficult and vexatious matter. A force of police is stationed at various points on our most crowded thoroughfares, generally at the intersection of cross streets, for the sole, or main, purpose of protecting pedestrians from the attacks of drivers of vehicles. It is a passage of terror, this crossing the streets of the metropolis. The managers of harnessed horses seem to assume that they have the exclusive right to the roadway, even on crossings, and at corners sometimes whisk around them in a way that endangers the lives and limbs of pedestrians. The only relief to this crowded state of our thoroughfares is a means of conveying passengers between different points without coming in connection with the press of vehicles on the streets. Two plans have been proposed: One that of subterranean travel by means of tunnels, and the other of elevating the roadway of passenger cars above the street.

To the first there are solid objections. Manhattan Island, especially at its upper portion, is a mass of rock, which extends so far beneath the surface that, even for sewers, water pipes, and gas conduits, it is necessary to make a way by blasting through the solid rock. The City Council have granted to the "West Side and Yonkers Patent Railroad Company" permission to erect a line of elevated railway on each side of Greenwich street and Ninth avenue, from the Battery to and across Harlem River, on certain conditions, one of which is that the company shall pay five per cent of its earnings, less the National, State, and local taxation, into the city treasury. The tracks will be laid on iron columns at least

fourteen feet high, placed along the curbstones of the sidewalk, twenty feet apart. A trial of the new enterprise will be made on Greenwich street; if this is successful, roads will be built on Broadway and the Bowery. The motive power will be a wire rope running over drums, which are to be driven by stationary engines at about half a mile apart. A device for gripping the rope attaches to the moving line, and allows the carriage to be started or stopped at will. Stations for passengers will be established at certain points in the second story of buildings, when possible, or by outside stairways. The principal designs for this railway were prepared at this office.

COUNSELING OUR ENEMIES.

We doubt very much the statement of the *Engineering*, in an article copied in this issue, that "Mr. Fox, the Assistant Secretary of the United States Navy, was ready to allow our whole fleet to hammer at the *Miantonomoh* for two days, provided we would afterward allow that vessel to work ten hours' havoc on our ships in return." However much we may be inclined to believe what we have heard stated, that the visit of Mr. Fox to Europe, in the *Miantonomoh*, was a private speculation, we cannot believe he was allowed such latitude as this.

We are well satisfied with the fact that we can build the most invulnerable gunboats, and manufacture the most effective artillery, without proving these facts, in time of peace, to the satisfaction of those who may be our enemies, and, in consequence of our own foolish demonstration, be enabled to fight us with our own weapons. In our issue of July 20th we deprecated such an exhibition as that contemplated by Mr. Fox, and from the remarks of our foreign—especially our English—exchanges, we feel pretty certain that we are throwing away all the advantages of our costly and repeated experiments by this free exhibition of one of our most effective ships, armed with our best guns.

Recently Sir S. Morton Peto stated in Parliament that while in this country he had free access to our navy yards, and had explained to him the minutiae of our naval architecture. Surely, it is enough that a foreigner—perhaps an agent of his Government—coming to this country, can be furnished a free pass to our shipyards and foundries, our fortifications, and other governmental institutions, and bear back with him the details of costly experiments, the results of which are invaluable. But, unsatisfied with this means of instructing the monarchies of Europe, we send to their own doors the completion of our exertions, and invite them to copy, and, if possible, improve on them.

This is an entirely new way of proving the *entente cordiale* between nations. The English Government do not open freely the doors and gates of their armories, foundries, and shipyards to the American traveler. Some of their processes are kept profound secrets; but, in our own case, the manner of fabricating our immense smooth-bore guns are minutely described in our journals, and the fact that a visitor is a foreigner is an *open sesame* to the establishments where the work is performed.

It is certain that we cannot hope to conceal, permanently, the results of our progress in naval and other warlike improvements; but, without this gratuitous advertising, they would become known only when we were engaged in a war, where they would be of service to us and of injury to our adversaries. Already the visit of the *Miantonomoh* has stirred the sluggish blood of our trans-Atlantic cousins, and we shall have plenty of copies of our monitors and big guns, all ready to operate against us when a rupture of our peaceful relations shall render it advisable.

REPORT OF THE REVENUE COMMISSION.—From the Secretary of the Treasury we have received the "Report of a Commission appointed for a Revision of the Revenue System." It is a valuable compendium of facts relating to nearly all branches of our industrial resources, obtained from persons directly interested in the business which they represent. Much information of an interesting character is also afforded in regard to the productions of other countries. The volume is a valuable addition to the industrial literature of the country, apart from its importance as a State document.

## AN ABATTOIR FOR NEW YORK.

A new abattoir, somewhat on the French plan, is now in course of construction at the foot of East 106th street, New York. It is intended to supersede the slaughter houses at present existing, which cause a great deal of sickness and mortality in hot weather among those who live in proximity to them.

The building, which is constructed of wood, is divided into three departments—the abattoir, legitimately so called, the size of which is 200 feet by 20 and 19 feet high; the pen for inclosing the cattle previous to killing, which is 200 feet by 40, and which is again divided into 20 smaller pens; and the fat-melting room, 120 feet by 20.

It is built facing the river, upon piles driven into the ground, below high-water mark, and has a platform on the river side with gutters and gratings to carry off all refuse to below low water mark. It is well ventilated by a tower in the center of the room, and the appliances for draining the floor are admirable. The builder is Mr. G. A. Kingsland, Greenpoint. It will be ready for use by the first of September. The method of slaughtering the cattle is as follows:—

They are driven into the small pens, 50 in each, and one by one are taken into the abattoir and hoisted by their hind legs by a simple apparatus till the animal's head is just clear of the ground, when its throat is cut. After it is dead and has ceased to bleed, it is lowered, partly skinned, and rehoisted, when it is dressed and slid along two beams, for the purpose, to the other side of the room, where it is lowered by a crane into an ice boat and sent down the river to the retail dealers.

There are 20 hoisting apparatuses, one opposite to each pen, thus enabling them to slaughter as many as 1,500 bullocks in one day. The blood will be used for fertilizing purposes, the fat melted and sold, and all other matter drained off.

As this abattoir is only for large cattle, it is proposed to build one on the same plan for sheep and other small stock. It is to be hoped the retail dealers will take advantage of this place and hire the use of the apparatus, thus doing much toward improving the appearance and health of the city. It is high time that the filthy and dangerous custom of driving animals through our streets should be stopped. The Health Board has this power, and it would be speedily exercised but for the interference of political judges, who disgrace the bench.

## Spontaneous Combustion of Coal on Board Ships.

The Committee of Lloyd's Salvage Association has issued the subjoined report upon this subject, which has caused the destruction of so many vessels:—

There are a great many opinions afloat relative to the cause of spontaneous combustion, some ascribing it to the chemical composition of the coal, others to the absence of ventilation, either natural or artificial, while others, again, consider it is caused by moisture.

First, As to the chemical composition of coal. Owners know that one kind of coal is more liable to heat than another, and some will not ship that which is dangerous; but others are less scrupulous and ship all kinds. This might be partially checked by obliging owners to deposit at the Customs an analysis of the coals sent by them; they would be afraid of having any fire traced to their coal. But a better method is suggested by Mr. R. Hunt, F.R.S., of the Museum of Practical Geology, in England. A machine has for some time been employed for washing away the iron pyrites or bisulphuret of iron from the small coal at the pit's mouth previous to converting it into coke. While the coal is in transit, the oxygen acts upon the bisulphuret of iron; and evolves great heat; consequently, if the iron pyrites were excluded, a great source of danger would be obviated. The cost is only about 6d. a ton for the washing, and would be amply set off by the lower rate of insurance consequent on greater security.

Second, As to natural ventilation. It is chiefly small coal which heats, there being room in large kinds for the air to circulate between the lumps, but as the Chilian consumer requires small coal for smelting purposes, the only remedy is for shippers to send as large coal as can be used.

Third, Artificial ventilation. Mr. Hunt proposes a method of securing this, but its efficacy has not yet been proved. It is to let down a pipe in the after part of the ship well into the coal, and to let down one in the fore part with the top communicating with the chimney of the cook's galley; this would produce an up draught and keep down the temperature of the coal.

Fourth, Moisture. Coals are in every way liable to get wet. At the pit's mouth they lay uncovered; in the wagons they are not in any way protected, the expense of tarpaulins being too great. While being shipped the hold is open to the weather, and at sea the hatches are frequently taken off, and the spray and sea air must necessarily damp them.

On the whole, the Committee commended to those connected with shipping coal that—

Coal of undue fineness or damp coal should not be shipped.

That a rod similar to those used in British ships should be used every 12 or 24 hours to ascertain the temperature of the coal.

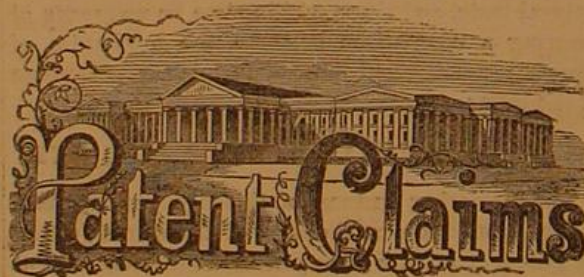
That the proposition of Mr. Hunt for artificial ventilation should be tried.

That the coal should be washed previous to shipping.

## "Gas for Less than Nothing."

Some of the English papers are parading paragraphs under the above heading, which assert that a Mr. Russell manufactures a gas from worthless vegetable substances which leave a valuable residuum; that the gas is of very superior illuminating properties, and by a simple apparatus can be made by any family, etc. The *Journal of Gas Lighting*, says:—

"From inquiries we have made, it appears that Mr. Russell's gas is manufactured from cocoa-nut shells, and that a high value is attributed to the residual charcoal. The process is by no means novel, for as long ago as Feb. 12, 1829, Edward Heard patented 'Improvements in illumination, or producing artificial light,' and cocoa-nut shells were one of the substances from which he proposed to manufacture his gas."



ISSUED FROM THE U. S. PATENT OFFICE  
FOR THE WEEK ENDING AUG. 7, 1866.

Reported Officially for the Scientific American.

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.

56,871.—PUMP.—M. J. Atthouse, Waupun, Wis.

I claim the inserting of a glass, stone, or metallic tube, or lining, into the barrel of a wooden pump, and firmly holding it there by means of rubber, or other elastic rings, in the manner and for the purpose heretofore set forth.

56,872.—BRIDLE BIT.—Stephen D. Arnold (assignor to himself and W. F. Arnold), New Britain, Conn.

I claim the combination of the tube bit, a, with the clasp, d, ring, c, constructed and arranged substantially as and for the purpose described.

56,873.—ANCHOR STOPPER.—George H. Babcock, Providence, R. I.

First, I claim, in anchor stoppers, the employment of a rotating tumbler, B, adapted to receive the link, C, or its equivalent, on a point or points lying in, or nearly in, the axis of rotation, substantially as and for the purpose herein set forth.

Second, I also claim combination with the rotating tumbler, B, sliding rod, D, substantially as and for either or both the purposes above specified.

Third, I also claim, in combination with the rotating tumbler, B, the stationary mousing piece, a', substantially as and for the purpose herein set forth.

Fourth, I also claim an automatically-locking anchor stopper, consisting of the rotating tumbler, B, the sliding rod, D, or equivalent device, and mousing piece, a', substantially as herein described.

56,874.—COAL SCUTTLE AND SIFTER.—C. L. W. Baker, Hartford, Conn.

I claim as a new improved article of manufacture, the scuttle, a, sifter, d, when constructed and arranged substantially as and for the purpose as described.

56,875.—SIDE SADDLE.—Clara A. Bartlett, Oakland, Cal.

I claim a side saddle, having one of its horns arranged thereon and attached thereto, so as to be operated substantially in the manner described and for the purpose specified.

56,876.—WASHSTAND AND DESK.—D. W. Bashore, Erie, Pa.

I claim the arrangement of the water-heating tank, B, with the other two tanks, C and D, in a washstand, and the construction of the waste-water space, E, to adapt the stand to use as a writing desk, as specified.

56,877.—CRUSHING, ROLLING, AND KNEADING MACHINE.—Caleb Bates, Kingston, Mass.

First, I claim the swinging bars, c c, provided with the reversible bars, e e, containing the rollers, G H, and arranged as shown to admit of either roller, G H, being used as the nature of the work may require, substantially as and for the purpose set forth.

Second, The slides, I I, in combination with the spring, F, and screws, E, as and for the purpose set forth.

Third, The perforated receptacle, J, applied to the bars, c c, in combination with the reversible bars, e e, and rollers, G H, substantially as and for the purpose specified.

Fourth, The combination of the receptacle, A, provided with a curved bottom, in combination with the bars, c c, rollers, G H, and swinging bars, c c, all arranged to operate substantially in the manner and for the purpose set forth.

56,878.—GANG PLOW.—William Battell, Quincy, Ill.

First, I claim the attaching of the axes of the wheels, B B, of the machine to the rear parts of the bars, c c, the front ends of which are attached by hinges, a, to the front part of the frame, A, in connection with the segment bars, D, attached to the rear parts of the bars, c, and the levers, E E, attached to the bars, D, all arranged substantially as and for the purpose specified.

Second, The arrangement of the curved bars, L, attached to the plow beams by links, M, guides, N, with rollers, J, fitted in them, and the levers, O, all arranged to operate substantially in the manner as and for the purpose herein set forth.

Third, The construction of the clevises, H, as shown and described, to admit of the adjustment of the plow beams, as set forth.

Fourth, The thimbles, g, provided with the set screws, h, in combination with the clevises, H, rod, I, and adjustable stays, Q, substantially as and for the purpose set forth.

56,879.—TWEER.—John Bayliss, New York City.

I claim the tweer, A, consisting of the water chamber, B, connecting pipes, D E, water reservoir, C, elbow pipe, H, air chamber, I, and pipe, J, and having an opening, G, combined and operating substantially as and for the purpose represented and described.

56,880.—GRAIN CLEANER.—C. F. Baylor, Clinton, N. Y.

I claim the arrangement of the wheel, H, with its groove, h, lever, F, screen frame, D, with its screens, b b', as described, pressure roller, H, and rollers, C C, constructed and operating in the manner and for the purpose herein specified.

56,881.—PRIVY-SEAT COVER.—William Beach, Philadelphia, Pa.

I claim the cover or lid (B), hinged to the underside of the privy seat, and operated by means of a treadle, substantially as and for the purpose described.

56,882.—LAST.—W. L. Beardsley, Binghamton, N. Y.

I claim placing the bolt and spring in the body of the last in combination with the position of the vertical opening, D, through the heel of the instep block, and the mode of unlocking and detaching said block, as described.

56,883.—STAVE-CUTTING MACHINE.—John Bell, Lancaster, N. Y.

I claim forming the knife with a bevel on the upper side, and combining the knife, when so constructed, with the frame, A, and reciprocating bolt hopper, substantially as and for the purposes set forth.

56,884.—TOOL FOR HOLDING AND DRIVING STAPLES FOR WIRE FENCES.—Albert C. Betts, Troy, N. Y.

I claim a device for holding staples for the convenience of driving the same, composed of a case in which the staples are placed, a slide and spring, and a sliding bar which is actuated by a hammer for driving the staples, all being arranged substantially as shown, so that when one staple is driven by striking the bar, and the latter is moved back, a succeeding staple will be adjusted or thrown in line with the bar for the purpose of being driven, as set forth.

I also claim the placing of the sliding bar, G, in a hinged cap, F, arranged with the case, A, so that when said cap, F, is opened the bar, G, will be out of the way and the end of the case left open for the ready insertion of the staples.

56,885.—DIE FOR SWAGING PISTOL FRAMES.—Charles E. Billings, Windsor, Vt.

I claim the cutting dies herein described, for forming pistol and rifle frames; formed with cavities, c c, and otherwise constructed as specified.

56,886.—ELECTRIC TELEGRAPH.—John Blackie, New York City.

I claim the construction and application of a switch to a line connecting two batteries, in such a manner that the electric current between the batteries may be reversed or transferred from one to the other of the poles of said batteries at will, whereby the batteries shall be made to neutralize each other, and thus remain dormant for the time being, substantially as set forth.

56,887.—FLOUR BOLT.—J. C. Blythe, Perry, N. Y.

I claim the combination of the partitions, E, and hoops, D, either or both, with the arms, B, ribs, C, and cloth of a flour bolt, when the said parts are constructed and arranged substantially as herein described and for the purposes set forth.

56,888.—HORSE SHOE.—Gustave Bonnet, New York City.

First, I claim the peculiar shape of my shoe, as shown in Fig. III.

Second, I claim the rubber band, F, in the combination, and for the purpose specified.

Third, I claim the combination of the shoe with the clamp, D, the hooks, E E, and the band, F, as and for the purpose specified substantially.

56,889.—TAPPING BARREL.—William Boynton, Auburn, N. Y.

First, I claim the solid plug, F, for shutting off the contents of the cask, as above set forth.

Second, Closing the end of the faucet, G, by means of a solid plug and projecting therefrom the tenon, J, for the purpose above specified.

Third, The apertures in the thimble, A, marked 123, and the corresponding apertures in the screw portion of the faucet, H, marked 45 and 6, when used as and for the purpose specified.

56,890.—BREECH-LOADING FIRE-ARM.—Isaac Bradley, Hartford, Conn.

I claim the arrangement of the spring slide, I, in the stock, A, operating with the breech piece, G, provided with the lug, M, in the manner and for the purpose herein specified.

56,891.—STOVE-PIPE DAMPER.—R. Moss Breckenridge, West Meriden, Conn.

First, I claim the rod, A, combined and arranged with the damper plate, C, substantially as and for the purposes herein set forth.

Second, The spring handle, B, at the upper part of the rod, A, combined with the rod, A, and damper plate, C, substantially in the manner and for the purpose herein shown and described.

56,892.—BODY CONFORMATORS.—S. O. Brigham, San Francisco, Cal.

I claim an apparatus or implement for the cutting and fitting of ladies' dresses and other garments, which when applied to the person will adjust itself thereto, and is provided with any suitable means for indicating the line or lines of the seams for the garment to be cut, substantially as herein described.

56,893.—REAPING AND MOWING MACHINE.—Robert Brown, Dayton, Ohio.

I claim, First, The combination of a crown wheel, which is adapted for receiving and forming independent bearings for vibrating rake and reel arms, with a cam, F, which is fixed to the post, E, around which said wheels turn, and which is so constructed as to act upon the inner projecting arms of the rake and reels, substantially as described.

Second, Dishing or opening the crown wheel, D2, for the purpose of receiving the cam, F, and allowing of depression of the inner projecting ends of the reel and rake arms, substantially as described.

Third, The construction and combination of the cam, F, and guard, F', for the purposes substantially as described.

Fourth, In a combined reaping and mowing machine, having a rake attachment substantially as described, I claim providing means, substantially as described, for making flexible or rigid the joints at e', substantially as specified.

Fifth, The arrangement of the bending and gathering board, L', directly on the jointed drag bar, L, the said board extending along the whole length (or nearly so) of the drag bar, and serving to assist the rake and reel in setting the grain on and off the platform without interfering with the motion of the platform, substantially as described.

56,894.—BAG FASTENER.—William H. Brown, Worcester, Mass. Antedated August 2, 1866.

I claim, first, The combination and arrangement of the segments, A B and C', the lever, D, and link, E, substantially as described.

Second, The method described of securing the clasp against accidental release.

56,895.—FENCE.—William H. Brown, Stockwell, Ind.

First, I claim the combination of the blocks, B and C, and inclined corner stakes, D, with the panels, A, when the blocks, stakes, and panels are constructed and arranged substantially as herein described and for the purpose set forth.

Second, The combination of the long poles or rails, E F, and stakes, G, with the panels, A, of the fence, substantially as described and for the purpose set forth.

Third, Combining the lower top rails, E, with the top of the uprights, a2, substantially as described and for the purpose set forth.

56,896.—COMPOSITION FOR GRINDING AND POLISHING.—N. A. Buhle, New York City.

I claim a compound for grinding and polishing, made as herein set forth.

56,897.—MACHINE FOR MAKING EYELETS.—Edwin B. Butler, New Britain, Conn.

First, I claim the employment of the movable die plates, c, having two or more rows of dies, d, substantially as and for the purpose described.

Second, I claim the male and female dies, constructed and operating as described.

Third, I claim the employment of the clearers, q, in combination with the die plates, c, arranged and operating substantially as and for the purpose described.

Fourth, I claim the employment of the slide plate, n, and pawl, n', in combination with the steps or pins, e, and die plates, c, substantially as and for the purpose described.

Fifth, I claim in combination with the male and female dies the clearer, h', substantially as described.

56,898.—METHOD OF OPERATING STEAM ENGINES.—Samuel G. Cabell, Quincy, Ill.

First, I claim providing for the use of a portion of the spent steam in the cylinder, to fill the vacuum on the opposite side of the piston, previously to the admission of fresh steam for its return motion, by means substantially as herein specified.

Second, The arrangement of a valve or valves in the piston of a steam engine, substantially as and for the purpose set forth.

56,899.—PISTON FOR STEAM ENGINE.—S. G. Cabell, Quincy, Ill.

I claim the combination of the flexible disks, D, with a steam or other piston, operating substantially as herein specified.

56,900.—HORSE NETTING.—J. Cantner and Michael Ulrich, Millheim, Pa.

We claim connecting the lashes B B, with the straps, A A, by means of looping through single holes, a, and holding them by locking lashes or cords, c, substantially as and for the purpose herein specified.

We also claim the metallic clasps, D D, in combination with the lashes, B B, substantially as and for the purpose herein set forth.

56,901.—WHEEL.—Joseph Carlin, Cincinnati, Ohio.

I claim the arrangement of hub, A, having the described concave or dished periphery, C C', and central collar, B, which supports on their inner sides two sets of straddling spokes, F F', substantially as and for the purpose set forth.

56,902.—NEEDLE-FEED SEWING MACHINE.—Wm. H. Cately, New York City.

First, I claim the combination of the mechanism for operating the needle, and varying the extent of the feed with the mechanism for operating the looper, the same being constructed, arranged, and operating substantially as described.

Second, The arrangement of the looper slide, J, so as to be operated directly by the crank pin of the shaft, G, in combination with the arrangement of the needle, so as to be operated directly by the crank pin of the shaft, C, substantially as described.

Third, The construction and arrangement of the plate, K, looper, J', and spring, S, in combination with a needle, which is hung upon a crank pin, substantially as described.

56,903.—WRITING AND DRAWING CARD.—Henry A. Clark, Boston, Mass., and Henry J. Griswold, Norwich, Conn. Antedated Aug. 1, 1866.

What we claim is a card or tablet, first printed upon, and the printing or surface covered with a transparent waterproof composition, so that the surface will receive pencil or ink marks which can be rubbed or washed off without defacing the printed matter, lesson or design, substantially as described.

56,904.—BUTTER TONGS.—J. S. Clark, Auburn, Mass.

First, I claim the combination of the parts marked A B C and D, constructed and arranged in relation to each other, substantially as and for the purposes set forth.

Second, In combination with the plates or pads, D, of the butter tongs, as described, I claim the indentations or ridges, e, formed in or upon said plates, as and for the purposes set forth.

56,905.—TUBE THIMBLE.—Charles W. Copeland, New York City.

I claim the construction of the calorimeter thimble, substantially as herein shown and described, so as to govern the calorimeter and reduce the draught without obstructing the lower part of the tube, as set forth.

56,906.—MACHINERY FOR UNLOADING RAILROAD CARS.—John Dable, Chicago, Ill.

First, I claim the horizontally vibrating arm, d, constructed with a loop, d', crosshead, d2, and provided with a pulley, c2, and anti-friction rollers, in combination with the bridge bearing, d3, all operating substantially as described, for laying the rope evenly upon the drum, c1.

Second, The construction and manner of application of the E E, in connection with the machine herein described for unloading railroad cars, and other receptacles, of their contents, substantially as set forth.

Third, The combination and arrangement of the swivel coupling, e e', drum c1, rope, b, and hinged frame, G, substantially in the manner and for the purpose described.

Fourth, The combination and arrangement of the spring friction device, J, drum, c1, rope, b, and hinged frame, G, substantially in the manner and for the purpose described.

Fifth, The combination and arrangement of the V form spring stop, b2, clutch lever, D, connecting rod, D2, lever, D1, drum, c1, and rope, b1, substantially as and for the purpose described.

Sixth, Connecting the frame or "shears," G, to the sill, A1, by

means of a rod, g, and providing at the same time for adjusting said frame laterally, and establishing it at any desired point, substantially as described.

Seventh, The combination of the convex ends, w w, of the pulleys, h h, with the convex surfaces of the plates or jaws, J J, of the hinged frame, G, substantially as and for the purpose described.

Eighth, The combination with the drum c1, friction brake, J, clutch lever, D, spring stop, b2, connecting rod, D2, lever, D1, rope, b1, and hinged frame, G, substantially as and for the purpose described.

56,907.—PROPELLER SCREW.—Wm. Edward Davis, Jersey City, N. J.

First, I claim the propeller screw blades, A A, cut out of flat metal plates, and bent up to shape, substantially as herein described.

Second, I claim the mode of connecting and fastening the separate screw blades upon the shaft of a propeller, in the manner and for the purposes substantially as herein described.

56,908.—GOVERNOR.—John Degnon, Cleveland, Ohio.

I claim the combination of the propeller, B, revolving in water, in the cylinder, A, the spindle, C, and rack, D, applied with the toothed segment, E, attached to the spindle, d, operated through the medium of the gearing, a b, substantially in the manner and for the purpose represented and described.

56,909.—STOP DEVICE FOR SEWING MACHINE.—Albert S. Dewey, Westfield, Mass.

I claim the spring, D, applied to shaft, B, either with or without the hubbed pulley, A E, substantially as shown and used, all arranged to operate in the manner substantially as and for the purpose set forth.

56,910.—WASHING MACHINE.—Wm. M. Doty, E. P. Doty and Ellis Doty, Janesville, Wis.

First, We claim the combination of the spiral springs, c d, fulcrum pins, b, and oscillating washboard, B, constructed as described, and operating substantially as and for the purpose specified.

Second, In combination with the above, I claim the projecting cheek pieces, C, with chamfered edges, constructed and operating substantially as and for the purpose described.

Third, The cleats, F, fastened to the ends of the tub, and provided with sockets to receive the upper ends of the legs, E, which are fastened to the lower edges of the ends of the tub with screws or bolts, substantially as and for the purpose set forth.

56,911.—WASHING MACHINE.—Amos Durant and Henry Gressinn, Stockton, Cal.

We claim the application and combination of the levers, c c and D D, working from different centers, and connected with the plunger, E, and worked by reciprocating motion, as herein set forth.

56,912.—FANNING MILL.—Charles K. Ehle, Greenbush, Wis.

First, I claim constructing the drum with its front side extended upward, and its top extended forward and upward, so as to form a throat through which the wind is discharged immediately beneath the hopper and above the screens, substantially as described and for the purpose set forth.

Second, The combination of the cross bar, I, and perforated screen board, J, with each other, and with the shoe, G, of the mill, substantially as described and for the purpose set forth.

Third, The combination and arrangement of the sieve, P, trough, R, and discharging spout, with each other, with the shoe, G, and with the side, O, of the mill, substantially as described and for the purpose set forth.

Fourth, The combination of the sieves, K L, trough, M, and spout, N, with each other, with the shoe, G, and with the side, O, of the mill, substantially as described and for the purpose set forth.

Fifth, The combination of the inclined board, S, trough, T, and spout, U, with each other, with the shoe, G, and with the side, O, of the mill, substantially as described and for the purpose set forth.

56,913.—PICKER MOTION FOR POWER LOOMS.—Hosea Elliott, Globe Village, Mass.

First, I claim, in combination with the loose crank, N, sweep, X, the lever, R, and the spring, P, for giving motion to the picker-staff, substantially as described.

Second, I also claim operating the picker staff of a loom by means of the appliances that act independently of the driving shaft, substantially as described.

Third, I also claim, in combination, the cam, U, the arm, G, and the cord, F, for drawing the picker staff inward, substantially as described.

56,914.—MODE OF TINTING PHOTOGRAPHS, ETC.—Charles Elveena, San Francisco, Cal.

I claim the mode herein specified of tinting surfaces for use in the arts, by the action of smoke or fumes within a closed chamber, as specified.

56,915.—SAFETY CAGE FOR MINES.—John Evans, Virginia City, Nevada.

I claim the employment or use of the lever, A, spring bar, B, with the friction roller, e, and guide pin, d (or their equivalents), when arranged substantially as described and for the purpose set forth.

56,916.—APPARATUS FOR TEMPERING CHISELS.—William M. Everitt, Malden, N. Y.

I claim the combination of the table, B, and rack, D, with the tub or water bath, A, for the purposes hereinbefore set forth.

56,917.—FISHING APPARATUS.—P. H. Ferl and W. Larkins, Detroit, Mich.

First, We claim a net of the form and construction herein substantially described.

Second, The construction and combination of the tube, A, the arms, F, the bolts, M, with the springs, ropes, and pulleys, substantially as herein described.

Third, The combination of the tube, A, the arms, F, the bolts, M, and the springs, ropes, and pulleys, substantially as herein described, with the net for the purpose of spreading, casting, and sinking the same, substantially as described and for the purpose hereinbefore set forth.

56,918.—CHURN.—Wesley S. Ferrier, Indiana, Pa.

I claim the combination and arrangement of the dashers or beaters, B B, shafts, c c', with the shafts F F', and gear wheels, G G, gear wheels, H, all for the purposes and substantially as herein described.

56,919.—PIPE WELDING FURNACE.—Joseph Fieldhouse, Taunton, Mass.

I claim the arrangement of the fuel supply throats, c c c c, of the welding heat chamber in the partition, G, which separates it from the oven, and with respect to the fuel supply throats, D D D D, of the fire place of the oven, substantially in manner as specified.

I also claim the combination and arrangement of the series of bridges, C C C, with the oven and its fire piece, the welding heat chamber and the two series of fuel supply throats, c c c c, D D D D, arranged in the side wall of the oven fire place and in the partition wall, G, substantially as specified.

56,920.—PEN AND PEN-HOLDER.—G. T. Foster, Jersey City, N. J.

I claim a single or double pointed pen connected with the holder by a swivel joint constructed as and for the purposes set forth.

I also claim in combination with the above, the offsets in the case, substantially as and for the purpose specified.

56,921.—BOOTS AND SHOES.—Samuel T. Fowler, Brooklyn, N. Y. Antedated July 27, 1866.

I claim securing to the soles of boots and shoes, india-rubber soles by means of screws, the washers upon said screws being expanded into guards, as shown in the drawing and described herein.

56,922.—SPINNING MULE AND JACK.—John Goulding, Worcester, Mass.

First, The combination in a spinning machine of the following

instrumentalities, viz, the carriage and jaws for the wings, and the stationary turning spool support, substantially as set forth.

Second, The combination in a spinning machine of the following instrumentalities, viz, the stationary jaws, stationary turning spool support, traveling jaws and carriage, substantially as set forth.

Third, The combination in a spinning machine of the following instrumentalities, viz, the traveling carriage, the shaft thereof, and ropes for turning the said shaft, substantially as set forth.

Fourth, The combination in a spinning machine of the following instrumentalities, viz, the drum for imparting motion to the spindles, pulleys, endless rope, tightening pulley, and adjustable weight, substantially as set forth.

Fifth, The combination in a spinning machine of the following instrumentalities, viz, the drum for imparting motion to the spindles, pulleys, endless rope, tightening pulley, adjustable weight and second tightening pulley, substantially as set forth.

Sixth, The combination in a spinning machine of the following instrumentalities, viz, the regulating wire, friction brake, and drum for imparting motion to the spindles, substantially as set forth.

Seventh, The combination in a spinning machine of the following instrumentalities, viz, the drum for imparting motion to the spindles, pulleys, endless belt, tightening pulley, and cams, substantially as set forth.

Eighth, The combination in a spinning machine of the following instrumentalities, viz, the drum for imparting motion to the spindles, friction brake and cam, substantially as set forth.

Ninth, The combination in a spinning machine of the following instrumentalities, viz, the arm of the backing-off mechanism, shifting screw and section nut, substantially as set forth.

56,923.—BRIDLE BIT.—F. N. Frost, New Britain, Conn.

I claim a bit for horses or other animals, made of a closely coiled or spirally wound metallic wire, substantially as described.

In combination with the above, the use of a chain or its equivalent as and for the purpose specified.

56,924.—HAY LOADER.—Austin Fuller, Plymouth, Ind.

I claim the hereinbefore described arrangement of a hay loader consisting of a derrick, C, mounted upon the center of one side of the rack, and sustained by the transverse timbers, B and B' so as to turn freely in all directions and by a guy, I, attached to a post, D, upon the opposite end of the timbers and restrained from turning by another guy, H, substantially as described.

56,925.—LOOM.—A. P. Garetson, Ripley, Ohio, and J. M. Hoffman, Miami, Ind.

We claim, First, The endless belt, C, and picker, A, with the hooks, H, and side binders, G, fastened in the breast beam, B, and the pin, K, in the lathe, J, all arranged as described for the purpose of vibrating the shuttle.

Second, The shedders, M, with their projections, N, and elevators, P, passing through them, with the arms, Q, and reacting pulley, T, on the cam shaft, R, when arranged and combined as herein described and for the purpose set forth.

Third, We also claim the square block, W, on the shaft, R, with the falling block, X, when operated by the lathe as herein described.

56,926.—CLOTHES DRIER.—Stephen L. George, Decatur, Mich.

I claim the arrangement and combination of the crank pulley, C, tightening pulley, K, grooved pulleys, D D, with the posts, B B, constructed and operated as herein described and for the purpose set forth.

56,927.—HYDRANT.—Napoleon B. Gousha, Baltimore, Md.

I claim, First, The perforated hollow screw valve, D, in connection with the flange, c, leather washer, f, as constructed and arranged in combination with the chamber, B, neck, a, and supply pipe, C, substantially in the manner and for the purpose herein set forth.

Second, The combination of the perforated hollow screw valve, D, with the wrench rod, F, and cup or valve, e, substantially in the manner and for the purpose as set forth.

56,928.—SCISSORS.—W. W. Grier and R. H. Boyd, Halton, Pa.

We claim providing shears or scissors with the ripping hook, a, substantially as and for the purpose set forth.

56,929.—HEAD BLOCK FOR SAW MILLS.—J. A. Griggs, Charleston, Ill.

I claim the setting of logs to circular saws by means of a bar or handle passing over the log and saw, to within convenient reach of the sawyer, and connected by a toggle and rock shaft to pawls which engage with racks on the head blocks, substantially as herein shown and described.

56,930.—TRAVELING-BAG FRAME.—Nicholas Groel, Newark, N. J.

I claim the angular encasing metallic band, D, made as described, for strengthening the hinged portions of a traveling-bag frame, substantially as and for the purpose specified.

56,931.—SHOW CASE.—Joel Haines, West Middleburg, Ohio.

I claim the revolving shelves and rack or frame constructed and arranged substantially as described for the purpose set forth.

56,932.—WASHING MACHINE.—C. H. Hale, Fayetteville, N. Y.

I claim the arrangement of the perforated and ribbed washboard, and covered rollers, E, in combination with the adjustable springs, K, as herein described, and for the purposes set forth.

56,933.—KEY FASTENER.—Marshal P. Hall, Manchester, N. H.

I claim the devices herein described, that is to say the notched piece, a, or its equivalent, entering the key hole at one point, and secured to the key at another point by the clamp, c, the washer, w, and the nut, n, or their equivalents.

56,934.—FRUIT JAR.—B. J. Harris, Harrisburg, Pa.

I claim the open mouthed can, A, provided with corrugations and groove arranged and used with the cross bar, B, and top, C, substantially in the manner and for the purpose herein specified.

56,935.—PERPETUAL CALENDAR.—Horace Harris, Newark, N. J. Antedated July 25, 1866.

I claim the table, B, arranged to slide by the days, C, substantially in the manner and for the purpose set forth.

56,936.—HORSE HAY FORK.—Samuel Harris and D. Harris, Shippenburg, Pa.

We claim the two pairs of bars, a a, pivoted at their upper ends to a cross bar, c, in combination with the levers, B B', and forks, C C, connected or applied to the bars, a a, as shown and provided at their upper ends with the hook, f, and slotted bar, E, or other equivalent fastening to connect the rod, A, with the levers, B B', all arranged substantially as and for the purpose set forth.

56,937.—FISHING-LINE REEL.—A. B. Hartell, New York City.

I claim the screw, a, in combination with the fixed stud, b, of the reel, substantially as and for the purpose specified.

56,938.—LEATHER-CHAMFERING MACHINE.—C. H. Helms, Poughkeepsie, N. Y.

First, I claim the cutter wheel having a projecting rim with a beveled face in combination with a cutter arranged in the said rim, substantially as hereinbefore set forth, for the purpose of chamfering or searing pieces of leather.

Second, I also claim the combination of a standard composed of two parts, substantially as hereinbefore set forth, with a guide plate, for the purposes as hereinbefore described.

Third, I also claim the method of clamping or holding the piece of leather at its back side, and back of the edge of the cutter, substantially as hereinbefore described, in combination with the cutter wheel and guide plate, for the purposes hereinbefore set forth.

56,939.—MAGAZINE FIRE-ARM.—Hiram W. Hayden, Waterbury, Conn. Antedated Aug. 3, 1866.

First, I claim the block, e, formed as a T head to the shank, e', and both occupying grooves in the breech pin, d, in combination with the housing, c, e', having notches for the reception of the ends of block, e, at each side of the breech pin, as and for the purposes specified.

Second, I claim the cross block upon a shank passing into a groove in the breech pin, in combination with a spring to throw said block down into place as the breech is closed, as set forth.

Third, I claim the slide exploding punch fitted as specified, and actuated by forcing the said cross block down to its place as set forth.

Fourth, I claim constructing the hammer with the latch and groove taking the pin on the said cross block, as and for the purposes specified.

Fifth, I claim the combination of the hammer, the cross block, the breech pin and the spring, n, as specified, whereby the said hammer lifts the said cross block, and draws back the breech pin in the act of cocking the piece, and the breech closes itself, as set forth.

Sixth, I claim the combination of the breech pin and sliding carriage conveyor with the lever, t, actuated substantially as and for the purposes specified.

56,940.—SCALE.—Charles E. Hoffman, Jersey City, N. J.

First, I claim making the knife edges, H' J', adjustable in slots, or their equivalents, in the levers, C' and G, and arranged to operate relatively to said levers and their connections, substantially as and for the purpose specified.

Second, I claim making the lever, G, in a single bar, with openings to receive the links, I' P', and to support them centrally therein, by which arrangement I construct the scale at less expense and with less liability of derangement.

Third, I claim receiving the post, M', within openings in the levers, C' and G, so that these parts shall mutually steady and support each other, substantially as herein specified.

Fourth, I claim the rigid posts, e1, e2, and straight knife edges, g1, g2, in contradistinction to flexible links, and hollowed or notched knife or edges, and arranged to operate substantially in the manner and with the advantages herein specified.

56,941.—MACHINE FOR HOLDING AND FILING DOCUMENTS.—Marcus L. M. Hussey, New York City.

I claim an improved letter file, having a removable or sliding door, E, which may be used as such door and also as a paper folder or cutter.

56,942.—GANG PLOW.—Samuel Hutchinson, Griggsville, Ill.

First, The elevating or adjusting of the frame, A, of the machine in a vertical direction in order to regulate the depth of the penetration of the plows, by means of levers, H H', provided with lower segment ends, a, and secured to the sides of frame, A, in combination with the pendulum pins, E E', attached to frame, A, and passing loosely through the axle, D, substantially as shown and described.

Second, The plow frame, I, fitted within the frame, A, and connected by a chain, O, with a plate, N, attached to a shaft, L, over frame, I, whereby the plow frame and plows may be raised when desired, and the plows when at work retained in the ground, substantially as set forth.

56,943.—SLIDING SLATE FOR COMPUTATION CARDS.—George N. Jackson, Chicago, Ill.

I claim the combination with the tabular card of a computing slate arranged to slide therefrom, substantially as set forth.

56,944.—CONVERTIBLE STEREOSCOPE.—William H. Jacoby, Xenia, Ohio.

First, I claim the eye piece, A A' B D D', formed for separate use, or in combination with a stereoscopic case, substantially as set forth.

Second, The arrangement of eye-piece, A A' B D D', lips, E F, chamber, G, and spring H, for the purpose explained.

Third, In the described combination with the elements of claim second, I claim the receptacle, I I' J J', substantially as set forth.

56,945.—DENTISTS' VULCANIZER.—Charles H. James, Cincinnati, Ohio.

I claim the yoke, F F', central set screw, G, and notched flange, B b, arranged and operating substantially as and for the purpose specified.

56,946.—STEAM-ENGINE VALVE.—Andrew Jamison, Taylorstown, Pa.

I claim the saddle-shaped valve, C, and its seats, B and D, made of corresponding shape thereto, when arranged together, substantially in the manner and so as to operate as and for the purposes specified.

56,947.—HOISTING APPARATUS.—Barton H. Jenks, Bridesburgh, Pa.

First, I claim providing for raising or lowering a carriage which is mounted upon an inclined track or perpendicular shaft by means of ropes or chains, and at the same time, to so construct the devices which act upon and move the wheels of said carriage, that should the hoisting rope or chain break, the carriage will remain in a steady and safe position upon the track, substantially as described.

Second, The means, substantially as herein described, for holding the upper end of the carriage down upon the inclined track, and preventing lateral displacement.

56,948.—DREDGING MACHINE.—John Johnson, Saco, Maine.

I claim the system or mode of dredging, consisting of an air-tight, flexible supply tube, an air-tight floating barge or vessel, and suitable pumps for removing air water from the vessel, substantially as herein described.

I also claim, in combination with an air-tight floating barge, the discharge valve, V, and the bulk heads, that allow the water to flow over them into the pump well, as it is displaced by the entrance of sand, or other dredged material.

I also claim the cross-tube, K L, in combination with the main supply tube, as specified.

I also claim the combination of the cross-tube, K L, with its bearings, I P', for the purpose of raising and lowering the tube without disturbing the position of the orifice through which the mud or sand passes.

I also claim the combination of the cross-tube with the cap or stopper, C, so fitted that it can be taken off for the purpose of removing obstructions, substantially as herein set forth.

56,949.—AERO-GAS BURNER.—Wm. Jones and M. H. Collins, Chelsea, Mass.

We claim the improved aero-gas burner, that is, one made with or having a means of closing, and more or less opening its air inlet or inlets, as specified.

We also claim the combination of the removable deflecting dome or cap, C, made with eduction orifices in it and near its base or lower part, with the aero-gas burner, as specified.

We also claim the peculiar mode, as described, in which to construct the aero-gas burner, viz: by uniting its two parts, A B, by screws, a b, and arranging the air-inlet holes of upper part, A, with respect to such screws, in manner as specified.

56,950.—WASHING MACHINE.—Albert Joyner, Elton, Wis.

I claim the manner, substantially as shown, of keeping the journals on which the rubbing concave is suspended in their bearings.

56,951.—SNAP HOOK.—Oliver S. Judd, New Britain, Conn.

I claim securing one end of the spring, g, in the heel of the shank of the hook or latch, while the other end bears against the opposite side of the chamber, and thereby produce a pulling motion, substantially as and for the purpose described.

56,952.—LAMP CHIMNEY.—Anson Judson, Brooklyn, N. Y.

I claim constructing a lamp chimney in the form hereinbefore

set forth, to prevent the fracture of the chimney by the unequal exposure to heat to which other forms are subject.

56,953.—BROOM HEAD.—J. W. Keene and W. E. Snediker, Utica, N. Y.

First, We claim the extension rod, F, in combination with the links, L L, and the straps, M M M, or their equivalents, constructed and operating substantially as described.

Second, The head, A, in combination with the arms, G G, or their equivalents, constructed and operating substantially as described.

Third, The slotted ferrule, C, the nut, E, and the cap, D, in combination, substantially as described, and for the uses and purposes mentioned.

56,954.—MACHINE FOR MAKING FORKS.—Horace B. Kinney, Leonardsville, N. Y.

I claim, First, Spreading and swaging the split blanks of two or many-tined forks by means of a die block and supports, constructed and operating substantially as described.

Third, The adjustable yoke-support, k, or its equivalent, in combination with a wedge-shaped reciprocating spreading die, substantially as described.

Third, Sustaining the tang and the tines of a fork blank during the act of forming the shoulders, against and between supports, constructed and arranged substantially as described.

Fourth, The movable shoulder plates, g g, in combination with back supports, N, and a reciprocating die or dies, H, substantially as described.

Fifth, The yoke, K3, with shoulders on it, in combination with a reciprocating shaping die, H3, or its equivalent, for shaping the forks after their lines have been drawn out under the hammer, substantially as described.

Sixth, The combination of splitting shears, J, with a fork bending and swaging machine, constructed substantially as described, said shears being actuated by the driving shaft of the swaging dies, substantially as described.

Seventh, The gages, S S', to support the fork blanks in proper position, during the operation of the shears in splitting these blanks, constructed and arranged substantially as described.

Eighth, The dies, constructed and arranged substantially as described, for making rounded or square shoulders at the junction of the tines of the fork blank with the tang or head, as set forth.

Ninth, The guide blocks, P P, in combination with adjustable shoulder plates, g g, or their equivalents, supported substantially as described, and reciprocating dies, H H, the guides, P P, closing the dies, H H, in their forward movement toward plates, g g, substantially as described.

56,955.—WASHING MACHINE.—Adolph F. Kuhlmann, Glenhaven, Wis.

I claim, First, The soap roller, K, in combination with the feed board, h, and oscillating shaft, c, constructed and operating substantially as and for the purposes described.

Second, The feed rollers, g g, in combination with the oscillating rubbers, E, wash-board, e, soap roller, k, and feed board, h, constructed and operating substantially as and for the purpose set forth.

56,956.—STEAM-ENGINE GOVERNOR.—T. S. La France, Elmira, N. Y.

I claim, First, A governor for a steam engine, having balls, G, supported upon the vertical arms of nut levers, E, which with the divergence of the balls, when in action, raise the weight, D, and actuate the valve rod, substantially in the manner set forth.

Second, I claim, in the mechanism of such a governor, the arms, C, attached to the spindle, B, and forming the fulcrum for the nut levers, E, substantially as set forth.

Third, Arranging the balls, G, upon the vertical arms of the nut levers, E, so as to regulate their action by altering their distance from the fulcrum, substantially as set forth.

Fourth, In combination with the flange, D', and lever, E, I claim the friction roller, F, the said parts being arranged substantially as and for the purpose set forth.

Fifth, In combination with the ball, D, and balls, G, I claim the spiral spring, I, substantially as and for the purpose set forth.

56,957.—STEP LADDER.—John S. Lash, Philadelphia, Pa.

I claim, First, The combination of the eye plates, c, socket plates, d, extension braces, F F, and hinged center bar, G, the whole constructed and operating substantially as and for the purpose set forth.

Second, Providing the top step, C, of a step ladder, with a hinged leaf, C', substantially as described.

56,958.—CENTER CHILL FOR CAR WHEEL.—John W. Latcher, Albany, N. Y. Antedated July 24, 1866.

I claim the employment of the metallic center chill or core, C C', constructed and held, substantially as shown and described, in combination with the periphery chill, as set forth.

56,959.—WASHING COMPOUND.—W. Leonard and J. J. Johnston, Allegheny City, Pa.

We claim the compound herein described, compounded of the ingredients named, and in the quantities specified, said ingredients being manipulated and treated in the manner and for the purpose herein described and set forth.

56,960.—HORSE RAKE.—P. Lugenbell and T. Barns, Greensburg, Ind.

We claim, First, A horse rake for gathering hay, etc., when constructed with wheels, C C, and a revolving axle, D, and two or more rows of teeth, E E, attached thereto, and having, also, reciprocating bars, I I, corresponding in number with the rows of teeth for checking the revolution of the axle and teeth, as they are successively brought into action, substantially as set forth.

Second, In combination with the bars, I, attached to the axle, we claim the wings, M, attached to the wheel and guides, k, with the flange, K', for alternately checking and permitting the revolution of the axle and teeth, substantially in the manner set forth.

Third, In combination with the bars, I, we claim the lever, F, and bell crank, H, arranged substantially in the manner and for the purpose set forth.

56,961.—GRAB TOOL FOR OIL WELLS.—J. H. Luther, Petroleum Center, Pa.

I claim the grab herein described, the same consisting of the hollow cylinder or tube, A, provided with grab jaws, B, connected to a common loose collar, D, and spiral spring, or its equivalent, when all constructed and connected together, substantially as described and for the purpose specified.

56,962.—FLOOD GATE.—Jeremiah Maebly, Portage, Wis.

I claim the tilting gate, c, pivoted so that the pressure of the water thereon shall cause it to open and close in the manner substantially as herein shown and described.

56,963.—WAGON.—Charles S. Martin, Milwaukee, Wis.

First, In combination with the bars, G, having shoulders resting upon the plates, S, and the plates, S, I claim the tapering india-rubber spring, E, substantially as and for the purpose set forth.

Second, I claim constructing the hind bolsters of a wagon with a recess, E', for the purpose of receiving an india-rubber spring, and with or without the strengthening plates and bands, M, substantially as set forth.

Third, I claim the double cups, I, and the caps, K, in combination with the india-rubber springs, in the form of frusta of cones or pyramids, the several parts being constructed and arranged for use, substantially in the manner and for the purpose set forth.

Fourth, In combination with projections upon the bolster plate, P, I claim a corresponding depression upon the top of the plate, covering the caps, K, substantially as and for the purpose set forth.

56,964.—COFFEE ROASTER.—H. B. Masser, Sunbury, Pa.

I claim a coffee roaster, composed of a wire cloth receptacle, with a flange fitted upon it, and provided with a stirrer and handle, substantially as shown and described.

56,965.—SAWING MACHINE.—James D. Matthews, Bowling Green, Ohio.

I claim the saw blades, hung to a common holder in such a man-

ner as to open from and close upon each other, in combination with a frame, A, or its equivalent, to receive the said saw-blade holder, when arranged together, and operating substantially in the manner and for the purpose described.

56,966.—BELT COUPLING.—James Mattix, Kokomo, Ind.

I claim the hereinabove described device for adjusting the length of belt couplings without removing the clasp, B B, by the insertion of a three-sided link, d', the ends of which are riveted by a yoke, E, attached to the screws, F, substantially in the manner set forth.

56,967.—EYE GLASS.—Edward Maynard, Tarrytown, N. Y.

I claim a stay or nose piece in combination with the frame of eye glasses, substantially in the manner and for the purpose herein set forth.

56,968.—HORSE RAKE.—William McCord, Sing Sing, N. Y.

I claim, First, Setting upon the four supports, D and E, an adjustable frame, A, upon which the whiffletree is placed, in the manner and for the purpose above described.

Second, The gathering fingers, C, to aid in depositing the hay in a compact row, in the manner described.

56,969.—CORN PLANTER.—O. C. McCune, Darby Creek, Ohio.

I claim the combination of the lever, Q, toothed segment, P, pinion, O, wheel, N, slides, K, and valves, e, all arranged as and for the purposes set forth.

56,970.—MACHINE FOR MARKING GROUND FOR PLANTING.—Preston W. McQuaid, Wenona, Ill.

I claim the frame, A, with draught hole, B, attached and having two marking wheels, C C, fitted within it on axles working in fixed bearings, in combination with the adjustable or rising and falling wheel, D, fitted within the frame, A, and connected with the driver's seat, F, substantially in the manner as and for the purpose herein set forth.

56,971.—PROCESS FOR THE REDUCTION OF FIBROUS SUBSTANCES TO A PULP.—Harrison B. Meech, Fort Edward, N. Y.

I claim, First, Reducing fibrous substances to a pulp by means of chlorine gas under pressure, in combination with an alkaline solution.

Second, The use of chlorine gas under pressure for the purpose of dissolving the glutinous substances during the first process in the preparation of paper stock from wood or other fibrous substances.

Third, Using chlorine gas under pressure in dissolving silica in fibrous substances, and then converting said substances into pulp and retaining the silica in the pulp.

Fourth, Reducing fibrous substances to a pulp for the manufacture of manilla paper by means of chlorine gas under pressure, in combination with the solution, herein described.

56,972.—FRUIT GATHERER.—S. Mellinger, Jr., Mount Pleasant, Pa.

I claim the combination of the toothed jaws or frames, A A2, hinged together with a bag or receiver secured to one when the whole is swiveled or pivoted to a suitable handle so as to swing in right angular planes thereon, substantially as and for the purpose described.

I also claim the trigger and cord, connecting it with the jaws or frame, A2, as and for the purpose specified.

56,973.—PADDLE WHEEL.—James Merkel, Mount Pleasant, Iowa.

I claim the combination of the stationary cam plate, M, anti-friction rollers, R R, and radially-reciprocating paddles, with a drum, H G, having the spaces between the paddles fitted and all constructed and arranged to operate substantially as described.

56,974.—LAMP.—Rufus S. Merrill, Boston, Mass.

I claim, First, The combination with a collar fitting over the top of a lamp of a central tube secured to said collar and extending therefrom toward the bottom of the lamp, substantially as and for the purposes herein shown and described.

Second, The combination with a lamp collar provided with a groove, or the equivalent thereof, as herein described, I claim the cylinder or tube having a flange around one end and longitudinal slits or grooves in its sides, the whole being arranged for operation as set forth.

56,975.—STOVEPIPE DAMPER.—Benjamin F. Miller, New York City.

I claim the divided case, f, fitted for the reception of the damper and for setting between the lengths of stove pipe, said case being provided with flanges attached together, as and for the purposes set forth.

56,976.—HARNES MOTION FOR LOOMS.—Charles Miller, St. Louis, Mo.

I claim the arrangement and application of a set of levers, D1 D2, to produce the loom harness motion, substantially as set forth.

56,977.—AXLE BOX.—M. V. Miller, Manchester, Pa., and George Henry, Steubenville, Ohio.

We claim, First, The plate, P, slots, G, in combination with the springs, F, journal box, B B', and case, A, when arranged as in the manner and for the purpose set forth.

Second, The combination of case, A, journal box, B B', axle or journal (x), springs, F F, stops, G, and plate, H, constructed and arranged substantially as shown and described and for the purpose set forth.

56,978.—APPARATUS FOR COOLING LIQUORS.—T. H. Miller, Allentown, Pa.

I claim the metallic-lined box, A, provided with the lid, D, with rubber strips, g, and tubes, C, to allow the bottles to be placed, forming a receptacle between each tube for the ice, F, the whole being arranged as and for the purposes herein set forth.

56,979.—HEATING STOVES.—G. Moody and W. P. Hall, Piqua, Ohio.

We claim, First, The lower hot-air chamber, E, in combination with the upper hot-air chamber or oven, H, with a flue and air passage for conducting heated air from the lower to the upper chamber, substantially as shown and described.

Second, In combination with the hot-air chamber, N', and the perforations, n, we claim the hinged adjustable grate with the ball or pawl, l, and the ratchet, l', substantially as shown and described.

Third, In combination with the lower chamber, E, and the upper chamber, H, with flue, and air passages communicating between them, as described, we claim the movable plate, G', as and for the purpose described.

Fourth, In combination with the flue, w', and throat, t, we claim the damper, I, to perform the double function of a damper and scraper, substantially as described.

56,980.—WRENCH FOR NUTS OF CARRIAGE AXLES.—Charles N. Morgan, Granby, Mass.

I claim the device for attaching the nut to the wheel, consisting of jaws, c, c, screws, D, and plate, E, provided with the socket, G, the whole combined and arranged in the manner and for the purpose herein described.

56,981.—CHUCK.—Rufus W. Morse, East Berlin, Conn.

I claim the combination of the case, g, sliding jaws, e, with the stocks, a a', substantially as and for the purpose described.

56,982.—FRUIT DRIER.—G. R. Nebinger, Lewisberry, Pa.

I claim, First, A dry-house for fruit, having the side walls made double, with an interior opening at the top, and an adjustable exterior opening at the bottom, as shown in Fig. 1, in combination with the hollow rear wall, D, having the air passages and valve, M, arranged as shown in Fig. 2.

Second, I claim arranging the racks, e, so as to form the passages for the hot air at the opposite ends alternately, for the pur-

pose of causing it to pass both over and under all the racks, as set forth.

Third, In combination with the rack, e, arranged as shown and described, I claim the furnace, B, with the inclined shield, C, when constructed and arranged to operate substantially as set forth.

Fourth, I claim the extension of the smoke pipe, F, within the furnace, B, as and for the purpose set forth.

**56,983.—ARTIFICIAL LEG.—Robert H. Nicholas, Chicago, Ill.**

First, I claim the combination of the jointed connection, C, D, the cushion, G, and spring, E, arranged and operating in the manner and for the purposes specified and shown.

Second, I claim the combination of the cushion, G, spring, E, jointed rod, C, D, and the springs, H, J, arranged and operating as and for the purposes set forth.

Third, I claim in combination with a jointed connection, C, D, allowing a free movement of the foot, the arrangement of the two cords, F, and springs, S, operating substantially as and for the purposes described.

Fourth, I claim the combination and arrangement of the connection, C, D, cushion, G, springs, E, cords, F, and springs, S, operating substantially as set forth for the purposes specified.

Fifth, I claim the recess, L, in the lower part of the leg, when extending around upon the sides thereof, as described, in combination with the heel, L, constructed with a corresponding projection extending around upon the sides of the foot, arranged and operating as specified and for the purposes set forth.

**56,984.—DREDGING MACHINE.—W. H. Nobles, St. Paul, Minn.**

I claim, First, The construction of the adjustable stanchions, E, attached to a boat, as herein described and for the purposes set forth.

Second, I claim the arrangement and combination of the chain, G, pulleys and grappling irons, K, when arranged and combined with the revolving plows, B, as herein described and for the purposes set forth.

**56,985.—FENCE.—Eli Odell, Winterset, Iowa.**

I claim, First, Pivoting the rails, F, or bars, U, to the cleats, Q, or pickets, P, in such a manner as to adapt the panels to the irregularities of the ground, as described, in combination with the notches, M, N, for locking the panels together, as specified.

Second, The hooks, M, N, for coupling the panels in combination with the self-sustaining brace-posts and pivoted rails, made and operating as described.

Third, The transverse brace and supporter, consisting of the long braces, E, E, the collar beam, H, the short braces, F, F, and the spur posts, G, G, or their equivalents, as described.

Fourth, The manner of locking and securing the corners as shown, at R, R, and S, S, in connection with prolonging the boards to supply the want of a collar beam, as shown at J.

**56,986.—JOINT FOR FRAMES AND LEGS OF TABLES.—Solomon Oppenheimer, Peru, Ind.**

I claim a metal clamp for joining the frame and legs of a table, having a socket, A, for receiving the legs and wings, B, with claws, a, for receiving the rails, C, and also lips, b, or equivalent devices, for attaching the top of the table substantially as set forth.

**56,987.—AUTOMATIC GATE.—John G. Page, Rockford, Ill.**

First, I claim in combination with the vertically reciprocating gate, A, the employment of the levers, D, and arms, E, arranged and operating substantially as and for the purposes herein set forth and described.

Second, In combination with the above, I claim the levers, G, and arms, E, arranged substantially as and for the purpose specified.

Third, I claim in combination with the levers, D, weighted upon their short arms as described, the employment of the springs, a, a, or their equivalent, arranged substantially as set forth.

**56,988.—ELECTRO-CHEMICAL TELEGRAPH.—Austin Ford Park, Troy, N. Y.**

I claim the recording of telegraphic signs by electro-chemical action, in a chemically prepared wet or moist line or path made in a strip or fillet of paper, as the latter is moved along to receive the telegraphic signs, substantially as herein set forth.

**56,989.—OBTAINING OIL FROM WELLS.—L. Phleger, Philadelphia, Pa., and George G. Lobdell, Wilmington, Del. Antedated Aug. 2, 1866.**

We claim inducing the flow of oil from a well by melting the paraffin by the application of heat from hot water, conveyed in a circuit through a pipe, substantially as shown and described.

**56,990.—SEWING MACHINE.—D. B. Piper, Winchendon, Mass.**

I claim the combination of the elastic connection, substantially as described (consisting of the yoke, D, the rod, E, and the spring, F, or their equivalents), with the crank or crank wheel, G, of the looper shaft, and with the cam, H, applied to the cam shaft, as described.

**56,991.—MOLASSES PITCHER.—Martin Robbins, Cincinnati, Ohio.**

First, I claim the pitcher, provided with a perforated handle, to which is attached a rubber bulb, for the purposes and substantially as described.

Second, I claim the spout, B, when extending nearly to the bottom of the pitcher, in combination with the handle, C, and bulb, F, substantially as described.

**56,992.—BOOT HEEL.—C. Robinson and J. C. Marshall, Springfield, Mass.**

We claim the combination of the india-rubber strip, C, with the shell, A, and movable bottom, B, arranged so that the edges of the said bottom press against and are supported by the strip, and is covered with or composed in part of leather, substantially as and for the purpose herein specified.

**56,993.—TRUNK ENGINE.—John B. Root, New York City.**

I claim the arrangement of the extended trunk, G, connecting rod, K, cross head or connection, J, and guide, L, in relation with each other, and with the cylinder, piston, and crank shaft, substantially as herein described for the purpose set forth.

**56,994.—MOSQUITO BAR.—E. A. G. Roulstone, Roxbury, Mass.**

I claim a mosquito bar for windows when constructed with a spring, o or n, applied to one or both sides thereof to hold the bar in position with relation to the sash above or below it, in combination with projecting edges or flanges to fit against the window heads, c or m, all substantially as set forth.

I also claim, in combination with a bar made with these projecting edges and springs, as set forth, so applying one of the springs, n or o, that it may be operated from within the bar, to insert or remove the bar, substantially as set forth.

I also claim, in combination with a bar so constructed with springs, o or n, and with a window sash, the employment of the vertical rods, f, for the better securing of the bar, and to enable it to be raised from, and lowered into, position, substantially as described.

**56,995.—DOUGH KNEADER.—Ansell P. Routt, Orange Court House, Va.**

I claim the combination of the two rollers, provided respectively with the round-headed projections and the straight-sided pins, as and for the purpose described.

In combination with the above, I claim the cutters, L, L, substantially as and for the purpose described.

**56,996.—WRENCH.—A. Newton and Frank Favro, Worcester, Mass.**

In combination with the upper movable or hammer jaw and the stationary lower jaw and handle of a wrench, constructed substantially as described, we claim the tip nut in the end of said wrench, when arranged and operating as herein shown and for the purposes set forth.

**56,997.—SMOKING PIPE.—Rufus Norwood, Baltimore, Md.**

I claim, First, A cap, B, constructed and applied to the stem and bowl of a pipe, in such a manner that the stem is connected by it

to the bowl, and at will may be disconnected or adjusted, substantially as and for the purpose described.

Second, The combination of a cap, a, cap, B, and a sliding stem, C, having a plunger applied to it, substantially as described.

Third, The combination of a hollow plunger stem, C, with a pipe, having a detachable cap, B, substantially as described.

**56,998.—KNIFE.—William Sausser, Hannibal, Mo.**

I claim, First, A knife blade provided with a slot, substantially as and for the purpose described.

Second, The spring holder, for the purpose described.

Third, The back spring, B, constructed and operating substantially as described.

**56,999.—LAMP CHIMNEY.—Ejler O. Schartan, Philadelphia, Pa.**

I claim the construction and combination of the glass chimney, jointed and constructed as herein described and for the purposes set forth.

**57,000.—FARE BOX.—J. B. Slawson, New Orleans, La.**

I claim, First, The inclined planes, b c d, arranged in zig-zag form, and provided with knife edges, g, in combination with the box, A, constructed and operating substantially as and for the purpose described.

Second, The recess, h, at the lower end of the inclined planes, c d, substantially as and for the purpose set forth.

**57,001.—SMUT MACHINE.—A. and G. Smith, Flint, Ind. Antedated August 2, 1866.**

First, I claim the spouts, C and p, having the perforations or springs, a, and revolving disk, i, arranged as shown, in combination with the fan, G, for the purpose of extracting the dust and other light refuse from the grain, previous to the latter's entering the smutter, as set forth.

Second, The shaft, g, having the disk, k, attached thereto, and located so as to receive the grain as it falls from the smutter, D, in combination with the duct or passage, l, and fan, G, all arranged and operating in the manner and for the purpose herein set forth.

**57,002.—COAL SCREEN.—J. B. Smith, Dunmore, Pa.**

I claim combining with a series of graduated, meshed screws, a series of smooth conveyers, so that as soon as the coal is separated, it shall be carried out of the machine without any further unnecessary agitation, which only produces waste, substantially as herein described.

**57,003.—BED BOTTOM.—J. G. Smith, Battle Creek, Mich.**

I claim the loops or clasps with the elliptic or spiral spring, in combination with the bed bottom, substantially as and for the purpose set forth.

**57,004.—ERASER.—Ruel Smith, Bangor, Me.**

I claim as my invention the new article of manufacture of a bookkeeper's eraser and burnisher, made and operating as hereinbefore set forth.

**57,005.—HARVESTER.—Willis W. Lowles, Manlius, N. Y.**

I claim the arrangement of devices for operating the cradle or receptacle, R, so as to discharge the grain delivered thereto from the cutters of the machine, the same consisting in hanging their sides, a (one of which is weighted), so as to swing, said sides being connected to a common beam or lever, e, by rods, d d, upon which beam rests a horizontal lever bar, h, having a pendent arm, o, with its stud, q, in combination with the snail, t, and friction pulley, o, of the apron shaft, J, or its equivalent, of the machine, the whole being arranged together, and operating substantially in the manner described.

**57,006.—GAS MAIN.—J. N. Stanley, Brooklyn, N. Y.**

I claim as an improvement in hydraulic mains for gas works, the combination with the elliptical or cylindrical main pipe, C, of the external supply tubes, D D D, cast in one piece, with the pipe, c, and communicating with the lower part of the latter, as herein specified, and for the purposes set forth.

**57,007.—CULTIVATOR PLOW.—William W. Stillman, Mt. Hawley, Ill.**

I claim the shank, B, the collar, C, and the clamp, E, arranged and used substantially in the manner and for the purpose set forth.

**57,008.—DEVICE FOR GATHERING FRUIT.—Warren H. Stone, St. John's, Mich.**

I claim the combination of the flexible tube, E, apron, D, with the frame, A, or its equivalent, all for the purposes and substantially as herein described.

**57,009.—PROCESS FOR RIPENING LIQUOR.—William Mont Storm, New York City.**

I claim subjecting liquors to violent agitation in a closed vessel while subjected to a pressure of oxygen gas, the liquor at the same time being made to constitute part of a galvanic circuit, substantially in the manner and for the reasons set forth.

**57,010.—PRESSER-FOOT OF SEWING MACHINE.—A. J. Tewksbury, Haverhill, Mass.**

I claim the device hereinbefore described, consisting of arm, A, screw, S, and spring, P, and affixing the same to the ordinary solid pressure pad, for the purpose of changing it into a flexible pressure pad, and applying the whole in connection with the feed wheel of a sewing machine, as and for the purpose set forth.

In combination with the above, I claim the holes, l, l, whereby the degree of pressure of the spring, P, upon arm, A, may be adjusted for different thicknesses of material.

**57,011.—DRILLING MACHINE.—R. A. Thomas, Damascus, Cal.**

I claim, First, The combination in a machine for drilling rock in drifts and tunnels of the stanchion post, B, the bar, C, that supports the feed screw and drill, and the adjustable box, H, constructed and arranged substantially as described.

Second, I also claim the square box, L, fitted to the stocks of the drill and feed screw, substantially as described, so that they can be connected at pleasure.

**57,012.—LIFE-BOAT.—George H. Tier, Fremont, Ohio.**

I claim, First, The air chambers, E E, with the compartments, a a a, as constructed and arranged with the sides, B B, for the purpose and in the manner set forth.

Second, The curving deck, F, the bottom, C, as arranged in combination with the curving sides, B B, the sides, D D, chambers, E, in the manner and for the purpose substantially as described.

**57,013.—STRETCHER.—Charles H. Tompkins, U. S. Army.**

First, I claim the frame, A, of a hand carriage stretcher, constructed with a transverse joint which is provided with bolts, a, a, for stiffening it, and is also constructed with binged legs, B B, and with jointed leg rests, J J, which are adjustable, and with a head rest, D, which is also adjustable, all substantially as herein described and for the purposes set forth.

Second, The open hand carriage stretcher frame, A, in combination with the adjustable divided leg rests, J J, and sliding bottom, G, substantially as and for the purpose set forth.

Third, Attaching the canvas bottom, G, at one end of the hinged frame, D, and at the other end to a sliding bar, H, having locking braces, d, d, or their equivalents, applied to it, substantially as described.

Fourth, The combination of the jointed supports, D, adjustable head rest, D, and the jointed stretcher frame, A, substantially in the manner and for the purposes described.

Fifth, The application of a flexible arm rest, K, to the stretcher, substantially as described.

Sixth, The hand carriage stretcher frame, A, constructed with a transverse joint near its middle, with an adjustable bottom, G, and with adjustable and sectional rests, J J, for the legs of a person, substantially in the manner and for the purpose described.

Seventh, Connecting the stretcher to transiting wheels by means of the sliding fastening, or its equivalent, which is so constructed that the wheels can be attached or detached at pleasure, as set forth.

Eighth, Constructing the axletree of the carriage wheels of the stretcher of folding sections jointed together, and provided with means for stiffening the joints, substantially as described.

Ninth, Attaching the carriage wheels to the loose screw collars, p p, upon the axletree, so that these wheels can be removed or applied at pleasure without the use of detachable nuts or other similar devices, substantially as described.

**57,014.—CAR COUPLING.—Henry H. Trenor, New York City.**

I claim the combination with the trucks, of a coupling bar extending throughout the whole length of the car, so that the cars shall be relieved from the strain due to the traction of the whole train, substantially as herein shown and set forth.

**57,015.—CAR BRAKE.—Henry H. Trenor, New York City.**

I claim the arrangement and alternating connection of the brakes, as herein described, by means of rods actuated by cranks mounted on horizontal or vertical axes, and vibrated through the intermediary of chain and windlass, or the mechanical equivalent thereof, by hand, steam, or other power.

**57,016.—COMPOSITION FOR LINING BARRELS.—H. W. C. Tweddle, Pittsburgh, Pa.**

What I claim is the use of common glue or gelatin mixed with a small quantity of bichloride of mercury, as a coating for the interior of barrels for holding petroleum, turpentine, and other articles.

**57,017.—LAMP AND CANDLE STAND AND HOLDER.—Gabriel Utley, Chapel Hill, N. C.**

I claim the lamp or candle stand constructed substantially as described, with a base, and spring arms with socketed termination.

**57,018.—MACHINE FOR TENONING SPOKES.—Oliver Vanorman, Ripon, Wis.**

First, I claim the combination of the knives, G and I, the levers, C, the spring, F, the adjustable gage, K, the adjustable face plate, H, the crane, L, and adjustable presser, M, with each other, and with the bed pie e, A, substantially as herein described and for the purpose set forth.

Second, The combination of the knives, G and I, the lever, C, the spring, F, the adjustable gage, K, the adjustable face plate, H, and the adjustable side-presser or holder, P, substantially as described and for the purpose set forth.

**57,019.—HAT.—W. F. Warburton, Philadelphia, Pa.**

First, I claim a sweat band secured in the interior of a hat or cap, at intervals, and arranged to be yielding or elastic at a number of points, in the manner and for the purpose described.

Second, The above in combination with the band or ring, C.

**57,020.—GAS APPARATUS.—William Warner and E. S. Redstreake, Philadelphia, Pa.**

First, We claim the combination of spiral or other springs with the disks, D D and D D, arranged and operating substantially in the manner and for the purpose above set forth.

Second, The combination of the induction pipes, B a, exit pipe, C, and disks, D, with the vessel, A, the whole being constructed and arranged in relation to each other for joint operation, substantially as described and for the purposes specified.

**57,021.—ROLLING APPARATUS.—Hervey Waters, Boston, Mass.**

I claim the combination, with a suit of roller dies, of a lateral or cross carriage for holding the work and guiding it to the successive dies.

Also, the arrangement or system of mechanism for moving the carriage laterally, and retaining it in proper position for the action of each pair of dies upon the blank.

Also, the system of die grooves equiangular and rhomboidal in respective joint cross section, substantially as described.

Also, in combination, the rolls, b b, having a suit of die grooves, with the index, m, the holder, z, the index, l, and the stops, l, for determining the position of the blank with relation to the dies, to which it is presented.

**57,022.—VENTILATED VAULT FOR WINE, POTATOES, ETC.—James Weed, Muscatine, Iowa.**

I claim the construction of preserving chambers, having waterproof walls, beneath the surface of the ground, said chambers having communication with each other, and means of access to them, and surmounted by a covering of some non-conductor of heat, substantially as herein described.

**57,023.—HARVESTER CUTTER.—John M. Wehrly, Somerville, N. J.**

I claim the mortised clamping plate, E, in combination with the notched or hook-shank knives, C C, and slotted knife frame, A, substantially as and for the purpose herein specified.

**57,024.—FRUIT BASKET.—Corydon Wheat and Charles Bunge, Geneva, N. Y.**

We claim the band, C, and claps, D and D, when made and used for the purpose herein set forth, in combination with the body of the basket when composed of one piece of stuff.

**57,025.—PITCHER.—Nathaniel J. Whiting, Lawrence, Mass. Antedated Aug. 3, 1866.**

I claim the dripping tube formed in two pieces, one fixed and the other so attached that it can be taken off when the pitcher is to be washed, in combination with the external dripping cup or lip.

**57,026.—HOT-AIR FURNACE.—Harry Whittingham, New York City.**

First, I claim the arrangement of the combustion chamber, B, with a firepot and with a series of vertical and horizontal air flues in combination with the air chamber, C, smoke chamber, D, and hot-air chamber, E, all constructed and operated substantially as and for the purposes described.

Second, The openings, e, in the bottom of the air chamber, C, in combination with the horizontal flues, c, and vertical tubes, b, in the combustion chamber, B, constructed and operated substantially as and for the purposes described.

Third, The air tubes, k, passing from the chamber, C, through the smoke chamber, D, into the hot-air chamber, E, constructed and operated substantially as and for the purpose set forth.

**57,027.—HOT-AIR FURNACE.—Harry Whittingham, New York City.**

I claim, First, The cone, F, in combination with the firepot, A, drum, E, and air pipes, H, constructed and operating substantially as and for the purpose set forth.

Second, In combination with the above I claim extending the air pipes, H, through the bottom of the heating drum, substantially as and for the purpose described.

Third, The annular evaporator, F, in combination with the jacket, B, and heating drum, E, constructed and operating substantially as and for the purpose set forth.

**57,028.—HOT-AIR FURNACE.—Harry Whittingham, New York City.**

I claim, First, The central air chamber, C, with pipes, a b, in combination with the firepot, A, and annular air chamber, E, constructed and operating substantially as and for the purpose set forth.

Second, The arrangement of a series of annular smoke chambers, D F H, with a series of air chambers, C E G, firepot, A, and escape pipe, b', all constructed and operating substantially as and for the purpose set forth.

Third, The annular head or chamber, b, in combination with the escape pipe, b', and with the smoke chamber, H, constructed and operating substantially as and for the purpose described.

**57,029.—HORSE SHOE.—Albert S. Wilkinson, Pawtucket, R. I.**

I claim, First, The combination of the double shoes, A a, toe clip, B, with its loop, c, curved heel clips, b b, with buttons, g g, clamping bands, i i, clamping screw, h, all constructed as described and operating in the manner and for the purpose herein represented and described.

Second, I claim the jam nut, i (Fig. 2), in combination with the clamping or retaining band, f, and clamping screw or bolt, h, substantially in the manner and for the purpose described.

Third, I claim the rubber padding, c, in combination with the heel clips, b, and toe clip, f, substantially in the manner and for the purpose described.

57,030.—HORSE SHOE.—Albert S. Wilkinson, Pawtucket, R. I.

I claim a round bottom or rolling shoe, A, having a toe calk, a', or having toe and heel calks, a' a', substantially in the manner and for the purpose set forth.

57,031.—BED BOTTOM.—J. E. Wilsey and D. Forbes, Chicago, Ill.

I claim the combination and arrangement of the slats, B and A, the latter being provided at their ends with the rabbeted cross bar, D, for the reception of the slats, F, with the spiral springs, G and H, interposed, as shown and described.

57,032.—TELEGRAPH SOUNDER.—Elisha Wilson, New Haven, Conn.

I claim, First, The employment of the open valve stop, v, or any equivalent therefor, to control the sounding at the end, at the mouth, or at the side of air, gas, or vapor-sounding instruments for telegraphic communication.

Second, Modifying the mouth and throat and generally reducing the dimensions of air, gas, or vapor-sounding instruments in order thereby to diminish the amount and force of the current until it ceases to essentially interfere with the free action of the armature lever, l, and valve, directly or indirectly opposed to it, and also to economize the sounding medium used, and to improve the tone for rapid utterance for telegraphic communication.

Third, The combination of the valve, n, and cord, d, to both raise and fill the reservoir in one act, for the same purpose.

Fourth, The combined use of two or more reservoirs in connection or with each instrument of a small expansive reservoir or gas bag, that the supply may be continuous while the reservoir is being raised and filled to supply air for telegraphic sounders.

57,033.—PROPELLING APPARATUS FOR VESSELS.—Daniel Winer, Lockport, N. Y.

I claim the inflated cylinder, A, provided with helical blades the whole length in combination with the inclosing trunk, B, with open ends, arranged and operating substantially as set forth.

In combination with the above-described device, I claim uniting two or more, B, together and inclosing the angular spaces, g', above their points of junction, and a horizontal line touching their peripheries to form a series of air chambers, substantially as shown and described.

57,034.—TYPE-SETTING MACHINE.—Charles Baer (assignor to himself and J. William Krietz), New York City.

First, I claim the revolving type-receiving channel, G, in combination with a series of radiating type cases, c, constructed and operating substantially as and for the purpose set forth.

Second, The lip, e, at the mouth of the type cases, c, in combination with the prongs, g', on the revolving type channel, G, constructed and operating substantially as and for the purpose described.

Third, The cams, g', on the forked mouth of the revolving type channel, G, in combination with the type cases and the line of type contained therein, substantially as and for the purpose set forth.

Fourth, The cams, r, between the mouths of the type cases, c, to act in combination with the line of type in the revolving type channel, G, substantially as and for the purposes set forth.

Fifth, The spring hooks, h, and pushers, e, in combination with the keys, f, and type cases, c, and lips, e, constructed and operating substantially as and for the purpose described.

Sixth, The spring hooks, s, and spring bearer, u, in combination with the revolving type channel, G, constructed and operating substantially as and for the purpose set forth.

Seventh, The adjustable galley, K, with the sliding-rake, M, in combination with the revolving type channel, G, constructed and operating substantially as and for the purpose described.

57,035.—STEAM-JET PUMP.—Charles Barnes (assignor to Warden, Rensford & Co.), Cincinnati, Ohio.

I claim a steam-jet pump constructed substantially as described, with jet perforations, d, and a direct water passage, A B C, as set forth, and for the purpose specified.

57,036.—CASTER.—Thomas Beach, Freeport, Pa., assignor to self and Stanley R. Moorhead.

I claim the cap, d, secured to the socket barrel by the shoulders, n, n', or other equivalent device, and the annular cup, b, the two being constructed, arranged, and combined substantially in the manner and for the purposes above set forth.

Second, A furniture caster, having a socket, a, an annular cup, b, a cap, d, and springs, m, arranged and combined substantially in the manner and for the purposes above set forth.

57,037.—PACKING RINGS FOR PISTONS OF STEAM ENGINES.—John F. Bogardus (assignor to himself and Jos. Anderson, and Thos. K. Schermerhorn), Brooklyn, N. Y.

I claim the arrangement of the packing rings, d, d' and e, with the edges that come in contact, inclined, and the ring, e, narrower at the back than on the face, and not so thick as the rings, d, d', so that the ring, b, and springs, c, shall only act to expand the ring, e, by the contact of the rings, d, with its inclined edges, for the purposes set forth.

57,038.—EXCAVATOR.—Jeremy Bradley, Cedar Falls, Iowa, assignor to himself, Walter Pastley, and S. B. Hewitt, Jr.

I claim, First, Combining with the scoop of a ditching or excavating or grading machine, a reciprocating shovel which is so arranged that it will automatically keep the forward part of the scoop clear of earth, substantially as described.

Second, The combination of the scoop, D', and elevator, a', with a shovel, E, operating substantially as described.

Third, The arrangement of the plows, E E, in front of the scoop, D', in combination with a shovel, E, and a contrivance for elevating earth, substantially as described.

Fourth, Sustaining the forward part of the machine upon transporting wheels, J, by means of the beams, F F', chain, g, and windlass, h, the latter being supported upon a post, K, which passes through a slot in said beam, F', substantially as described.

Fifth, Connecting the transverse beam, F, to the bolster, G, by means of a jointed rod, G' substantially as described.

Sixth, Transmitting motion to the endless discharging apron from the upper roller, a, of the elevating apron, a', by means of a shaft, C, a gimbal joint b, and spur wheels, c, c', substantially as described.

57,039.—BED BOTTOM.—Albert D. Chase, Reading, Pa., assignor to himself and Amos T. Hubbard, Philadelphia, Pa.

I claim the heretofore described mode of suspending the slats of beds, by means of the double hooks, B, rod, C, loop, D, cross piece, E, and plate, F, the said several parts being respectively constructed and combined for use, substantially as set forth.

57,040.—SAFE LOCK.—William B. Dodds (assignor to himself and Neil Macneale), Cincinnati, Ohio.

I claim the L-shaped bolt pivoted in brackets secured to the frame of the door, and moving on a vertical axis under the impulse of the lock and connecting bar, substantially as described.

57,041.—BRICK MOLD.—James M. Ferrell, Philadelphia, Pa., assignor to himself, Wm. H. Siner and Charles H. Dedrick.

I claim, First, The combination of the rods, C D, gears, F F', cams, E, ways I', handles, G, bottoms, L, and frame, A, in the manner and for the purpose substantially as shown and described.

Second, I claim the V-shaped stops, h, h', arranged and operating in the manner and for the purpose substantially as shown and described.

57,042.—MACHINE FOR MAKING NUTS AND WASHERS.—Charles P. Geissenhainer (assignor to himself and Joseph Graff), Pittsburgh, Pa.

I claim the combination of the stationary dies, d and f, with the hollow die or sleeve, g, and punch h, which move together, arranged and operating for the manufacture of nuts, substantially in the manner heretofore described.

57,043.—MACHINE FOR BENDING CHAIN LINKS.—Edward L. Keeler (assignor to himself and Joseph Graff), Allegheny, Pa.

I claim the combination of the mandrel or mandrels, a, projecting from the periphery of a revolving disk, C, the converging dies, D D', and knife set so as to bevel the ends of the link, constructed and operating substantially as and for the purposes heretofore described.

The converging dies, D D', having grooves, o, slightly inclined in different directions in combination with the mandrel or mandrels for the purpose of bending over the ends of the link, without closing the link, substantially as and for the purposes heretofore set forth.

57,044.—SAW SET.—John Lyle (assignor to himself and Cotton H. Allen), Newark, N. J.

I claim a saw set constructed and arranged substantially as herein described and for the purpose set forth.

57,045.—RIVETING MACHINE.—Ransom Lyon, West Troy, N. Y., assignor to himself, A. Shiland, and E. Joseph Gerdorn, Jr.

First, I claim the combination and arrangement as described of stationary frame and sliding frame with hammer, E, which is elevated by the arms, S S, on the driving shaft and forced down by the spiral spring, J, and rotated as described by ratchet wheel, K, in connection with the levers, M, and N, which are acted upon by the crank on the driving shaft; these parts or their equivalents arranged and operating as and for the purpose set forth.

Second, I claim the arrangement of the adjustable bed-plate, T, jaws, P P, opened by spiral spring inserted between, and closed by the action of the arm, W, in connection with the sliding frame, the whole arranged and operating as set forth.

Third, I claim the combination of the adjuster, R, spiral spring, J, rubber packing, F, with hammer, E, substantially as described.

57,046.—SAWING MACHINE.—Salmon W. Putnam, Fitchburg, Mass., assignor to the Putnam Machine Co.

I claim so constructing and operating the frame, I, which carries one or more saws, that it can be revolved entirely around and bring each saw to its desired position in respect to the table, when arranged substantially as described and for the purposes set forth.

57,047.—SEWING MACHINE.—T. K. Reed, East Bridgewater, Mass., assignor to Elmer Townsend, Boston, Mass.

I claim the method of preventing the hook from catching into the bow of the loop through which the needle is passing, by swinging the loop around on the needle, substantially as described.

Also, combining with the hook needle and other mechanism, the reciprocating rod and its finger, the rod receiving its motion and the finger acting on the thread, substantially as set forth.

57,048.—NECK-TIE SUPPORTER.—Theodore Rosenthal (assignor to Julius Solinson, Julius Meyer, and Jacob Schawb), New York City.

I claim the plate or spring, A, provided with projecting spring jaws, b, which form a clasp to embrace the shirt button, substantially as and for the purpose specified.

57,049.—CATTLE HITCH.—Charles H. Sawyer (assignor to himself and T. J. Little and Samuel C. Rundlett), Hollis, Me.

I claim the combination of the block, B, clapper, C, bow, A, and cord, H, when arranged in the hitch as set forth, all constructed and operating as herein specified.

57,050.—DITCHING MACHINE.—Judd Stevens, Chicago, Ill., assignor to the Chicago Spading and Ditching Machine Company.

First, I claim so attaching and arranging a series of shovels in the periphery of a wheel, M, that said wheel may have a forward slip upon the shovels, substantially as and for the purposes described.

Second, In combination with the shovels and wheel aforesaid, I claim the arrangement of the stationary curved bearing, O, operating substantially as and for the purposes specified.

Third, In combination with the series of shovels and wheel, M, I claim the arrangement of the pivoted arms, m, and cam-bearing T, for the purpose of locking said shovels to the wheel, as and for the purposes set forth.

Fourth, I claim the arrangement of the cam, Q, with the wheel and shovels aforesaid, for the purposes and in the manner described.

Fifth, I claim, in combination with the wheel, M, and shovels, N, the arrangement of the cam, W, operating substantially as and for the purposes specified.

Sixth, I claim the arrangement of the cam, Y, with the shovels, N, for the purposes set forth.

Seventh, I claim attaching the shovels to the wheel by means of the jointed arm, a, b, substantially as and for the purposes described.

57,051.—CHURN.—Alexander C. Wade (assignor to himself and George Thilman), Paris, Ill.

I claim the double-winged beater, I J K, journaled to the lid, D, as described, in combination with the removable frame, L, and its accessories, N N' O O', all arranged and operating as explained and set forth.

57,052.—WASHING MACHINE.—Alexander C. Wade (assignor to himself and George Thilman), Paris, Ill.

I claim, First, The provision, in a washing machine, of the double beater, H, consisting of the two series of rods, I and J, and pivoted to permit a swinging motion, substantially as described and set forth.

Second, I claim the double beater, H I J, when journaled to the lid, C, in combination with the removable roller frame, L, the whole being arranged and operating in the manner herein explained and set forth.

57,053.—CURTAIN FIXTURE.—George M. White (assignor to himself and F. B. Carpenter), New Haven, Conn.

I claim the combination of the two cords, f, f', with one or more rolls provided with pulleys corresponding to the said cords, f, and arranged with a compensating spring, and so as to be operated substantially in the manner and for the purpose set forth.

57,054.—TURNING LATHE.—S. C. Wybell (assignor to himself and F. N. Bixby), West Meriden, Conn.

I claim the attachment, constructed, arranged and operated substantially as and for the purposes set forth.

57,055.—SAD-IRON HEATER.—Patrick Flinn, deceased (by Abel T. Atherton, Administrator), Lowell, Mass.

First, I claim the angular pillars, j, in solid connection with the top plate, f, of the fire-box to the bottom plate, g, as herein described.

Second, I claim the top plate, f, of the fire-box, so constructed as to throw the flame of gas herein described.

Third, I claim the flues, O and P P, located at the back end of the fire-box, for the purpose described and manner set forth.

Fourth, I claim the flattened, perforated gas-pipe, l, and spiral springs, n, n', for the purpose herein described.

57,056.—CONSTRUCTING BLOCKS OR PLATES FOR PRINTING MAPS.—George Washington Bacon, London, England.

I claim the combination of the block or sheet, A, having an engraved surface, with the electrotype letters mounted upon a block, B, in the manner substantially as described.

57,057.—INJECTOR FOR BOILERS.—James Gresham, Manchester, England.

I claim the arrangement of mechanical devices, as herein set forth, whereby a supplemental steam jet may be produced for raising water, in combination with the ordinary steam jet of the Gifford injector for forcing water, in the manner and for the purpose as herein set forth.

57,058.—BORING APPARATUS.—Samuel Cary, Centerville, La.

I claim the combination and application of the center point spring valve, with the double spur lip, cutter blades, semicircular scoop, and tubular shank, for coupling to, for any desired depth, substantially as herein described, for the purposes specified.

57,059.—UNITING IRON AND STEEL FOR THE MANUFACTURE OF RAILROAD RAILS.—William Baty, Troy, N. Y.

I claim the employment, as a flux, of the compound or mixture herein mentioned and described, substantially in the manner and for the purposes herein set forth.

57,060.—WATER RESERVOIR FOR COOKING STOVES.—Esek Bussey, Troy, N. Y.

I claim the reservoir boiler, or tank, A, constructed entirely of cast iron or other cast metal, and covered or coated upon the inner surfaces thereof, with or by an enamel, b, when applied to and combined with cooking stoves, in the manner substantially as and for the purposes herein described and set forth.

## REISSUES.

2,326.—COMPOSITION FOR KINDLING FIRE.—Elizabeth Bellinger, Mohawk, N. Y. Patented Dec. 13, 1859.

I claim a self-lighting fire kindler, made substantially as herein described.

2,327.—(Div. A.)—CUT-OFF GEAR FOR STEAM ENGINES.—Albert D. Crombie and Lucy Colborn, Baltimore, Md., and John M. D. Greene, Funksville, Pa. (assignees by mesne assignments of Wells L. Colborn). Patented March 1, 1864.

We claim the combination of the sliding block, I, the fulcrum, g, and the rock lever, G, or their equivalents.

2,328.—(Div. B.)—CUT-OFF VALVE GEAR FOR STEAM ENGINES.—Albert D. Crombie and Lucy Colborn, Baltimore, Md., and John M. D. Greene, Funksville, Pa. (assignees by mesne assignments of Wells L. Colborn). Patented March 1, 1864.

We claim the sliding block, I, the fulcrum, g, and the rock lever, G, or their equivalent devices, in combination with a steam valve and governor.

2,329.—SAUSAGE STUFFER.—Purches Miles, New York City (assignee of John J. Weeks). Patented Sept. 19, 1854.

I claim, First, The revolving cylinder and conveyor or conveyors, eccentric to the case or cylinder, in combination with a hopper for containing the meat, and with a tube through which the sausage meat is delivered and stuffed into a gut or intestine, substantially as set forth.

Second, The shaping and protecting tube, K, in combination with the delivery tube, I, substantially as and for the purposes specified.

2,330.—MELODEON.—George A. Prince, Charles E. Bacon, and Calvin F. S. Thomas, Buffalo, N. Y. (assignees of Josiah A. Rollins). Patented June 3, 1856.

We claim, First, Placing and arranging within a melodeon, or other like reed musical instrument, two or more sets of valves, in connection with two, three, or more sets, or parts of sets, of reeds, so that one set of valves will act upon and open another set of valves, by the action of one set of keys, and one set of push-down pins, substantially as described.

Second, Supporting the front set of valves by a strip of wood, k, or other equivalent, for the purpose and substantially as described.

2,331.—PEGGING JACK.—D. Whittemore, North Bridgewater, Mass. (assignee of William R. Landfear). Patented Nov. 28, 1865.

I claim a pegging jack as made with its last supporter sustained by and so as to be capable of being moved or turned laterally on either of two separate centers, d, e, substantially as and for the purpose described.

I also claim a pegging jack as made with its last supporter sustained by and so as to be capable of being moved or turned laterally on either of two separate centers, d, e, and also of being tipped or turned longitudinally on a third center, a, the whole being substantially as described.

I also claim the last supporter, A, as made with the two arms, b, b, substantially as represented.

I also claim the arrangement of the pins or screws, d, e, f, and the slots, g, h, i, with the plates, B, C, arranged and combined with the last supporter, A, substantially as specified.

## DESIGNS.

2,375.—METALLIC ARMOR FOR BOOTS AND SHOES.—Amos Hamlin, Schoharie, N. Y.

2,376.—WORK BASKET STAND.—Henry Hunermund, New York City.

2,377.—CLOCK CASE.—Nicholas Miller, New York City.

2,378.—TRADE MARK.—Silas S. Putnam, Dorchester, Mass. (assignor to S. S. Putnam & Co).

2,379.—PLATES OF A STOVE.—G. Smith and H. Brown (assignors to Abbott & Noble), Philadelphia, Pa.

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A GOOD NUMBER.—The Phrenological Journal for August contains Portraits of Ben. Franklin, Lewis Cass, C. F. Brydges, Brunell, Mrs. Parkhurst, etc., with articles on Responsibility; Sowing and Reaping; The Servant Question; Getting Married; Writing, the Philosophy of Phonography; How to Live; Air and Sunlight; Summer, and its Lessons; Over-Eating; Head and Body; Man-Monkeys; Insanity, and Religious Excitements; Physiognomy, Time, Tune, Veneration, Double Chins, Large Ears, etc. 20 cents, or \$2 a-year. FOWLER & WELLS, N. Y. 7 2

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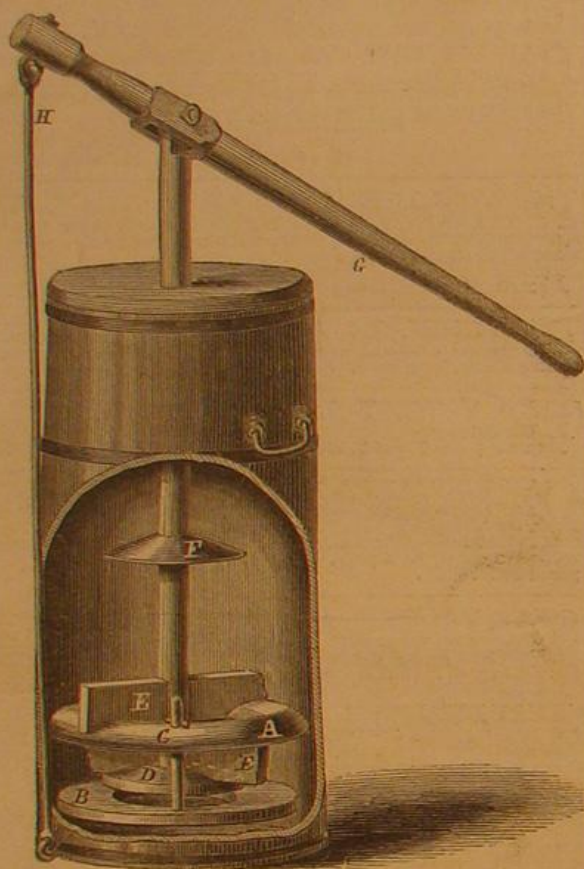
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**BAILEY'S CHURN.**

The object, in producing butter, is to agitate the cream rapidly so as to break the vesicles in which it is contained, and it is obvious that a great variety of mechanical contrivances and motions can be introduced for the purpose. It is claimed that many of the churns in common use injure the grain of the butter, and thereby reduce its market value; but the inventor says that the one here shown is capable of reducing the cream in a much shorter space of time than common churns, and that a superior quality of butter is made by it. The chief novelty is in the dasher, which is constructed in two parts, A and B; the lower disk, B, has a hole through it, and is suspended from the upper one by rods, C; these rods allow the disk to rise and fall vertically. As the dasher is forced down through the cream, the latter passes up around the edges of the dasher to the top of it.

On raising the dasher again the bottom disk drops, thus affording an opening through the valve, D, by which the cream falls to the bottom again, thus continually passing and repassing through openings, and against the surfaces of the several parts,



resulting in the end desired. There are partitions, E, in the top of the valve, and also in the upper disk, so that the process is expedited, and there is a loose disk, F, which plays up and down on the dasher rod, and equalizes the flow and pressure through the various parts.

The dasher is worked by the handle, G, which is attached to a rod, H, so that it can vibrate freely and allow the dasher to rise without binding.

This invention was patented by Thomas R. Bailey, through the Scientific American Patent Agency, April 4, 1866. For further information address him at Lockport, N. Y.

**Mutual Dependence.**

Farmers are popularly supposed to be "independent," that is, above the necessity of calling on their neighbors or individuals who follow other callings, for the necessaries of life, but reflection will show that all classes of society, in a state of civilization, are mutually dependent. The farmer raises his bread and his clothing, but if no one buys his surplus, he must live in a hut devoid of all that makes life agreeable.

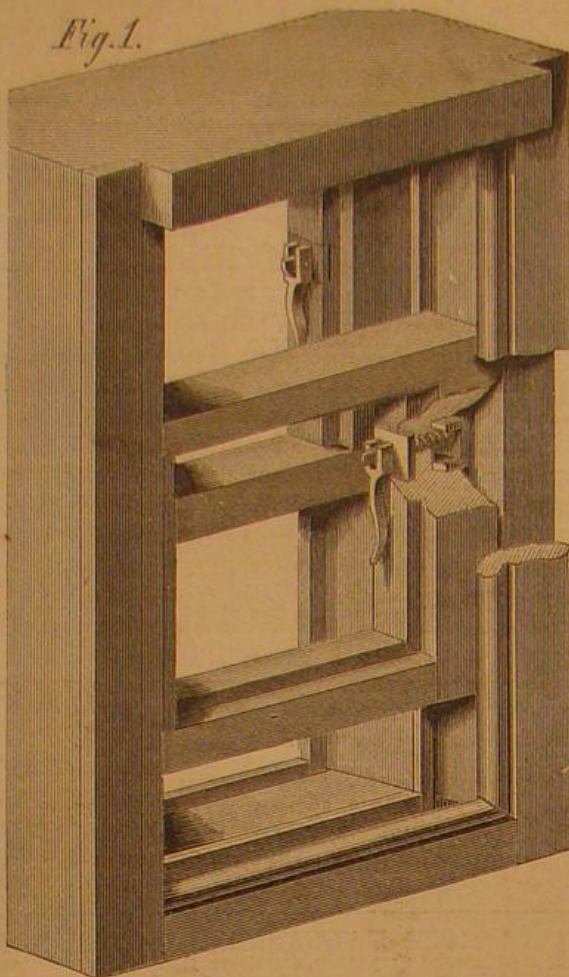
A "Digger" Indian is an example of "independence," and an example of the most abject degradation the human species can sink to. His clothing is nothing at all in summer, and, in winter, what he can find. His meat is carrion and insects, and his home a burrow in the ground. Who wouldn't be independent?

A COTTON factory costing \$75,000 is to be erected at Auburn, Alabama.

**ELLIOTT'S SASH SUPPORT.**

This sash supporter is also a lock or guard against undesirable intruders, such as midnight marauders and others of the baser sort. It is readily attached

Fig. 1.



to any window sash, and not only serves the purposes alluded to, but also prevents rattling and shaking of the window in its casement.

In detail, it is a casting, A, provided with a rod, B, roughened at the end, which works against the side of the frame, as shown by points in the engraving. A handle, C, is fastened to the end of the rod, and so formed that it can be turned down, as in Fig.

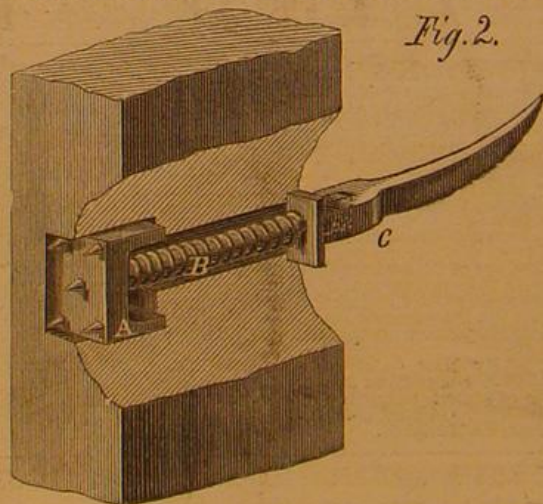


Fig. 2.

1, or thrown out horizontally, as in Fig. 2. When horizontal, the corrugated or spiked foot is withdrawn from contact with the casement, and the sash can be raised; when vertical the foot is thrown in and the sash is held suspended at any point. These fittings can be applied to any sash, old or new.

The invention was patented by J. W. Elliott, June 12, 1866, to whom all communications should be addressed, box 556, Toronto, C. W.

**The Silk Spider of South Carolina.**

Dr. Wilder, in a lecture recently delivered in Boston, claims that the silk species of spider was discovered by him in August, 1863, and from its body he wound one hundred and fifty yards of silk in one hour and a quarter. In 1864, an officer in the army wound three thousand four hundred and eighty-four yards from thirty spiders, a single thread being sufficiently strong to sustain a weight of 44 to 107 grains. In 1865, Dr. Wilder, after many disappointments, succeeded in getting a number of the spiders, though from ignorance of their habits, etc., they all died; but from their eggs several hundreds were afterward raised. The silk is either golden-yellow or silver-white, and of great brilliancy; the former

is elastic, and the latter non-elastic, and is used for the main stays of the web. Dr. Wilder has at present several young broods living in his room at Boston, and also at the Cambridge Conservatory.

**Explosion of Bombshells.**

A few days since a bombshell exploded in some hydraulic works at Brooklyn, breaking the arm and otherwise severely injuring the limbs of the workman who was engaged in breaking it up. Explosions and accidents of this nature are becoming far too common, nor is it over-stating the case when it is said that scarcely a fortnight has elapsed since the war in which similar catastrophes have not occurred. The shell in question was brought from Richmond, along with a lot of old iron, and it was evidently supposed that the length of time which had elapsed since its manufacture, and the rusty condition in which it was found, precluded the possibility of its explosion. This, however, by no means follows.

Some twenty years ago a relic of the old French war was picked up at Lake George, which spoke loudly for itself and told emphatically what it was made for. This was a bombshell, which was found in the lake, near the shore, under Fort William Henry, and which was in all probability discharged at the fort at the time that the Marquis de Montcalm besieged it in 1758. This shell must, therefore, have lain at the bottom of the lake about eighty years. Those who found it undertook the fool-hardy experiment of testing its efficiency, and applied a fuse to it. To their astonishment it exploded, and a piece of it passed through the side of the Lake House (which is of wood) and lodged in an attic chamber.

Mr. Sherrill, the proprietor of the house at that time, deposited this piece of the shell, together with an account of the transaction, in the cabinet of the Brooklyn Lyceum, where both may be seen. The composition of this shell was found to be different from those now in use—the iron being mixed with some brittle and earthy material. That which makes this case the more remarkable is the fact of the length of time which it had lain under water. —*Journal of Commerce.*

THE survey of the proposed Chattanooga and Cincinnati Railroad was begun on the 6th of August, at which time the work of locating the line was also begun. About a million of dollars have been subscribed in Cincinnati for the road.



**INVENTORS, MANUFACTURERS.**

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# Scientific American.

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[NEW SERIES.]

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## New Method of Propelling Steam Vessels.

Kinkel & Hubbe's new method of propelling steam vessels consists, generally, in the reactionary power of water. The propulsion of steam vessels by means of wheels and screws has probably attained its highest perfection, the velocity of ships propelled by these means not being capable of a great increase, for the reason that great velocity in rotating wheels or screws necessarily reacts upon the vessel and requires a proportionate increase of strength in the construction of the hull, which again tends to counterbalance the velocity of the moving vessel, while, by the method of propulsion adopted by the invent-

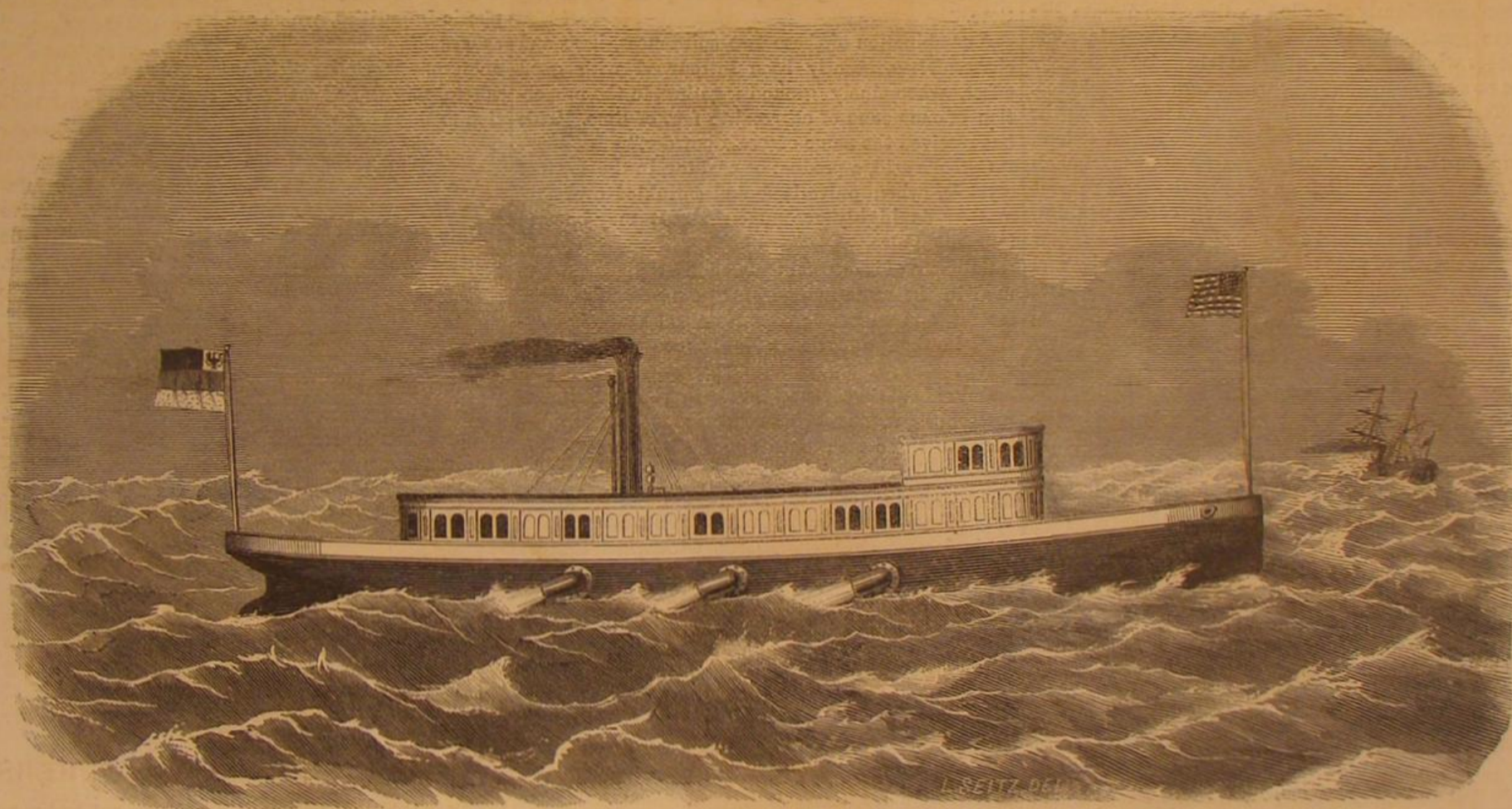
An equal number of such pipes are inserted on each side of the vessel; all of them are properly packed in stuffing boxes. The end of each of said pipes in the inside of the vessel is connected with a force pump, and each pump is driven by a small steam engine. Each of said pumps is supplied with water by a suction pipe through the bilge or bottom of the vessel, and all the engines are supplied with steam from one boiler, in such a manner that a supply of steam may be cut off from each engine separately, or from any number of engines, or from all of them, as may be desired.

The inner ends of the outboard pipes are connected

city, where those interested may receive further information.

## Iron and Steel Railroad Tracks.

The *London Railway News* says: "Mr. Williams furnishes some details which will serve to show the enormous wear and tear to which the rails of our leading lines are subjected. On the section between Hatfield and London, on the Great Northern line, 57,536 trains, carrying 17,760,926 tons, destroyed in three years the rails laid down in 1857. Some heavier rails, laid in 1860, were worn down in three years by 65,529 trains, and 13,484,661 tons. In the



KINKEL & HUBBE'S METHOD OF PROPELLING STEAM VESSELS.

ors, no reaction upon the ship will be perceptible, however great the velocity which a vessel thus propelled may attain.

That the reaction of water forced out of pipes from a ship may be used as a propelling power is demonstrated by the fact that a few vessels, constructed in Europe on that principle, have actually been used for traveling purposes, and are still in use.

The construction adopted in these vessels consisted mainly in placing in the center of the ship a turbine wheel moved by a steam engine which discharged two jets of water simultaneously out of two nozzle pipes, one on each side of the vessel; but the discharge pipes (or nozzle pipes) on either side of the turbine wheel, being necessarily different in length, the power thereby exerted on one side of the vessel is greater than on the other, which impedes the proper steering of the vessel; and, again, the propelling power itself is limited by the two discharge pipes only, all of which is obviated by this invention. The principal features of this invention are as follows: A series of bent pipes are inserted through the sides of the hull, below or above the water line, as required for the particular use of the vessel, the said pipes being adjustable by a mechanism in such a manner that the parts of the pipes on the outside of the vessel may be turned aft, forward, or perpendicular

with a mechanism by means of which the discharge pipes on either side of the vessel may be turned simultaneously in any direction at the will of the engineer or other person having charge of said mechanism.

Thus, if it is desired to move the vessel in a certain direction, all the nozzle pipes are placed in the opposite direction, and the water being forced out of them strikes or reacts upon the water in which the vessel is floating, and thereby causes the motion of the vessel.

It is claimed that vessels constructed on this principle attain a much higher rate of speed, with a lesser consumption of coal than is the case with paddle wheel or screw steamers, that the steering of this new vessel is easier and more certain, that the shaking of the vessel (caused by the action of the engine on the screw or paddle wheel) is here entirely avoided. These and other advantages make it desirable to test boats constructed on that principle, and for that purpose the inventors have designed an experimental boat on a large scale, which they intend to build and to sail with it on the Hudson or East rivers, and which is to attain a speed of 25 or 30 miles in an hour.

The plans and drawings may be seen at the office of Mr. Charles Wehle, No. 290 Broadway, in this

case, however, of a section of railway between Bury and Accrington, 62,399 trains and a gross tonnage of 12,451,784 passed over rails which lasted seven and a-half years, or two and a-half times as long as those of the Great Northern, with about an equal amount of traffic. Again, at Bolton, it required 203,122 trains, and 38,803,128 tons to wear out the same description of rails in seven and a-quarter years. The cause of this rapid wearing out of the rails of the Great Northern as compared with those of the other lines, is due, apparently, to the greater speed of the trains. In the case of iron rails, as in the delicately constructed mechanism of animal life, it is 'the pace that kills.'

"Two steel rails of twenty-one feet in length were laid on the 2d of May, 1862, at the Chalk Farm Bridge, side by side with two ordinary rails. After having outlasted sixteen feet of the ordinary rails, the steel ones were taken up and examined, and it was found that at the expiration of three years and three months, the surface was evenly worn to the extent of only a little more than a quarter of an inch, and to all appearance they were capable of enduring a great deal more work. These two rails had, during the period of little more than three years, been exposed to the traffic of 9,550,000 engines, trucks, and carriages, and 95,577,240 tons. It is an amount of

traffic equal to nearly ten times that which destroyed the Great Northern rails above referred to in three years. The result of this trial was to induce the London and Northwestern to enter very extensively into the employment of steel rails, and we learn from Mr. Webb that in a short time arrangements will be made at Crewe for the production of three hundred and fifty tons of steel per week, of which three hundred will be used for rails; and that at the present time there are about fifty miles of steel rails in use on the line, and three thousand tons of steel-headed rails."

#### THE DOMESTIC SOURCES OF CHOLERA AND THE MEANS OF AVOIDING THEM.

At the present time, when the influences of this terrible pestilence are manifest in all sections, the above subject is one of the most important that can engage the attention of the people. We observe that the members of the medical profession are at variance in their opinions as to the contagiousness of this fearful disease, but they are unanimous as to its local causes, and the measures necessary to prevent it. These latter may be summed up in these three words—*Cleanliness, Pure Air, and Disinfection.*

The history of the epidemics of cholera, in almost every quarter of the world, demonstrates most decidedly that where these preventive principles have been scrupulously attended to, there the disease has been greatly diminished in degree, and in some places wholly avoided, and that it invariably displays its power most vigorously where they are neglected.

The first of these, cleanliness, is an idea which the most ignorant can comprehend in its fullest extent, implying as it does, simply, the careful removal of all kinds of dirt and filth from the premises and persons of the household, and the keeping of every thing about the house sweet and clean.

The matter of pure air involves the principles and practice of ventilation, which is a subject rather less understood by people generally, though of equal importance with the others, and easily attainable by various means. The removal of foul air, and the supply of fresh, pure air, are the points involved therein, for which various methods have been suggested—a further allusion to which we may make on a future occasion.

In many respects the practice of disinfection is the most important of all these preventive measures. It is universally admitted by those best informed upon the subject that the foul gases, generated by the putrefaction of animal and vegetable matters, are the most active and abundant causes of this disease and of many others. To prevent the decomposition of all such substances, and thus avoid the production of the poisonous gases, is therefore a matter of the very first importance. Modern chemistry has happily supplied us with materials for this purpose, which are easily obtained, and when properly applied are certain in their action.

It is a singular fact, that among the most active sources of the poisonous gases alluded to are the exhalations and excrements of our own bodies. Thus we are told by the Council of Hygiene of the New York Citizens' Association, that "Careful observation has established the fact that neglected and putrescent excrements and the effluvia from privies serve to localize the outbreak of cholera, and more fatally than almost any other class of nuisances."

The Consulting Physicians of the City of Boston tell us in a recent public document, "Among the causes which act upon the human system to induce the disease (cholera), are exhalations from the bodies of human beings in crowded residences, and unremoved excretions."

Dr. Greenhorn, of London, an eminent sanitarian, says, "An atmosphere impregnated with the products of fermenting excrements is at once the most obvious and most constant concomitant of cholera."

Dr. E. M. Snow, the distinguished Superintendent of Public Health, of Providence, R. I., tells us:—

In some conditions of the atmosphere, particularly when there is excessive heat and moisture, and when there is any epidemic influence prevailing, the impure air arising from these collections of swill and house offal is a most injurious nuisance and a prolific source of diseases. The danger is still greater when, as is frequently the case, the swill and offal are deposited in cellars or are thrown into privy vaults,

We might multiply to an indefinite extent the evidence of this singular fact, that these results of the vital operations of our bodies are a powerful cause of our own sickness and death, but our readers will doubtless be satisfied with the above extracts, and the question then arises, how are these consequences to be avoided? The answer is equally plain—by cleanliness and disinfection; and we are pleased to be able to state how the latter operation can be most effectively performed.

Among the rules laid down by the Council of Hygiene of the Citizens' Association, for the prevention of sickness in general, and cholera in particular, is the following: "Avoid and prevent effluvia from excrementitious matters, sewers, privies, and chamber vessels. Frequently and thoroughly disinfect these sources of fever poison." How to do it is therefore the important question.

The following is a list of the substances at present regarded by chemists and sanitarians as the most available and effective for the purpose.

Common lime is useful as an absorbent of moisture, and a preventive of the decomposition of some substances.

Freshly-burned charcoal is a powerful absorbent of noxious gases, and to a certain degree a preventive of decomposition. It is well known that wooden stakes, whose surfaces have been charred by fire, when placed in the ground, will be preserved a long time.

A combination of these two substances, lime and charcoal, has recently been introduced with good effect, when finely ground together, in the proportion of one pound of charcoal to four of lime. This has received the name of "calx powder."

Carbolic acid, a product of coal tar, in the form of crystals, when pulverized and sprinkled over foul matters, is highly recommended. It may be used in solution also.

Sulphate of iron, commonly called copperas, when used in the same manner, is also a valuable disinfectant and antiseptic. It may also be used in solution, in the proportion of an ounce to a quart of water.

Chloride of lime has achieved a high reputation as a disinfectant, but for domestic use it is less available than those mentioned above. Its value for this purpose depends almost wholly upon the chlorine gas which it gives forth. This is not only in itself a very offensive substance, but as a gas it is only useful in decomposing other gases, with which it must come in contact after they have escaped into the air. This is like trying to catch a thief after he has run away. The other disinfectants will prevent the escape of the noxious gasses.

We here make no mention of any of the numerous advertised disinfectants, because their compositions are kept secret, and are, no doubt, chiefly made up of the substances herein mentioned, in great part, if not wholly, and are got up solely for the purpose of making money.

There is one combination, however, which is no secret, and which we have personally proved to be one of the very best compositions known for the purpose. It is called the "Ridgewood Powder," and being made up of several of the substances previously enumerated, it combines their deodorizing and antiputrescent properties in a very remarkable degree.

How and where to apply these poison preventives, is the question next in importance. In their report on epidemic cholera, the Council of Hygiene informs us, when speaking of domestic hygiene, that:—

In every private residence, tenant domicile, hotel, boarding house, public school, and place of resort, there should be a thorough examination of the local and house drainage—the stench traps, the cellars, the vaults, the cesspools, and privies. Immediate cleaning and disinfection should be enforced, and proper precautions against every source of domiciliary impurity should be adopted; and all privies, water-closets, sinks, and excrementitious matters should receive scrupulous care and thorough disinfection.

To facilitate this most important and essential sanitary measure, so that disinfectants may be applied in all the places indicated, without trouble or delay, and without exposing fecal or other foul matters to the air, an instrument has recently been introduced which may be used in any locality and by any person, even by a child, without the possibility of mistake or danger. It is called the "Ready Disinfectant,"

and may be attached to any chamber vessel, water closet, privy seat, swill pail, or other vessel containing house offal, and the disinfecting powder applied by it without exposing their contents to the air.

This apparatus, the "Ready Disinfectant," is a very simple and easily managed instrument. It has been approved by the New York Academy of Medicine, by which it was unanimously recommended to the consideration of the Metropolitan Board of Health.

The vast extent of the beneficial effects derivable from the general use of such an instrument may be comprehended by one fact, viz, that if employed for the disinfection of all water closets, chamber vessels, slush buckets, privies, etc., in cities like New York, Philadelphia, and Boston, not only would there be no odor arising therefrom in any dwelling, but all the sewers would likewise be completely deodorized, whereby one of the most potent causes of cholera, and many other diseases, would be entirely removed.

Any further information of the subject, either of disinfectants, or the mode of applying them, may be had by addressing Mr. John H. Keyser, No. 158 Ninth street, opposite the Bible House, New York.

It is not for the prevention of cholera alone that these sanitary measures should be universally adopted, but as against fevers of almost all kinds, especially those of the typhoid character, many disorders of the lungs, erysipelas, diarrhea, cholera morbus—in fact, all diseases derived from atmospheric impurities, which are known to medical men as *zymotic* diseases. There is no doubt that the enormous mortality of infants, which occurs everywhere, might be greatly reduced by careful attention to these ideas.

#### The Brazilian Exhibition.

We are indebted to Counselor Azambuja, Minister of Brazil, for the following particulars relative to this exposition, which is to be opened in Rio de Janeiro on the 19th of October, in the present year.

By the regulations and instructions of the managers, it appears that foreign machinery and implements are admitted and must be labelled "Foreign," and accompanied by the name of the manufacturer, and inventor, with the cost of the machine. They may be worked by the exhibitors, but may not compete for the premium, the space and steam power required being furnished free of expense; but machinery requiring any special construction will not be admitted. The cost of transportation must be paid by the exhibitors. No machinery can be taken away without a special permit, and if, after the closing of the exhibition, they are sold, they will be subject to a duty of 1½ per cent ad valorem; but if re-exported will be free of duty. Free passes are furnished to the exhibitors. All persons wishing to exhibit must give due notice to the Minister of Brazil in New York, with full particulars of their machines.

The Minister informs us that the Empire of Brazil, is a field which our manufacturers of agricultural implements cannot afford to neglect.

#### The Rebuilding of Charleston.

The Charleston City Council has referred to a special committee the following proposition to rebuild the city. It is proposed to issue bonds of the city, drawing seven per cent interest, to all who may wish to rebuild, upon the following basis:—

When a lot is valued at \$10,000, and the parties owning the same wish to build a store, warehouse, or dwelling, worth \$15,000 upon it, it is proposed to issue to the parties \$15,000 of city bonds at par, the city to take a bond and mortgage with insurance policies assigned for security, and as an additional safety and security for the city, the interest is to be paid semi-annually, and the parties borrowing the city bonds are to be required to pay the interest in advance, so the city can be sure of meeting the interest on these bonds. This would increase the revenue of the city taxes in the following proportions: A lot now valued at \$10,000, yielding \$175 taxes, would, with a building valued at \$20,000 erected upon it, yield \$525, or from \$300 to \$350 increase over the present tax.

CABLE BUSINESS.—There were twelve messages received at the New York Telegraph office for Europe in one day, for which the sum of \$1,313 in gold was paid.

## THE PRUSSIAN NEEDLE GUN.

We have received from an intelligent correspondent at Washington, who is thoroughly informed upon the subject, and has spent considerable time in Europe, the following observations upon the Prussian needle gun. In our next number we shall give an illustration of the working parts of this arm, to gratify the curiosity which its advertised success has aroused:—

The late European news proves conclusively that a very defective breech-loader, such as the needle gun, is a much more effective weapon in actual war than the best muzzle-loader.

The needle gun is a clumsy, unsightly, heavy, and expensive gun compared to many American breech-loaders, it is complicated in its parts, and delicate in its construction. The breech-piece, which contains the breech-loading mechanism, is enormously long, extending not less than eleven inches to the rear of the cartridge chamber. The bore of this breech-piece is enlarged to receive a hollow cylindrical plunger or breech-closer, about five inches long. The plunger is operated back and forth in order to open and close the breech of the gun, by means of a knobbed handle which slides in a longitudinal slot in the top of the breech-piece; this slot is widened for half its length from the front toward the rear, thus forming a shoulder to receive the knobbed handle and support the breech-closer when the gun is fired. Within the cylindrical breech-closer is a longitudinal steel pin which carries the needle, and is surrounded by a spiral spring. In the bottom of the breech-closer is a narrow longitudinal slot to admit the trigger to take hold of the needle pin. On the front end of the closer is an expanding steel ring or gas check, which performs its functions badly, as there is so much escape of gas that the gun cannot be fired one hundred rounds without being cleaned. There is also considerable escape of gas into the mechanism through the needle hole in the face of the breech-closer. This escape of gas soon fills the chamber in the cylindrical breech-closer, which contains the needle-pin and spiral spring, with a residuum of burned powder, and seriously impedes their action. To open the breech preparatory to loading, strike up with the hand on the knobbed handle of the breech-closer from behind the shoulder, and withdraw it to the rear; but now the soldier must be very careful in inserting his cartridge, lest he injure the delicate needle, which projects its full length into the opening, or lest the needle injure his own hand. To shut the breech the closer is shoved hard forward, and the knobbed handle thereof pressed down in front of the shoulder on the right hand side of the slot.

When the cylindrical breech-closer is shoved forward, the trigger, having taken hold of the needle-pin from below, retains it to the rear, and thus compresses the spiral spring, so that the simple act of closing the breech cocks the piece, and it is only necessary to pull the trigger to fire it. This arrangement is a convenient one for the soldier, and facilitates the firing, but it is an objectionable feature in a military arm, because when loaded it must necessarily remain at full cock. It is true there is a means provided for locking the needle-pin in this position to prevent accident, but if the soldier should forget or neglect to avail himself of it, then serious accident is liable to take place at any time.

The ammunition for the needle gun is complicated, expensive, and difficult to make up, considerable special machinery being required for that purpose. The ball is contained in a small papier-maché cup or sabot, to the base of which is attached the igniting charge, consisting of a friction wafer; the needle must penetrate the whole length of the powder charge before it reaches the fulminate; thus the powder is ignited forward instead of at the rear, as usual. This is believed to be advantageous to the range of the piece. The needle gun cannot be fired more than half as many rounds per minute as most of the American metallic-cartridge guns. There is no denying, however, that the needle gun is proving itself a truly formidable weapon in the hands of the Prussian soldiers, who have been educated to its use for more than twenty years; but its success proves nothing in favor of the needle-gun as a specialty, while it proves everything in favor of breech-loading principle. If the Austrians had been armed

with good breech-loaders, the results of the conflict would have been very different from what they are. The writer spent seven months in 1859 making trials with a breech-loader before the committee in Vienna. The report strongly urged the adoption of my arm for the cavalry, to be extended to the infantry later. That recommendation was never complied with by the War Department. From that date until this the writer, either in person or by an agent, has never ceased to urge upon the attention of the Austrian authorities the importance of breech-loading arms, both large and small. What must be the present feelings of the Austrian Emperor toward those of his officials to whom he assigned this important subject for examination and decision, and who have thus long neglected to act, wanting either the capacity or courage to arrive at a decision in favor of any one of the many inventions proposed?

It is stated that all the great powers are taking steps to obtain needle guns. This report is totally without foundation; all the great powers, this country included, being thoroughly familiar with the principles of its construction, and having pronounced it totally unfit for military purposes. The needle gun which the Emperor Napoleon is said to have received some years ago, and placed in his cabinet of curiosities, is very properly bestowed, for that is sure to be its final destination. The Prussians adhere to the needle gun only because it is Prussian in its origin, and may continue to do so with impunity until compelled to abandon it by the adoption of a better arm by other governments.

The Prussians are beating the Austrians because of their superior arms, and the Austrians are, at the same time, beating the Italians for precisely the same reason; the No. 1 rifled musket of the Austrians being as much superior to the heterogeneous collection of low-priced guns with which the Italians are armed as the Prussian breech-loader is superior to the Austrian arm. The Italians are brave as any troops in the world, and are now inspired with a degree of patriotic enthusiasm which ought to render them invincible if they were only armed with a good breech-loader. It does not seem to be generally known that all the Prussian field artillery are also breech-loaders. These guns are a combination of the Prussian and the Broadwell systems, consisting of the Kreiner double-wedge for closing the breech and the Broadwell gas-proof principle.

Breech-loading artillery and small-arms having been adopted, it only remains to introduce the Gatling gun to complete the national armament. The Gatling gun is a revolving battery, capable of throwing two thousand missiles per minute when using his compound ammunition, and one hundred half-lb. balls when using simple ammunition. This gun is designed to occupy the middle position between artillery and small-arms; it is destined to supersede the old flank defense howitzers, and to be extensively used in the field for defending fords, bridges, etc.; it will also, no doubt, be used for boat howitzers in the navy. The recent successful trials with this gun at Fortress Monroe astonished and gratified all who witnessed them.

Success in war is no longer a question of numbers, nor of courage and discipline on the part of troops; nor yet of military genius and experience on the part of leaders; but rather one of arms; and this will continue to be the case until equality of armament shall restore the old relations.

## INSURANCE AGAINST STEAM-BOILER EXPLOSIONS.

We are gratified to learn that this subject is beginning to attract the attention it deserves. In the eleventh Annual Report of the Insurance Companies of Massachusetts, we find the following:—

"Another very important experiment has been conducted to a successful issue in the mother country. Steam boilers have always been a terror to timid fire insurance companies, and the enterprising proprietors of the grand motor of modern civilization have had to pay a very excessive premium for indemnity against its fire damages, while they insured themselves against its hot water.

"In 1850 there was established in Manchester, England, an association for the prevention of boiler explosions. The plan was to employ the best science extant to avoid the causes which lead to these fright-

ful and destructive accidents, and to establish a vigilant supervision.

"Each boiler, we believe, required the payment of one guinea per annum to the fund of the association. A detailed annual report was made of the proceedings of the association, with statistics in regard to the boilers under its charge, and likewise in regard to those not inspected by it. The success of this experiment in diminishing the relative number of those accidents, and bringing steam proprietors better to understand the nature and laws of the force in their employ, soon led to the formation of other associations, not only in Great Britain, but in other countries. It has at last become so decisive that the association now offers for half a guinea per annum, in addition to the guinea already paid, to insure against loss by explosion the boiler itself and surrounding property to the amount of £300. This is less than half the average annual premium of the mutual fire risks in Massachusetts; and in relation to the whole expense of the membership in the association, where it insures, the premium is not half what is charged by stock companies for insuring risks comprising steam boilers.

"The value of this positive discovery to the vast steam interests of this country, if it should ever become generally known, would not be less than that of the discovery of petroleum or a new continent. Men of practical science now believe that boiler explosions, especially those of the most destructive sort, are wholly unnecessary, and easily prevented. What is wanted is a steam boiler insurance company which shall also act as a board of caution and prevention. The experiment of Manchester shows that the principle of mutual insurance is particularly applicable to this specialty, and, encouraged as it might be by a State guaranty, it would result in saving far more than half of what has now to be expended in so imperfectly insuring this most important species of property."

We are very happy to announce that this suggestion is being carried out. Some of the leading engineers of this city have given their support to the formation of a company to insure against accidents and loss occasioned by the explosion of steam boilers, as will be seen by reference to our advertising columns.

## An Inefficient Boiler.

A correspondent—H. M. C., of New Jersey—says he has a horizontal cylindrical boiler, two feet in diameter, ten feet long, containing fifteen two-inch flues, which does not draw well, the tubes being of too little capacity. The smoke passes under the boiler and returns through the tubes, being discharged into the smoke stack over the furnace door. He proposes to relieve the tubes by constructing a brick arch from the rear end of the boiler, over its top, to connect with the smoke box at one end and the chimney at the other. It seems to us that it would cost less and be more efficient to turn the boiler end for end, and convey his smoke directly through the tubes without return. The proposed arch would render his tubes useless, and his boiler would be merely a common untubed boiler. The trouble, we think, is that the draught is not sufficient to control the double passage of the smoke. If it passed directly through the tubes, their capacity would probably be found sufficient.

M. GRIPON has presented a note to the Academy of Sciences, "On the Conducting Power of Mercury for Heat." Experiments made after Pelet's method showed that if the conducting power of silver = 100, that of mercury = 3.54. It stands, therefore, the last of the metals, and a little before marble and gas coke. The author mentions that in this case the conducting power for heat and for electricity are very different, the former being 3.54, the latter 1.80.—*Mechanics' Magazine*.

PETROLEUM IN ENGLAND.—There appears to be good reason for supposing that an abundant supply of petroleum exists in the rocks of England. It is stated that the surface indications of various parts of Shropshire lead to this inference. Experimental borings are already in progress. The oil pit which has been sunk at Leeswood Green, in Flintshire, continues in active operation, and is increasing in product.

**Improved Sorghum Evaporator.**

The process of making sorghum sugar is very greatly expedited by the many machines and apparatuses introduced for the purpose. Sorghum sugar as first made was of a greenish-yellow color, not half drained, but we have seen samples that would equal New Orleans sugar in appearance.

The engraving represents a new evaporator which is claimed to be a valuable improvement on those generally used. Defecation is more thorough, and the removal of the scum is facilitated, while the danger of burning the sirup is obviated. The pan is made of cast iron, formed in sections. The inventor states that he tried sheet iron, but found that he could not increase the heat beyond 220 deg. Fah. without burning the sirup, and at that temperature the mucilage was not separated from the juice; in fact, not thoroughly until about five degrees hotter—it settling to the bottom and adhering there. With cast-iron pans, however, this trouble was not experienced, and the heat could be raised to the right point, when the mucilage rose to the top and was taken off with the scum, leaving the bottom clean. The several sections can be at any time added to increase the length of the pan, they being held together by bolts passing through lugs.

The skimmer is very convenient, being suspended from a frame, A, by chains, B. The chains are attached to springs, C, which hold the skimmer up when not in use. When needed, a slight pressure brings it down over the pans. The claim covers an inclined scum trough with a depression in the center covered by a strainer, but in the model before us this feature is not shown. The ledges, D, cause the juice when boiling to flow back and forth in currents through the whole length, and the scum is deposited as fast as formed on the coolest side, which is arranged to be the scum trough.

The whole affair is set on a brick arch, and is convenient of access in all parts. It is claimed to be economical in the matter of fuel, and safe with proper management.

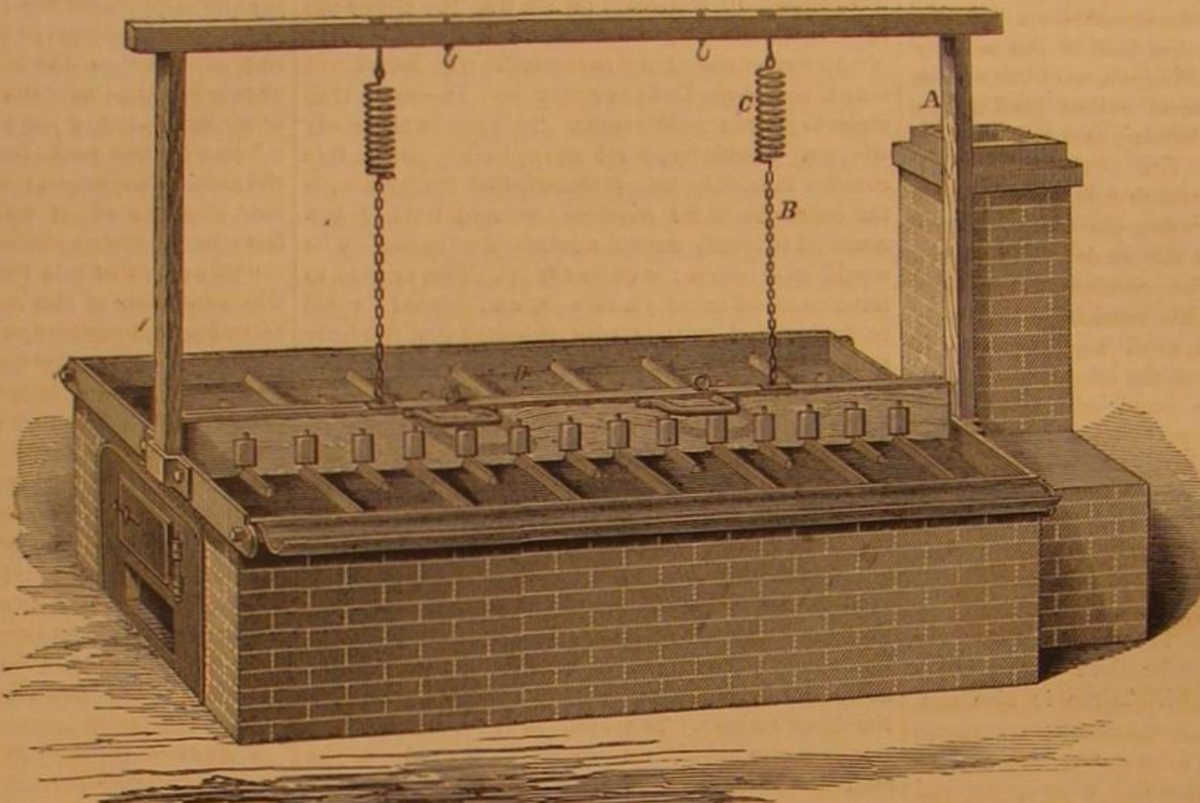
It was patented by J. F. Riggs, of St. Joseph, Mo., through the Scientific American Patent Agency, on July 3, 1866. For further information address Messrs. E. R. Brandow & Co., who are manufacturing the apparatus at the above place.

**Precipitation of Metals from their Saline Solutions by Means of Magnesium.**

M. Roussin has just published a paper on the action of magnesium on metallic solutions, and on its application to toxicological researches, which shows that magnesium is particularly well adapted for the precipitation of other metals from solutions of their salts. It is a general principle that one metal will precipitate from a saline solution any other which is less readily oxidable than itself, but some metals, by no means among the most oxidable known, had nevertheless, when M. Roussin began his researches on this subject, resisted all attempts to precipitate them by the contact of another metal with their saline solutions. With two exceptions, however, all the metals alluded to are precipitated in the metallic state by magnesium, the two exceptions being chromium and manganese, which appear to be precipitated as oxides. Among the metals which M. Roussin has precipitated in the metallic state, by means of magnesium, from slightly-acidulated solutions of their salts, are gold, silver, platinum, bismuth, tin, mercury, copper, lead, cadmium, thallium, iron, zinc, cobalt, and nickel. The precipitated

metals, when washed from the saline liquid and then dried and compressed, possess a very remarkable degree of brilliancy. Iron, cobalt, and nickel, so precipitated, are highly magnetic; zinc takes the form of a large spongy mass, which the least compression renders brilliant. Magnesium does not precipitate aluminum at all, and chromium and manganese, as already mentioned, it precipitates as oxides. It does not precipitate arsenic or antimony, though it decomposes their salts, the arsenic or antimony flying off in combination with hydrogen. M. Roussin shows that great advantages result from the substitution of magnesium for the metals ordi-

ains, among others, the following remarks on monitors as cruisers: "Can the monitor style of iron-clads, invented by Captain Ericsson, be so constructed as to make them efficient fighting, sea-going cruisers? The facts with regard to the behavior of this vessel in a moderate gale of wind and heavy sea, when a frigate would find it impossible to use her battery, are as follows:—With head to the sea she takes over about four feet of solid water, which is broken as it sweeps along the deck, and after reaching the turret is too much spent to prevent firing the 15-inch guns directly ahead; with broadside to the sea, either at rest or while moving, her lee guns can always be worked without difficulty, the water which passes across the deck from windward being divided by the turrets, and her extreme roll so moderate as not to press her lee guns near the water; lying in the same position, her 15-inch guns can be fired directly astern without interference from water; and when stern to the sea, the water which comes on board is broken up in the same manner as when going head to it. In the trough of the sea her ports will be liable to flooding, if required to use her guns to windward. This, then, would be the position selected by an antagonist which designed to fight a monitor in a sea-way. The turret guns of a monitor occupy a central position, where, notwithstanding the lowness of the vessel's hull, they

**RIGGS'S SORGHUM EVAPORATOR.**

narily employed in toxicological researches for the detection of these and other metallic poisons; but into that part of his subject it would be beyond our province to follow him. His only further statement respecting magnesium calling for mention here is one relating to its use as a voltaic element. "The foregoing qualities," he says "encouraged the hope that a substitution of magnesium for zinc in ordinary piles would offer a great electro-motive force, and experiment confirmed this theoretical inference. A small plate of magnesium, 0.1 grain in weight, placed beside a plate of copper in a small tube of glass of six centimeters cube, filled with acidulated copper, produced in less than ten minutes an electro-magnetic appearance, and illuminated a Geisler's tube ten centimeters long. If magnesium should ever become cheap, this would decidedly be the best way of producing electricity."

In a note to his paper, M. Roussin states that he has observed that a sodium amalgam, shaken up with an acidulous solution of a salt of chromium or of a salt of manganese, changes to an amalgam of chromium or of manganese, as the case may be, and that an amalgam of either of these metals, obtained in the manner indicated, when distilled in a current of hydrogen, after having been first carefully washed in acidulated water, leaves the pure metal in the form of a pulverulent sponge. The amalgam of manganese, he adds, is opalescent and crystalline; that of chromium more fluid, and less variable at ordinary temperatures. When the latter is heated in a small porcelain capsule in the air, as the mercury flies off in vapor it carries off mechanically with it particles of chromium, which take fire, producing a singular scintillation, which is best observed in a darkened room. At length the chromium remaining in the capsule suddenly becomes incandescent, and burns to oxide.—*Mechanics' Magazine.*

**Sea-going Monitors.**

Captain Fox, Assistant Secretary of the American Navy, has reported to his Government upon the performances of the *Miantonomoh* at sea. His report is dated Queenstown, June 16, 1866, and con-

are more easily and safely handled in a sea-way than guns of the same height above the water in a broadside vessel. The axes of the bore of the guns of this vessel are 6½ feet above the water, and the extreme lurch, when lying broadside to a heavy sea in a moderate gale, was 7 degrees to windward, and 4 degrees to leeward—average five and a half degrees, while the average roll at the same time of the *Augusta*, a remarkably steady ship, was 18 deg., and of the *Ashuelot*, 25 deg.—both vessels being steadied by sail. A vessel which attacks a monitor in a sea-way must approach very close to have any chance of hitting such a low hull, and even then the monitor is half the time covered by three and four feet of water, protecting her and disturbing her opponent's fire. From these facts, not unknown to monitor men, and the experience we derived from the use of such vessels during the war, we may safely conclude that the monitor type of iron-clads is superior to the broadside, not only for fighting purposes at sea, but also for cruising. A properly constructed monitor, possessing all the requirements of a cruiser, ought to be constructed of iron, and have but one turret, armed with not less than 20-inch guns, two independent propellers, and the usual proportion of sail.—*Mechanics' Magazine.*

AN EXPERIMENT.—Two ounces of the explosive compound used in Roberts's torpedo, were experimentally fired off in a piece of tubing and drive pipe, yesterday morning, above ground. The drive pipe was broken into irregular pieces, and the tubing transformed into shoe strings. As demonstrating the probable effect of a subterranean explosion of the torpedo, it was a very satisfactory experiment.—*Titusville Herald, Aug. 9th.*

PERUVIAN guano, which is held at \$60 per tun in gold by the agents of the Peruvian Government in New York, has fallen from \$110 to \$90 per tun in Alexandria. This is the most remarkable decline that any other commodity in our markets has sustained, and must be attributable to unnatural competition.

## WEDGING OF GASES WHEN CONFINED.

In remarking on the experiments made in England with guns, or rather steel tubes open at each end, we said, in our issue of June 23d, that we could account for the velocity imparted to the projectile only on the hypothesis that the air, in the rear of the charge, confined between two felt wads, was compressed laterally, changing its particles from the spherical to the cone-like form, and thus acting as wedges, producing a transverse strain upon the walls of the tube, and forming, at the instant of discharge, a diaphragm of resistance, acting as a solid breech.

Although not certain of being correct in venturing this supposition, which, however, was the only hypothesis on which we could find a theory accounting for the results of the experiments, we have some additional evidence that this is the path for investigating these facts. We give, with this article, a cut representing two conical bullets fired from a Colt's revolving rifle of thirty-one inches length of barrel and "44" caliber. The circumstances are these: One of our correspondents, H. W. S. Cleveland, of Danvers, Mass., in using the Colt's rifle at a target, left his wiper rod in the piece to attend to a temporary call, and when he returned, forgetful of what he had done, he fired his rammer at the mark. He fired again, and again, until he began to imagine from the appearance of the target that he had been shooting "wild." He found, on examination, that he had pierced the target with a queer shaped projectile. Disengaging it he found it as it appears



in the illustration. One ball, probably that which projected the wiping rod, had lodged in the barrel for want of projectile force to propel it and the rod beyond the muzzle. The next ball fired struck the lodged ball and drove itself against it, changing the form so much as to alter a cylindrical shot, with cone-like termination, into a cylinder, compressed in a concave form at the end which before was a cone, and expanding the barrel about ten inches from the muzzle. On the whole outward surface of this compressed cylinder the rifling or "gains" of the gun barrel are clearly impressed. It is evident, then, that the explosion, in connection with the obstacle interposed between the projectile and the atmosphere by the lodgment of the first ball in the barrel, changed the form of the projectile from that of a cylinder, convex at the top, to that which is represented in the illustration. The Colt's bullet offers only a portion of its surface to the effect of the discharge combined with the rifling of the piece. But this projectile is clearly marked with the "gains" of the barrel for its whole length. As this length is more than that given to an ordinary bullet, and, besides, as the illustration shows, the bullet is "upset" or contracted in length by the explosive force of the gas, it is evident that an agent differing from that employed in discharging a projectile from a gun was a means in producing this effect. The bullet, notwithstanding its compression, which changed its form from that of the ordinary projectile to that of a perfect cylinder perforated at one end, where before it presented a cone-like protuberance, is now a cylinder bearing on its entire length—which is almost as much as its original length—the marks of the rifling of the gun. It seems to be evident that another force than that of explosion, or percussion in a direct line, was exerted to produce this result.

Again, the appearance of the ball, which was lodged in the piece in advance of that which drove it out, is such that it is hardly possible to draw any other conclusion from its elongated and attenuated appearance than that the wedging of the gases against the walls of the gun tube contributed to compress the material of which it is composed.

Having some doubts as to the critical acumen of our informer, we had an interview with him, in which we plainly stated these doubts. We had the idea that possibly the bullet which showed the rifling on its surface was the first which left the

gun, or, at least, the first which struck the target. Our doubts were removed when he told us that he found the double projectile in the target—a cedar post—the elongated bullet in advance of the other, and the two so firmly united that it required some force to separate them. Could the two bullets have changed their relative positions in the flight from the gun? This would be against the experience of gunners, or those who use the rifle. Undoubtedly the elongated projectile reached the target first, and its elongation was due to a compression it was subjected to before it reached the target; otherwise how could it appear lodged in the target in advance of the bullet which followed it, showing on its surface the rifling of the gun and the depression of the butt of the first bullet?

In regard to this singular matter, Mr. Cleveland makes the following statements:—

"The position of the first bullet in the barrel was about ten inches from the muzzle. To move that bullet forward would require but little force, as any one may prove by ramming a bullet through a barrel. It is obvious, therefore, that no portion of the enormous force required to expand the barrel could have been exerted against the bullet, or it would have given way instantly. The only conceivable mode in which this lateral pressure could be produced, is by the wedging together of the component particles of air. The process of the operation was therefore in the following order, although the whole performance was (to our apprehension) instantaneous. The column of air between the two bullets being compressed by the advance of the rear one, and wedged together by its lateral pressure, caused the barrel to expand at the base of the bullet which was fast in the gun. The moment this expansion commenced a space was opened round the bullet, which was instantly filled with the air, and the bullet being of soft metal, was compressed and elongated, thus relieving the barrel from the necessity of further expansion. At the same moment, this elongated bullet was struck by the one in the rear, the point of which was expanded by the blow so as to fill the threads of the rifle, and the two passed out together, firmly united, but with their momentum so far diminished that they made but a slight penetration of the target."

It seems plain that the principle of Hardy's non-recoil gun is at least worth investigating, and it shows, also, that our idea of the compression of explosive gases is the best means of accounting for such a singular phenomenon as this we illustrate.

We wait for further information. Evidently there is much in this matter that ought to engage the attention of our scientists and mechanics. If Hardy's plan for firing projectiles, from tubes open at both ends, has any value as a useful means of simplifying gunnery, it should be known, and it seems that such experiments as we have illustrated will do much toward giving that information.

## NATIONAL ACADEMY OF SCIENCES.

This body has just held a session of five days at Northampton, Mass. A large number of the most distinguished scientists of the country were in attendance, and the proceedings were of a most satisfactory character to those attending, particularly to the learned men themselves.

It is unfortunate, in our opinion, for the country at large, that these gatherings do not assume a character of a more useful and popular nature. By many they are regarded as convenient occasions to ventilate speculations and theories looking to no useful result as their ultimate. Science should lead and direct art, but papers on abstractions, which, by no effort of the mind and no endeavor of the will, can be made to yield a particle of useful information, are altogether out of place in a meeting of scientific men. Whether language belongs to the field of physical science or to the domain of moral philosophy, does not appear to be a question that can in the remotest degree affect the improvement of the race. Such problems may do very well as amusements for hypercritical minds or transcendental tastes, but for all their benefit to the world at large we might as well have a treatise on the cause of lunacy in bedbugs.

It is pleasant to know that all the investigations and the amusements of this scientific society are not of this style. It may be well enough to allow some

mere abstract speculator to ventilate his learned nonsense before a company of sympathizing savans and befogged listeners; but the true value of the Academy must be found in their useful labors.

Speaking of the labors of the Academy, the reporter for the *Tribune* says that "Professor Bache, the President, was in such intimate relations with the Government, and Mr. Lincoln set so high a value upon his services, that a Cabinet meeting was held in his office every week during the war. It was Professor Bache who made the Academy especially valuable to the Government. By his vast labors during the war, Professor Bache was entirely broken down, and for the last year has been utterly unable to work. It is to be most ardently hoped that he may soon recover and resume his great usefulness to the country and to science. Of the immediate usefulness of the Academy to the country, there is sufficient evidence in the fact that the annual report shows that the Government has referred to the Academy for reports on the following subjects:—

"In the first year, from the Navy Department, weights, measures, and coins, their decimalization, etc.; methods of protecting the national currency from being counterfeited; Saxton's alcometer, intended as a substitute for the hydrometer now in use. The protection of the bottoms of iron vessels from corrosion by sea-water and from fouling. The correction of the compasses of naval vessels, especially of iron vessels and iron-clads. The inquiries as to the expediency of continuing in their present form the publication, by the Navy Department, of the wind and current charts, and of the sailing directions. In the second year, from the Surgeon General—as to the best method of testing the purity of whisky employed for medicinal purposes. From the Navy Department—to conduct, witness, and report, upon experiments on the expansion of steam. From the Treasury Department—the examination of aluminum, bronze, and other alloys, for the manufacture of cent coins.

"On most of these subjects the Academy has already, by a committee, presented elaborate reports, which have been accepted as decisive and exhaustive so far as they claim to go. It will be seen that these subjects embrace matters of the utmost importance to the country. Thus the Academy has indorsed the French decimal system of weights and measures as against the anomalous and puzzling lack of system now in use in this country, and recommended its adoption. Should their suggestions be followed, their influence would reach almost every person in the country almost every day, and after the change was once made, affect him most desirably."

## Bleeding from the Nose.

Some two years ago, while going down Broadway, in New York, blood commenced running from my nose quite freely. I stepped aside and applied my handkerchief, intending to repair to the nearest hotel, when a gentleman accosted me, saying, "Just put a piece of paper in your mouth, chew it rapidly, and it will stop your nose bleeding." Thanking him rather doubtfully, I did as he suggested, and the flow of blood ceased almost immediately. I have seen the remedy tried since quite frequently, and always with success. Doubtless any substance would answer the same purpose as paper, the stoppage of the flow of blood being caused doubtless by the rapid motion of the jaws, and the counter action of the muscles and arteries connecting the jaws and nose.

Physicians state that placing a small roll of paper or muslin above the front teeth, under the upper lip, and pressing hard on the same, will arrest bleeding from the nose—checking the passage of blood through the arteries leading to the nose. H. C. K.

THE London Pneumatic Dispatch, by which small parcels are transported from one part of the city to another, by means of the exhaustion of air from a tube, is familiar to our readers. It appears, from a report recently made by the directors of this company, that 120 tons of goods can be transmitted through the tube every hour, at a speed of eighteen miles an hour, and that the cost is less than one penny (two cents) per ton for each mile. They anticipate large dividends from the line when completed to points outside the city.

## Photographing Cannon Balls.

[From the British Journal of Photography.]

Some months ago when on a visit to Woolwich Arsenal, we were shown by Mr. M'Kinlay, Proof Master, some photographs taken of guns while being fired, which not unnaturally excited feelings of surprise. So rapid had been the exposure, and so well had the proper moment for the exposure been seized, that the projectile could be seen protruding from the cannon's mouth while in the act of proceeding on its distant mission. Mr. M'Kinlay kindly afforded us every requisite information relative to his invention for securing such wonderful results; and, from the fact that the comparative efficiency of certain kinds of small-arms and the influence they are now exercising in European affairs are at present receiving a large share of public attention, we think that it may not prove uninteresting to bring before our readers some matters of scientific interest in connection with our own "great guns," and the means employed for ascertaining by photography, and with the utmost possible precision, not only the path of a projectile in the air, but the time occupied in its progress between two or more points anywhere in the course of its flight. It will be obvious that when it is desired to obtain a photograph of a gun at the moment of discharge, the gun itself must be made subservient to the exposing and covering of the sensitive plate. It is impossible that any person, however delicate his eyes and ears may be, can operate so dexterously as to stop the exposure when the ball has been projected, say a few inches from the muzzle of the gun, and when it is consequently traveling at its greatest velocity. This can only be accomplished by automatic arrangements, aided by electricity.

Let us now suppose that a stereoscopic camera, fitted with powerful lenses of short focus, has a thin, light disk fitted up in front of the lenses, revolving on an axis between the two lenses. Two holes in this disk correspond with the apertures of the lenses, so that if a circular spring—like that of a pair of snuffers—cause the disk to make half a revolution with great rapidity, the holes or apertures will, when flashing past the apertures of the lenses, admit the light for an exceedingly brief period of time. This is the means employed in the Arsenal for effecting the exposure of the plate.

We shall now enter into the details of the manner of discharging and arresting the circular exposing diaphragm. The opening and shutting of the camera at the precise instant of time is, as we have said, by far too nice an operation to be accomplished by hand. It must be borne in mind that a gun commences to recoil as soon as the projectile is fairly clear of its muzzle. The picture which we examined had been taken when the projectile was yet emerging from the gun's mouth, and before it had got quite clear of it, and consequently before the recoil of the gun had commenced. The exposure was very rapid, but not so much so as to show the front edge of the emerging projectile with a sharp outline. Although the gun, from the recoil not having commenced, was quite sharp, the front edge of the projectile, was, so to speak, vignetted.

The gun is fired by means of the galvanic tube invented by Mr. M'Kinlay, and such as is used in proving ordnance. Inside of this there is a small platinum wire, which, when a current of electricity is passed through it, instantly becomes red hot and melts. Let us now see how this affects the operation of photographing the gun. When the gun is ready for firing, the disk in front of the lenses is wound up so that the rotating force of the spring in the center is at its maximum. It is retained in this position by means of a catch and trigger, the latter of which is operated on by means of an electro-magnet. The following, then, is what takes place: When the galvanic current is sent through the wire, the fine platinum wire imbedded among the gun powder of the discharging tube or fuse immediately becomes red-hot and melts. But while in progress of melting, it accomplishes two things—it transmits a current through it by which the electro-magnet becomes vivified and pulls the discharging trigger of the disk in front of the camera lenses; and secondly, it ignites the gunpowder and discharges the gun. But were this all, the exposure would be made before the powder had had time to ignite and consequently dis-

charge the gun; hence it is important that the lenses be kept open until the gun really discharges its contents. The means for effecting this are as simple as they are ingenious and complete. When the trigger acts so as to release the disk from its enforced pent-up condition, it is propelled forward by the central spring until the apertures in the disk and those of the lenses coincide, where, by means of a stop, the disk is retained until the powder is ignited and the gun discharged, when, the platina wire being ruptured, the passage of the electricity is stopped, the electro-magnet simultaneously losing the power by which it was enabled to arrest the rotatory progress of the disk, which thus darts forward and closes up the camera as the contents of the gun are in the act of being ejected from it.



## Developing Heat.

MESSRS. EDITORS:—I see in your foreign correspondence, on page 98, current volume of the SCIENTIFIC AMERICAN that Mr. B. Stewart, at Kew, is conducting some new experiments for developing heat by rotating a disk in vacuo, and that this heat arises from causes unknown. Allow me to observe that this experiment is only a modification of the experiments of Arago, who rotates a disk under a compass needle, and so produces currents in the disk, which react on the needle, and Foucault, who turns a disk between the poles of an electro-magnet, and thus develops currents which strongly heat the disk.

In every rapidly-turned metallic disk, electric currents are induced by the influence of the earth's magnetism, and these currents will necessarily heat the disk. When the magnetic influence is weak, as is the case with the earth, the currents are weak, and the heat developed will be so slight, that it takes a thermo-electric pile to observe the rise of temperature. As the friction and disturbance of the surrounding air may produce much more heat, the disk is placed in vacuo in order to eliminate this influence, but when trying to neutralize the earth's magnetism by an opposing steel magnet, placed at a certain distance, we may neutralize the earth's action on the compass needle placed at a certain point, but the opposing neutralizing currents will be still there, and show their action in any moving metallic mass, by inducing electric currents, of which the existence is proved by the consequent rise of temperature. P. H. VANDER WEYDE, M. D. Philadelphia, Aug. 10, 1866.

## Fleas and Mosquitoes.

MESSRS. EDITORS:—In an article on page 82, current volume of the SCIENTIFIC AMERICAN, you state that oil or essence of pennyroyal is believed to be a specific against the attack of fleas. I have always used it when fleas were in my bed or about my clothing, and found that it would banish them entirely, and am now using it with equal success to banish mosquitoes; they will not come near where it is. W. N. TAYLOR.

## Steam Fire Engines.

MESSRS. EDITORS:—If any of your readers can give the greatest performance of an American steam fire engine, replies upon the following points are solicited:—Diameter of steam cylinder; stroke of do.; pressure of steam; diameter of water cylinder; pressure; number of strokes per minute; length of hose through which one stream was projected; diameter of nozzle and distance of projection. Length of hose of 100 feet is preferred. C. H. H. New York, Aug. 10, 1866.

## Preserving Green Peas.

MESSRS. EDITORS:—In answer to the inquiry concerning green peas, on page 69, current volume, I give the following:—

I have found that, by gathering peas when young, and in the best condition for immediate use, then podding and scalding, and drying thoroughly in the sun or oven, they will keep almost any length of time done up in paper bags. When wanted for use, soak them in mint tea until they swell again to their natural size. J. H. D.

## AGRICULTURAL EXHIBITIONS.

Notwithstanding our best endeavors, we have not succeeded in procuring so complete a list of prominent fairs as we desired. We give a selection from the list we have.

The New England Agricultural Society and the Vermont State Society will hold a joint exhibition at Brattleboro, Vt., on the 4th, 5th, 6th and 7th days of September. The Agricultural and Mechanical Association of St. Louis will open an exhibition in that city Oct. 1st, to continue six days. The premiums amount, in the aggregate, to over \$20,000.

STATE FAIRS.—American Pomological, St. Louis, Sept. 4; Canada West, Toronto, Sept. 24, 25; Illinois, Chicago, Sept. 24, 25; Indiana, Indianapolis, Oct. 1, 5; Iowa, Burlington, Sept. 18, 21; Kansas, Lawrence, Oct. 2, 5; Kentucky, Paris, Oct. 2, 5; Michigan, Adrian, Sept. 18, 21; Minnesota, Rochester, Oct. 3, 5; New Hampshire, Nashua, Sept. 18, 20; New York, Saratoga, Sept. 11, 14; Ohio, Dayton, Sept. 25, 28; Pennsylvania, Easton, Sept. 25, 27; Wisconsin, Janesville, Sept. 25, 28.

NEW YORK.—State and County:—Albany, Albany, Sept. 25, 28; Genesee, Batavia, Sept. 19, 20; "International," House's Point, Sept. 18, 19.

MASSACHUSETTS.—State and County:—Bristol, Taunton, Oct. 2; Berkshire, Pittsfield, Oct. 2; Essex, Haverhill, Sept. 25; Hampshire, Franklin and Hampden, Northampton, Oct. 4; Hampden, Springfield, Oct. 2; Middlesex, Concord, Sept. 20; Norfolk, Dedham, Sept. 27; Plymouth, Bridgewater, Sept. 27.

NEW JERSEY.—State and County:—Monmouth, Freehold, Sept. 19, 20; Morris, Morristown, Sept. 11, 14.

PENNSYLVANIA.—State and County:—Bucks, Newtown, Sept. 25, 26; Chester, Westchester, Sept. 27, 29.

KENTUCKY.—State and County:—Warren, Bowling Green, Sept. 18, 20.

MICHIGAN.—State and County:—Jackson, Jackson, Sept. 25, 28.

ILLINOIS.—State and County:—Cass, Virginia, Sept. 4, 6; Peoria, Peoria, Sept. 19, 21.

WISCONSIN.—State and County:—Brown, Green Bay, Sept. 25, 27; Horse Show, Milwaukee, Sept. 11, 13.

IOWA.—State and County:—Cerro Gordo, Mason, Sept. 20, 21.

## THE MARKETS.

Although there are many complaints of the general dullness in business, and there are no very encouraging signs of an early fall trade, yet prices are well sustained, and money is plenty and obtainable at low rates. The new tariff law, which went into operation Aug. 10th, has tended to enhance the prices of such imported articles as were subjected to a higher rate of duties. Reports of a damaged crop of cereals have not had the effect to stimulate speculation to any great extent, notwithstanding the facility of obtaining money. This is probably owing to the manifest unreliability of these reports; as it is morally certain the crop will be an unusually large one: at least, whatever occasional failure there may be in the wheat crop, induced by local causes, will be more than counterbalanced by the excess in the corn yield. The unsettled state of European affairs still threatens the peace of that continent, and although the European crop reports are generally favorable, we believe the demand for American grain will be large.

GOLD—Has held firmly at about 149. Exchange is dull and the rates in favor of the buyer. Money is obtained on call at 4@5 per cent. Discount at about 6 per cent.

ASHES—Pots are quite dull, but with continued light receipts, market steady: the sales are 30 bbls. at \$8 3/4@8 50. Pearls are nominal; we hear of no business.

BRICKS—Common Hard have advanced to \$12. Croton and Philadelphia are unchanged at \$14@15 for the former, and \$40 for the latter.

COFFEE—Rio held firm. No disposition to sell. St. Domingo, 11 1/2c, in bond, and Costa Rica at 17 1/4; both gold.

COPPER—Detroit, 31@31 1/2; Portage Lake, 31.

COTTON—Market depressed. Prices have declined from 23@4c. Ordinary, 25@28; middling, 33@37c.

FLOUR—Slight advance. Common brands, \$8 3/4@8 50; Genesee extra, \$10 25@12 50; Canada not in demand.

MEAL—Dull.

GRAIN—Wheat advanced slightly. Milwaukee, \$2 20@2 22 1/2 Amber, \$2 75; North Carolina Red, \$2 85. No exports. Bye, Western, 82c; Corn, 80@81c; Western Mixed, \$1; Oats declined to 30@44 Chicago; 45@47 Milwaukee; 57 Delaware.

IRON—Market inactive. No. 1 American pig \$47@48. Scotch, \$47@50. Bar and scrap very quiet.

LATHS—Are firm, with sales of Eastern, at \$4, three months.

LEAD—Pig is in better demand, and, though prices are without notable change, the market is rather in sellers' favor; the transactions are 300 tons Spanish at \$6 75; 50 do., English (Cookson's), \$7, all gold. Bar, Sheet, and Pipe may be quoted steady at 10 1/2c, cash.

LEATHER—The market for Hemlock Sole continues dull, and prices are very firm. We quote Rio Grande and Buenos Ayres Light Weights, 35@34 cents; Middle do., 35@36; Heavy do., 35@37; California Light, 31@32; Middle do., 31 1/2@34 1/2; Heavy do., 34@35; Orinoco, &c., Light, 31@32; Middle do., 32@34; Heavy do., 29@32; Slaughter Upper in Rough, 31@33. Oak Sole is in light stock, and the market is firm. French and American Calf Skins are firm with a fair demand.

LIME—Rockland is in good demand. Common at \$1 50; Lump is nominal at \$2 00, cash. Rosendal Cement, \$1 75, cash.

LUMBER—There is an active demand for Eastern Spruce, with sales at \$35, usual terms.

MOLASSES—There has again been a more active demand for the low and medium grades Cuba, a considerable portion of which, we learn, is to pass into the hands of distillers. The operations, including two or three cargoes to arrive coastwise, are 1,704 hhd. and 84 tes. Clayed Cuba, at 42@44c.; 480 hhd., 10 tes., and 151 bbls. low grade Cuba Muscovado, 48c.; 454 hhd. do., 52@55; 197 hhd. and 28 tes. English Island, 50; 65 hhd. Porto Rico, 60@70, 4 mos., the lower price for tart; and 450 hhd. and 75 tes. Centrifugal Cuba, on terms not mentioned.

NAILS—Cut are very firm and scarce, with a tendency to advance; some sizes are scarce, and for these 1/2 cent more is paid. We quote: Cut, 6 1/2@7 cents; Clinch, 8 1/2; Forged Horse, 32 Pressed do., 22@24; Copper, 50; Yellow Metal, 33; Zinc, 20; and Wrought Ship and Boat Spikes, 7@8 cents, as to sizes, net cash.

SUGAR—Prices have favored sellers, and we have to notice an advance of 1/4 of a cent per lb. on Refining grades, bringing Fair Refining Cuba to 19 1/2@19 3/4 cents; Good, do., to 11@11 1/4; and No. 12 Box to 11 1/2@11 3/4, 4 mos. Grocery grades are without particular change, but are the turn dearer. Refined continues in good demand, but is less active than before. Messrs. Stuart quote their best Crushed, Granulated, and Ground, 15 1/2 cents; White A, 16 1/2; and Yellow C, 15 1/2—the range of other manufacture is 16 1/2@17 cents for Hard; 15 1/2@16 1/4 for Soft White (B and A only), and 14@15 1/4 for Yellow.

WIRE—Telegraph, 9c.@10c. for Nos. 7 and 11, and for hoop skirt, 55c. for No. 13 covered, and 35c. for uncovered.

WOOL—Market unsettled. Western Fleeces at 48@50c. for low grades, 55 for ordinary, and 65@72 for choice—the latter price for Ohio picklock; super and extra pulled, 53@65; short staple at 35; Texas, 15@18 for inferior, 20@24 for ordinary, and 25@30 for superior.

ZINC—9 1/2c. less 4 per cent. for gold; 13 1/2c., currency, for L. High.

**NEW INVENTIONS.**

The following are some of the most prominent of the patents issued this week, with the names of the patentees:—

**LOOM.**—W. B. WALKER, AND N. D. HARTLEY, Salem, Iowa.—This invention is to simplify and improve that kind of hand loom in which several leaves of harness are employed.

**POUNCING HAT BODIES.**—S. S. WHEELER AND D. B. MANLEY, Danbury, Ct.—This invention consists in pouncing a hat body by means of an emery cylinder or wheel revolving at a high speed against the surface of a hat body revolving at a comparatively low speed.

**COAL-OIL AND OTHER LAMPS.**—C. H. BAGLEY, Elgin, Ill.—This invention consists, among other things, in trimming the wicks of coal-oil and other lamps by means of a scraper so hung within the top of the lamp as to be moved across the upper end of the wick tube, and its wick, thus scraping off or removing the charred or burnt portions of the wick.

**RENDERING TALLOW, ETC.**—J. J. ECKEL AND I. S. SCHUYLER, New York City.—This invention is a device for rendering tallow which will preclude the possibility of the tallow being scorched or burnt during the process, and by which all offensive odors will be avoided.

**STREET LANTERN.**—B. A. JOHNSON, Jeffersonville, Ind.—This invention consists in forming the bottom or base portion of a street lantern, of cast metal, and the body of sheet metal, whereby sufficient strength is secured in connection with durability and convenience of handling, and diminished expense.

**SPREADING MASTIC ROOFING.**—W. R. COE, West Meriden, Ct.—This invention is an improved apparatus for spreading roofing cement, evenly, quickly, and conveniently, and consists in the combination of the guiding and pressure roller, the box or hopper, and the adjustable spreading board.

**CIGAR HOLDER AND HAT HOOK.**—CHAS. G. SCHWIND AND JOHN GREYER, Union Hill, N. J.—This invention relates to a simple device which can be conveniently carried in the pocket and used as a cigar holder, and also a hat hook whereby the hat can be suspended in any convenient spot.

**TOBACCO BOX.**—THOS. HUCKAUS, New Baltimore.—This invention consists of a box for carrying tobacco having a partition through it with an A-shaped base, which latter forms a receptacle for matches, which are to be withdrawn from an opening in the front of the box, a slide attached to the cover confining them in the case when the lid is closed.

**DITCHING MACHINE.**—PETER LUGENBELL, Greensburgh, Ind.—This ditching machine consists in a novel construction of the excavator and the arrangement of the same in the framing, whereby a very simple and efficient device for the purpose specified is obtained.

**SORGHUM EVAPORATOR.**—P. C. VAN SLYKE, Bloomfield, Ind.—The object of this invention is to improve the construction of evaporators for sorghum sirups so as to promote crystallization and the production of sugar.

**SOLDERING EAVESTROUGHS.**—E. W. WILKINSON, JR., Mansfield, Ohio.—This invention relates to a holder for eavestroughs, while being soldered, whereby the work can be accomplished with much facility and more evenly than by the method heretofore practiced.

**KITCHEN TABLE.**—E. L. STAPLES, Nashville, Tenn.—This invention relates to a table which serves all the purposes of the common one, being convertible into a kneading trough and table combined, and it appears to be very simple and compact in its combination and to fully answer its purposes.

**HINGE.**—ALVAH WISWALL, New York City.—This invention consists in applying a spring to one or both of the hinges of a door or gate, in such a manner that the spring will close the door or gate after being opened for a person to pass through, and when the door or gate is opened further than is necessary to keep it open.

**HAY-ELEVATING DEVICE.**—E. SHORLEY, Lewisburgh, Pa.—This invention relates to a new and improved device for elevating hay in barns and depositing it in bays by the aid of a horse.

**SLIDE BOLT.**—JOHN DECKER, Sparta, N. J.—This invention consists in applying a series of tumblers to a slide bolt in such a manner that an ordinary bolt may be rendered as secure a fastening as an ordinary tumbler lock, and without materially augmenting the cost of the manufacture of the slide bolt.

**INCORUSTATIONS IN STEAM BOILERS.**—N. SPENCER THOMAS, Painted Post, N. Y.—This invention relates to a compound which, when introduced into a steam boiler, will prevent the formation of incrustations or scales, and which can also be used with advantage for the purpose of removing scale already formed in steam boilers.

**VULCANIZING INDIA-RUBBER, ETC.**—L. HOFFSTADT, Philadelphia, Pa.—This invention consists in the arrangement of a self-acting regulator in combination with a vulcanizing apparatus in such a manner that the flame which heats the boiler of the vulcanizing apparatus is extinguished when the temperature rises beyond a certain degree.

**CARPENTER'S CLAMP.**—HERMANN SCHMIDT, New York City.—This invention consists in a carpenter's clamp which is provided with movable nuts in such a manner that by releasing the nuts from the screws, the two jaws of the clamp can be moved freely in either direction and readily adjusted at the desired distance apart.

**RENDERING LARD.**—JOHN J. ECKEL AND ISAAC S. SCHUYLER, New York City.—The object of this invention is to avoid the dissemination of vapors and unpleasant odors from kettles in which tallow is being rendered, and to utilize said vapors by rendering them available as a fuel.

**THROTTLE VALVE.**—R. B. ANGUS, Tremont, Pa.—This invention relates to a flask made for the purpose of casting throttle valves; it is composed of a cylinder bored out to the diameter of the seat into which the valve has to fit, and is provided with suitable blocks, the inner ends of which, when properly put together, form the mold for the valve to be cast. The blocks are held in position by a screw clamp so that they can be screwed up as the

metal shrinks, and a suitable hole passing transversely through the cylinder allows of introducing the pin or rod which forms the core for the axle of the valve in such a manner that the hole for the axle is cast in and a valve is obtained which is ready to be put in its seat immediately upon being removed from the mold.

**PRESSURE FOOT, ETC.**—JAMES J. RUSS, Worcester, Mass.—This invention consists in so arranging a pressure foot for planing and molding machines that it can be adjusted in position to accommodate itself to the cutters of the machine, whether large or small, and also adjusted to conform to the bevel or inclination of the surface of the stuff or wooden strip which is being passed through the machine.

**PLOW-CLEANING ATTACHMENT.**—TIMOTHY TERREL, Spring Hill, Ohio.—This invention relates to a new, simple, and useful attachment for plows, whereby the same are effectually prevented from becoming choked or clogged up with weeds, etc., during the operation of plowing.

**FISHWAY.**—ALONZO LIVERMORE, Ashland, Pa.—This invention consists in constructing a fishway of any desired diameter, divided off into compartments to form pools or water chambers, an opening being made through each division wall for the current to pass through, and around these openings there are secured water breaks in the form of tubes pointing obliquely and against the current; by which contraction and arrangement the velocity of the current is broken.

**SNAP HOOK.**—B. B. LEWIS, New York City.—This invention is a snap hook for hitching straps which will admit of being disengaged from a post or ring by simply pulling the reins or lines by which a horse is driven, and thereby obviating the necessity of detaching the hook from the ring previous to getting into a vehicle or mounting a horse.

**CONCENTRATED LIQUID EXTRACT.**—N. SPENCER THOMAS, Painted Post, N. Y.—This invention consists in the application of jets of air or steam injected at or through the bottom of a vacuum pan in which the concentration of a liquid extract is to be effected, so that by these jets of air or steam the moisture contained in the extract is completely expelled, and a solid extract can be made before removing it from the pan.

**PICKER FOR FIBROUS MATERIAL.**—LEVI FERGUSON, Lowell, Mass.—This invention consists in giving to the comb plates a vibrating motion toward and from the cylinder by means of suitable cams, eccentrics, or other means, in such a manner that the teeth of the comb plates alternately take the fibers from the cylinder as they move toward the same, and cleaning themselves as they move from the cylinder. The operation of picking is greatly facilitated.

**DISINFECTING COMPOUND.**—HENRY NAPIER, Elizabeth, N. J.—This invention relates to a disinfecting compound, the chief ingredient of which is phenic acid, and which can be used with good effect in public places, or in hospitals, sick rooms, and wherever a disinfectant is required.

**FOUNTAIN PEN.**—H. MADEHEIM, Brooklyn, N. Y.—This invention consists in a fountain pen with a hollow piston rod, stationary piston and movable pump barrel, in such a manner that the barrel or reservoir can be filled from either end, and a comparatively large supply can be taken in by the pen.

**SKELETON SHAPE OR FRAME.**—MISS P. A. LA MENT, New York City.—This invention consists of a skeleton frame or "shape," which, being applied to the waist of a person, can be so adjusted as to perfectly conform thereto, and when removed the form will be retained, over which a dress can be fitted.

**SHEET METAL PANS.**—M. S. SAGER, Washington, Ohio.—This invention relates to a useful machine for the manufacture of sheet iron and other sheet metal pans, whereby such portions of the sheet metal as are to constitute the sides of the pan can be bent upward, and their several corners firmly united.

**BED BOTTOM.**—E. M. PAYNE, Waverly, New York.—This invention consists in the combination of sacking, rollers, pawls, and ratchet wheels with each other, and with the frame of the bed bottom, for the purpose of straining or tightening the sacking; and in the combination of half elliptic springs or equivalent with the frames of the bed bottom.

**DRYING HOUSE.**—H. B. GALLOP AND CHARLES WOOD, Watertown, Wis.—The object of this invention is to obtain a house for drying lumber and other substances, which will be fire-proof, and possess other advantages over drying houses now in use.

**MACHINE FOR TURNING HUBS.**—HIRAM INMAN, Haganan's Mills, N. Y.—This invention relates to a new and improved machine for turning hubs, whereby the work may be rapidly and perfectly performed, effecting a great saving both in time and labor.

**CUTTING APPARATUS FOR GRAIN AND GRASS HARVESTER.**—M. P. HATHAWAY, Mankato, Minn.—This invention consists in having the cutters of a harvester attached to an endless apron placed at the front end of the platform, or a suitable bar arranged in such a manner that they will work or pass each other with a drawing cut, and operate similar to a pair of shears.

**SECURING TEETH IN CIRCULAR SAWS.**—WILLIAM CLEMSON, Middletown, N. Y.—This invention relates to a new mode of securing teeth in circular saws, whereby the following results are obtained:—First, The ready removal of the teeth from the saw plate, as well as the ready attaching of them thereto. Second, The preventing of the swelling or warping of the plate by the lateral pressure of the clamp which secures the teeth in the plate.

**FOLDING UMBRELLA.**—DANIEL KELLEY, Slatersville, R. I.—This invention relates to an umbrella the ribs of which are made in two parts to slide one on the other, and are provided with a spring catch in such a manner that when the ribs are extended to their full length they are rigid, and the umbrella when folded is reduced to a small compass.

**CAR COUPLING.**—G. D. SPOONER AND J. F. F. HALL, Rutland, Vt.—This invention consists in the arrangement of a central horizontal partition in the drawheads of a car coupling in such a manner that the link or shackle bar can be readily adjusted for cars of a different height, and a universal self-locking car coupling is obtained.

**BUTTON.**—E. A. ROBINSON, Waterbury, Conn.—This invention consists in the use of a metallic plate, made of a corresponding

diameter to that of the mold, the center of which is broken out, forming a "ragged" edge, flange, or lip. This plate by its flange is driven into the center opening of the mold in which the eye or loop is first placed, tightly and firmly securing it.

**SEWING MACHINE.**—AUSTIN LEYDEN, Atlanta, Georgia.—This invention is a sewing machine which will make, at the pleasure of the operator, several varieties of stitches without requiring to be stopped for alteration or adjustment.

**SEWING MACHINE.**—ANTON GALLETH, New York City.—This invention is an improvement in rotating feeding devices for sewing machines, consisting in improved means for converting a reciprocating into an intermittent rotary motion.

**SHOE CLEANER.**—B. FRANK EARLY, Palmyra, Pa.—This invention consists of a frame constructed and arranged in such a manner that corn husks and other suitable substances may be made to form a durable and efficient mat or foot cleaner, to be renewed at pleasure.

**CLOTHES BAR OR HOLDER.**—THEODORE F. SNOVER, Menasha Wis.—This invention consists of a series of bars or rods so hung within a common head or frame, that when not desired for use they can be swung up out of the way.

**WASHING MACHINE.**—B. BISBEE, East Pharsalia, N. Y.—This invention relates to improvements in that class of washing machines in which a revolving cylinder is used, into whose interior the fabrics, etc., to be washed are placed, and whirled round to cleanse them.

**VALVE IN THE HULL OF A VESSEL.**—JOHN H. FAIRBANK AND FREDERICK RHODES, McKeesport, Pa.—This invention consists in the application of a valve to the hull of a vessel, whereby the vessel can be filled with water and sunk in case of fire.

**BEER MEASURE.**—JAMES DAILEY, Albany, N. Y.—This invention is a device for measuring fermented liquors while the same are in either a foaming or quiet state.

**ROSE ENGINE LATHE.**—THOMAS LIPPIATT, New York City.—In this lathe the dictator, in lieu of being stationary, is arranged so as to move laterally as the mandrel is revolved, according to the figure of the pattern secured on the mandrel, the cutting tool being connected with the dictator in such a manner as to partake of its movements, thus transferring to the article turned a similar configuration to that of the pattern.

**VEHICLE.**—FRANCIS CRICK, Beanesville, Ohio.—This invention consists in the peculiar construction of the spring and gearing of wagons and other vehicles.

**LARD LAMP.**—TIMOTHY TERREL, Spring Hill, Ohio.—This invention consists in a novel manner of securing or arranging the wick within the fountain, whereby the wick may be raised or lowered with the greatest facility.

**HOLDER FOR NECK-TIES.**—W. H. HART, JR., Philadelphia, Pa.—This invention relates to a holder for scarfs, neck-ties, etc., by means of which they can be readily secured in position upon the neck, or removed therefrom without injuring or soiling the collar, and without requiring the scarf or neck-tie to be passed entirely around the neck.

**QUESTION ABOUT PRIOR INVENTION.**  
BEFORE THE EXAMINERS-IN-CHIEF ON APPEAL.  
*Interference between the respective applications of W. H. Salisbury and Charles Jones.*

The above case came on, some time since, for hearing before the Examiners-in-Chief of the Patent Office. Jones proved clearly that he had a rude model of the invention in dispute in October, 1833. But he took no further steps toward completing it till the fall of 1834, when he applied for a patent. It is equally clear that, in June, 1834, Salisbury put a single specimen in actual use, and in the course of the next month, as many as twenty. The date of his invention goes no further back than June.

The Board found, from the testimony, that Salisbury obtained the invention from Jones, and that Jones had not abandoned it as an unsuccessful experiment, although the evidence upon these points was not decisive. The discussion respecting it would not prove interesting; but a legal question was raised, upon the state of facts that is of general importance.

On the part of Salisbury, it was contended that Jones had forfeited his right to a patent in consequence of his not having used due diligence in perfecting and adapting his invention, while Salisbury had actually reduced it to practice. In support of this position, his counsel urged that even he who obtains a patent surreptitiously, or unjustly, while the true inventor is thus negligent, is entitled to hold it against the latter, under the 15th Section of the Act of 1836. It has been held in several cases. They further added, that he who first reduces an invention to practice is entitled to a patent against him who had conceived it previously, but had been giddy of laches in maturing it. From this they argued that Salisbury was, under the circumstances, entitled to a decision.

The Board came to a different conclusion. They did not acquiesce in the position first advanced, for, though it might be implied from what has been sometimes said, that he who obtains a patent surreptitiously may hold it against a prior but negligent inventor; yet, if so, this must be regarded as a sort of penalty inflicted upon the latter for his lack of diligence. Like all other penalties, however, it can be imposed only under the precise circumstances under which the statute has prescribed it; and that is, when a patent has been actually obtained. Where neither party holds one, no such punishment can be inflicted.

If, indeed, the parties were both independent inventors, who had acted in good faith, he who first matures the invention thereby acquires the right to it, except in the single instance where his competitor first conceived it, and has been diligently engaged in adapting and perfecting it. But this doctrine merely determines the civil rights of two innocent and bona fide competitors. It has never been applied where one of them is found to have obtained the invention from the other. To hold this would be inflicting the penalty in a case where the law has provided none; that is, where the party who first matured the invention had not obtained a patent.

The decision declaring Jones the prior inventor was accordingly pronounced by S. H. Hodges for the Board. The decision was lately done affirmed by Carter, Chief Justice of the Supreme Court for the District of Columbia.

**SPECIAL NOTICES.**

Joseph J. Couch, formerly of Philadelphia, Pa., now of Brooklyn, N. Y., having petitioned for the extension of a patent granted to him the 23d day of November, 1832, for an improvement in machines for drilling stone, it is ordered that said petition be heard on Monday, the 5th day of November next.

Stephen C. Mendenhall, Richmond, Ind., having petitioned for the extension of a patent granted to him on the 9th day of November, 1832, for an improvement in mode of throwing shuttles in looms, it is ordered that the said petition be heard on Monday, the 23d day of October next.

Stephen C. Mendenhall, of Richmond, Ind., and Obed King and Ezra King, of Salem, Iowa, having petitioned for the extension of a patent granted to them on the 9th day of November, 1832, for an improvement in hand looms, it is ordered that the said petition be heard on Monday, the 23d day of October next.

## DEAD-STROKE POWER HAMMER.

There is no question but that the employment of power hammers would be far more universal at the present time if some simple and efficient machine existed for the purpose. The ancient trip hammer is not by any means uncommon in the best workshops, and where steam is available, we find many hammers worked directly by it. Atmospheric machines are also in use, but each and all of these have peculiar difficulties inherent in them which cannot be surmounted. The trip hammer, as is well known, entails constant supervision and



SHAW'S DEAD-STROKE POWER HAMMER.

outlay to keep in order, for the entire weight or force of the blow, uncompensated by any arrangement whatever, comes upon the handle of the hammer, and through it is transmitted to the center on which it vibrates, to the bed plates, and even to the line of shafting which drives it. As a consequence the handle has to be renewed very often, and the saddle piece, as well as other parts, are constantly broken by the shocks they undergo. Steam hammers also require great oversight, for having many parts, valves, pistons, levers, etc., inspection is requisite to keep the tool in good order. Pneumatic or atmospheric hammers, that depend upon the compression of air for their motive power, are open to similar objections, for air is a much more subtle fluid than steam. Space is also a consideration in many cases, and the trip hammer is particularly objectionable on this account.

The hammer here illustrated is an entire novelty in its line, as well as in mechanical effect for the power expended. The proprietors and manufacturers are large workers of steel in the form of car springs, and finding the common difficulties with trip hammers, were led to investigate with a view to improvement—the result is the hammer illustrated.

It is well known to mechanics, especially steel workers, that forging thin plates of it is the hardest duty a hammer can do. The heat is soon lost, and much of the work is unavoidably done at a black heat. Trip hammers running on this work soon jar themselves to pieces, as do all others, unless care is taken. Owing to the peculiar construction of this hammer, however, the very causes which destroy others are taken advantage of here to give greater efficiency—the recoil is stored up and made to operate to some purpose.

The parts are few and simple; an upright frame, A, is fitted with a transverse shaft at the top, on which is a crank wheel, C; to this crank is attached a connecting rod, D. This rod is attached to a spring, E, and works the hammer in the guide brace, F. These are the principal points. When the hammer is given a reciprocating movement by the parts alluded to, it strikes with a force proportioned to its velocity. When the revolutions are increased rapidly, the efficiency of the machine is very great—a hundred-pound hammer being capable of drawing a four-inch bar down to any desired thickness at one heat; it strikes with irresistible force, and is equal in round numbers to a blow of 20,000 lbs. weight. While this efficiency is obtained, the arrangement is such that the working parts above receive no injury, for the hammer head is attached to a peculiar connection, G, which is made of leather belting, so that it is held suspended, and free from communicating any shock or jar to the shaft and bearing.

The dies are also well arranged for convenience. By reference to the engraving it will be seen that a wedge, H, is employed as usual, but instead of battering at it with a sledge for some minutes in order to loosen it, a bolt is screwed into the frame so that by one turn of it the dies can be removed in a moment. This feature is of great importance.

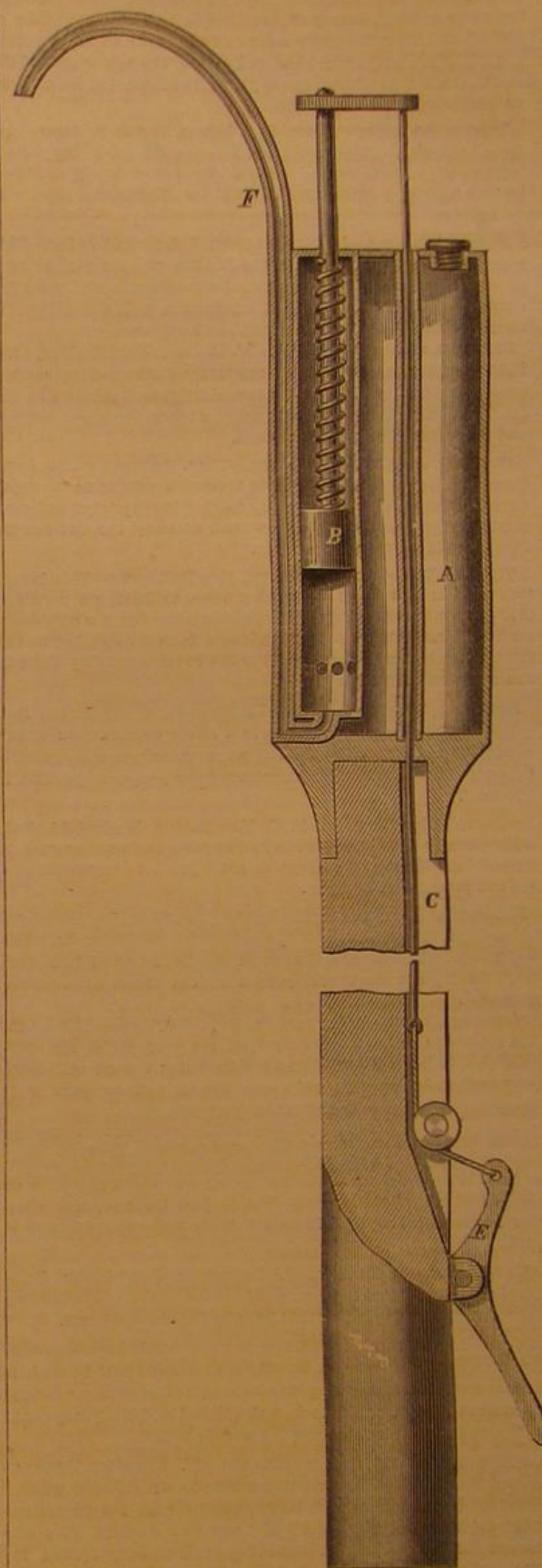
We are not able to give, in a short article like this, a just idea of the utility of the hammer. It is capable of being applied to a great variety of uses and is so simple that it can be worked by one man. The belt tightener which operates the hammer can be worked by the foot of the smith, and when he has a heat ready he can work it off without the necessity of calling his helper. It can be run fast or slow, strike light or heavy, will forge thin steel, and may even be run on the dies with impunity. It is confidently recommended as a useful and economical tool. The manufacturer has had one in use forging plates for car springs for a long time and no repairs of any amount have been needed.

This power hammer was invented by Thomas Shaw, and is manufactured by Philip S. Justice, No. 42 Cliff street, New York, and No. 14 North 5th street, Philadelphia, to whom all orders should be addressed. Patented Feb. 27, 1866.

COAL oil is a better substance for preserving potassium and sodium than naphtha. In coal oil, sodium keeps its luster for months, while in the purest naphtha it is dimmed in a few days.

## KING'S OILER.

Any one who has seen a laborer oiling shafting in a factory must have often trembled for his safety. Many lines of shafting are so full of pulleys that it is scarcely possible to get a ladder near the bearing to be oiled, and the man often reaches his arm in among rough-edged pulleys and couplings, with projecting bolt heads, at the risk of having it torn from his body. The common way of pouring oil from a can is also wasteful, for much more is applied than is necessary.



This oiler is claimed to be an improvement on the old plan, for it is not necessary to use a ladder at all, and the quantity of oil discharged at once can be seen. The details consist of a vessel, A, filled with a cylinder in which a plunger, B, works. This vessel, A, is filled with oil which finds its way to the small cylinder through holes in the bottom of the same. The plunger is operated by a wire, C, which runs down to the bottom of the shaft, D, on which the oiler is fixed. This shaft may be made of any desired length. By pressing on the lever, E, the plunger will be drawn down and oil forced up through the pipe, F, on to the bearing over which it is held. It is claimed that this is a desirable instrument for the purpose.

It was patented through the Scientific American Patent Agency by John King, of Ansonia, Conn., on July 10, 1866, who wishes to dispose of county or State rights.

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ARTISTS AND ARTISANS.

It is gratifying to notice our progress in refinement, as shown in the desire of our engineers and mechanics to consider the beautiful, as well as the useful, in their productions. It is only within a few years that any attention was paid by them to beauty of form, while they consulted safety, strength, necessity, and durability in their works. Indeed, a strong prejudice deterred the mechanic from embodying his ideas of beauty and harmony in forms of strength and utility. A bridge was simply a structure to permanently connect two points, and if the ends of strength and durability were attained, the design of the builder was fully answered. A machine was simply an agglomeration of masses of metal and wood—looking only to the utilitarian, and offensive to the eye and the taste. The gratification of taste was deemed a weakness.

As the demands of the world increased the products of the mechanic, educated taste revolted at the permanent divorce of the useful and the beautiful, and an attempt was made to reconcile the two by adding to the misshapen structure an overlay of meretricious ornament—carving, painting, and gilding. The radical deformities were thus brought into more repulsive relief, and the eye, offended, turned to less pretentious structures, which assumed to fulfill only the object of utility.

A new element of beauty has, however, been introduced into our mechanical progress. It is that of form rather than of ornament. An unadorned structure, possessing a graceful form, is more pleasing than an uncouth mass decorated with inharmonious gewgawa. A church, fashioned like a barn, may be commodious and answer the purpose of congregational worship, but however plain it may be, there is no reason why it should not possess distinctive characteristics to denote its uses and not offend the eye. The lines of a bridge need not be ungraceful. A tall chimney need not be uncouth. In fact, the architect, the engineer, and the mechanic may be artists and in no way detract from their usefulness. It is their duty to consult the requirements of correct taste as well as to follow the rules of mechanical construction; for every work of art subserves the purposes of education, and a love of the beautiful is implanted in our nature for a wise and benevolent purpose. To be sure, there is a beauty in the perfect adaptation of the means to the end.

There is a satisfaction in witnessing the operations of a machine which answers the end proposed by the builder, apart from the form which the material is made to assume; but beyond this is the gratification of taste in viewing a perfect union of the useful with the beautiful. And there is no valid excuse for the designer if he wantonly neglects this higher demand while endeavoring to subserve the lower requirements of use; for in the hands of the mechanic all materials become plastic, and he is false to his better tendencies if he forces them to assume outlines offensive to the eye, when this object of symmetry can be attained without sacrificing utility. And certainly, the cases are few where both these objects may not be attained.

Viewed rightly, an invasion of the sphere of the artisan by the artist is no degradation of the latter. It is not necessary to refer to the example of some of the greatest artists to illustrate this fact; nor is it puerile for the artisan to study the specialty of the artist, and endeavor to catch and fix the spirit of beauty in his works. We look for a rapid improvement in this matter now that it is not thought beneath the dignity of institutions of learning to recognize the mechanical engineer as a proper object to wear their honors. When the mechanic is conceded his proper place he will rank with the discoverers in science, the masters in literature, and the ministers of the beautiful, and with them be considered as an educator of the race.

TOOLS FOR SPECIAL AND FOR GENERAL USE.

Possibly it is prejudice, but we confess we always look upon a combination tool with a certain degree of suspicion. Yet the genius of our inventors seems to be guided in the direction of constructing appliances for work which are intended to be capable of performing several very distinct and differing branches of labor. Sometimes the combinations are successful, but oftener not. A machinist's lathe will turn a shaft or cut a screw with equal facility; but let the same lathe be used indiscriminately for turning wood and iron, or for chucking, boring, drilling, and turning, and it will soon be found that it fails to do one, perhaps all these differing processes, with the exactness and nicety required. The results of the work done by the planer and the milling machine are frequently very similar, but what machinist does not know that the latter is invaluable even when he possesses one of the best of the former. Again, the milling machine is but a modification of the gear cutter, yet the latter is necessary for accuracy. The shaping machine, working with adjustable crank, with quick return motion, is but a miniature and restricted planer; yet both are necessary to rapidity and perfection in doing work.

Probably no tool used by mechanics generally is capable of so many diverse applications as the lathe, and because of this it is often greatly abused. Take a well-adjusted screw-cutting turning lathe, and screw on the live arbor a massive universal, or scroll chuck, which receives a pulley or gear weighing fifty or one hundred pounds. Then apply the drills and reamers, or the resistance of a turning tool against the rim of a wheel as large as the lathe can swing. How long will it be before the lathe cannot be depended upon to turn a shaft or cut a fine screw? The intelligent manager, knowing that this application of one tool to varying purposes is seldom successful, furnishes his shop with "special tools," and in this he is right and reasonable. Let the screw lathe, the chucking lathe, the drilling lathe, each do its legitimate work, and be confined to its specialty. Let the planer be restricted to planing, and never forced to do the work so much better performed by the milling or the shaping machine, and the employer, customer, and workman will be gainers. We have seen a mechanic calling himself a workman planing in a lathe. Cutting a key-way by means of the carriage of a lathe may be a bright idea, but it is not a profitable one.

We prefer to see a machine or tool specially designed for a particular department of labor, and confined to that use; and where this plan is followed, we may be sure the work turned out will be of the best quality; at least the fault will not be because of imperfect tools.

It may be that commonly-used implements can be adapted to two or more purposes. We know of

such cases, but they are when the tool is one that cannot be injured for one class of work by using it for another. Still, in the general use of tools, those will be found to be most serviceable which have a particular work to perform, and are not diverted to strange and unnatural uses. Every shop or mechanical concern should be furnished with tools perfectly adapted to the specialty of its business. It is well enough for small manufacturers to utilize the means at their hand, and compel their tools to do double duty; but when in a position to avail themselves of tools specially designed for the different departments of their work, they are blind to their own interests if they waste the time necessary to convert a tool or machine from its legitimate purpose, and adapt it to a new one, and risk the injury to tools and the unfinished state of a job, together with their reputation, for this false economy.

ENGINES OF THE STEAMSHIP "RISING STAR."

The magnificent paddle wheel steamship *Rising Star* made her engineer's trial trip on the afternoon of the 11th, running from the foot of King street, North River, to below the outer Quarantine and returning. She is a noble vessel, unusually strongly built, and fitted up in the most complete and thorough manner. She was intended originally for the New Orleans route, but is, we believe, to run on the Atlantic route to Aspinwall, under the auspices of the Pacific Mail Steamship Company.

The main boilers are 30 feet long by 15 feet 9 inches diameter, of Smith's pattern, with a double tier of furnaces. The fire surface has 12,500 square feet, and the grate surface 400 square feet. The cylinder is 100 inches diameter with 12 feet stroke. The wheels are 36 feet diameter and 12 feet face, the paddles divided and graduated, and one wheel set in advance of the other, designed to prevent that unpleasant jar usually noticed in paddle-wheel ships. That this object was attained was evident to all who accompanied the ship on her trial trip.

She has a tubular condenser with a surface of 5,000 square feet. The cylinder is provided with a super-heating steam jacket, the steam for the jacket being supplied by an independent boiler, at a pressure of about ten pounds more than that of the steam supplied to the cylinder from the main boilers. The steam in this auxiliary boiler is made from salt water, and after circulating in this hollow cylinder head, the jacket, and cylinder bottom, enveloping the working cylinder, it passes to the main boilers, thence to the piston, performing its work, when it is condensed and used to supply the main boilers. By this means these boilers are supplied with comparatively fresh water—a great desideratum which has never yet been fully realized on any sea-going vessel. This jacket of high steam is hotter than the steam used in the cylinder, preventing any loss of power by radiation.

The rims of the wheels are planed to an edge before being formed into segments, so that the peripheries between and outside the paddles offer but little resistance in passing through the water.

The pillow blocks are peculiar, being arranged to admit of the removal or repair of the brasses without the usual labor and cost of disconnecting the engine, and also admitting of the "lining up" of the engine without disturbing the fastening of the pillow blocks. Practical engineers will see at once the advantages of this arrangement.

The engine was built at the Etna Iron Works, this city, from the designs and under the direction of Erastus W. Smith, A. P. D., assisted by Mr. Thomas Main, engineer for the builders.

The *Rising Star* was commanded on her trial trip by Captain Horatio Nelson, and in all respects the test was a most satisfactory one, the engine, during a portion of the time, making 18 turns per minute with perfect ease and without jar.

The nineteenth annual exhibition of American manufactures and the mechanic arts of the Maryland Institute will be opened at the hall of the Institute, at Baltimore, on Tuesday evening, Oct. 2, 1866, and continue to Oct. 30th. Exhibitors intending to compete for the premiums must enter their goods by the 27th September. For further information address the Actuary of the Institute.



ISSUED FROM THE U. S. PATENT OFFICE  
FOR THE WEEK ENDING AUG. 14, 1866.

Reported Officially for the Scientific American.

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.

57,061.—PITMAN BOX.—A. S. Acker, Albion, New York.

I claim the combination of the cap, C, as described, part B, with the reservoir, E, opening into the inner face thereof, the flanged ball, d', and the pitman, A, arranged and operating in the manner and for the purpose specified.

57,062.—MOLD FOR CASTING THROTTLE VALVES.—R. B. Angus, Tremont, Pa.

I claim the blocks, B C, and screw clamp, D, in combination with the cylinder, A, all constructed and operating substantially as and for the purpose specified.

57,063.—METHOD OF MAKING SMOKE BELLS.—J. S. and T. B. Atterbury, Pittsburgh, Pa.

We claim the method substantially as herein described, of producing glass smoke bells and other articles, consisting in blowing the glass in divided molds, and then shaping the bells over conical fluted formers, substantially as set forth.

57,064.—LAMP.—Chas. H. Bagley, Elgin, Ill.

I claim, First, So arranging or hanging within the top of the lamp in which a wick is used, a metallic or other suitable scraper or trimmer that it can be moved forward and backward over the said wick at the other end of the wick tube, substantially as and for the purpose described.

Second, In combination with the above, so placing a receptacle upon the wick tube of a lamp and below its upper end that it can be readily removed or replaced at pleasure, substantially as and for the purpose specified.

Third, Forming the upper end of the wick tube of a circular or curved shape, in combination with a slot in the lamp cap piece, and the receptacle, J, or its equivalent, when arranged together, substantially as described and for the purpose specified.

57,065.—SPINNING FLYER.—B. A. Bailey, Lewiston, Me.

I claim constructing the abutting check of the spring, h, from its own wire at the upper end thereof, substantially as shown and described.

Also in combination with the shaft, c, and spring, h, the clutch, g e, when constructed, arranged and operating substantially as described.

And the combination with the part, e, of the clutch, of one or both of the stops, f, as described.

57,066.—GARDEN RAKE.—Milton G. Baker, New Burlington, Ohio.

I claim pivoting or joining the handle, A, to the head, B, of a garden rake, substantially as and for the purposes herein specified.

I also claim the flattened and sharpened ends of the head, B, for the purpose set forth.

I also claim the peculiar construction and arrangement of the two outer teeth, G G, for the purpose set forth.

I also claim the construction and arrangement of the middle teeth, H H, for the purpose specified.

57,067.—GRUBBING MACHINE.—Cortland Ball and J. W. Houghtelin, Detroit, Mich.

We claim the arrangement of the drum, C, ratchets, D D, lever frame, E, pawls, G G, clamp or chain, H H, applied in combination with the axle, A, of the wheels, B, all constructed and operating in the manner and for the purpose described.

57,068.—MODE OF HITTING HORSES TO SEEDING MACHINE.—D. C. Baughman, Tiffin, Ohio.

First, I claim pivoting the double tree, A, to an inclined rod, a, which is supported at its upper and lower ends and made adjustable in a direction with its length, substantially as described.

Second, The adjustable screw rod, a, having the double tree pivoted to it and provided with adjusting set screws, c c, and a lower brace, c, substantially as described.

57,069.—MALT SHOVEL.—William Beach, Albany, N. Y.

I claim the construction of a wooden shovel by making the handle with a cross bar separate from the blade, and fastening them together with screw bolts, or rivets and straps, so that they may be separated from each other, in the manner and for the purpose described.

57,070.—VEGETABLE CUTTER.—David Bearly, New Castle, Ind.

I claim the arrangement of a vegetable cutter having the gearing, C D, frame, H, curb, C, and cover, C', with a revolving disk, G, bearing adjustable knives, the several parts being attached, connected and arranged, substantially as set forth.

57,071.—PORTABLE DRUG CRUSHER.—H. C. Becker, New York City.

I claim connecting in a drug crusher and cutter, the plate, cutter and crusher, under the arrangement, substantially as set forth.

57,072.—SAFETY POCKET.—John A. Bell, Lacon, Ill.

I claim the clasp or pin, D, in the described combination with the bar, C, and elastic thong, A, to admit of the latter being readily applied to the garment or detached therefrom at the will of the user.

57,073.—FARM FENCE.—John S. Bettis, Hanover, N. Y.

First, I claim the hook, c, as a means of holding and connecting the rails and post made either with a single or double loop, substantially as herein described.

Second, I claim the hook or staple, C, with a single or double loop, made adjustable on the post by means of the key or wedge, d, substantially as set forth.

57,074.—HAT PROTECTOR.—G. W. Bidwell, New Haven, Ct.

First, I claim the combination of three or more pins, a, on the top of the hat when constructed and arranged to operate in the manner and for the purpose herein set forth.

Second, The combination and arrangement of three or more pins, p, upon the brim of the hat, substantially as and for the purpose specified.

57,075.—WASHING MACHINE.—B. Bisbee, East Pharsalia, N. Y.

First, I claim the slats, B B, having their edges beveled off on opposite sides, as shown, to form the openings for admitting to

the interior of the cylinder the suds or water, substantially as shown and described.

Second, The cleats, C C, secured upon the inside of the slats, B B, at an angle therewith or obliquely, substantially as and for the purpose herein specified.

Third, In cylinder washing machine, I claim the employment of the catch, D d, for automatically locking the lid or door of the machine, and holding it when closed as well as providing a quick means for liberating the door when desired, substantially as herein shown and described.

57,076.—HAT RACK AND SEAT.—Edward S. Blake, Pittsburgh, Pa.

I claim the hat rack, f, in combination with the seat, c, constructed, arranged, combined and operating substantially as herein described and for the purpose set forth.

57,077.—HOOP-SKIRT SUPPORTER.—Erastus Blakeslee, Plymouth, Ct.

I claim the combination of the two hooks, A B, united together by, and combined with a hook or its equivalent, C, and arranged in relation to a corset and skirt, substantially in the manner and for the purpose specified.

57,078.—FLOORING CLAMP.—Asa S. Blinn and D. W. Hewitt, Dubuque, Iowa.

We claim the arrangement and combination of the head block, A, arms, H, parts, C, with the screw, B, ratchet wheel, T, pall, F, and lever, D, when constructed to operate substantially as described.

57,079.—OIL INJECTOR FOR STEAM ENGINES.—G. B. Brayton, Boston, Mass. Antedated July 30, 1866.

I claim the construction by which the oil orifice of the injecting barrel is worked through a packing, inserted and compressed between the reservoir and steam tube, substantially as set forth.

57,080.—ROOFING.—Albert Brisbane, New York City. Antedated Aug. 3, 1866.

I claim the construction of roofing or weather boards, formed in a curved or trough shape, by bending, and laid together and combined with the concave rafters or bearers as herein described.

57,081.—GANG PLOW.—A. H. Burlingame, Sparta, Ill.

I claim, First, The combination of the tongue, G, pivot, f, rock-bar, G', plow beams, D D, and laterally adjustable support, J, substantially as and for the purpose described.

Second, The rear under support, J, applied and operated substantially as herein described for the purposes set forth.

Third, The perforated rocking bar, G', tongue, G, plow beams, D D, laterally adjustable rear support, J, and the device, h j k, all combined and arranged substantially as described.

Fourth, The combination of the vertical joint, f, and the horizontal joint, G', with plow beams, D D, and a carriage, A B B', which is susceptible of being depressed or elevated at one or both ends, substantially as described and for the purpose set forth.

57,082.—HARVESTER.—Caleb Cadwell, Waukegan, Ill.

First, I claim the circulating cutting device, consisting of the teeth, P', when constructed as herein described and employed in combination with the sprockets, G, G', in the manner and for the purpose set forth.

Second, I claim the arrangement of the finger beam, A, cap plate, B, stationary cutter bar, E E', plate, C, guide, D D', plate, J, and cutting device, F P', all constructed and operating as herein shown.

Third, I claim the rotating blocks or sprockets, G G', and hollow journals, G G G, when combined and arranged as and for the purpose herein shown and described.

Fourth, I claim the reels consisting of the parallel arms, K, chains, K', wheels, L M, uprights, O, and adjustable arms, N, all constructed and arranged in the manner and for the objects specified.

57,083.—PHOTOGRAPHIC PRINTING FRAME.—J. W. Campbell, New York City.

I claim, First, Holding the plate to the back of the photographic printing frame by atmospheric pressure, substantially as and for the purpose described.

Second, The double hinged section, C, in combination with the backs, B, and the frame, A, substantially as and for the purpose described.

Third, The lock, D, in combination with the double hinged section, B, and back, B, constructed and operating substantially as and for the purpose described.

57,084.—LET-OFF MECHANISM FOR BRAIDING MACHINES.—James M. Carpenter, Providence, R. I.

I claim the combination of the tube, T, the stud, f, and groove, g, or their equivalent, with the spool, its spindle and the let-off mechanism or its equivalent.

I also claim the improved let-off mechanism, consisting of the gear with one range of teeth and of the dent and wedge lip applied to the spindle and the tension weight, substantially as specified.

57,085.—CORSET CLASP.—John W. Carter, Greenville, N. J.

I claim the armed looped clasps, D E F, made in one piece, and secured substantially as described for the purpose specified.

57,086.—PUMP FOR DEEP WELLS.—Aaron Carver, Little Falls, N. Y.

First, I claim the pump cylinder in combination with an outer cylinder, J, within which it is eccentrically placed so as to form a chamber, L, between them, substantially as described.

Second, I also claim locking the valve box of a pump within the cylinder so that it cannot be displaced by pressure from below, substantially as described.

Third, I also claim making the diameter of the neck of the valve box less than that of its body and perforating it as described to allow any liquid in the valve box to escape and make way for the end of the piston when the latter is screwed into the neck of the valve box, substantially as above set forth.

57,087.—REGULATOR FOR GAS BURNERS.—William Clark, Boston, Mass.

I claim, in combination with the tip of a gas burner, a regulating device constructed of the frusto conical valve and valve seat, with the cross bar c, and the screw spindle, d, operating together in the manner described.

57,088.—SAW.—William Clemson, Middletown, N. Y.

I claim slots, f, one or more, made in the shanks or tangs of the teeth or in the saw plate, or both, and having such a relative position with the rivets, clamps, or fastenings, as to form springs or elastic strips, E, to bear or bind against the rivets, clamps or fastenings with an elastic or yielding pressure, substantially as described.

I also claim the plate or clamp, G, fitted in the recess, F, in the saw plate in connection with the recess, D, in the shank or tang, a, substantially as and for the purpose set forth.

57,089.—WATER WHEEL.—Walter R. Close, Bangor, Me.

I claim the improved water wheel made substantially as described, viz., with the arched annulus, the series of curved and bent wings and the shaft tube or the same and its flange, arranged as set forth.

57,090.—THRILL COUPLING.—Geo. E. Clew, Port Byron, N. Y.

I claim the socket, C, catch, d, and shoulders, e e, employed in connection with the thrill iron, A' A', a, substantially as and for the purpose specified.

57,091.—METHOD OF SPREADING MASTIC ROOFING.—Winfield R. Coe, West Meriden, Ct.

I claim the combination of the guiding and pressure roller, B, the box or hopper, A, and the adjustable spreading board, F, with each other, substantially as described and for the purpose set forth.

57,092.—WHEEL TIRE.—Ebenezer Coleman, Woburn, Mass.

I claim the arrangement and combination of the series of notches, c c c, and teeth d d, or the r equivalents, and the slot, e, with the tire laps, a b, the same being to operate together with a felly and confining bolts, substantially as specified.

57,093.—MODE OF DISINFECTING BONE-BOILING ESTABLISHMENTS.—Dominique E. Contaret, New York City.

I claim the disinfection of bone-boiling and fat-melting establishments, by means of chemical process and reagents, or any others substantially the same, and which will produce the intended effect as desired.

57,094.—RUNNING GEAR OF CARRIAGES.—Francis Crick, Beanesville, Ohio.

First, I claim the semicircular or horse shoe springs, D and F, constructed as described, in combination with the axles, D and J, and with the body, A, of the carriage, substantially as described and for the purpose set forth.

Second, The gearing consisting of the reach, M, the lever, N, the circular arm, K, the horizontal arm, L, and king bolt, I, constructed and arranged as herein described in combination with the axles, E and J, substantially as described and for the purpose set forth.

57,095.—BURNING FLUID.—James P. Cross, Watertown, N. Y.

I claim the combination of the within ingredients in the manner and about the proportion described, for the purpose specified.

57,096.—CURTAIN FIXTURE.—W. R. P. Cross, Portland, Maine.

First, I claim the combination of the bent wire having the ring and hook, with the curtain roller sheave, as and for the described purpose.

Second, The combination of the wire, h, having the friction hook, i, and swivel, j, with a curtain cord, tassel, and roller, in the manner and for the purposes set forth.

57,097.—LIQUID MEASURE.—James Dailey, Albany, N. Y.

First, I claim the combination of the vessels, A and B, with a spiral or other spring, C, and index plates, one or more, D, and indices, b, substantially as shown and described for the purpose specified.

Second, I claim the spiral spring, C, in combination with the vessels, A and B, substantially as and for the purpose specified.

57,098.—TRACE BUCKLE.—John Wesley Denton, Paris, Ill.

First, I claim the check, A, clamp, E, and tongue, F, arranged and adapted to operate as set forth.

Second, In combination with the elements of the clause immediately preceding, I claim the spring, N, attached to the heel of the tongue, and operating as set forth.

57,099.—MACHINE FOR TURNING WAGON SPOKES.—T. Derington, Carbondale, Ill.

First, I claim the feeding and governing pattern, constructed with irregular grooves or threads, substantially as and for the purpose set forth.

Second, The arrangement of the rollers, b' b', straps, b b, and horizontally adjustable beam, C, with rail on its top, in a machine which is constructed and operated substantially as described, all for the purpose set forth.

Third, The arrangement of the spring, c', with its roller, f', upon the cutter carriage and the rail, f, for holding the tooth, c', up to the patterns, substantially as herein described.

Fourth, The arrangement with the cutter head of a pulley on both ends of its shaft, and applying belts which move with the cutter carriage on both of said pulleys of the head, all for the purpose of driving the cutter with a more regular and steady motion, as herein set forth.

Fifth, The combination of a cutter head constructed with right and left auxiliary sets of cutters, S S, and a central main or finishing set of cutters, with a reciprocating carriage and the feeding pattern, constructed as described, so that the work of roughing and smoothing is performed at one time, and also during the back as well as the forward movement of the cutter carriage, substantially as herein described.

57,100.—AXLE AND JOURNAL FOR CARRIAGES.—Lathrop Dorman, Worcester, Mass.

First, I claim the combination with the axle, A, and projection, B, of the wrist, G, hollow journal, D, nut, E, and shoulder, C, substantially as set forth.

Second, The combination with journal, D, of nut, E, and projection, B, substantially as set forth.

Third, I claim making the journal, D, hollow its entire length, and providing it with a wick, f, which passes through hole, h, whereby the outer surface of journal, D, is always kept lubricated, and the end, B, if accidentally broken off, can be removed, substantially as set forth.

57,101.—BUTTON.—R. N. Eagle and C. D. Smith, Washington, D. C.

First, We claim a button or button-head made of soft rubber, or analogous elastic material, substantially as described.

Second, We claim a button or stud having one or more elastic heads and a shank of different or harder material.

Third, We claim a rubber head attached to a metallic tubular shank by means of a stem, a, which is held within said tubular shank, substantially as described.

Fourth, We claim the combination of an elastic head, A, metal shank, B, and disk, C, substantially as and for the purpose herein set forth.

57,102.—SHOE CLEANER.—B. Frank Early, Palmyra, Pa.

I claim a frame composed of adjustable side pieces, substantially as shown, in combination with rods having corn husks or other suitable substance doubled or adjusted around them, and fitted or clamped within the frame to form a new and improved mat, for the purpose specified.

57,103.—APPARATUS FOR RENDERING TALLOW, ETC.—J. J. Eckel and I. S. Schyler, New York City.

We claim, First, The two kettles, B C, the latter, C, being fitted within the former, B, and sufficiently less in diameter to admit of a space, c, between them, in combination with the holes, d, in the kettle, C, substantially as and for the purpose set forth.

Second, The rotary stirrer, K, placed within the kettle, C, when used in connection with the case, D, or other cover for the kettles, for the purpose specified.

Third, The condensing apparatus composed of the chambers, E, or other suitable or equivalent water passages in the tube, D, for the purpose of admitting of the kettles being closely covered during the cooking or rendering process.

Fourth, The receiver, H, arranged with the pipes, G J, substantially as shown and described, to serve as an auxiliary to the condensing apparatus, and also to insure the drawing off of the condensed steam or vapor from D.

57,104.—APPARATUS FOR RENDERING TALLOW.—John J. Eckel and Isaac S. Schyler, New York City.

We claim, First, In rendering tallow, the drawing off of the vapor or vapors from the contents of covered, or confined, or partially confined kettles, by means of a suction or a vacuum produced in pipes by any suitable mechanical means.

Second, The injecting of the vapor or vapors drawn off from the kettles into the fire, by which the contents of the kettles are cooked either by the direct application of the fire or through the agency of steam generated by the same, substantially as set forth.

57,105.—MACHINE FOR CUTTING TURF.—Richard H. Emerson, Fond Du Lac, Wis.

I claim a machine for cutting turf, having a shaft, A, wheels, B, stops, D, knives, C and F, constructed and arranged substantially as herein specified.

57,106.—FRUIT PICKER.—Elijah Evans, Sparta, Ohio.

I claim, First, A fruit picker in which two quarter spherical

jaws, C, are caused to close by mechanism, operating substantially as set forth.

Second, Attaching the jaws, C, by a single rivet on one side, and by separate rivets on the other, so as to produce a shearing motion by the junction of their edges, substantially as set forth.

Third, In combination with the jaws, C, I claim the lugs, C', and pins, D2, actuated substantially as set forth.

Fourth, The device for actuating the jaws of a fruit picker, consisting of the pulleys, D and D', the spring, E, cords, G C and A, or their equivalents, and bell crank, I, attached to the handle, A, said several parts being respectively constructed, and the whole combined for use substantially as set forth.

**57,107.—SCREW DRIVER.—Cyrus Eversol, Commerce, Missouri.**

I claim, First, Forming the face or edge of the screw driver, B, in the form of a cross with equal arms, substantially as described and for the purpose set forth.

Second, The combination with the handle, C, of the screw driver of a ratchet wheel, D, and pawl, E, constructed and operated substantially as described and for the purpose set forth.

**57,108.—VALVE FOR THE HULLS OF VESSELS.—J. H. Fairbanks and Frederick Roads, McKeesport, Pa.**

We claim a valve, A, applied to and arranged in the hull of a vessel, so as to operate and to be operated substantially in the manner described and for the purpose specified.

**57,109.—PICKER FOR FIBROUS MATERIALS.—Levi Ferguson, Lowell, Mass.**

I claim the arrangement of the comb plates, E, with their arms moving in slots, b, of the frame, the cam grooves, c, and the segmental apron, D, operating with the picker cylinder, A, all constructed in the manner and for the purpose herein specified.

**57,110.—HORSE HAY FORK.—Daniel Figge, Jenners Cross Roads, Pa.**

I claim the bars, A and B, constructed as shown and described, and arranged to operate in combination with the lever, C, as and for the purpose set forth.

**57,111.—MACHINE FOR CUTTING FAT, LARD, ETC.—Charles Forscher, New York City.**

First, I claim the arrangement of a series of knives, F and J, crossing each other in the end of a trough or longitudinal box, C, in combination with a piston, D, capable of passing into the openings formed by the knives, F and J, in the manner and for the purpose substantially as described.

Second, I claim in combination with the above the knives, N, operating at right angle to the trough, C, or to the motion of the piston, D, in the manner and for the purpose substantially as set forth and specified.

**57,112.—METHOD OF TRANSMITTING POWER BY MEANS OF RAILROAD CARS OPERATING UPON RAILS.—Clinton Foster, Galesburg, Ill.**

First, I claim the oscillating lever, B, arranged to operate in combination with the rail, A, substantially as and for the purpose set forth.

Second, I claim the use of the rubber springs, h, in combination with the lever, E, and pitman, n, as shown and described.

**57,113.—CORN HARVESTER.—F. F. Fowler, Upper Sandusky, Ohio.**

I claim, in combination with a machine for cutting corn, a pivoted holding and transferring lever, with its cord, pulley, hook, and reel, for compressing and holding the shock of corn while being transferred from the machine and set up upon the ground, where it may be bound, substantially as herein described and represented.

**57,114.—HORSE HAY FORK.—F. F. Fowler, Upper Sandusky, Ohio.**

I claim locking and releasing the brace, G, by means of the cord or rope, e, which is also the guiding and directing rope of the fork, substantially as described.

**57,115.—STACK BOTTOM AND FEED RACK COMBINED.—F. F. Fowler, Upper Sandusky, Ohio.**

I claim a portable stack bottom, feed rack, and stock shelter, constructed, arranged, and operating as herein described and for the purpose set forth.

**57,116.—FEED WHEEL OF SEWING MACHINE.—Anton Galleth, New York City.**

I claim the nose, e, on the jointed feed wheel, C, in combination with the friction block, B, and feed wheel, A, constructed and operating substantially as and for the purpose described.

**57,117.—DRYING HOUSE.—H. B. Gallup and Charles Wood, Watertown, Wis.**

We claim a drying house, having its walls constructed of brick, stone, iron, or other fire-proof material, provided with a flooring of metal bars, and arched roof, provided with meta; vent-pipes, and the interior surfaces of its walls provided with gutters, all arranged substantially in the manner as and for the purpose set forth.

**57,118.—WATER GAGE FOR STEAM GENERATORS.—George M. Githens, New York City.**

I claim, First, The arrangement of the secondary water-pipe, F, with the connection, D, in combination with the gage, B, for the purpose of obtaining a constant flow through said pipe and connections, substantially as herein set forth.

Second, The three-way cock, E, in combination with the connecting pipe, F and D, arranged for the purpose substantially as herein specified.

**57,119.—HOE.—James Glasson, Brooklyn, N. Y.**

I claim the hoe constructed and attached to the handle, in substantially the manner specified.

**57,120.—MACHINE FOR CUTTING BARREL HOOPS.—Andrew Goodyear, Springport, Mich.**

I claim, First, The use of the cam, I, in combination with the gear wheels, S1 S2, fly wheel, w, and vibrating rod, R, arranged and operated relatively with each other, and with the platen table and frame, substantially as and for the uses specified.

Second, The mode of securing the cutter knife, C', by clamping it between the half beams, A, in combination with backing bolts, e, and nuts, n, substantially as herein described.

Third, The employment of a spring, j, in combination with recessed guides, L, for safely discharging a hook, h, or other cut article as set forth.

**57,121.—STRAW CUTTER.—Heinrich Gottfried, New York City.**

First, I claim the circular knife, E, placed eccentric on shaft, D, the latter being central or nearly so with the feeding trough, B, substantially as and for the purpose herein set forth.

Second, The compressing plate, L, or its equivalent, in combination with lever, K', and cam, K, shaft, I, bevel gears, H H, shaft, D, and knife, E, substantially as and for the purpose herein set forth.

**57,122.—CLEANING WOOL AND WOOLEN GOODS.—William A. Govern, Holyoke, Mass.**

I claim the use of the articles above named, or either of them, for the cleansing of wool and woolen goods, whether used alone or in combination with other ingredients, substantially as set forth.

**57,123.—MANUFACTURE OF ILLUMINATING GAS.—H. D. Green, Portland, Oregon.**

I claim the manufacture of illuminating gas from coal and sawdust combined, and subjected to distillative distillation, substantially in the manner and for the purpose set forth.

**57,124.—TAPS AND DIES.—Franklin S. Gregg, Cincinnati, Ohio.**

I claim the process of manufacturing case hardened wrought iron taps and dies, substantially as described.

**57,125.—PULLEY ATTACHMENT FOR RAISING WEIGHT.—George W. Gregory, Binghamton, N. Y. Antedated Feb. 14, 1866.**

I claim the combination of the grapple and pulley, and the arrangement of the several parts whereby to facilitate the action and move the apparatus from place to place, substantially as and for the purpose herein set forth.

**57,126.—CIGAR HOLDER AND HAT HOOK.—Charles Gschwind and John Grether, Union Hill, N. J.**

We claim a device composed of two jaws, a, b, sliding ring, f, springs, e, and sharp pointed hook, g, all connected and operating substantially as and for the purpose set forth.

**57,127.—MACHINE FOR ADJUSTING CHAIN CABLES.—Charles Hall, New York City.**

I claim the combination of a stretching frame for sustaining the strain incident to stretching the chain with a clamp link-holder, and with means of applying force to the chain held by the link-holder, substantially as set forth.

I also claim the combination of a stretching frame for sustaining the strain incident to stretching the chain with a hook link-holder, and with means of applying force to the chain held by the hook link-holder, substantially as set forth.

I also claim the clamp link-holder, with recessed jaws, constructed substantially as set forth.

I also claim the hook link-holder, recessed at its inner side, substantially as set forth.

**57,128.—BRICK MACHINE.—Enoch Hallett, Hillsdale, Mich.**

First, I claim the combination of the levers, R T, applied to the follower, F, substantially in the manner as and for the purpose set forth.

Second, The combination and arrangement of the segments, c c, chains, Q Q', and the segments, D D, and chains, J J, for the purpose of operating the mold carriage, L, and follower, F, as set forth.

**57,129.—NECK-TIE SUPPORTER.—William H. Hart, Jr., of Philadelphia, Pa.**

I claim in combination with a neck-tie supporter, A, the loop, C, and catch, D, as arranged, substantially as described.

**57,130.—CUTTING APPARATUS FOR HARVESTER.—M. P. Hathaway, Mankato, Minn.**

First, I claim the endless cutting belt, B, provided with cutters, H, having diagonal or oblique cutting edges, and arranged relatively with the platform or bar, A, to operate in the manner substantially as and for the purpose set forth.

Second, The combination of the belt, B, wheel, C, wheel, D, rollers, E, sliding bar, F, guides, a, a screw, G, arranged and operating in the manner and for the purpose herein specified.

**57,131.—WIND MILL.—John H. Heyser, Hagerstown, Md.**

I claim the sail, a b c d, slides, e e, cords, p p, pulleys, g g, and fulcrums, H H, in combination with the wind wheel, all constructed and arranged as specified, and for the purposes substantially as described and set forth.

**57,132.—WASHERS FOR BOLTS.—Gibbons G. Hickman, Coatesville, Pa.**

I claim providing the washer with a lip or lips, to be bent into a groove in the bolt, either with or without the lip, c5, to be bent against the side of the nut, according to the circumstances of the case, substantially as and for the purpose described.

**57,133.—RAILROAD-CAR BRAKE.—Aaron Higley, South Bend, Ind.**

First, I claim the combination of friction clutch, D, pulley, F, and clutch lever, G, the dog, I, ratchet wheel, b, and pulleys, E E', as and for the purpose set forth.

Second, The spring, H', swivel, P, and chains, c e, in combination with the chains, d', and spring, d, as and for the purpose set forth.

Third, The clutch pulley, E E', friction clutch, D, in combination with the ratchet wheel, b, and pulley, F, substantially as and for the purposes set forth.

**57,134.—BASIN FAUCET.—Jacob Hills, Haydenville, Mass.**

I claim as my invention the above-described improved faucet as made with the pivot, f, and step, g, the valve, c, and the key, D, applied to the parts, A and E, as specified, and with the globe, B, of the discharging tube, B' applied to the base tube, A, in manner, and so as to be capable of being revolved thereon, substantially as specified.

**57,135.—VULCANIZING FLASK FOR DENTISTS.—L. Hoffstadt, Philadelphia, Pa.**

First, I claim providing the boiler, A, with a flange, a, in combination with the cover, E, and hook-shaped screws, b, constructed and operated substantially as and for the purpose described.

Second, The regulator, F, in combination with the boiler, A, and dial, G, constructed and operating substantially as and for the purpose set forth.

Third, The lever catch, H, and stop cock, D, in combination with the regulator, F, adjustable screw, h, and boiler, A, constructed and operating substantially as and for the purpose described.

Fourth, The regulator, F, boiler, A, lever catch, H, stop cock, D, hammer, m, and bell, n, all constructed and operating substantially as and for the purpose set forth.

**57,136.—PUNCH.—Cyrus B. Holden, Worcester, Mass.**

I claim the slotted lever, A, pivoted arm, C, and lever, B, in combination with each other and with the punch, constructed and arranged substantially as and for the purpose herein set forth.

**57,137.—COAL SCUTTLE.—James Holden, Philadelphia, Pa.**

I claim, as a new article of manufacture, a coal scuttle made of flat wooden sides, shaped as described, in combination with the sheet iron casing, B B', substantially as described.

**57,138.—GRAIN BINDER.—Solomon T. Holly, Rockford, Ill.**

First, I claim the combination, in a binder, of the drum and arbor of the compressing strap with a ratchet wheel and pawl, substantially as set forth.

Second, The combination, in a binder, of the ring carrier with shear blades for cutting the binding material.

Third, The combination, in a binder, of the traveling fingers or forceps for gripping the end of the binding material with shear blades for cutting it, substantially as set forth.

Fourth, The combination, in the binder, of the traveling fingers or forceps and the instrument for carrying them around the gavel, with a stationary projection in the track of the binding material for retaining it in its proper place, substantially as set forth.

Fifth, The combination, in a binder, of the traveling forceps with a stationary inclined block for operating them, substantially as set forth.

Sixth, The combination, in a binder, of the traveling forceps with a heel extending across the opening between the jaws, substantially as set forth.

Seventh, The combination, in a binder, of the jaws of the traveling forceps with a guard, substantially as set forth.

Eighth, The twister, with radial jaws, projecting from concentric shafts, constructed and operating substantially as set forth.

Ninth, The twister with radial and hooked jaws projecting from concentric shafts, constructed and operating substantially as set forth.

Fifteenth, The combination, in a binder, of the swinging arm of the spool of the binding material with a movable bearing, and with a curved chair for said bearing, substantially as set forth.

Sixteenth, The combination, in a binder, of the ring carrier and spool of the binding material with mechanism for moving said spool slightly from the wheel that is in friction contact with it, substantially as set forth.

Seventeenth, The arrangement, in a binder, of the spool of the binding material and the mechanism for relieving its pressure upon the instrument that resists its turning by friction, in such manner that the turning of the spool, when the pressure is relieved, is sufficiently resisted by friction to neutralize the movement of the spool, substantially as set forth.

Eighteenth, The arrangement of guide for the binding material, spool, and friction tension mechanism, in such manner that the drawing of the material through the guide tends to move the spool from the friction tension mechanism, substantially as set forth.

**57,139.—BOX FOR TOBACCO AND MATCHES.—Thomas Huckaus, New Baltimore, N. Y.**

I claim a tobacco box, A, divided into two compartments, a b, one for holding smoking, and the other for chewing tobacco, and also provided with a match receptacle, D, substantially as herein described.

**57,140.—HARVESTER PITMAN.—Butler J. Hunter, Ledyard, N. Y.**

I claim the swivel piece, C, constructed with a chamber or recess for the reception of the pitman head, B, substantially as and for the purposes set forth.

I also claim the combination of the swivel piece, having a recess, with the boxes, F and G, and bolts, E, substantially as described.

**57,141.—TIRE SHRINKING MACHINE.—Gideon Huntington, Almont, Mich.**

I claim the combination of the platform, A A, movable heads, B B, wheel, L, with eccentric threads, G G, segments, H H, cogs, I I, and block, E, with the loops or beveled mortises and self-acting keys, when made and used as above described, and for the purpose herein set forth.

**57,142.—MACHINE FOR MAKING AXLES.—Edwin F. Hurd, Johnsonville, N. Y.**

First, I claim the adjustable compound guide and gage, v, constructed and operated substantially as described.

Second, The movable gage, v', used in connection with the dies, w', constructed and operated substantially as herein recited.

Third, The arrangement, on the same bed or platform, of the tilt hammer with dies, and the machine herein set forth.

**57,143.—HARNESS.—Robert Huyck, Sheboygan Falls, Wis.**

In combination with the wagon tongue, A, the springs, E E, and straps, F F, for the purpose set forth.

**57,144.—CLOTHES DRIER.—Lewis T. Ilgin, Cedarville, Ill.**

I claim the arrangement and combination of the slats, a b, with the rods, c c' c'', and elbow stops, d, substantially as and for the purpose set forth and described.

**57,145.—LATHE FOR TURNING WAGON HUBS.—Hiram Inman, Haganan's Mills, N. Y.**

First, I claim the rotary cutters, P P, and fixed cutters, e e, attached to a carriage, L, on the frame, A, of the machine, and arranged in connection with the fixed heads, B B', and arbors, C C', between which the block, Q, is centered, substantially as and for the purpose set forth.

Second, The carriage, T, with cutter, W, and stops j j, attached, in connection with the arbors, S S', in the fixed heads, B B', substantially as and for the purpose specified.

**57,146.—SHIP'S WINDLASS.—Peter H. Jackson, New York City.**

First, I claim the sleeve, h, connected by the gearing, p q r, and s, with the shaft, c, in combination with the capstan barrel, f, and keys, i i, for connecting the said capstan barrel and sleeve to give to the said shaft, c, and windlass, a slower movement than that of the capstan, or allow of the separate movement of the capstan, as set forth.

Second, I claim the head, l, on the upper end of the shaft, c, in combination with the keys, o o, and capstan barrel, f, and gearing, p q r and s, as and for the purposes set forth.

Third, I claim the friction band, u, applied to the inner recess of the chain wheel, t, as and for the purposes set forth.

Fourth, I claim the combination of the friction strap, u, blocks, v, and 2, and cam, 3, applied substantially as and for the purpose set forth.

**57,147.—PLOW.—David Jacoby, Mendota, Ill.**

I claim for the arrangement said combination of the screw, F, and its lever by which the end of the plow is elevated or depressed and thus a deep or shallow plowing effected; the levers, L, for directing the lateral motion, and the hinged paddle, G, for regulating the vertical motion of the plow, with the diagonally set wheels as herein described.

**57,148.—STREET LANTERN.—B. A. Johnson, Jeffersonville, Ind.**

I claim a street lantern, having its base, A, made of cast iron or other suitable metal, and its body, B, of sheet tin or other suitable sheet metal, substantially as described and for the purpose specified.

I also claim the ferrule or sleeve, F, secured to the bottom or base, A, of a sheet lantern by means of arms, E, substantially as described.

**57,149.—LAMP-CHIMNEY CLEANER.—W. J. Johnson, Newton, Mass.**

First, I claim constructing the two arms of a lamp-chimney cleaner of a single piece of wire, or its equivalent, bent into the requisite shape, substantially as set forth and for the objects specified.

Second, Uniting the two arms, A A, by means of the spring, B or its equivalent, substantially as and for the purpose described.

Third, The loop or guide, d, substantially as and for the purpose described.

Fourth, Confining the material of which the brush is formed, by means of the serrated plate, G, and clasp, E, substantially as and for the purpose described.

**57,150.—LATCH FASTENING.—Henry M. Jones, West Meriden, Conn.**

I claim the reversible latch, consisting of the semicircular bolt, g, with its square end, q, and beveled end, r, handle, l, slotted plate, h, and end piece, c, arranged and operating in the manner as herein described.

**57,151.—UMBRELLA.—Daniel Kelly, Slatersville, R. I.**

I claim the flanges, d and d', and spring catches, e, in combination with the two parts, c c', of the ribs of an umbrella, substantially as and for the purpose set forth.

**57,152.—GATE LATCH.—Frank Ketcham, Elizabeth Township, Pa.**

I claim the combination of the bracket, C, cap, D, wheel, F, post, B, and gate, A, substantially as shown and described.

**57,153.—RECLINING CHAIR.—John Kline and Anton Schmacker, Cincinnati, Ohio.**

First, We claim the arrangement of seat, A, hinged back, B C, hinged and sliding arms, D E, stationary posts, F, studs, G, notched channel, H J, spring latch, I, and retracting thongs and springs, K, for the purpose set forth.

Second, The sliding rest, L, adapted to support the seat when the chair is used in a sitting posture, and to support the feet when in a reclining posture.

**57,154.—LADY'S IMITATION COLLAR.—Charles Lang, New York City.**

I claim an improved article of manufacture, being an imitation of ladies' imitation collars, made of paper linen, cotton-lined paper, paper mixed with cotton threads or linen threads, cotton cloth, linen cloth, or similar material, made in the manner substantially as described, by one continuous operation, by embossing the design on said paper or similar material, and by remov-

ing the elevated parts thereof while lying on the die, for the purpose substantially as described.

57,155.—MEDICINE.—Joseph Levy, Chicago, Ill.

I claim the medicine prepared from decoctions and juices or powders of young oak tree rind, camomile flowers, parsley, black radish rind, peppermint, and cinnamon, in the manner and proportions herein described and specified.

57,156.—SNAP HOOK.—B. B. Lewis, New York City.

I claim a snap hook attached to a hitching strap, and constructed and applied substantially as shown and described, to admit of the detachment of the hook from the ring by the simple pulling of the rein or line to which the hitching strap is connected, as set forth.

57,157.—SEWING MACHINE.—Austin Leyden, Atlanta, Ga.

I claim the combination with the detainer, F, of the crank, H, and bar or rod, G, substantially as described.

57,158.—ROSE ENGINE LATHE.—Thomas Lippiatt, New York City.

I claim the combination of the movable dictator, h, and cutting tool, r, projecting arm, m, sliding rest, n, and sliding block, P, arranged relatively to each other, and operating in the manner as and for the purpose herein specified.

57,159.—FISHWAY.—Alonzo Livermore, Ashland, Pa.

I claim constructing a fishway or other conduit, with division walls built transversely to its length, and openings through said division walls and tubes or lips projecting therefrom in an oblique direction and against the current, by which construction the velocity of the current can be decreased as may be desired.

57,160.—DITCHING MACHINE.—Peter Lugenbell, Greensburgh, Ind.

First, The rotary excavator, composed of the cylinder, K, with blades, J, and rims, L, L, attached and provided with movable plates, N, operated through the medium of the stationary cam, J, substantially as and for the purpose set forth.

Second, The adjustable curved strips, P, P, in combination with the excavator, when the same is constructed substantially as and for the purpose specified.

Third, The colters, Q, Q, in combination with the rotary excavator, substantially as and for the purpose set forth.

Fourth, The pendent plate, O, in combination with the rotary excavator, as and for the purpose specified.

Fifth, The combination of the rotary excavator with an adjustable frame, F, arranged as shown, and adjusted through the medium of a screw, substantially as described.

57,161.—CAR BRAKE.—George F. Lynch, Milwaukee, Wis.

First, I claim the ratchet or pawl bar, m, in connection with the lever, p, or the inclined face of the cross bar, o, by which the brakes are locked as applied at the one end or tripped by the bumper at the other end, as they are arranged and operated substantially as herein recited.

Second, The extra bar, v, in connection with the bumper or draw bar, constructed and operated as and for the purposes substantially as set forth.

Third, The combination of the cross head guide, bars, and slides, by which the motion of the bumper or extra bar is communicated to the levers, and through them or their equivalents to the brakes, as described.

Fourth, The use of the hand or ratchet wheel and stem, in combination with the other means herein recited for taking up the slack and wear, substantially as set forth.

57,162.—FOUNTAIN PENS.—Herman Wadeheim, Brooklyn, N. Y.

First, The combination of the hollow piston rod, b, piston, a, ink retainer, c, movable barrel, e, and pen, d, all constructed and operating substantially as and for the purpose described.

Second, The longitudinal partition, i, in the ink retainer, c, substantially as and for the purpose described.

Third, The stops, j, on the inner end of the body of the penholder, or on the end of the barrel, c, for the purpose set forth.

Fourth, The air channels, k, in the body of the barrel, as and for the purpose described.

57,163.—PISTON-ROD PACKING.—Richard Martin, Brooklyn, N. Y.

I claim a steam packing made by combining with the body of said packing, a covering consisting of wire and fibrous material, interwoven, intertwined, or interbraided together to form said covering, substantially as set forth.

57,164.—APPARATUS FOR CARBURETTING AIR.—Hugh L. McAvoy, Baltimore, Md.

First, The air-forcing chamber, C, revolving in the tank, B, which is surrounded by the reservoir, A, in which the carbureting cylinder, or its equivalent, revolves.

Second, The inverted chamber, F, vibrating upon the axis and actuated by the varying pressure of the gas contained therein to operate as a regulator, substantially as described.

Third, The displacing chamber, c, in the chamber, C, operating as described.

Fourth, The carbureting cylinder, D, provided with cups or receptacles on its inner side, and with reticulated or permeable surface on its periphery.

Fifth, The chamber, B, containing the fluid in which the air-forcing cylinder revolves, and separating it from the fluid in the reservoir.

Sixth, The hanging stands or tapes, h', in the chamber, C, as and for the purpose described.

57,165.—STUFFING AND CURRYING LEATHER.—Thomas McDonald, Roxbury, Mass.

I claim the employment of caoutchouc or a solution thereof, substantially as described, with the oil and tallow or fatty matters used in currying leather.

I also claim the employment of beeswax and resin, or either, and a solution of caoutchouc with the oil and tallow or fatty matters used in stuffing leather, they being combined as set forth.

I also claim buffing the leather with a slicker, while such leather is damp, and subsequently coloring such leather and applying the stuffing to it as specified, not meaning to claim the application of the stuffing to the leather, and subsequently carrying on the operations of stuffing and coloring as set forth.

57,166.—HARROW.—William McFishback, Union, Ohio.

First, The arrangement in the plane of a harrow frame of two or more rock shafts, each being provided with teeth and cleaners, as described, in combination with coupling bars and levers for vibrating said shaft simultaneously, the whole being arranged for operation as shown and described, so that the teeth of the one shaft may be cleared by the cleaners of the next succeeding shaft.

Second, In combination with the rock shafts provided with teeth and cleaners, as described, I claim the stationary cleaners attached to the cross beam in rear of the rocker shafts for the purpose of clearing the teeth of the rear rock shafts, as herein shown and set forth.

Third, I claim the cleaners constructed as herein described, that is to say, each cleaner being formed of one continuous piece of metal, which is bent to form the jaws between which the harrow teeth pass, the rear end of the cleaner forming the base by which the same is secured in its position.

Fourth, In combination with a harrow frame, having a vibratory or rocker frame provided with teeth and cleaners as above set forth, I claim the wheels mounted in said frame on a fixed axle, in the manner and for the purposes herein shown and set forth.

Fifth, In combination with a harrow constructed as set forth, I claim the hereinbefore described device for making furrows, that is to say, the rock shaft provided with shovel teeth and guide, arranged and operating as and for the purposes herein shown and specified.

57,167.—LANTERN.—Charles F. Moeller, Newark, N. J.

I claim a lantern having a hook, J, flanges, E, spring hook, S, slide, F, spring catch, w, and hook, v, adjusted, combined, and arranged as herein specified.

57,168.—SHOE BRUSH.—C. F. F. Moeller and C. Latham Sholes, Milwaukee, Wis.

We claim the construction and arrangement of the scraper, in combination with the brush as herein described, consisting of the end, f, for cleaning the edge of the sole, the point, c, for cleaning between the sole and upper, the curvilinear edge from c to d, and attached to the side of the brush, for the purposes set forth.

57,169.—HOOP SKIRT.—E. L. Morris, Boston, Mass.

I claim, in combination with a hoop skirt, and so as to form part of the same, a cloth band so applied to the hoops, c, as to be detachable therefrom, the band being provided with pockets and with hoops or wires sliding loosely therein, and the ends of the band being made to lace or fasten together, all substantially as described.

57,170.—IRONING BOARD.—Miss S. A. Mort, Dayton, Ohio.

I claim the combination of the legs, G, the pressing block, H, neck, B, rest, d, shoulder, c, pin, l, fly, f, and rod, J, all arranged as and for the purpose herein set forth.

57,171.—DOUBLE REVOLVING PLOW.—John Mott, Danville, Cal.

I claim, First, The peculiar depressions in the front and back standards, a a b, and extension of the arms, d d, of the front standard conforming to the mold boards, and the forked brace, c, for strengthening the plows, as described.

Second, The corked washer, f, and adjustable washers, m m, and lever, e e, and the peculiar shape of the outer ends of the set screws, l l, substantially as described and for the purposes set forth.

57,172.—MODE OF PREVENTING THE FREEZING UP OF GAS PIPES.—James H. Mulhall, Albany, N. Y.

I claim the employment at the junction of the lamp post gas pipe and of the service pipe at the bottom of the post, of a reservoir to hold alcohol or other fluid uncongealable at the lowest temperature of the climate, said reservoir to be formed, fitted, and arranged substantially as described.

57,173.—RAILROAD CAR ROOFS.—William H. Myers, New London, Conn. Antedated July 9, 1866.

I claim in roofs for railroad cars and other structures combining the strips, c, which form the bodies of such roofs with metallic bands and nosings, substantially as above set forth.

57,174.—DISINFECTING COMPOUND.—Henry Napier, Elizabeth, N. J.

I claim, First, The combination of phenic acid with alumina, for the purposes set forth.

Second, The combination of a metallic perchloride with alumina, for the purposes set forth.

Third, The combination of a solid sulphite with alumina, for the purposes set forth.

Fourth, A disinfecting compound, made as herein described.

57,175.—EXPLOSIVE COMPOUND.—Alfred Nobel, New York City.

I claim nitrate, or crystallizing nitro glycerin, produced by the mixture of glycerin, sulphuric acid, and nitric acid, free or nearly free from hyponitric acid, for the purpose specified.

57,176.—CARPENTER'S BENCH HOOK.—Lewis F. Noe, New York City. Antedated Aug. 2, 1866.

I claim a reversible bench hook, constructed and operating substantially as herein set forth.

57,177.—LOOM FOR WEAVING CLOTH WITH SWELLS OR GORES.—Morris Opper, New York City.

I claim the pressure rollers operated by the lay of the loom, substantially as described, and controlled by the jacquard or equivalent therefor, in combination with the take up roller, substantially as and for the purpose specified.

57,178.—MACHINE FOR CONVERTING RECIPROCATING INTO ROTARY MOTION.—John B. Page, Chicago, Ill.

I claim the arrangement and combination of the racks, D, supports, F, with the lever, k, and pinion, H', substantially as described and set forth.

57,179.—CARRIAGE POLE.—Henry W. Painter, New Haven, Conn.

I claim the combination of the bar, B, with the pole, inserted in the manner and for the purpose specified.

57,180.—HEAD BLOCK FOR SAW MILL.—John W. Parsons, Owenton, Ky.

I claim, First, The setting mechanism, consisting of the double rack, D, and pawls, F f F', capable of simultaneous or separate action, substantially as set forth.

Second, I claim the cam, K, lever, L, rod, l, and tongue, M, adapted for the optional release of both or either head block, in the manner explained.

57,181.—BED BOTTOM.—E. M. Payne, Waverly, N. Y.

I claim the combination of the half elliptic springs, D, with the upper and lower frames, B and A, of the bed bottom, with rollers, C, pawls, F, ratchet wheel, E, and canvas, G", substantially as described and for the purpose set forth.

57,182.—MACHINE FOR WRITING AND PRINTING.—Abner Peeler, Webster City, Iowa.

I claim, First, Printing reading matter by means of a self-adjusting type plate having a compound movement, and a lever press, substantially as described.

Second, The lever, C, and pin, E, combined with the hinged block, F, when used for the purpose specified.

Third, The finger plates, R and S, with their several adjuncts as described, or their equivalents, for the purpose of moving and adjusting the type plate.

Fourth, The hinged blocks, F and I, constructed and operating substantially as and for the purposes set forth.

Fifth, The sliding beam, O, ratchet and pawl, N, and paper holder, P, constructed, combined, arranged, and operating substantially as and for the purposes specified.

Sixth, The entire machine constructed, combined, and arranged substantially as described.

57,183.—DERRICK FOR RAISING SUNKEN VESSELS.—Sherman Petrie, Buffalo, N. Y.

I claim the double set of lifting tackle, C C, and chains, G G', arranged, combined, and operating substantially as described, by which the sunken vessel may be raised, and at the same time the derrick vessels maintained in their upright positions, as set forth.

57,184.—ALLOY.—Frederick Pfeiffer, Philadelphia, Pa.

I claim the aforesaid new and improved alloy metal, plated or covered, and particularly the addition of bismuth, antimony, and tin, to lead and copper, in the order, proportions, and for reasons, as already stated, using for that purpose the aforesaid metals, or any other substantially the same, and which will produce the intended effect.

57,185.—COMBINED SEEDER AND CULTIVATOR.—Thomas J. Price, Auburn, Ky.

I claim, First, The combined cultivator and seed coverer, constructed and arranged substantially as herein shown and described, that is to say, having adjustable, interchangeable teeth, capable of being shifted and secured in different parts of the frame, as and for the purpose set forth.

Second, In combination with the cultivator with adjustable and interchangeable teeth, as described, I claim the spiked roller when constructed and arranged for operation as and for the purposes herein set forth.

Third, The combination in a cultivator or seed coverer, constructed and arranged as herein described of the roller with a stationary spiked cross bar to clean the roller and prevent its becoming clogged, substantially as herein set forth.

57,186.—PIANO.—Richard Raven, New York City.

I claim introducing beneath the principal sounding board of a piano a drum or sounding chest, composed of one or more sounding boards, on which the principal sounding board is supported, with their edges secured permanently to the case of the instrument, substantially as shown.

57,187.—HEATING FURNACE.—C. R. Rand, Dubuque, Iowa.

I claim, First, The open furnace, provided with the air passage, G, in combination with the lateral air flue, D, located in the upper part of the fireplace, as shown and described.

Second, In combination with the air passages, G and D, I claim the hollow or tubular barred gates, U, arranged and operating as set forth.

Third, In combination with the open furnace I claim the air chamber, R, and the vertical flues, P and P', arranged as shown and described.

Fourth, The arrangement of the smoke flues, I' H and H', as set forth.

Fifth, The adjustable water vessel, K, located within the hot-air chamber, as shown and described.

Sixth, The dividing chamber or passage, F, when provided with the valves, i, and deflecting plates, K, arranged as herein set forth.

57,188.—STEAM PUMP.—Louis C. Rodier, Springfield, Mass.

I claim, First, The arrangement in each end of a steam cylinder of the valve, b, with a steam reservoir, L, and post, f, so as to be operated by the piston to admit steam to the main valve chest, substantially in the manner and for the purpose set forth.

Second, The construction of the stem of the valve, b, at each end of the cylinder, in such a manner that it shall be moved reversing the main valve before the piston reaches the end of the cylinder so as to cushion the piston, as set forth.

Third, The arrangement of the ports, h and s, respectively in the main valve and its seat so as to communicate with the exhaust port, and the valve chest, substantially as set forth.

Fourth, The arrangement of the water valves hung on trunnions in the plugs, substantially as set forth.

Fifth, The construction of the upper plug divided into three parts by means of partitions communicating with either end of the cylinder and with the delivery pipe and air chamber, as shown and described.

Sixth, The arrangement of the yoke, n, operating substantially as set forth.

57,189.—PISTON-PACKING RING.—John B. Root, New York City. Antedated August 8, 1866.

I claim a packing ring beveled at its outer edges, as shown at e, e, and herein described, and fitted to the piston and cylinder, to operate as herein set forth.

57,190.—TRUNK ENGINE.—John B. Root, New York City.

I claim the arrangement of the packing rings within the trunk in combination with the cylindrical guides, F F, attached to the cylinder, substantially as and for the purpose herein specified.

57,191.—PLANING MACHINE.—James J. Russ, Worcester, Mass.

I claim the pressure foot for planing machines, arranged and constructed to operate substantially as described.

57,192.—MANUFACTURE OF PAPER.—William A. Russell, Lawrence, Mass.

I claim the improved fabric or manufacture of paper as composed of a coarse, stronger and more opaque material (such as Manila hemp or Manila rope, Sisal grass, jute or gunny bagging) and two superficial or finishing layers of a finer and whiter material (such as linen or cotton or a mixture of both), applied, arranged, and combined together, under circumstances and in manner as hereinbefore explained.

57,193.—HORSE HAY FORK.—Andrew V. Ryder, Germano, Ohio.

First, I claim the above-described arrangement of the tines, A and D, with the tubular head, B, arms, C, and rope, E, substantially in the manner and for the purposes set forth.

Second, I also claim the arrangement of the locking lever, G, with the tumbler, H, and dog, I, substantially as described.

57,194.—DESULPHURIZING ORE.—Van Buren Ryon, New York City.

I claim the process, substantially as described, of subjecting ores which have been desulphurized and their base metals oxidized, to the action of the gases evolved from the process of desulphurizing another charge of such ores in the presence of atmospheric air, and mingled with binoxide of nitrogen and jets of steam, for the purpose specified.

57,195.—HAND-SCREW CLAMP.—Hermann Schmidt, New York City.

I claim the movable nuts, c, c, in combination with the screw, B B', and ja's, A A', of a carpenter's clamp, constructed and operating substantially as and for the purpose described.

57,196.—LUBRICATOR.—Charles Schott, Nashville, Tenn.

I claim the arrangement of the ratchet wheel, c, carrying the dippers, the pawl, e, lever, B, and cam, I, in relation to the journal box, in the manner and for the purpose herein set forth.

57,197.—MEAT CUTTER FOR SAUSAGES.—Jean Se-gondy, St. Louis, Mo. Antedated July 31, 1866.

I claim the sliding head blocks, G, and the slide, I, when constructed and employed as and for the purpose set forth.

57,198.—CAR SEAT AND COUCH.—Thomas Sharp, Carlisle, Pa.

First, I claim providing means, substantially as described, whereby hinged backs of car seats are elevated after they are swung over to a horizontal position, and after being thus elevated are retained in position, either permanently or with only a slight freedom to move up and down, all for the purpose set forth.

Second, The arrangement of the suspension rods, g g, and springs, h, in combination with the hinged vertically-adjustable backs of car seats, substantially as and for the purposes described.

Third, The jointed or folding cushions, D, in combination with supports, a, formed on the seat frames beneath the bottoms of the seats, D', whereby the cushions, D, when not in use are sustained out of the way of the foot rests, C, substantially as described.

Fourth, The combination of the cushions, D or D', springs, S S, and slats, E E, substantially as and for the purposes set forth.

57,199.—HORSE HAY FORK.—E. Shorkley, Lewisburg, Pa.

I claim the case or sheath, A, provided with an arm or projection, B, at its upper end in connection with the hooks, F F, connected with the rod, c, and case or sheath, A, and operated through the medium of the lever, D, or its equivalent, substantially as and for the purpose set forth.

I also claim the particular arrangement of the hooks, F F, links, g g, and arms, h h, to operate in the manner substantially as and for the purpose specified.

57,200.—PLOW.—J. B. Skinner, Rockford, Ill.

First, I claim swiveling the colter or cutter for plows or cultivators in sockets or brackets so attached to the beam as will permit the colter or cutter a lateral and vertical adjustment, substantially as and for the purpose set forth.

Second, Giving the swiveled colter or cutter, both a vertical and horizontal adjustment, substantially in the manner and for the purpose set forth.

57,201.—BRAIDING MACHINE.—Thomas J. Sloan, New York City.

I claim the second guide on the carrier bar, and the second guide on the sliding weight, in combination with the first guide on the carrier bar and weight heretofore used, substantially as and for the purpose described.

57,202.—BUTTON HOLE.—Charles D. Smith, Washington, D. C.

I claim a button hole having a continuous metallic binding, substantially as and for the purpose specified.

57,203.—MODE FOR CURING PORK.—Morris H. Smith, Brooklyn, N. Y. Antedated Aug, 8, 1866.

I claim the suspending of hams and shoulders, during the process of curing, with the but forward and the shank down in such a way that the brine dripping from one ham will fall on that beneath, as herein described, using for that purpose parallel bars, or any other means substantially the same, and which will produce the intended effect.

57,204.—CLOTHES DRIER.—Theodore F. Snover, Menasha, Wis.

I claim the combination of the plate, B, with its shouldered collar, D, the slotted plate, F, and bars, H, with studs, A, constructed as described and operating in the manner and for the purpose specified.

57,205.—SAW-TOOTHING MACHINE.—Adam Sawden, Cincinnati, Ohio.

I claim the arrangement of shearing jaws, J J, and toothing, jaws, K K', in the described combination with the adjustable traveling gages, N, as and for the purposes set forth.

57,206.—Suspended.

57,207.—POTATO AND DRILL MACHINE.—Silas L. Spencer, Hopewell Cross Roads, Md.

I claim the arrangement of the double hopper, J K, and strike, k, in combination with the delivering boxes, e e e, in the opening joints, l l l, endless belt, c c, rollers, C D, driving mechanism, E F, and frame, A, constructed and operating in the manner, herein described for the purpose specified.

57,208.—CAR COUPLING.—G. D. Spooner and J. F. F. Hale, Rutland, Vt.

We claim the double stop, c, in combination with the horizontal partition, a, and coupling pin, b, of a car coupling, constructed and operating substantially as and for the purpose set forth.

57,209.—TABLE.—E. L. Staples, Nashville, Tenn.

First, The inclined molding board or kneading trough, D, in the top of a table, substantially as described.  
Second, The combination of the sliding top, E, with its attached leg, and the inclined molding board on the top of a table, substantially as and for the purpose herein specified and set forth.

57,210.—VULCANIZING FLASK FOR DENTISTS.—Eli T. Star, Philadelphia, Pa.

First, The combination of the two rings, A B, and interchangeable plates, s e, substantially as herein set forth for the purpose specified.

Second, The holes, f, beveled or counter-sunk at their outer ends, in combination with the covering plate, A, and a ring A or B, substantially as herein set forth for the purpose specified.

Third, The slotted lugs, g, recessed as described of the plate, s, in combination with the T bolts, j, nuts, r, and perforated lugs, k, of the plate, e, substantially as herein set forth for the purpose specified.

57,211.—METHOD OF ELEVATING WATER IN RAILROAD TANKS.—Charles L. Stevens, Galesburg, Ill.

First, The rail platform, A, operating on a series of compound levers, c c c, and so connected with the rods, a a a, of the platform, and the shafts, E E E, as to impart, by means of the passage of a train of cars, sufficient motion thereto to operate one, two or three pumps, as may be desired, substantially in the manner and for the purpose as herein set forth.

Second, The rods, a a a, of the platform constructed with the ratchet rollers, e e e, on their ends and operating in slots, D, in the bed sills, B, under and against the rails as to give the proper direction and position to the platform in its elevation and depression, substantially in the manner and for the purpose as herein set forth.

Third, I claim depressing the rail platform and retaining it in that position by means of the lever, h, on the shaft, being locked into the upright spring plate, i, by the brakeman or man in attendance, substantially in the manner and for the purpose as specified.

Fourth, The fulcrum lever, h", vertical rod and lever connecting therewith in combination with the shaft, E, substantially in the manner and for the purpose as herein specified.

Fifth, The weights, F F, and levers, f f, on shafts as arranged to elevate the rail platform on every succeeding depression of it by the cars of the train when passing thereon, substantially in the manner and for the purpose specified.

57,212.—PRESERVE CAN.—Charles F. Stiltz and J. C. Knoepke, Pennsylvania City, Pa.

First, We claim the combination of the tin can, A, the conical flanged neck, d, the cast iron stopper, E, gum ring, G, ears, K K', and spring bar, M, when arranged and operating substantially as described.

We claim the combination of the tin can, A, the conical flanged neck, d, the cast iron stopper, E, gum ring, G, loops, o o, cross-bar, N, and thumb screw, p, when arranged and operating substantially as described.

57,213.—GRATER FOR CARROT AND OTHER VEGETABLES.—Emos Stimson, Montpelier, Vt. Antedated July 30, 1866.

I claim a rotary grater with an open end attached to the end of an arbor operated by gears and crank in connection with the frame and rest as described and for the purpose above specified.

57,214.—SADDLE.—H. Stockton, Newport, R. I., and W. S. Smoot, Washington, D. C.

First, We claim a saddle tree highly arched underneath, flat on top, opened between the bars and covered and bound, substantially as herein described.

Second, In combination with a saddle such as described, and without padding, a saddle cloth having a leather re-enforce, c, substantially as and for the purpose set forth.

Third, The combination with the stirrup loop of a hinged locking and unlocking lever, x x, operated without a spring, substantially as set forth.

57,215.—LARD LAMP.—Timothy Terrel, Spring Hill, Ohio.

I claim a lamp for burning lard and other similar substances, having a cylindrical body or fountain, A, with a toothed wheel, E, fitted concentrically within it, on a horizontal shaft, D, to act upon the wick, F, substantially as herein shown and described.

57,216.—PLOW CLEARING ATTACHMENT.—Timothy Terrel, Spring Hill, Ohio.

I claim the sliding rod, D, applied to a plow, substantially in the manner as and for the purpose herein set forth.

57,217.—PROCESS FOR MAKING EXTRACTS.—N. Spencer Thomas, Painted Post, N. Y.

I claim the within described process of concentrating extracts or other substances by the action of jets of air injected at or through the bottom of the vacuum pan in which the evaporation of said substance is to be effected, substantially as set forth.

57,218.—APPARATUS FOR EXTRACTING TANNING MATTER FROM BARK.—N. Spencer Thomas, Painted Post, N. Y.

I claim, First, The apparatus herein described consisting of a tank, A, movable top, B, hinges a', catch, h, tie rods, a, pipes, b f, rose, c, bottom, C, perforated false bottom, d, rim, e, and radiating channels, g, when constructed and arranged in the manner and for the purposes specified.

Second, I further claim the process herein described of extracting bark or other materials by the continuous application of steam and intermittent application of water in an apparatus of the construction specified.

57,219.—COMPOSITION FOR REMOVING INCrustATIONS FROM BOILERS.—N. Spencer Thomas, Painted Post, N. Y.

I claim a compound for removing and preventing incrustations in steam boilers, made of the ingredients set forth and mixed together or applied in about the proportions specified.

57,220.—FAUCET.—Thomas J. Thorn, Skaneateles, N. Y. and Jonathan Dennis, Jr., Washington, D. C.

We claim a faucet stock or tube fitted for insertion in a cask, tank, boiler or other vessel, with two holes through it, and a valve at its inner end, worked by a rod or screw passing through one of the holes, and independent of the hole through which the water or liquor is drawn or flows.

And in combination with the above claimed faucet we claim a strainer arranged beyond the valve of the faucet.

And in combination with the strainer arranged beyond the valve, we claim an arm arranged to sweep or clear the strainer, substantially as described.

We also claim the extension of the valve rod through the strainer to work the arm that sweeps the strainer.

57,221.—BEER COOLER.—Matthew Tschirge and Louis Kammuller, Dubuque, Iowa.

We claim cooling beer on its way from the "cool beds" to the fermenting tun, by causing the beer to flow in an unbroken sheet over both sides of a series of cold water pipes, arranged one above another, and provided with thin blades, g, substantially as described.

57,222.—CULTIVATOR.—J. W. Tyson, Lower Providence, Pa.

I claim the mounted frame, provided with laterally adjustable and longitudinally slotted bars, E, as and for the purpose set forth.

57,223.—SPRING MATTRESS.—Charles Van Dyeck, Nashville, Tenn.

I claim a spring mattress, constructed with a frame, A, diaphragm, b, and spiral springs, a a, enclosed in a casing, d, the several parts being constructed, secured, and arranged for use, substantially as set forth.

57,224.—SORGHUM EVAPORATOR.—P. C. Van Slyke, Bloomfield, Ind.

I claim, First, In evaporators connecting their divisions by pipes running from one to the other, below their bottoms, substantially as described.

Second, I also claim perforating the connecting pipes at their lowest points, substantially as described.

57,225.—APPARATUS FOR AUGMENTING SOUND IN PIANO FORTES.—Maurice Vergnes, New York City.

I claim clamping two sounding boards upon the flange of the frame, at a distance within two inches of each other, to render them solid with the case, and to admit of tightening them when the case shrinks.

Second, The use of the strips, D I and G, to prevent a jar of the board on the frame.

Third, Using in the sounding-board the proportion as to thickness of 2 of the upper to 3 of the lower one, which is perforated to equalize them in strength.

57,226.—HAND LOOM.—W. B. Walker and N. D. Hartley, Salem, Iowa.

We claim the driver strap, b, described and shown in Fig. 5, made substantially as described, so as to be stiff except in the part that is pivoted to and that embraces the head of the shaft, for the purpose above set forth.

Second, We also claim in combination the picker staff, B, the said driver strap, b q', made as shown, and the spring, h, for holding the staff stationary, while the strap is limbered up, substantially as described.

Third, We also claim the depressors, c c, having rounded shoulders, b', their bottoms being inclined or beveled in two directions, and having planes formed thereon, corresponding in number with the number of treadles in the loom, substantially as described.

Fourth, We also claim the reciprocating rod, g, attached to the lay, whose hooked end engages with holes in the treadle shaft to hold the shaft stationary when the lay is still, substantially as shown.

Fifth, We also claim making the pulley, l, in sections, so that it can be removed from the shaft, in order to change from one-sized pulley to another, substantially as described.

Sixth, We also claim the stop, r, connected with the rake-up rod, E, which gives it a vibrating movement for the purpose of acting as a stop to the pins, R, and so aiding in making the shaft move around or rotate a regulated distance at each reciprocation of the lay, substantially as set forth.

Seventh, We also claim the combination of the treadle-shaft, having movable pins, R, a ratchet, K, and a loose pulley and pawl, constructed as shown, with the adjustable bar, S, which operates it from the lay, whereby a loom can be operated with three leaves of treadles, and with other odd as well as even numbers, by changing the position of the pins adjusting the height of the end of the bar, S, on the lay, changing the number of ratchet teeth, and changing the size of the pulley, substantially as described.

57,227.—HAY PRESS.—Edgar A. Ward, Gallipolis, Ohio.

I claim the shaft, D, with the cube, a, attached, and the spiral sectional drum, E, and in combination with the lever, L, ratchet, R, and ropes or chains, m and n, the whole operating as described and for the purposes set forth.

57,228.—STEAM ENGINE.—George J. Washburn, Worcester, Mass.

I claim the cylinder, A, constructed as described, with a diaphragm or partition at its central portion, traversed by the piston-rod, and combined with the pistons as specified.

The combination of the cylinders, A B, constructed and operating as described.

57,229.—SPRING BED BOTTOM.—D. P. Webster, Upper Gilmanton, N. H.

I claim the single wire clamp, e, with its hooks, f, catching under the top of the spring, and holding it up against the slat, substantially as described for the purpose specified.

57,230.—MACHINE FOR CUTTING RASPS.—Alfred Weed, Boston, Mass.

I claim producing the teeth of rasps in arcs of parallel circles, by giving to the tool and the rasp blank movements substantially as described.

Also, the means for giving lateral vibration to the cutter, consisting of the lever, f, when pivoted to its rocker-shaft, j, the lever, g, and the cam, u, and spring, s, combined to operate substantially as described.

Also, the compound compensating jaw in lever, q, formed by the two cylinders, t and u, slotted and arranged substantially as specified.

Also, the means for intermittently feeding the blanks, consisting of cam, a', rocker, b, the spurs on ratchet, p', and latch, k', arranged to operate the ratchet, f, and thereby to move the blank carriage, k.

And the combination with the presser holder of the rod, p', weight, u', or its equivalent spring and treadle, o', arranged and operating together as described.

57,231.—METHOD OF DRIVING FENCE POSTS.—Geo. E. West, Indianapolis, Ind.

I claim raising and dropping the weight, C, by means of the cam, G, pins, a s, and wheels, H and I, when mounted on wheels and made portable, and arranged and operated in the manner and for the purpose substantially as set forth.

57,232.—MACHINE FOR POUNCING HATS.—Sidney S. Wheeler and Daniel B. Manley, Danbury, Ct.

First, The pouncing cylinder, L, or its equivalent, adapted to move at a comparatively high speed, in combination with the hat block, a, adapted to move at a comparatively low speed, operating substantially as described, whether the motion be rotary or otherwise.

Second, We also claim carrying a rotating, cutting cylinder, or wheel, for pouncing hats in a vibrating frame, so that such cutting cylinder or wheel can act both on the crown and sides of hat bodies, which are stationary or are moving forward in a straight line, substantially as above shown.

Third, We also claim giving an advancing motion, and at the same time a rotary motion, to a hat-block, upon which hat-bodies are placed to undergo the operation of pouncing, substantially as and for the purpose above set forth.

Fourth, We also claim, in combination in machines for pouncing hat bodies, the carriage, b, the hat-block, a, so mounted as to be capable of rotary motion, the worm, o, cog-wheel, P, and rack, V, for moving the carriage forward, and a suitable spring for driving the carriage back when it is released from its driving-wheel, P, substantially as above shown.

Fifth, We also claim, in combination, a conical emery rotating surface, h, for pouncing the brims of hat-bodies, and a conical supporting surface, 3, to hold the brim up to the cutting surface, substantially as shown.

Sixth, We also claim, in combination, a conical rotating cutting surface, h, for pouncing the brims of hat-bodies, and conical feeding rolls with elastic surface, g g, for feeding the brim to the cutting or pouncing surface, substantially as shown.

57,233.—FABRIC FOR TUBING, ETC.—Thomas R. White and William G. Bedford, Philadelphia, Pa.

We claim a fabric composed of threads and wires, interwoven and coated with a waterproof material, substantially as described.

57,234.—SHOE NAILS.—A. A. Wilcox, Fair Haven, Ct.

I claim a shoe-nail, provided with a collar, a, or its equivalent, substantially in the manner herein described, as a new article of manufacture.

57,235.—HORSE SHOES.—Albert S. Wilkinson, Pawtucket, R. I.

I claim the continuous clip, c, in combination with the bar, A, and continuous calk, d, whether the latter is situated on the inner or outer edge of the shoe, all constructed as illustrated and described in Figs. 1 and 2.

57,236.—CALK FOR HORSE SHOES.—Albert S. Wilkinson, Pawtucket, R. I.

I claim an adjustable calk in B' B b, constructed and fastened substantially in the manner and for the purpose specified.

57,237.—DEVICE FOR HOLDING EAVESTROUGHS WHILE SOLDERING THEM.—E. Wilkinson, Jr., Mansfield, Ohio.

I claim the frame, F, and flanges, v, in combination with the concave bed, B, having clamps, C C, all constructed and arranged together, substantially as and for the purpose specified.

57,238.—MANUFACTURE OF VINEGAR.—Alexander C. Wills and Hugh Sharp, Marlton, N. J.

We claim utilizing the refuse of apple-presses and cider-stills, by treating these substantially as described, to form vinegar.

57,239.—SHUTTER FASTENING.—Jacob D. Winslow, Wilmington, Del.

I claim the notched lever, B, hung upon the bar, A, in combination with the staple or equivalent device, projecting downward from the lower edge of the shutter, E, all being arranged and operating as set forth.

57,240.—DOOR SPRING.—Alvah Wiswall, New York City.

I claim the V-shaped spring, D, attached to the door or gate, in combination with the roller, d, attached to a plate, c, projecting from the door-frame, or from the part, a, of the hinge attached thereto, and all having such a relative position with each other, to operate in the manner substantially as and for the purpose set forth.

57,241.—DOOR BOLT.—George M. Wood, Decatur, Ill.

I claim the semicircular hollow bolt, A, provided with a longitudinal slot, a, in its inner side, and a hole for a knob on its outer side, in combination with the plate, B, having a longitudinal slot, b, in it for the screws, D, to pass through and secure the plate and bolt to the door or other article to which the bolt is to be applied substantially as shown and described.

57,242.—MACHINE FOR TILLING THE SOIL.—Sylvester Woodbridge, Benicia, Cal.

First, I claim the tilling frame, B', tiller shaft, G, and guide plate or shaft, K, in combination with the crank on the tiller shaft, G, and crank shaft, F, and connecting rods, H, substantially as and for the purpose set forth.

Second, I claim the truck frame, A, and driving wheel or cylinder, C, spur gear, D (whether internal or external), and pinion, E, with or without intermediate gearing, in combination with the means hereinbefore described and set forth, of operating agricultural implements by cranks, rods, guide plates, or shafts, substantially as set forth.

57,243.—PACKING FOR PISTON BOILERS.—William P. Woodruff, New York City.

I claim a steam packing made of a gasket, a, braided or otherwise produced, by hemp or other suitable material, and protected by a flexible covering, B, in combination with a strip of tin foil fastened to its inner circumference by one or more strips of brass, substantially as and for the purpose set forth.

57,244.—CULINARY STEAMER FOR BOILERS.—Fred. W. Bacon (assignor to himself and D. A. Strong), Washington, D. C.

I claim the construction of steamers for culinary purposes, provided with the perforated diaphragm, D, or its equivalent, the concave center, c, or its equivalent, and the conical bottom, B, with the tubes, t t, or their equivalents, made substantially in the manner and for the purposes set forth.

57,245.—METHOD OF USING EXPLOSIVE LIQUIDS FOR THE PRODUCTION OF LIGHT AND HEAT.—William Beschke (assignor to himself, P. H. Vander Weyde, and L. Straus), Philadelphia, Pa.

I claim filling up the whole or a part of the interior of the lamps, bottles, cans, barrels, tanks, reservoirs, etc. (the former to burn, and the latter to retain and to transport gasoline or other explosive fluid), with saw-dust, cotton, asbestos, beads, gravel, shot, etc., and with wire gauze or perforated thin plate, for the purposes specified.

57,246.—DROP-HANDLE URN COCKS.—Henry Bailey and Edwin L. Bailey (assignors to Henry Bailey), Philadelphia, Pa.

We claim the plug, B, having a rightangular groove, D D', operating with the fixed pin, C, or its equivalent, on the face of the tapering hole of the body, A, provided with nut, E, and washer, F, substantially as described, for the purpose specified.

57,247.—SHOE-LACING FASTENING.—George Butterfield (assignor to David Robinson, Jr., Dorchester Mass.), Boston, Mass. Antedated August 1, 1866.

I claim the lacing plate, A, provided with an eye, b, having an angular slot, a, extending from it, substantially as and for the purpose specified.

I also claim the combination of such plate, A, with a series of lacing or eyelet holes, c, the plate being arranged with respect to the holes, c, and to secure the lacing, d, substantially as shown and described.

57,248.—WHIFFLETREE.—Philip B. Curtis (assignor to himself and Albert P. Sawyer), Amesbury, Mass.

I claim the arrangement and combination of the brace at each end, B C, and the bolt, z, and its holders, e e, with the whiffletree, A, and its end loops, b b, the whole being substantially as specified.

I also claim the combination of the safety spring with the whiffletree, the bolts, z, its holders, and the attachment straps, B C, applied to such whiffletree, as specified.

57,249.—SLIDE BOLT.—John Decker (assignor to himself and Charles W. Wardwell, Brooklyn, N. Y.), Sparta, N. Y.

I claim the bolt, B, fitted in a case, A, and provided with a pro-

jection, d, at its rear side, and with a shoulder or stop, e, at its outer side, in combination with the tumbler, D, notched as shown, to receive the projection, d, and the oblong slot, b, in the case, A, all arranged to operate substantially in the manner as and for the purpose set forth.

57,250.—CARPENTER'S VISE.—Orlando V. Flora (assignor to himself and John G. Moore), Madison, Ind.

I claim the combination of the fixed catch, B, and the catch bar, G, movable up and down, to clear and engage with the catch, substantially as and for the purpose herein specified.

57,251.—MACHINE FOR FLATTENING AND PUNCHING UMBRELLA RIBS.—Jacob Fox (assignor to Carr & Company, Philadelphia, Pa.), Minersville, Pa. Antedated August 1, 1865.

First, I claim the slides, P, with their flattening, punching, and indenting dies, arranged in line and parallel with each other, in combination with similarly arranged counter dies, the whole operating as set forth, for the purpose specified.

Second, The combination of the above with shaft G, and notched disks, H, the whole being arranged and operating substantially as and for the purpose herein set forth.

Third, The combination of the slides, D, and their punching and flattening dies, I, with the holding rod, d, and its spring, c.

57,252.—MODE OF UTILIZING TINNERS' WASTE.—Charles Gotey and Aug'te Guillemin (assignors to themselves and Charles Fox, and Joseph Oppenheimer), Cincinnati, Ohio.

We claim, First, The process of removing tin from iron, substantially as set forth.

Second, The furnace, substantially as described and for the purpose set forth.

57,253.—LADY'S FAN.—Samuel A. Grant (assignor to Burlington Manufacturing Company), Burlington, N. J.

I claim as a new article of manufacture, a fan having its body and handle made in one piece, and of one and the same veneer or sheet of wood, substantially as herein described, and for the purpose specified.

57,254.—APPARATUS FOR MEASURING AND FITTING DRESSES.—P. A. La Ment (assignor to himself and Eliza La Ment), New York City.

I claim a skeleton frame or "shape," consisting of a series of bands, B and C, when so arranged and constructed together that they can be separately and severally adjusted, substantially in the manner described, and for the purpose specified.

57,255.—SWINGING CHAIR.—Ernst Marx (assignor to himself, Hermann Dittrich, and Julius Keer), New York City.

I claim the leg, E, and jointed and curved arm, D, supporting the seat, and operating substantially as described.

57,256.—INSTRUMENT FOR REMOVING EFFERVESCING FLUIDS FROM BOTTLES.—Whitney W. Melgore (assignor to himself and L. A. Stedman), Nashville, Tenn.

First, I claim the fluid-extracting instrument, a c b, constructed and operating in the manner as shown and described.

Second, The combination of the tube or instrument, a c b, with the cork, D, or its equivalent, and bottle, A, operating in the manner set forth.

Third, The combination of the several parts just named, with the auxiliary tube, t, operating substantially as set forth.

57,257.—PIANO.—William Nordhoff (assignor to William Knalee & Company), Baltimore, Md.

I claim the plate, B, secured to the wrest plank, c, in combination with the frame, A, when said parts are constructed and arranged to operate substantially as and for the purpose herein set forth.

57,258.—MACHINE FOR PRIMING METALLIC CARTRIDGES.—Timothy J. Powers (assignor to J. P. Fitch and J. R. Van Betchen), New York City. Antedated July 31, 1865.

First, In a machine for depositing the fulminate priming in cartridge shells, I claim a feeder which descends into a box, vessel, or reservoir containing the priming, in a fluid or semi-fluid state, picks up the requisite quantity of priming therefrom, and again descends into or over the cartridge shell, to deposit the priming therein, substantially as herein described.

Second, I claim suddenly arresting the feeder in its descent over or into the cartridge shell, substantially as herein specified, for the purpose of insuring the complete discharge of the priming therefrom.

Third, I claim the combination of a feeder, a priming reservoir, and a cartridge shell carrier, operating substantially as herein specified.

Fourth, Commencing the rotary or spinning motion of the shell about the axis before the deposit of the priming therein, substantially as and for the purpose herein described.

57,259.—CORN PLANTER.—Henry Reed and William P. Pennewell (assignors to themselves and Walter Caldwell), Middleton, Mo.

We claim the sheet-iron teeth or wires, x, when attached to the pieces, A and A', for the purpose of scattering the seed.

57,260.—BUTTON.—E. A. Robinson (assignor to the United States Button Company), Waterbury, Conn.

I claim a button having the loop screwed to and in the mold, by means of a metallic plate or blank, D, having a ragged edge or lip, E, substantially in the manner described.

57,261.—MACHINE FOR MAKING SHEET METAL PANS.—M. S. Sager (assignor to S. B. Yeoman), Washington, Ohio.

I claim the combination of the sliding mold block, M, and stationary bed plate, B, having lever arms, or binders, H, hinged to the sides, and secondary binders or lever arms, K, hinged to the binders, H, for the purpose of bending or laying over the projecting corner pieces of the metal sheet, arranged and operated substantially as described.

57,262.—CARPET-BAG FRAME.—Cornelius and Zachariah Walsh (assignors to Cornelius Walsh), Newark, N. J.

I claim the combination of the jaws, A, with the interior frames, consisting of the wooden pieces, C G, metallic hinge pieces, I, and plates, D, the latter secured by tenons, F F, to the jaws, and both jaws and interior frames pivoted upon the bolt, B, the whole constructed as described and represented.

57,263.—CLAMP FOR CLOTHES LINE.—William Winter (assignor to himself, Isaac Townsend, and Theodore H. Beacher), Philadelphia, Pa.

I claim a clothes line spring-clamp, consisting of a hollow cylinder, open at each end, divided along one of its sides, and having its inner edges beveled or rounded off, all as set forth and described.

57,264.—MANUFACTURE OF PIGMENT.—John Dale, Manchester, Eng.

I claim, First, The production of a pigment, by decomposing the known pigment, satin white, by means of chloride of barium, or strontium, so as to replace, or partially replace, sulphate of lime, by sulphate of barium or strontium.

Second, The production of a pigment, by using caustic baryta or strontia instead of, or partly instead of, the lime ordinarily used in making "satin white."

57,265.—FILTER PRESS.—L. P. R. De Massy, Paris, France.

I claim a filter press having a corrugated surface, covered with wire cloth or gauze, against which the material from which the liquor is to be extracted is pressed, all substantially as and for the purpose described.

57,266.—REPEATING WATCH.—F. A. Lange, Glashutte, Saxony.

I claim, First, The pusher, G, in combination with the levers, H I, when constructed and operating substantially as described.

Second, The lever, I, in combination with the pusher, G, lever, H, pinion, E, and hammer, F, when constructed and operating in the manner substantially as set forth.

Third, The lever, H, when constructed with the projections, M and N, and the slot, S, substantially in the manner and for the purposes described.

Fourth, The lever, H, in combination with the lever, I, small wheel, Q, quarter wheel, P, spring, W, and spring, R, when constructed and operating in the manner substantially as set forth.

Fifth, The lever, I, when constructed with the rack, K, the rack, L, the screw, T, and the spring, R, substantially in the manner and for the purpose described.

Sixth, Providing the star or hour wheel, O, with twenty-four teeth, in the manner and for the purpose set forth.

Seventh, The hour wheel, O, in combination with the small wheel, Q, quarter wheel, P, spring, Y, substantially as set forth.

Eighth, The hammer, F, when provided with the pawl, a, on the sliding stem, b, and constructed substantially as and for the purposes set forth.

Ninth, The hammer, F, in combination with the spring, X, as described.

Tenth, The wheels, D and E, in combination with the levers, G H and I, and the hammer, F, when constructed substantially as and for the purpose set forth.

Eleventh, The combination and arrangement of the pusher, G, levers, H and I, pinion, E, and wheels, D and C, the lever, Z, springs, R and W, hour wheel, O, small wheel, Q, quarter wheel, P, spring, Y, with the hammer, F, and spring, X, substantially as and for the purpose set forth.

57,267.—APPARATUS FOR REEFING AND FURLING SAILS.—John Medhurst, Drummond Road, Bermondsey, Eng. Patented in England, March 4, 1866.

I claim the combined arrangement of the parts for reefing and furling a sail on a roller, c c, substantially as herein described.

57,268.—GAS METER.—Jean Theodore Schotte, Paris, France.

I claim, First, The apparatus for measuring gas, as herein shown and described, the same consisting of the following elements combined:

First, A drum with interior spiral partitions actuated by the gas, as herein shown and set forth.

Second, A valve, together with floats so arranged that it may open and close automatically.

Third, A regulating or discharge pipe for carrying off all water in excess of the proper level.

Second, In apparatus for measuring gas or other fluids, as specified, I claim the drum provided with interior spiral partitions, and actuated as herein shown and set forth.

57,269.—BRECH-LOADING FIRE-ARM.—Jasper H. Selwyn, Woodland Crag, Grasmere, Eng. Patented in England, October 12, 1865.

I claim the improvements in breech-loading fire-arms described and represented, that is to say, making the charge chamber of a conical or spheroidal-conical figure, and making an annular groove or depression, the end of the cartridge box case is expanded on discharge, and retained so as to be started or drawn on the separation of the charge chamber from the barrel.

57,270.—HARMONIUM.—Carl Frederick Uhlig (assignor to George Frederick William Pabst), Chemnitz, Saxony.

I claim, First, The combination of flexible pipe, l, air movable chamber, B, and bellows, D, substantially in the manner represented and described.

Second, The combination of the air chamber, B, spring catch, m, arranged with lip, p, operating with the button, q, operating substantially as and for the purpose herein represented and described.

Third, The combination of the lever, F, rod, n, air chamber, B, provided with the spring catch, m, operating with lip, p, substantially in the manner and for the purpose represented and described.

Fourth, The combination and arrangement of the keys, a, with pins, a', lever, j, with pins, a2, air chamber, B, spring catch, m, lip, p, button, q, rod, n, lever, F, flexible pipe, l, bellows, D, constructed and operating substantially as described, for the purpose specified.

## REISSUES.

2,332.—CIDER MILL.—Tobias J. Kindleberger, Eaton, Ohio.—Patented May 29, 1855.

I claim, First, A mill for grinding fruit, when constructed with three rollers, E G and H, the former of which is placed above the two latter, and so arranged, in relation to the sides of the hopper, that the fruit shall be broken by the longitudinal projections on the roller, E, and crushed against the breast piece, and then delivered upon the two crushing or grinding rollers between which the pomace passes, substantially as set forth.

Second, I claim, in a cider mill, having the three parallel rollers arranged as shown, in combination with the gearing arranged as described, and each of the grinding rollers revolving, by means of said gearing, at different velocities, as set forth.

Third, An adjustable breast piece, I, or its equivalent, by which the space between it and the upper crushing roller can be varied as desired.

Fourth, The scraper, h, arranged to operate in combination with the roller, E, substantially as set forth.

Fifth, Constructing the case, B, with concave or segmental metallic end pieces, B', as and for the purpose set forth.

Sixth, The use of a slatted grate, or its equivalent, to form the bottom of the tub or curb for the purpose of permitting the juice to drain through it, as set forth.

2,333.—PROCESS OF MAKING STEEL DIRECT FROM THE ORE.—George Hand Smith, Rochester, N. Y. Patented July 18, 1854. (Div. 1.)

I claim the process, substantially as herein described, for converting iron ores directly into steel by subjecting the ore, in the comminuted state, in connection with carbon, and with or without other flux, in a close oven, retort, or equivalent vessel, to a high degree of heat, and when converted, treating it in a reheating furnace to weld and ball the particles, and then hammering, rolling, or squeezing the balls to express the impurities and complete the welding, and compact the mass, as set forth.

I also claim, in the process of conversion, charging the comminuted ore and charcoal, or other carbonaceous substance, in the cementing oven, or other equivalent vessel, in alternate layers, substantially as and for the purpose specified.

2,334.—PROCESS OF MAKING STEEL DIRECT FROM THE ORE.—George Hand Smith, Rochester, N. Y. Patented July 18, 1854. (Div. 2.)

I claim the combination of the process of deoxidizing iron ore, and carbonizing the metallic particles, substantially as herein described, with the process of melting in crucibles, substantially as and for the purpose described.

2,335.—MACHINE FOR PUNCHING AND EYELETING SHOES, ETC.—Elmer Townsend, Boston, Mass., assignee by mesne assignments of Jeremiah Keilh. Patented Dec. 16, 1862.

I claim the combination, with eyelet setting or clinching tools, of a magazine in which the eyelets are loosely contained, but from which they emerge in upright position for the action of the setting tools.

Also, the combination with the eyelet magazine and eyelet clinching tools, of an interposed chute or conductor into which the upright eyelets emerge from the magazine, and by which each

in succession is conveyed to position to be seized by the pin of one of the setting tools.

Also, a construction by which the eyelets in the magazine are agitated to cause them to assume positions in which they may emerge from the magazine.

Also, so constructing the lower end of the chute that each lowermost eyelet is detained in position until removed by the eyelet pin.

Also, combining with an automatic eyelet-presenting and setting mechanism, an automatic punching mechanism, operating in the same vertical line of operation with the clinching mechanism.

Also, combining with the mechanism, which brings each eyelet into position before the clinching mechanism, a yielding pin, projecting from the anvil set, said pin receiving the eyelet and holding it in position for the descent of the upsetting tool, and yielding to the pressure of said upsetting tool, or the pin projecting therefrom.

2,336.—GRAIN BINDER.—Samuel Jacob Wallace, Carthage, Ill. Patented April 12, 1864.

I claim, First, A rack, c, in combination with arm, D, or its equivalent, for giving motion to the twister, substantially as described.

Second, The slotted wire holder on binding arm, D, formed of bent plates, b b, substantially as described.

Third, The spring fingers, e e, and spring, e', for carrying the strand to the twister, and releasing the strand, substantially as described.

Fourth, The spring fingers, e e, and spring, e', in combination with the slotted twister, F, operating substantially as described.

Fifth, The binding arm, D, provided with bent plates, b b, for holding and afterward catching the wire, in combination with the spring fingers, e e, for introducing the wire into the twister, substantially as described.

Sixth, The binding arm, D, provided with bent plates, b b, for holding and afterward catching the wire, in combination with the twister, F, and spring fingers, e e, for introducing the wire into the twister, substantially as described.

Seventh, The cutter, d, attached to the binding arm, D, and operating in combination with the twister, substantially as described.

Eighth, Effecting the several operations of carrying the strand around the sheaf, drawing up the slack of strand, forming the fastening, and severing the sheaf from the machine in the manner described, by the action of the lever, D', moved backward and forward, substantially as described.

Ninth, The binding arm, D, in combination with the levers, D1 D2, the two latter being pivoted to the arm, D, and to the draught frame of the harvester, on the grain side of the drive wheel, substantially as described.

Tenth, The levers, D1 D2, binding arm, D, and bottom plate, E, operating as described, and arranged independently of the grain platform, and so that the parts can be operated by the driver, substantially as set forth.

Eleventh, The reel, H, in combination with the ratchet, K, and levers, J and D2, the whole operating substantially in the manner and for the purpose set forth.

Twelfth, The binding arm, D, in combination with the levers, D1 D2, reel, H, plate, E, spring fingers, e e, slotted twister, F, and rack, c, substantially as described.

2,337.—LANTERN.—William Westlake, James E. Cross, and James F. Dane, Chicago, Ill. (assignees of William Westlake). Patented July 18, 1865.

We claim, First, Constructing a lamp pot of a lantern, with edge or sides extending above the top of the pot and forming a flange, z, the side and flange forming one piece, so that the globe of the lantern will rest upon this flange, substantially in the manner described.

Second, The oil pot, e, having its sides, g, extended upward, and perforated for air passages, and provided with a flange, d, so as to form the base of a lantern, in one piece, and combined with a detachable globe guard, a, as set forth.

Third, The hole, h, with the sliding door, l, in combination with the recess, j, of the globe, for lighting the lamp, as herein described.

2,338.—RAILWAY JOURNAL BOX.—Ransom C. Wright, Meadville, Pa. Patented Nov. 14, 1865.

First, I claim the dovetailed projecting flanges, D' D', and dovetailed slides, E F, (the slide being composed of two pieces constructed and united as described), in combination with the rod, g, for securing the same, the parts being arranged for use, substantially in the manner and for the purpose set forth.

Second, The bearing, B, with its projection, h, and chambered recess, b, with or without the bar, m, substantially as and for the purpose set forth.

## DESIGNS.

2,380.—COFFIN HANDLE.—S. D. Arnold, New Britain, Conn., assignor to P. & F. Corbin, same place, and J. C. Shurler & Co., Amsterdam, N. Y.

2,381 to 2,386 inclusive.—COFFIN TRIMMINGS.—S. D. Arnold, New Britain, Conn., assignor to P. & F. Corbin, same place, and J. C. Shurler & Co., Amsterdam, N. Y. Six cases.

2,387.—COFFIN HANDLE.—Alonzo B. Bailey, Middle Haddam, Conn.

2,388.—FENCE.—J. C. Gearhart, Jersey Shore, Pa.

2,389 to 2,426 inclusive.—CARPET PATTERN.—Henry G. Thompson, New York City, assignor to the Hartford Carpet Co., Hartford, Conn. Thirty-eight cases.

## EXTENSIONS.

8,984.—POWER LOOM.—R. Reynolds, Stockport, N. Y. Letters Patent Dated June 1, 1852.

I claim, First, Connecting the rocker of each picker staff, made and operated substantially as specified, with the bed on which it rocks by means of an interposed strap of leather or other flexible substance attached at the inner end to the bed, and at the outer end to the rocker, substantially as and for the purpose specified.

Second, Forcing the shuttle binders inward against the shuttle while boxing, by a gradually-increasing force, by means of arms on a rocker provided with a spring which is acted upon by a pin on the connecting rod of the lay, substantially as described.

Third, Securing the raw-hide pickers to the inner face of the staffs by means of a leather strap, or the equivalent thereof, embracing and binding the two together, substantially as described, to insure the firm union, to resist the rapid blows, and to prevent pieces of raw hide from breaking and flying, as set forth.

8,992.—PROCESS OF MANUFACTURING GUTTA-PERCHA.—John Rider, New York City. Letters Patent Dated June 1, 1852.

I claim the preparing of gutta-percha for vulcanizing by a preliminary separate heating of it to such a degree as to expel its volatile ingredients, herein specified; which I find can generally be effected at the high temperatures, from 285 to 430 degrees Fah., substantially as herein set forth.

I also claim the process herein described of vulcanizing gutta-percha by first heating it to a sufficiently high temperature to expel from it the volatile ingredients, herein specified, which it is believed can be accomplished between 285 and 430 degrees Fah., and then incorporating with it, substantially as herein specified, a hyposulphite, either alone or in combination with metallic sulphurets, or whiting, or magnesia, or with all of them together, and then subjecting the mixture to a temperature of from 285 to 320 degrees Fah., all the steps of the said process being performed substantially in the manner herein set forth. At the same time desiring it to be understood that I disclaim the vulcanizing of gutta-percha in all cases save when it has been prepared for the vulcanizing operation by the aforesaid preliminary heating.

9,015.—MANUFACTURE OF GRANULAR FUEL FROM BRUSH WOOD AND TWIGS.—Reuben Daniels, Woodstock, Vt. Letters Patent Dated June 15, 1852.

I claim the granular fuel produced from brush wood and twigs by cutting the same into lengths about equal to its average diameter, as herein described, as a new manufacture.

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STEAM ENGINES AND BOILERS.—THE ALBERTSON & DOUGLASS MACHINE CO., New London, Conn., have on hand, and are now building, Engines of 8, 10, 11, 12, 14 and 16 inches diameter of Cylinder. Latest improved Circular Saw Mills. Cotton Gins for Hand and Power. Steam Boilers of any size made to order.

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**Improved Spoke-turning Lathe.**

The automatic lathe of Blanchard, for turning irregular forms, is one of the most remarkable inventions of the day. We say is, for although the inventor is dead and gone, his work lives after him, and to this day remains essentially the same.

This machine is an improvement of the Blanchard lathe in some details, rendering it easier to handle and more rapid in execution. By it are produced spokes for wheels, stocks for guns, chair legs, ax and hammer handles, or any other shape that cannot be turned in common lathes; busts of the human form have even been turned in such lathes. In this machine a fac-simile of the work to be made is used as a pattern; from this the machine works and reproduces it literally, with all its curves and outlines. The engraving shows this model at A, and it is held between two centers, one in the upright frame, B, the other in the arm, C; this arm is attached to the main frame by wrought-iron bars, and is also fastened at the bottom to the shaft, D. It is capable of sliding on this shaft so as to take any length of model, and the bars above can also be adjusted for the same purpose. The work to be turned is placed between another pair of centers, E, lower down, and the cutters which do the work are in the wheel, F, and these are run along the whole length by suitable feed at the end. The vibrating frame has two projections, C, at the top which embrace the model and cause the frame to move back and forth as the model revolves. The centers for holding the work are one of the points of novelty in this machine, the eccentric lever, H, being used instead of a mallet; and another is in attaching a lever, I, to the frame so that it can be easily drawn over against the force of the spring, J; the latter tends to keep the working frame against the model.

The pulley which drives the cutting wheel above is fitted to the shaft, K, below the frame, and is carried on a cast-iron sleeve which runs in the bearings, L—one on each side. The sleeve is fitted with a feather, and the shaft with a slot, so that the pulley, carriage and wheel can slide along the shaft either when the machine is in motion or at rest, and there is a stop, at M, which prevents the carriage from being run out too far if the feed clutch does not throw out; there is also an arrangement, at N, by which the carriage can be run back when the spoke is done; the check block, M, can be set at any point to hold the carriage in the right position.

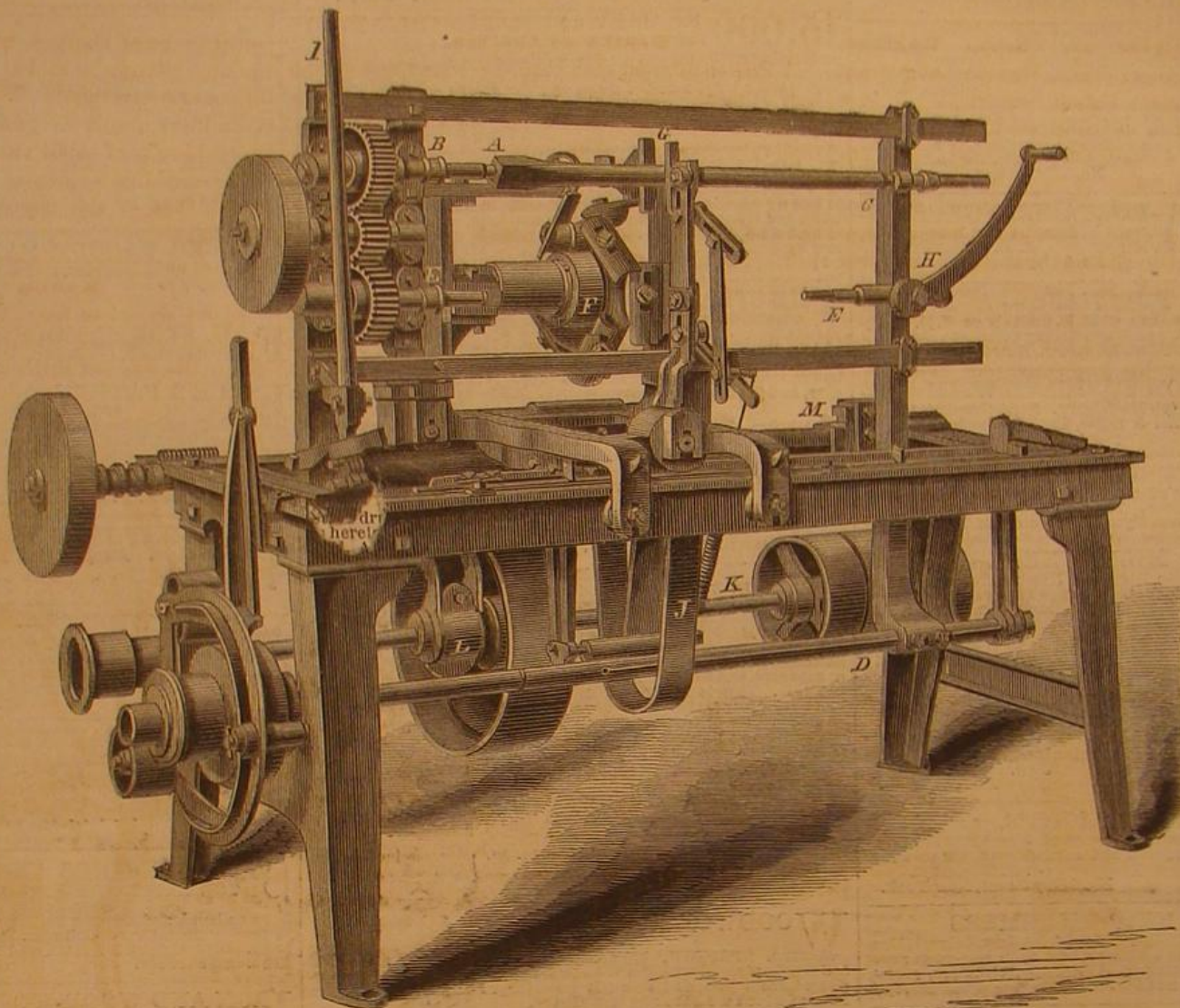
These machines are manufactured by J. Gleason, 1,030 Germantown avenue, Philadelphia, to whom all inquiries should be addressed.

**Improved Connecting Link.**

This is a convenient fixture, in cases of accident, to chain-trace hooks or other appurtenances of a similar nature. Many cases occur in daily life where such

an affair would be of immense value. It is simply a cast-iron link, A, divided in two parts, and furnished with studs and holes which receive the same, the whole when put together assuming the form shown in the engraving, where also the detached portions are given. The studs are larger than the link itself and can be riveted over so as to make the link solid. From this elucidation every person will perceive the object of the invention, and also find many uses for it not here enumerated.

It was patented through the Scientific American

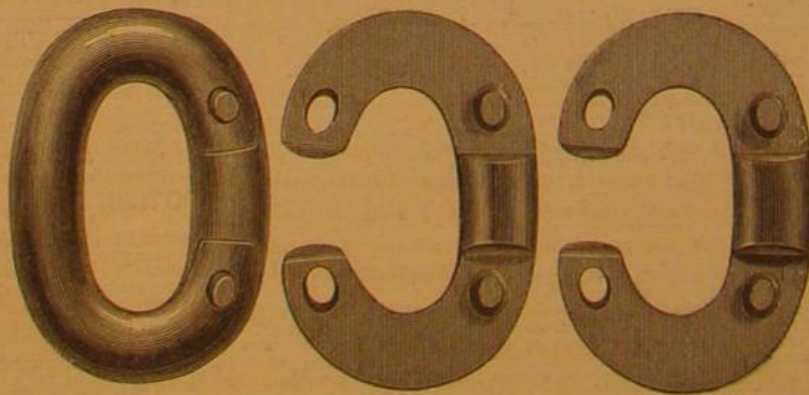


**GLEASON'S SPOKE-TURNING LATHE.**

Patent Agency, by C. J. E. Thompson, of Providence, R. I., on Aug. 5, 1862.

**Progress of the Metric System.**

At the meeting of the National Academy at Northampton, Hon. Samuel B. Ruggles gave an account of the result of his attendance at the Berlin conference for investigating and recommending a uniform system of weights and measures. This result was the coinage of the new five-cent piece. This coin weighs five grams with a diameter of 1-50th of a meter. He himself had persuaded the Connecticut Legislature to have the metric system taught in the



**THOMPSON'S CONNECTING LINK.**

common schools. Congress has passed a law allowing the metric system to be used. The English had always made objection to it, because it was the fruit of the French Revolution. The third bill of Congress was one ordering the distribution of the measures through the States. The fourth bill allowed the postmasters to use the word gram for ounce. This work was the result of the National Academy. Half

of Mr. Fairbank's scales are metric—many of them go to South America, and some to China.

**Boys Using Tobacco.**

A strong and sensible writer says a good sharp thing, and a true one, too, for boys who use tobacco. It has utterly spoiled and utterly ruined thousands of boys. It tends to softening and weakening of the bones, and it greatly injures the brain, the spinal marrow, and the whole nervous fluid. A boy who smokes early and frequently, or in any way uses large quantities of tobacco, is never known to make a man of much energy, and generally lacks muscular and physical as well as mental power. We would particularly warn boys who want to be anything in the world to shun tobacco as a most baneful poison. It injures the teeth. It produces an unhealthy state of the throat and lungs, hurts the stomach, and blasts the brain and nerve.

TRAVELERS and geologists have been at a loss to account for the origin of the masses of asphalt, sometimes of considerable size, found floating on the water of the Dead Sea. In a paper recently presented to the Academy of Sciences by M. L. Lartet, "On the Deposits of Bitumen in Judea, and on the Asphalt of the Dead Sea," the author states his belief in the existence

of a series of hot springs which rise through bituminous limestone, and bring up the asphalt.



**INVENTORS, MANUFACTURERS.**

The SCIENTIFIC AMERICAN is the largest and most widely circulated journal of its class in this country. Each number contains sixteen pages, with numerous illustrations. The numbers for a year make two volumes of 416 pages each. It also contains a full account of all the principal inventions and discoveries of the day. Also, valuable illustrated articles upon Tools and Machinery used in Workshops, Manufactories, Steam and Mechanical Engineering, Woolen, Cotton, Chemical, Petroleum, and all other Manufacturing Interests. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Electric Chemical, and Mathematical Apparatus, Wood and Lumber Machinery, Hydraulics, Oil and Water Pumps, Water Wheels, Etc., Household, Horticultural, and Farm Implements—this latter Department being very full and of great value to Farmers and Gardeners, articles embracing every department of Popular Science, which every body can understand and which every body likes to read.

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[NEW SERIES.]

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## Improved Regulator for Steam Engines.

The engraving gives a perspective view of a steam engine with Douglas's Patent Governor. It is a simple and efficient mode of connecting the governor with the valve, so that not a moment is lost in communicating the action of the balls to the slide valve. The means employed are simple and not liable to become deranged. Its most noticeable feature is a link, A, with sliding box, B. The lower portion of the link is pivoted to an arm, which is secured at the other end by a loose collar around the crank shaft, and has a connection with the governor stem by a pivoted rod. The upper

## Depths of the Sea.

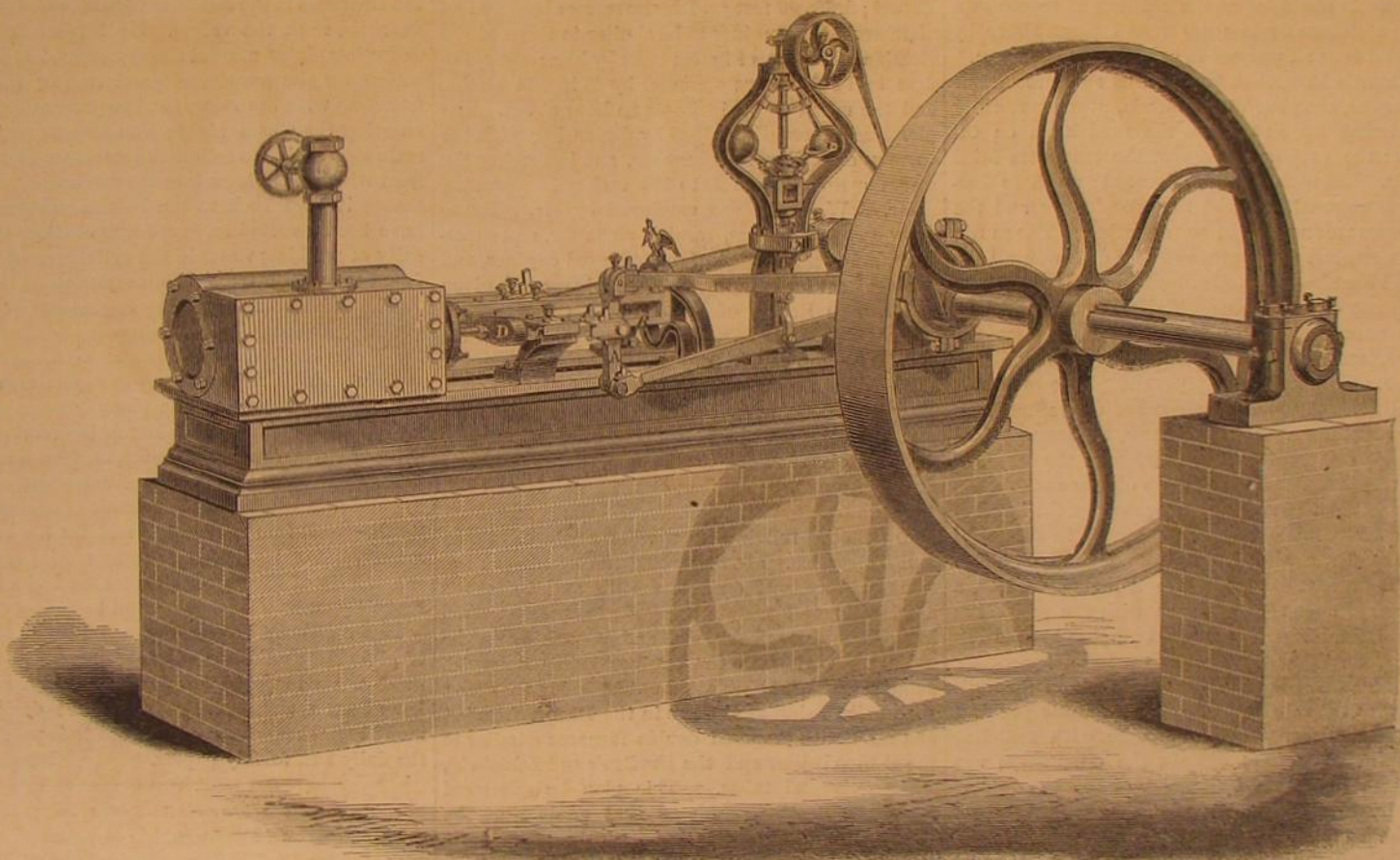
A French journal says that the soundings for the new transatlantic cable have enabled comparisons to be made of the depths of the different seas. Generally speaking, they are not of any great depth in the neighborhood of continents; thus, the Baltic, between Germany and Sweden, is only 120 feet deep; and the Adriatic, between Venice and Trieste, 130 feet. The greatest depth of the channel between France and England does not exceed 300 feet, while to the southwest of Ireland, where the sea is open, the depth is more than 2,000 feet. The seas to the south of Europe are much deeper than those in the

jected to proof charges with the sediment of four hundred charges in it, but came out in perfect condition, and was again fired with safety. This extraordinary result is probably without a parallel in the history of small arms.

The rapidity of fire of this arm is more than double that of the famous "needle gun" of the Prussians.

## Kaolin Works.

About six miles from Augusta, Ga., on the South Carolina side, are situated the kaolin potteries. Before the war but little work was done there, but



DOUGLAS'S REGULATOR FOR STEAM ENGINES.

end of the link is curved to form a segment of the circle described by the radius of the lower arm and eccentric rod, and slides freely through the enveloping box, B, which is part of the valve guide, C, connecting with the stem at D.

From this reference to the parts, the operation of the device can be readily understood. Any increase of motion in the governor will raise the screw, E, and with it the arm, the end of which, at A, forms a fulcrum for the play of the link. This will give a shorter reciprocating motion to the valve, and cut off the supply of steam. In the same way the depression of the arm at A will allow the eccentric to exert almost its full throw on the valve stem, and thus increase the amount of steam admitted.

The value of this simple attachment will be acknowledged by engineers and mechanics. It was patented Sept. 8, 1863, by Frank Douglas, of Norwich, Conn. For further information, address the manufacturers, C. B. Rogers & Co., as above.

EXPERIMENTS are still in progress which may possibly lead to the substitution of cast-steel barrels for those now employed in the Enfield rifle.

interior. In the narrowest part of the Straits of Gibraltar the depth is only 1,000 feet, while a little more to the east it is 3,000 feet. On the coast of Spain the depth is nearly 6,000 feet. At 250 miles south of Nantucket (south of Cape Cod) no bottom was found at 7,000 feet. The greatest depths of all are to be met with in the Southern Ocean. To the west of the Cape of Good Hope 16,000 feet have been measured, and to the west of St. Helena 27,000. Dr. Young estimates the average depth of the Atlantic at 25,000 feet, and of the Pacific at 20,000 feet.

## Gun Trial in England.

We learn from the London *Engineer* that the prize offered at Wimbledon for the best breech-loader, has been won by an Enfield rifle converted, on a plan invented by Col. Berdan, of this country.

The Berdan musket was fired from the shoulder, before the members of the Board, one hundred times in five and a-half minutes—the first twenty rounds in one minute. It had previously been fired three hundred times for the purpose of "fouling" it; had then been rusted in salt and water, and afterward rolled in fine sand; and, finally, was sub-

the present owners, Messrs. Mosher, Thomas & Schaub, have rebuilt and refitted the works, which had fallen into decay. A bed of kaolin has been recently discovered from 15 to 30 feet deep, which compares favorably with the clay used in English potteries. The process of making kaolin into articles for household use is as follows. The kaolin is put in its crude state into mixing tubs and ground up with proportionate quantities of felspar, quartz, or flint, ball and china clay, and, after going through two or three processes, is molded into any desired shape, and subjected to an intense heat in a biscuit kiln for 48 hours, after which it is put into a glazing kiln for 36 hours, and is then ready for use.

Upward of seventy workmen are employed, most of them having had long experience in the English works. Mr. Lawton, the superintendent, was for many years in the Staffordshire potteries.

A MISSOURI paper announces the discovery of a new oil in Pike county. It is obtained from bituminous shales, and from tests made, it appeared to be richer than petroleum and non-explosive; one hundred pounds of shale yielded three gallons of oil.

## A WEEK ON OIL CREEK.

BY PROF. CHAR. A. SEELY.

I have spent a week on Oil Creek. From my point of departure—the "Crittendon House," a very excellent hotel at Titusville—I have made daily excursions up the neighboring "runs," and over the "farms" which are famous in the history of oil.

[A "run" is a little brook which flows down a wild ravine; and a "farm" is a strip of mud, limited on one edge by the Creek, while the other loses itself among the rocks and trees of a precipitous and ragged hill side.]

This is the region of wonders. I have picked up enough material out of which to make several books, or on which to found stories that would require a life time to relate. There is something here for every pleasure-seeker and every lover of the marvelous. The *blasé* gentleman who looks down the crater of Vesuvius and finds nothing in it, may still hope here to experience a new sensation. If he is not moved by what may on any day be observed, let him wait a little while for a flood or a conflagration!

But the *SCIENTIFIC AMERICAN* calls for practical facts, and out of my budget I select a few which, by reason of their novelty and utility, I consider most presentable. The inventor has recently been on Oil Creek, and his devices have changed the whole order of thought and action so quickly and thoroughly that one is reminded of the shifting of scenes at a theater. These devices are what I mean above by practical facts; I proceed to exhibit some of them.

**HARLEY'S PIPES.**—A few months ago processions of wagons, carrying oil in barrels, were constantly floundering up and down the mud farms on Oil Creek; the profane shouts of the teamsters filled the air. But to-day all is changed; no more barrels, no wagons! I trust the poor horses and the teamsters are engaged in better business. The music of the engine, the pump, and the drill was all the sound I heard. It is to Harley's pipes that much of this happy change is due. Mr. Harley has laid iron pipes over the hills, down the "runs," across the "farms," and stops only when he reaches the railroad station. Through these pipes the oil flows almost literally out of the wells aboard of the railroad car. The propelling agent is, of course, the steam pump. Thus oil, 600 feet below the surface of the earth, at Oil Creek, reaches Jersey City, a distance of over 400 miles, without having been touched by the hand of man. Many miles of pipes are now in successful use, and Mr. Harley proposes to lay a line of pipe from Petroleum Center to the Alleghany River, a distance of about ten miles. I wish the politicians would lay their pipe to as good purpose as does Mr. Harley.

**CAR TANKS.**—When it was the fashion for wells to flow at the rate of thousands of barrels per day, it was found impossible to procure with sufficient promptness vessels to contain the oil. There was an immense demand for barrels, and all the coopers were busy; there was danger that the barrel stock of the country would soon be exhausted. When barrels became plentiful the fact was developed that many evils attended their use, and that they must be abolished. Harley's pipes and storage tanks—some of them are of the capacity of thousands of barrels—relieved the farms and the runs, and at last the car tanks took the place of barrels on the railroads. To-day crude oil is not carried by rail in barrels. The car tanks are a permanent fixture on the car. Two tanks, each of the capacity of forty barrels, built of clear pine planks, and provided with closely-fitting covers, are attached firmly, side by side, to the floor of the truck. I suppose there are now in constant use thousands of these oil cars. Some of them may be seen any day in Jersey City, and on a journey by the Erie Railway they will be found everywhere along the road.

**COL. ROBERTS'S TORPEDOES.**—The natural reservoirs of oil are supposed to be fissures and other cavities in the rock. If the boring tools do not penetrate one of these cavities no oil is "struck;" a miss was supposed to be as good as a mile. The reamer which enlarges the diameter of the work of the drill only an inch, has, in several cases, struck oil and made a valuable well out of what otherwise would have been a "dry hole." How tantalizing it must be to the man who gets no oil after spending \$10,000

in boring, to reflect that he may have attained to within half an inch of a fortune! But now Col. Roberts, with his torpedo, infuses new hope among the proprietors of dry holes, and he promises more rapid fortunes to those who own the paying wells. I find an excellent description of the torpedo and its uses on page 54, current volume of the *SCIENTIFIC AMERICAN*, and I have only to add that I am a witness to the great utility of the invention. While on Oil Creek I visited personally twenty-one wells in which thirty torpedoes had been exploded, where, in every case, the well had been improved, and the aggregate increase was upward of 1,200 barrels of oil per day. The increase of production on Oil Creek, by reason of the torpedo, probably exceeds 3,000 barrels per day. There used to be talk about sinking shafts eight or ten feet in diameter down to the oil strata, and then running drifts after the oil reservoirs. The torpedo seems to be the practical realization of that fanciful dream.

For the *Scientific American*.

### History of the Ram "Dunderberg's" Machinery.

In July, 1862, Mr. Wm. H. Webb obtained a contract from the United States Government to build an ironclad steam ram with a casemate and two turrets on the casemate deck, of his own design, and of about the following dimensions:—Length, 360 feet; beam, 72 feet; draft, 20 feet; with one screw about 20 feet diameter; the engines to be similar to those of the Russian and Italian frigates built by him; the cylinders to be 90 inches diameter by 45 inches stroke, and the speed to be 15 knots an hour at sea. The plan was afterward changed by dispensing with the turrets, extending the casemate, and increasing the steam cylinders from 90 to 100 inches in diameter.

Mr. E. W. Smith was employed by Mr. Webb to draw up specifications, furnish plans for, and superintend the construction of the enlarged engines, and the contract for building this machinery was given to Mr. John Roach, of the Etna Iron Works, New York City. Mr. Smith, on his being intrusted with this work, applied, in August, 1862, to Mr. Thomas Main (then Chief Engineer at the Allaire Works, New York City), to assist him in preparing the plans and specifications for this machinery. Mr. Main devoted his evenings to this work at his residence during August, September, October, and November, 1862, and placed his collection of books, drawings, and sketches, relating to marine engines, at Mr. Smith's service. Mr. S. devoted his evenings occasionally to consult on this matter and write the specifications—Mr. Main being always present, making references, calculations, and consulting on the subject. Owing to the engines being enlarged, sufficient grate surface could not be got in the space, with boilers similar to those in the Italian frigates, and Mr. Smith proposed double furnaces (similar to the Collins boilers and the *Puritan's* and *Dictator's*), with horizontal tubes. This plan he afterward matured. It was considered that engines of the Italian frigate type (with condenser, pillow block, and air pump all cast together), would be unsafe on so large a scale, and Mr. Main proposed engines similar in construction to those of the U. S. S. *Iroquois*, designed by him for the Fulton Iron Works, in 1858. This plan of engines was adopted with certain modifications made by Mr. Smith and General Inspector W. W. Wood. Mr. Smith proposed to substitute the Worthington duplex pump, to work independently from the main engines, in place of the air and circulating pumps, and to hang the cross-head slides from the under side of the condenser. He adopted Holmes's method of applying the cut-off valve on the back of a double-ported valve; also Waddell's method of packing the valve to relieve the pressure on the back; also Allen's method of packing the condenser tubes, Wilmarth's universal shaft coupling, and Silver's governor. Mr. Wood proposed to make four pillow-block frames in place of three, to make the pillow block in halves, so as to take out the bottom brass without moving the shaft, and to have double ports in the valves, similar to the *New Ironsides*. These points were settled about the close of the year 1862.

In December, of that year, Mr. Main was employed by Mr. Roach, of the Etna Iron Works, as superintending and constructing engineer, for the machine-

ry of the *Dunderberg*, for two gunboats, and for one steamboat, which he had contracted to build, and nearly all the shops and tools had to be constructed in order to execute this work. From this time the whole responsibility of designing, arranging, and carrying out the details of the *Dunderberg's* engines actually devolved on Mr. Main. The working drawings were all made at the Etna Iron Works, many of them by him, and all of them from his sketches, and by his direction. They embrace the propeller stern work, line shafting, thrust pillow block, valve gear, steam and cut-off valves, reversing engines and gear, bilge and feed pumps, sea valves, holding-down bolts, smoke pipes, hoisting gear for the smoke pipes, arrangement of steam pipes, feed and blow pipes, stop valves, fire-room floor, platform and blower arrangement, stairs, galleries and railing, lugging water and oil pipes to main journals. Mr. M. introduced a new way of putting the crank shaft together by boring the crank eyes in their places, heating them and shrinking them on the pins, and so making a perfect job. He also introduced a method of circulating water through the crank-pin boxes by means of jointed pipes. He also proposed to make the steam valves and chests in two sections (so as to go in the planing machine then at the Etna Works), to place the valves at an angle, extend the steam chests in length, carry the ports direct out from the cylinder, and thus reduce the clearance to the minimum space, while one set of gear will work the valves. He further introduced deflecting plates around the dry pipes, inside of the boilers, for the purpose of precipitating the water forced up with the steam, and so preventing it from entering the steam pipes; also a water trap on the main steam pipe to collect the water into a receiver, from which it is blown into the condenser, and from thence it goes back to the boilers. These devices have been resorted to, in order to obviate the difficulty of working water in the cylinders, which was found to occur in the preliminary trials at the dock.

The independent pumping engine—or Worthington duplex pumps—were designed and constructed at the Hydraulic Works, South Brooklyn. Mr. Smith superintended this machinery in a general way, examining and approving the plans occasionally during its construction. Mr. Roach is deserving of a great deal of credit, inasmuch as, from a comparatively small beginning, he has furnished the means to build up a large concern, capable of executing the largest work in the country, and for his excellent arrangements for making large castings, and for the solidity of the foundations for the large tools, so that they may do the largest and best class of work.

This statement has been drawn up with the view of giving an unbiased and fair account of the progress of the machinery of the *Dunderberg*, as there have been many inquiries about the design, and many imperfect accounts in regard to it published in the daily and weekly papers. IMPARTIAL.

### Petroleum Formed from Seaweed.

This theory of the formation of rock oil has been advanced by Prof. Wilbur, of Hamilton, C. W. His idea is that petroleum has had its source in marine vegetation, just as coal has been derived from terrestrial plants. Few persons have an adequate idea of the immense growth of seaweed in the depths of the ocean. After their term of growth was completed they became detached, floated off, and finally sunk to the bottom. It is a received opinion among geologists that this portion of the North American continent had once been the bed of a salt water ocean. The ocean floor, as must be remembered, was not level, but had throughout its whole extent deep hollows and ridges. It was, of course, in these deep hollows that these seaweed deposits would find their last resting place after long tossing about in the waves and ocean currents. In this way it would come to pass that they would not be evenly distributed over the bottom, but only in those hollows or pockets. Meanwhile, the deposit of solid stratified rock, or what afterward became such, was going on, and after untold ages these masses of seaweed became covered to various depths. He considered it no very unreasonable or unscientific supposition that these masses of oily, carbonaceous matter should, under the circumstances, take the form of oil, of a liquid hydro-carbon.

## THE PEN—ITS CONSTRUCTION AND USE.

We have no desire to write an essay on the doubtful axiom that "the pen is mightier than the sword;" but we design merely to draw attention to some facts and reflections on the use and the construction of this wonderfully powerful instrument.

The split pen, now universally used by enlightened nations, is of great antiquity. It was used by the Egyptians in writing on the sheets produced from the papyrus, from the name of which our word paper is derived. It was made from a species of reed, which was prepared by a sweating process, induced by burial under fermenting manures, causing the reed to acquire hardness and elasticity, and drying the pith. These pens are still in use in the East.

Later, the quills of the swan, eagle, goose, and crow came into use as pens, and those of the goose, especially, are still largely used, notwithstanding the introduction of pens of steel, gold, and other metals. Goose quills, when first plucked, are soft and tough, covered within and without with a membrane. They are dried in hot sand, which shrivels the outer skin and the inner pith. They are then dipped in a hot solution of alum, or in diluted nitric acid, which hardens them.

The immense consumption of quills proved the necessity of a more durable pen, and in 1822 Mr. Gillott, of Birmingham, succeeded in producing excellent pens of sheet steel. Being the first to succeed in this manufacture, he still stands at the head, both for quantity made and quality of work. Gillott's pens have a world-wide reputation, and are deservedly esteemed. We believe there are but few manufactories in this country, that of the Washington Medallion Pen Company, and that of the Estabrook, in Philadelphia, being among the largest. The processes of manufacture are very simple. The blanks are punched from a thin sheet, then the hole which marks the termination of the slit is punched; the device or lettering is then made by a stamp. Dies give the semi-cylindrical curve to the blanks. Grinding perfects the nibs, and gives the requisite elasticity. The slitting is done by two cutters, one working against the other. Hardening and tempering, with the careful assortment of the products of the manufacture, complete the work.

But there is a certain unyielding rigidity in steel pens which prevents them from being universally preferred to the goose quill. They manifest also a tendency to adhere to the surface of the paper, requiring some degree of force to propel them, and sometimes piercing the sheet. For these reasons many are disinclined to use them. The gold pen, when properly made, approaches more nearly to the qualities which have for so long a time made the goose quill the favorite as a medium of writing. But even the best of the gold pens are by many deemed inferior to the quill, and this prejudice, or partiality, induced the manufacture of pens from quills by machinery, which were used in the same way the steel or gold pen is used, by being fastened in a holder. Some years ago the manufacture of these quill pens was extensively prosecuted in Taunton and Boston, Mass. They never, however, won their way to public favor.

Gold pens were first successfully made in this country by Mr. Levi Brown, of Detroit, in 1840. We believe he continues still to manufacture in New York. Without disparagement to others, it may be safely asserted that the pens made by him have never been surpassed. We purchased one in 1847, bearing that date and his name, which we used continually for over fourteen years, and then presented it to an editorial friend, who still employs it in his daily labors. Gold pens are tipped with iridium, making what are commonly known as "diamond points." The iridium for this purpose is found in small grains in platinum, slightly alloyed with this latter metal. In this form it is exceedingly hard, and well adapted to the purpose of the gold-pen maker.

The gold for pens is alloyed with silver to about sixteen carats fineness, rolled into thin strips, from which the blanks are struck. The under side of the point is notched by a small circular saw, to receive the iridium point, which is selected with the aid of a microscope. A flux of borax and a blowpipe

secure it to its place. The point is then ground on a copper wheel with emery. The pen blank is next rolled to the requisite thinness by means of rollers especially adapted to the purpose, and tempered by blows from a hammer. It is then trimmed around the edges, stamped, and formed in a powerful press. The slit is next cut through the solid iridium point by means of a thin copper wheel, fed with fine emery, and a saw extends the aperture along the pen itself. The inside edges of the slit are smoothed and polished by the same means of rapidly-running wheels and emery, and burnishing and hammering, to produce the proper degree of elasticity, finish the work.

## THE MANUFACTURE OF LEAD PENCILS.

The lead pencil is in more general and constant use than almost any other implement considered necessary among civilized people. It is difficult to assign a date to the first use of graphite, or plumbago, for writing purposes, but the device of incasing the mineral in a cylinder of wood is quite modern. The celebrated mine at Borrowdale, Cumberland, in England, furnished the first specimens of graphite from which writing and drawing implements were made. The mineral was originally obtained from this mine in nodules, or distinct masses of varying sizes, and the pencils were cut from them without any intermediate process of manufacture. The mine was considered so valuable that it was protected by guards, and the workmen wrought under the most rigid surveillance. The mine was worked only once in seven years, subsequently for six weeks in each year, in order to husband the supply and control the market; yet this six weeks' product was frequently valued at from £30,000 to £40,000.

Mines of graphite exist, and have been or now are worked at Starbridge, Mass., Brandon, Vt., Fishkill and Ticonderoga, N. Y., Wake, N. C., and St. John, N. B. It is largely used in the manufacture of crucibles for melting refractory metals, and under the name of black lead, or carburet of iron, for polishing iron castings, as stoves. Molds for iron are often faced with the powdered plumbago, to give a finish to the surface of the casting, and it is employed with oil as a lubricator for heavy journals.

But graphite is more familiarly known in its employment as pencils. It is ground to fine powder and treated with acids to purify it from foreign substances. Then, being mixed with water, it is molded into cylindrical masses and dried in a kiln. Being afterward baked in crucibles until the requisite degree of hardness is attained, which is determined by the grade intended for the pencil, the cylinders are ready to be cut into the proper form for insertion in the wood. This is the French style, varied, however, by additions of clay in certain proportions with the powdered graphite, as it is intended to give differing consistencies to the pencils. The American Lead Pencil Company, whose works are in Hudson city, New Jersey, employ a different process. The molded graphite is seasoned several months in vaults, and then baked, the hardness of the pencil depending on the length of exposure to heat, when the cylinders are forced through dies in a press and cut into square lengths for the wood.

The wood is dyed, sawed into strips of sufficient width for four pencils, grooved, the strips of plumbago inserted and covered by corresponding strips of wood secured with glue. These strips are then cut into pencil lengths, and, by machinery, planed or turned to an octagonal or cylindrical form, polished, and stamped with the name and quality of the pencil. The graphite used by this company is procured mainly from New York State, and the pencils are of excellent quality, as we have ascertained by trial.

THE amount of tobacco raised in 1850 was 199,736,336 pounds, and, in 1860, 429,364,751 pounds, an increase of 115 per cent. It is a matter of common belief that it is mainly a Southern crop. Of the crop of 1860, the loyal States produced 230,343,321 pounds and the disloyal States but 199,021,430 pounds. This gives the loyal States more than half of the entire crop. The increased production since 1860 has been the greatest in the loyal States. Therefore, tobacco is a crop in which all the States are interested, and one which seems well adapted to almost every climate of the United States.

## MANUFACTURE OF WHITE LEAD.

Mr. Spence has recently patented in France a method of making white lead, which consists in dissolving the oxide or the carbonate of lead by the employment of an alkali caustic solution, such as caustic soda. The oxide or carbonate of lead, or substances which contain them, are reduced to powder and mixed with the solution of caustic soda. It is not necessary that this solution should be hot. After it has been dissolved, a fresh supply is added until all the carbonate of lead in the powdered substance is dissolved. The patentee affirms that all minerals which can, by being calcined, or by other methods, be converted into an oxide or carbonate of lead, or which contain a considerable portion of this carbonate, can be used for the manufacture. They are calcined at a low temperature, in an ordinary reverberatory furnace, or in any other convenient furnace. These substances are then heated till the lead glance is completely calcined, but avoiding its reduction to lead metal. The galena is converted partly into oxide of lead and partly into sulphate of lead. Before mixing these products with the caustic solution, they should be submitted to the action of a solution of soda ash; but if the calcined galena, or the mineral containing it, also contains oxide of copper, or a large quantity of oxide of zinc, these latter can be dissolved by a solution of caustic soda.

The ammoniacal solutions of carbonate of ammonia, or of carbonate of soda, do not dissolve the oxide of lead; they simply eliminate the sulphuric acid or the sulphate of lead. If the minerals or other substances only contain a small quantity of oxide of zinc, and if their solution by the caustic soda and their precipitation with the carbonate of lead are not considered prejudicial, it is then preferable to employ a solution of carbonate of soda to eliminate the sulphuric acid.

The soda or ammoniacal solution being withdrawn and washed with water, the substance containing the calcined galena is then filtered in order to be mixed with a solution of caustic soda. Having thus obtained, from all these minerals or substances containing the oxide or carbonate of lead, by the mixture just spoken of, a liquid containing oxide of lead in solution, it is allowed to stand until perfectly clear, and then placed in several vases into which can be easily injected a continuous current of carbonic acid gas by means of pipes pierced by many small holes.

The carbonic acid gas combines with the soda and the oxide of lead, and as soon as the soda is carbonized the gas unites with the oxide of lead, and is precipitated as a pure white substance, composed partly of oxide and partly of carbonate of lead. As soon as it is seen that the precipitation of the oxide is no longer continued, the injection of gas is stopped, and it is then that the white lead is deposited. The solution becomes carbonate of soda, is separated, and after having been submitted to the action of caustic of lime it is again ready to act upon the substances containing—as has been shown above—oxide or carbonate of lead.

For the precipitation of this oxide of lead, the carbonic acid gas that the patentee employs, can be obtained either by the action of hydrochloric acid on lime or on carbonate of lime, as well as by the combustion of coke or wood charcoal, or in any other convenient manner. It is, however, necessary that there should be no sulphureted hydrogen in the carbonic acid employed.

Carbonate of ammonia or bi-carbonate of soda, or any of the soluble carbonates, can be used for the precipitation of white lead; nevertheless, Mr. Spence prefers carbonic acid gas as being the most economical. The solution of soda employed with the calcined galena should be replaced after a certain time, when it is converted into sulphate of soda. The ammoniacal solutions can be separated from the copper and zinc by the recognized methods. The solution of soda can be employed afresh. It is only necessary to be made caustic by quicklime, after the precipitation, and before it is used again, to dissolve the oxide of lead.

The white lead which is precipitated should be washed in pure water, and afterward dried before being used.

**"WELL-ROTTED MANURE."**

The phrase "well-rotted manure" has been a costly one to the farmers of the country.

About half the substance of trees and other vegetables is carbon, and this is obtained principally from the atmosphere through the leaves in the form of carbonic acid. The underside of every leaf is filled with innumerable mouths (called *stomata* by botanists) through which carbonic acid is absorbed from the air. Each molecule of carbonic acid is made up of one atom of carbon and two atoms of oxygen, the proportion by weight being 6 pounds of carbon to 16 of oxygen. In the leaf the molecule is broken up into its constituent elements—the oxygen is returned to the atmosphere, and the carbon is carried by the sap and deposited to help build up the structure of the plant. Exact experiments have shown that this decomposition does not go on in the night, and there is no doubt that it is effected by the actinic or chemical rays of the sunbeam.

The burning of charcoal is simply the recombining of its carbon with the oxygen of the air, forming again carbonic acid—an invisible gas which floats away in the atmosphere. All chemical actions are accompanied by a change of the temperature, and in this case the change is so great as to produce the heat and light of combustion. Frequently carbon and oxygen combine more slowly than in the act of burning, and then, though the quantity of heat produced is exactly the same as in the case of combustion, it is not so intense—the intensity being in proportion to the rapidity of combustion. One instance of the slow combination of carbon and oxygen is fermentation. In some forms of fermentation the oxygen is absorbed from the atmosphere, and in others it is obtained from combination with other organic elements.

When manure is piled up in large heaps and allowed to ferment, one of the principal products of the fermentation is carbonic acid. If the manure is about the roots of growing rye, wheat, or other crop, as the carbonic acid rises among the leaves a large portion of it is caught by their *stomata*, and the carbon is appropriated to build up the plant. On the other hand, if the fermentation takes place where there are no leaves, the carbonic acid is blown away by the wind, and is wasted. It is not uncommon for farmers in their desire for "well-rotted manure," to burn up one-half of their most valuable fertilizer. If a man wants to utilize the whole of his manure, the place to have it rot is beneath the thick clustering leaves of his growing crops.

**SALT—ITS USES AND PRODUCTION.**

It would be interesting if one could learn the secret of the strange yearning mankind has for salt. It occurs in every part of the human frame; it creeps into every corner of the body, and plays a part in all the complicated processes of life, without which the machinery would be arrested in its operation.

Salt possesses a peculiar interest from its being one of the usual and necessary constituents of food, while the enormous consumption in the arts invests this substance with an importance second to none. As early as the time of the destruction of Sodom and Gomorrah, mention is made of it in connection with the judgment against Lot's wife, and in Leviticus it is alluded to as a preservative and a component of the prescribed sacrifice. In the Gospels it is employed as an emblem of eternity, wisdom, and purity, which no doubt has established the tradition still existing among some heathen people, that salt is an emblem of hospitality. In the Eastern story of the "Forty Thieves," the chief robber enters the house of Morganza's master on a false pretense, and is enjoined to make such excuses whenever his host offers him salt as will enable him to refuse partaking of it without suspicion.

Although salt is employed very extensively in the arts, we more commonly recognize it as a preventive of putrefaction of almost all our aliments, without producing any such change upon them as to render them unfit for nourishment. As an antiseptic it is proved by experiments that though common salt, when mixed with animal substances in large proportion, preserves them, yet when a small quantity of it is employed, it considerably accelerates putrefaction. Hence it appears that small quantities of salt,

such as are taken with food, facilitate digestion, which is a kind of putrefaction, and serves at the same time as a mild stimulant to the stomach itself.

It would be curious to trace the history of the common law as applied to the production and sale of salt, but this subject is foreign to our present purpose. At the present time the salt trade in Europe is guarded by very strict laws, differing in each according to the facility of production.

The most important salt mines in the world are those of Cracow, in Poland, and Salzburg, in Austria, which supply large quantities of rock salt. In the United States large quantities of salt are used for pickling and curing meats for foreign markets, and of the 30,000,000 bushels annually consumed, about one-half is imported; but as the home supply is rapidly increasing, it will ere long equal the demand.

The saline springs of Onondago county, in this State, yielded last year 2,928,187 bushels, which shows an increase of 714,000 bushels over the previous year. In 1860 the Saginaw salines, of Michigan, yielded only 20,000 bushels, while in 1865 the production reached 3,200,000 bushels. The Hocking Valley and Pomeroy mines, in Ohio, yield very largely, as also do those in Pennsylvania, Texas, Illinois, Louisiana, Missouri, and West Virginia. The Kanawha, W. Va., salt works produced before the war annually 300,000 bushels, and the Pennsylvania springs yielded about 1,000,000 bushels. There are two methods of procuring salt from the springs—by boiling and by solar evaporation—but with the exception of Ohio and Pennsylvania, where fuel is at hand and cheap, solar evaporation is generally resorted to.

The brine is brought to the surface by force pumps from wells from 100 to 300 feet deep, the deepest water yielding most salt—the proportion being about 56 pounds of salt from 30 to 45 gallons of the best brine. It is then exposed in vats to the sun or placed in kettles and boiled, and the residuum—salt—is dried for sale.

From the rapid annual increase, it is fair to presume that in a short time, comparatively, the supply of salt will be more than sufficient for home consumption, and American provisions shipped to the Old World will be wholly cured with American salt.

**Dyeing Fabric and Yarn.**

A patent has recently been taken out in England for dyeing, by John Lightfoot, the object of which is to dye, print, or stain a fast black from aniline on wool, silk, feathers, or other animal substances or fabrics made from wool, and also fabrics made of a mixture of animal and vegetable substances, such as delaines, and similar mixed goods.

For mixed goods I wince or steep them in a solution of hypochlorite of lime, commonly known as chemick, or a mixture of hypochlorite of lime, hydrochloric acid, and water, for the purpose of preventing the deoxidizing properties of the animal fibers and substances, thereby rendering them capable of receiving the aniline black.

Although I have here named only hypochlorite of lime, I wish it to be understood that other similar oxidizing agents will answer the purpose, such as hypochlorous and chlorous acids, hypochloric, chloric, and perchloric acids, or a solution of their salts of alkaline or metallic bases. Other oxidizing acid salts, such as nitric acid, nitromuriatic acid, bichromate of alkalies, and permanganate of alkalies, will produce a certain effect; but I prefer as more economical and of greater utility, the chlorine mixtures before described. When the wool or animal substance is thoroughly oxidized to its maximum, and in a fit state to receive the aniline black already named (by oxidation being understood the change, whatever it may be, that animal fibers undergo, when exposed to the substances described), it may be known by the following simple test:—Take a dilute solution of permanganate of potash in two test tubes, and into one put a piece of the oxidized wool and into the other a piece that has not been oxidized, and apply a gentle heat: the solution containing the one that is in a fit state to receive the aniline black remains pinky, but the other is decolorized immediately.

The proportions for preparing the wool are about as follows:—I take for every pound of cloth, wool, yarn, silk, delaine, feathers, or animal substance (well

cleaned) six gallons of water at about 100 deg. Fah., two and a-half ounces by weight of hydrochloric acid of commerce, and one pint of hypochlorite of lime in solution, containing sixteen ounces of hypochlorite of lime per gallon. I keep the goods in this solution for from twenty to thirty minutes, or until the wool becomes quite yellow; I then wash well in water and dry.

I am aware that woolen fabrics and fabrics of mixed wool and cotton have been previously steeped or prepared in mixtures containing chlorine or hypochlorous acid for the purpose of subsequently printing or dyeing such fabrics with ordinary colors not aniline black, but the chlorodizing or oxidation sufficient for such purposes is not applicable to aniline black, and a point of oxidation or chlorodizing is required which would not be advisable to give to fabrics intended for ordinary colors.

In dyeing coburgs and similar goods the present processes involve two operations; first, the cotton has to be dyed, and then the wool or silk. I avoid this twice dyeing by preparing the mixture of cotton, wool, silk, or other animal substance as above, so that they will both take a black dye at one and the same time. I steep or pad the goods either before dyeing or after in the following dye:—One gallon of water, four ounces of chlorate of potash, twelve ounces of chloride of aniline crystals, six ounces of sal-ammoniac, two ounces of sulphate of copper. I then dry the goods at as low a heat as possible and age for two or three nights in a moist room at from about 76 deg. to 80 deg. Fah., and when the color is thoroughly developed it becomes an intense myrtle green, almost black. I raise the goods either in water or any weak alkali, or in a weak cold solution of neutral chromate of potash, which I use in preference; and if a brownish black is required, the goods may be subsequently dyed in a weak hot solution of archil or cudbear.

When the prepared cloth is used for printing, I print on the aniline black color, and dry and age in a warm moist room, and raise in a weak alkali as before. I then pass the goods through a warm solution of sulphite or hyposulphite of soda, or a solution of any suitable deoxidizing agent, to improve the white or whites; or the goods may be passed through one of Mr. Thom's sulphuring apparatuses, which restores the white in the parts not printed, but does not injure the black. It is preferable, after sulphuring, to repress the goods through a weak alkali.

**Report on Disinfectants.**

In the first number of the present volume we referred to, and made some extracts from, the report "On the Application of Disinfectants in Arresting the Spread of the Cattle Plague," by William Crookes, F.R.S., a distinguished chemist, of London. We are now indebted to Mr. Crookes for a pamphlet copy of his very able and exhaustive report on the general value of disinfectants. In reference to the cause of the propagation of the cattle disease, he says:—

There are weighty reasons for deciding that the infecting matter is neither a gas nor even a volatile liquid. The almost infinite attenuation which a gas undergoes, owing to its rapid diffusion into the atmosphere, would render its supposed noxious influence imperceptible a few yards from the focus of infection. Moreover, the infection is capable of being carried considerable distances in clothing or running water, and in a variety of ways incompatible with the behavior of gases. For these reasons, and many others unnecessary to adduce here, it seems clear that the disease must be communicated by the agency of solid, non-volatile particles.

In regard to the various substances employed as disinfecting agents, he gives the preference to tar acids (carbolic and cresylic) as, under all circumstances, the most powerful in arresting all kinds of fermentative and putrefactive changes.

The Board of Health has just resolved to adopt the use of carbolic acid as a disinfectant, and have made a contract with a chemist in this city to furnish a liberal supply. This subject is one that urgently commends itself to the Health Boards of Cincinnati, St. Louis, New Orleans and other cities, where the cholera is now existing.

THE curvature of the earth amounts to seven inches per mile. A man six feet high cannot be seen from a distance of ten miles.

**INFECTION.**—At a recent discussion in the English Parliament in regard to sanitary inspection, one of the members stated that the Committee of the Privy Council had recommended the medical officer, before surveying a house, to have on a particular dress, consisting of "strong water-tight boots, reaching to the knees, and greased all over, a water-proof coat closely buttoned up to the neck and at the wrists, and the head covered with a cap which takes the hair well in." The member hoped the medical officer would be clothed in this safety dress before he embarked in the dreadful danger of visiting these nuisances; especially as he had to report to the nuisance authority; or, going into these pest houses, he would himself come out pestiferous. It was the more necessary that there should be a definition of "infection," from the visitation of cholera with which we were threatened. He had formerly asked a question on this subject, and referred to the fact that the Emperor of the French had been visiting the cholera hospitals in Paris. There was also the experiment mentioned in the newspapers of a young student, named Jerard, who, to show that cholera was not infectious, took the perspiration off the forehead of a dying man and the fur off his tongue, and put them in his own mouth. It was announced that the Emperor of the French had for the second time visited the cholera patients in the hospitals at Amiens.

**CAPILLARY ATTRACTION.**—At a recent sitting of the Academy of Sciences, M. Chevreul gave an account of some experiments illustrating what he calls capillary affinity. He made a paste of white lead and water, and another of white lead and linseed oil, and placed them in separate tubes. Above the oily paste he placed water and above the watery paste oil. The oil in the latter case displaced the water, but water did not displace the oil in the former. In corresponding experiments with clay and pure kaolin it was found that water would in each case drive out oil, but oil would not drive out water.

**PURIFYING WATER.**—Mr. Bird, of Birmingham, has patented the use of the neutral sulphate of alumina for purifying water. Its action depends upon the presence of carbonate of lime in the water to set free hydrated alumina, and as carbonate of lime is almost universally present, the process is as universally applicable. The advantage of the use of this compound is, that beyond converting carbonate into sulphate of lime it introduces no new salt, while the organic matter is carried down with the hydrated alumina.

**DESTROYING RATS.**—M. Cloez entertained the Academy with a mode of destroying rats and other animals that burrow. The Museum of Natural History at Paris is, or rather was, dreadfully infested with rats, but, thanks to M. Cloez, it is now free from the nuisance. The happy thought of pouring bisulphide of carbon into the holes occurred to this gentleman, and the vapor, we need hardly say, was fatal to all the rats who stopped to inhale it.

**SOIL AS A DEODORIZER.**—Dry earth, sprinkled over the contents of a vault, is said to be a good deodorizer. The top soil, exposed to the sun, or dry loam, sprinkled or shoveled on the contents of a privy every day or two, will prevent the exhalation of offensive odors, and vastly increase the value of the contents as a fertilizer.

It is said that the English doctors have for some time past been engaged in an interesting series of experiments with a view of testing the poisonous qualities of the flesh of cattle who have died of the rinderpest. The doctors collected a number of dogs and fed them on this meat exclusively, in some cases giving them the most diseased portions. The dogs like it, and have got fat on their generous diet, and the doctors are completely nonplussed.

A CHEMIST suggests that to avoid accidents in the transport of nitro-glycerin, so useful in mining, that when used in stone quarries it should be manufactured on the spot when wanted.

LUCK lies in bed, and wishes the postman would bring him news of a legacy. Labor turns out at six o'clock, and, with busy pen or ringing hammer, lays the foundation of a competence.

SOME young apple trees and heath plants were sent out to Australia in the ice-well used for the transportation of salmon ova. They were in perfect health when they arrived, and suitable for planting.

PROF. AGASSIZ says he found the valley of the Amazon uncommonly fertile, and its climate very healthy. It is his opinion that it will one day become the mart of the world, supporting in comfort 20,000,000 of inhabitants.

THE total value of the prizes to be given at the forthcoming Paris exposition is \$160,000 in gold. The jurymen to decide upon the merits of articles sent from United States are to be selected by the United States Commissioners.

DIAMONDS have been found in Georgia, Hall Co., which have been examined and proved to be of real value. They were discovered by Dr. F. M. Stephenson, at a place where miners had been at work, and had the external appearance of worthless pebbles.

IN the district of which Moscow is the center, there is an immense coal bed, covering an area of 120,000 square miles, and in the region of the Don River there is also an enormous coal bed. The Moscow coal basin is said to be as large as the entire bituminous coal area of the United States; while the coal basin of the Don is more than half as large as all the coal measures of Great Britain.

MR. R. MUSHET states, in a letter to an English journal, that one of his improvements will, in conjunction with Bessemer's pneumatic process for producing steel or highly refined iron, return an annual revenue of one million dollars. He also states that "one of his patent processes alone is at present of more commercial value than all the patent processes (with two exceptions) collectively, for the improvement of iron and steel, taken out by others during the present century."

**NATIONAL BANK CURRENCY.**—As there are at present so many counterfeit and altered National Bank notes in circulation throughout the country, we publish the following list of designs on the back of the genuine notes: \$1000 notes, Washington resigning his commission; \$500 notes, Surrender of General Burgoyne; \$100 notes, Declaration of Independence; \$20 notes, Baptism of Pocahontas; \$10 notes, De Soto discovering the Mississippi; \$5 notes, Landing of Columbus in 1492; \$2 notes, Sir Walter Raleigh, 1585; \$1 notes, Landing of the Pilgrims. All National Bank notes the backs of which do not correspond with the above, are bogus.—*Shipping and Commercial List.*

**AMERICAN MILITARY INVENTIONS.**—Russia takes a very great interest in the improvements in military science lately made in this country, and has sent an officer of the Royal Russian Mining Engineers—Capt. Kholostoff by name—on a tour of inspection throughout the United States, with instructions to make monthly reports to the home Government. He has visited the armory at Rock Island, Ill., and lately witnessed the casting of the twenty-inch gun for the *Puritan*, at Pittsburgh. At present he is in St. Louis, and it is said has arranged with the inventor of the Rodman gun to furnish some of that kind of artillery to the Russian Government.

**FACTORIES SOUTH.**—An Alabama paper says:—"We hear of factories springing up all over the country. At Camden, Wilcox county, a wealthy company have taken the initiatory steps to erect a large building, and fill it with the most approved machinery. At Carrollton, Miss., a factory is now in operation, which in a short time will employ one hundred and eighty spindles. In Marengo county they are making arrangements to manufacture on a large scale. At Cuba Station, Sumter county, a factory is shortly to be in operation. These are a few of the indications that the South will soon become filled with factories. The results of the war, in throwing capital into an entirely new channel, the facilities of easy intercommunication, abundance of material to be used in manufacturing, contiguity to the said material, equability of temperature, and a thousand other facts, point out this region as the future home of the factory."



### Theory of Tornadoes.

MESSRS. EDITORS:—I happened to cross the ferry at Havre de Grace in the evening immediately after the railroad bridge, now in course of construction there, had been destroyed by the tornado of the 25th of last month, and it struck me that the effects were not such as we should expect from air currents or strong winds alone. These could not possibly displace so well-constructed frameworks of small surface, through which the wind easily passed in all directions. The ruins of the bridge illustrated, on an immensely large scale, what we see on a small scale in the lecture room experiments about electric attraction and repulsion. Almost everybody knows the experiment of the dancing figures—light wooden or paper objects, placed on a brass plate, connected with the earth, are lifted up, thrown down, projected indiscriminately around, or piled up, by the attraction of an isolated brass plate, charged with electricity, and placed at a short distance above them.

If we now imagine the surface of the water at the mouth of the Susquehanna River, or rather the Chesapeake Bay, to represent the lower plate, a layer of clouds, charged with electricity, the upper isolated plate, and the timbers of the bridge the figures made of matches, paper, or other light materials, we have the exact similar conditions, only enlarged, and we may easily explain the lifting up of the arches and the throwing down of the same from the isolating piers. The upward rush of wind, of course, assisted to produce these effects, but these winds are also caused by the electric attraction of the clouds, which, during a tornado, not only lift up all kinds of heavy objects, but also attract air, and thus cause upward whirling currents, which naturally assist in raising trees, houses, and even large columns of water. The latter phenomenon is known under the name of waterspout.

The tornado in question took place, as always, during a severe thunder storm, this time extending along the Atlantic coast from Massachusetts to South Carolina. In the same way as these effects may be annihilated on a small scale, by placing pointed conductors upward between the figures lying on the lower brass plate—say pins or needles—touching the lower plate, and thus discharging the electricity quietly, so we may obviate the destructive effects of tornadoes a great deal, and perhaps entirely, by placing lightning rods, with their lower extremities carefully connected with the water, over such a bridge. Two rods on each pier would be sufficient, one at the right and one at the left. Those rods would attract the positive electricity from the clouds, and discharge it in the ground; or, if we adopt the dualistic theory, they would also discharge the negative induced electricity from the ground or water upward, and thus neutralize the positive-electric clouds. The neighborhood of strong positive-electric clouds makes the parts of the earth under them strongly-negative electric, which latter charge is called an "induced" electricity.

A few years ago, a certain Mr. Peltier proved (see Prof. Henry's Report, Smithsonian Institute) that the earth is almost always negative-electric, but he did not explain why this is so; that, consequently, the clouds are mostly positive-electric by induction. Pouillet demonstrated, however, long before (about thirty years ago), that the vapors of saline water are always positive electric, thus conclusively settling the question that the vapors continually arising from the surface of the earth, of which three-fourths are saline, must be positive-electric, and, consequently, the earth's surface negative. It is true that Faraday has made some counter experiments, to disprove Pouillet's theory, but when we fairly compare and repeat the series of experiments of both these eminent savans on this subject, we are compelled to adopt Pouillet's ideas.

It is a curious fact that, in America, the land where the lightning rod was invented, there are fewer lightning rods than in Europe; and, what is worse, many are so poorly and carelessly constructed, that, in place of giving protection, they increase the

danger, even in this city of Benjamin Franklin, where he made his world-celebrated kite experiment.

I close with expressing the hope that one of the greatest scientific discoveries the world ever saw, may be appreciated, and more universally applied to the protection of life and property. What is the expense of a well-constructed lightning rod, compared with the loss its absence may originate?

The damage of the above-mentioned bridge is estimated at about half a million dollars.

P. H. VAN DER WEYDE, M. D.  
Philadelphia, Aug. 16, 1866.

P. S. After finishing this paper, I found an account of an aerial voyage among the clouds during a thunder storm, made in Ohio, in 1852, by Mr. Wise, in which he had occasion to observe the formation, by electricity, of an uprising whirlwind or tornado, and also of hail stones. A hail storm is acknowledged, long ago, to be an electric phenomenon, and lightning rods have been suggested to be raised on a kind of telegraph poles, at regular distances, in districts subjected to destructive hail storms. They are said to be partially, and in some localities, perfectly successful.

P. H. V. W.

#### A Simple Code of Signals Wanted.

MESSRS. EDITORS:—Will you permit me to improve the opportunity, while there is considerable interest among your readers on the subject of "Cryptography," to make a suggestion which, if followed up, would, without doubt, result in great practical good. This suggestion is, that a formal request be made of the Signal Bureau of the War Department, asking that a simple code of signals, on the general plan of those used during the war, be made public for general use. This request, if made by some of our scientific or commercial associations, or by a few of our citizens who are known to be specially interested in the promotion of science, would, I think, be complied with.

The utility and novelty of such a code would soon bring it into general use. It would furnish a pleasant pastime in our schools, as well as an agreeable exercise. It would be taught at our military and naval academies, and would become an accomplishment which would be sought by all.

Let me suggest a few of its uses. A manufacturer, residing a few miles from his establishment, could thus receive a daily report from his business without a personal visit. In the construction of bridges, communication could be carried on across large rivers, and to piers or islands situated in the middle of the stream. During excursions for pleasure or for scientific objects, the power of signaling a few miles would often be a great advantage. In cases where human beings are separated by fire or flood from their fellow men, how often would such a power be an immense saving both of life and treasure. If every vessel which sails from our ports were obliged to carry such a code with them, and to furnish themselves with a set of signal flags and torches, vessels could thus communicate at sea without the detention caused by the present mode; the present cumbersome signal paraphernalia of our navy could be dispensed with; and in cases of shipwreck a simple system of signals, universally known, would prove invaluable.

By means of the fog trumpet or steam whistle, communication could be kept open during foggy weather. According to the report of Prof. Henry before the American Academy of Science, a steam whistle has been invented which can be heard thirty miles. As far as sounds could be clearly and distinctly made, their meaning could be readily interpreted. Signals with flags have been read twenty-five miles with the small signal telescopes used in the army.

Such a code would be in no manner dangerous to the present cipher signal used in the U. S. Army. It might be made an international code, and thus by means of dictionaries, which could be carried on shipboard, communication could be had in all languages. That such a code will be adopted at some future time, I doubt not, and that the subject has already been broached at Washington, I am certain. I think I cannot be mistaken in asserting it would meet the approval of Col. A. J. Myer, to whom the country owes the perfect system of signals which has been of such incalculable benefit during the late

war. That it has, in fact, been a favorite idea with him for years, I can with safety assert. The present head of the Signal Bureau at Washington is Col. B. F. Fisher, who, as a practical signalist, has no superior in the country. That he would favor a project promising such auspicious results I have little doubt.

GEO. C. ROUND,

Late Lieut. and Signal officer U. S. army.  
Windsor, N. Y., Aug. 15, 1866.

#### Lightning-Rod Insulation.

MESSRS. EDITORS:—I am glad to see you are ventilating the subject of lightning rods, for it greatly needs it, to save the community from swindlers, and to protect its lives and property. In your last article you say "some advocate insulation, and some argue against it," although it is plain from your former article that you agree with most scientific men, that it is desirable. But the question arises, what is insulation? In your first article you say, "passing the rod through glass insulators does not seem to be always effective," and yet nine-tenths of the rods peddled through the country are put up with such glass rings, and are called insulated rods. Hence the prejudice against insulation, and with many against all rods. They see the failures, and not knowing the cause, condemn indiscriminately. As well might they condemn all medical treatment of disease for the same reason. A properly insulated lightning rod should never pass through the glass, nor come in contact with it, for when a bolt of electricity, following a rod, comes in contact with a body of glass, it is very sure to shatter it, leaving the rod in contact with the staple or strap which held the glass to the building, in which case the rod is no better or worse than a rod put up without insulation, and fastened with staples directly to the building, which rod may conduct the bolt safely off, but is dangerous if overloaded, or improperly entered in the ground, or if its connections are the least impaired. A few years since, the house of Mr. Conrad Swackhamer, at Fort Washington, was furnished with lightning rods which were supported by being wired to the outer end of glass knobs. The rod was struck and the glasses were shattered all over the house, but as there were no surrounding staples or straps for the bolt to follow into the building, it passed safely to the ground. Mr. S. having learned wisdom by experience, procured insulators to repair his rod which do not permit the rod to impinge upon the glass. By this example we see the necessity of not only insulating the rods, but of preventing all contact of rod with the glass used for insulation, and we see also the reason for the frequent failures of glass-ring insulators.

J. D. WEST.

#### Pickling Castings.

MESSRS. EDITORS:—I don't propose to give your readers any thing new about this common subject, but to give a caution as to what is done with the pickle when exhausted or saturated so as to render it useless for the purpose for which it was originally intended.

On a recent occasion I was called to apply the indicator to a steam engine, to determine its power, and proportion it between landlords and tenants. I observed uncommon evidences of some destructive agent on the piston rod and other parts exposed to the action of the steam and water. After concluding the indication I got a specimen of the water used, which was from a well in the yard. On testing it by the taste my suspicions were confirmed that the destructive action was from the water. I applied a test for iron and found it in abundance. I applied a test for acid and found that also.

On further inquiry I found that when the engine was first started in February last, the water was considered of superior quality, perfectly palatable and soft; that in April it began to get bad, not drinkable, and would not do to wash with. This led me to suppose that the cause of deterioration was extraneous and not inherent in the source. Further investigation brought out the fact that the castings used in the manufacturing of machinery were pickled and washed off in the yard around and about the well, and the ground being sand, the pickle saturated with iron readily found its way to the well.

It will be remembered that from February to April the water was good; but when the frost left

the ground the saturated pickle, sulphate of iron, easily found its way through the sand to the well.

This is the second case that has come under my observation. The first case was more destructive, in consequence of the great quantity of sulphuric acid used, five carboys in a week, which entirely destroyed two boilers of sixty horse-power before the cause was discovered.

F. W. B.

#### NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees:—

CLAMPING AND STRETCHING SEAMS.—ELIJAH SHAW, Milwaukee, Wis.—This invention relates to a useful device for clamping and stretching fabrics, or any substance connected by sewed or stitched seams, for the purpose of enabling the edges of the fabric, adjoining the seam, to be burnished or rubbed down, and also trimmed with great facility. This work has hitherto been performed exclusively by hand, involving a considerable expenditure of time, and materially augmenting the cost of manufacture, especially the manufacture of shoes, the operating upon the seams of the uppers of which this improvement is more especially designed for.

VENTILATING BOOT.—SAMUEL PERRY, New York City.—This invention consists in forming a canal or channel between the inner and outer soles of the boot, the canal communicating with the interior of the boot through numerous holes formed through the inner sole, and with the air through tubular canals having orifices through the upper of the boot or shoe.

LETTER SCALE.—R. MURDOCK, Baltimore, Md.—The top of the beam of this scale is made flat, and the notches and figures denoting the weight are made on the same, instead of on the sides of the beam, as in the ordinary letter scale, thus facilitating the reading of the weights.

GLASS PRESS.—HIRAM DILLAWAY, Sandwich, Mass.—This invention consists, among other things, in a novel mode of operating the plunger or followers of the press to obtain the requisite degree of pressure upon the glass within the mold.

LOCK.—G. M. WOOD, Decatur, Ill.—This invention relates to a new and improved mode of operating a sliding latch and locking the same, whereby, it is believed, several advantages are obtained over the ordinary sliding latches now in use.

BRICK MACHINE.—ROBERT L. WALKER, Globe Village, Mass.—This invention relates to a new and improved machine for pressing and molding brick, and has for its object the pressing and molding of the bricks with rapidity in a very compact manner, and with a smooth and finished appearance.

HAY-LOADING DEVICE.—HOSEA WILLARD, Vergennes, Vt.—This invention relates to a new and improved attachment to be applied to wagons or carts, for the purpose of loading the same with hay as they are drawn over the field, thereby avoiding the manual labor of pitching and raking the hay up into cocks. Various devices for this purpose have been devised, but they have not been generally adopted on account of being cumbersome, liable to get out of repair, and incapable of being adjusted so as to rake nearer to or further from the surface of the ground, as occasion may require, and admitting of the hay, during its elevation from the ground on the wagon or cart, being scattered by the wind, difficulties which, it is believed, are fully obviated by this invention.

HOP-VINE SUPPORT.—N. C. ROBERTS, Burlington, N. Y., and E. W. BADGER, Otsego, N. Y.—In this invention a series of posts are set into the ground, with horizontal rods running from top to top. From the first series of posts others are elevated, and are supported in their upright position by horizontal wires extending between high posts, the whole weight of the secondary posts, with their contents, resting upon the primary posts.

FIRE OR CINDER TONGS, ETC.—SILAS D. YERKES, Downingtown, Pa.—This invention consists in so constructing the tongs that they can be used as a poker or a lifter for stove covers.

HORSESHOE.—WILLIAM LITZENBERG, Macomb, Ill.—This invention consists of an improved horseshoe formed by combining with the main part of the shoe heel and toe calks, so constructed with double flanges, that when one flange has become worn and dull the calks may be reversed, and the other flange used, and which may be removed and replaced with new calks, without removing the main part of the shoe from the horse's foot.

APPLE PARER AND CORER.—HENRY SELICK, Lewistown, Pa.—This invention consists in an improved machine for paring, coring, and quartering apples at one operation, by means of which the work may be done quickly and well.

BOTTLE STOPPER.—FREDERICK MILLER, Newark, N. J.—This invention relates to a new and improved stopper for bottles, whereby the use of corks, and the labor of using the same, are avoided. The invention is more especially designed for bottle for holding soda water, porter, and other liquids impregnated with carbonic acid gas, and which require to be uncorked expeditiously in consequence of their contents being sold over a counter for immediate use.

BROOM HEAD.—M. W. OWENS, Waterford, Pa.—This invention consists, principally, in combining the wooden head, the metallic clasp, and the bars and bolts with each other, and with the corn of the broom, the wooden head being constructed with a groove for the reception of the upper edge of the clasp, and with an expanding tenon, which enters the upper part of said clasp.

WATER-ELEVATING DEVICE.—DANIEL FLAGG, Concord, N. H.—This invention relates to a new and useful device for assisting in elevating water from wells, cisterns, etc., etc., and consists in having an air chamber connected with the lever end of the suction pipe of a pump, whereby the pressure of the air within the chamber is made to counteract, in a certain degree, the gravity of the water, and thereby greatly aid in elevating the same.

**FRAME FOR TRAVELING BAGS.**—LOUIS FRUHNSFELD, Newark, N. J.—This invention relates to a new and improved metal frame for traveling bags, and consists in constructing the bars of which the jaws of the frame are composed, of curved or bent form in their transverse section, so as to insure lightness with strength, and also in having the ends of the jaws of taper form, or gradually decreasing in width from points above the rivets down to the same, whereby the cloth, leather, or other material of which the bag is constructed, will not be liable to be torn by the ends of the jaws as the latter are opened and closed.

**BED-BUG TRAP.**—EZRA B. LAKE, Bridgeport, N. J.—This invention consists in a circular cup or box, to be placed under the feet of the bedstead, the interior of which is divided into three concentric, annular compartments by low partitions, the intermediate compartment containing poison powder, and the others, attractive powder. The top edges of the outer sides project inward over the poison, so that the bugs, in endeavoring to reach the bait, will fall into the poison.

**ROOF.**—CHARLES S. CLARK, Huntsburgh, Ohio.—This invention consists in forming the roof with four or more gables and four or more ridges, the ridges meeting in a peak at the center.

**WATCH.**—SMITH D. FRENCH, Wabash, Ind.—This improvement consists in a new escapement for watches, where the pallets are drawn upon a curve from the staff of pallets as a center, the teeth of the escapement wheel playing or striking on the concave side of the pallets.

**STREAM VALVE.**—JAMES B. WOOD, Lansingburgh, N. Y.—By this invention many important advantages are obtained, such as cheapness and simplicity.

**SCREENING AND WEIGHING DEVICE.**—W. H. TAYLOR, Pittsburgh, Pa.—This invention relates to a new and useful device or screening and weighing, simultaneously, coal, limestone, and other similar substances, as they are delivered on shipboard, or put into vehicles to be transported to the place where they are to be used. The object of the invention is to economize in labor and time, now largely expended in manipulating for screening and weighing heavy substances of the kind specified.

**EVAPORATOR.**—WM. H. ISAACS, Terre Haute, Ind.—This invention consists in providing the pan with suitable holders against which to strike the inverted skimmer, to remove the warm scum, and on which to rest it to drain when temporarily disused, and also in the arrangement of holders and recesses for retaining the skimmer in a proper position in the pan.

**HORSE HAY FORK.**—A. J. LAIRD, Middleton, Pa.—The upper horizontal part of the bent tripping lever, when the fork is locked in position for retaining and hoisting its load, is passed through the eye at the upper end of the fork, and the tripping rope connected to the end of said lever, also passing through the eye by the side of said horizontal part of the lever, it is caused always to act thereon in the same direction for tripping the fork.

**BEE-HIVE.**—LEVI W. ABBE AND SIMON W. ABBE, South Charlestown, N. H.—This invention relates to a new and improved bee-hive, and consists in a novel construction of the same and in a peculiar arrangement of its parts, whereby many advantages are obtained and superior facilities afforded for bee culture.

**SPICE HOLDER.**—A. J. WALKER, Lowell, Mass.—This invention relates to an extremely useful, convenient and desirable utensil for household purposes. It consists of a wheel, divided into several oozes to receive the various spices, or condiments used in cooking, such as cinnamon, ginger, etc., and so arranged that it can be revolved, for bringing any one of its several boxes in line with an opening made in the stand, when desired to use the spice or condiment contained in such box, or to refill the same.

**LETTER-FILE.**—FREDERICK ASHLEY, New York City.—This invention relates to an extremely simple and cheap file for letters, memorandums, bills, etc., and for use in counting rooms and offices it seems to be a very desirable, convenient and useful device.

**JAPANNED FABRICS.**—JOHN FLETCHER, Newark, N. J.—This invention relates to a fabric which is intended as a substitute for japanned, or what is generally known by the term "patent," leather. The fabric is composed of muslin, silk, leather, or other suitable material, which is combined with tissue or other suitable paper, and coated with the ordinary leather japanner's varnish, in such a manner that a cheap and durable fabric is produced, which can be used in many cases with great advantage in place of patent leather.

**BUTTONHOLE CUTTER.**—WM. LIEBER, New York City.—This invention relates to a buttonhole cutter, the knife of which is guided in a suitable guide groove formed by a bracket extending from the handle, which also connects with the arm, on which the anvil is fixed, in combination with a lever handle, the fulcrum of which is close to the knife, and on its outside end, which is provided with a stud catching in a slot in each knife, in such a manner that the cutting edge comes down flat upon the material to be cut, said edge being parallel with the face of the anvil, whether the knife be raised or lowered.

**MITERING MACHINE.**—FRANK A. HOWARD, Belfast, Me.—This invention consists in a mitering machine, which is composed of a transversely sliding head, provided with one or more bladed adjustable cutters, in combination with rests, which are adjustable in segmental slots, in such a manner that for the purpose of mitering edgewise the rests can be adjusted to any desired angle, and for the purpose of mitering flatwise, the knife or knives are brought in the desired inclination, and any required angle can be given to a strip of wood or molding.

**COMPOUND UNIVERSAL CHUCK.**—ROBERT ROSS and THOMAS ROSS, Middleburg, Vt.—This invention relates to a chuck, the jaws of which are combined with suitable gearing, in such a manner that the same can either be moved simultaneously, or each independent of the other, and can be used for clamping pieces of metal, wood, or other material, concentrically or eccentrically, as may be desirable.

**HYDRANT.**—JAMES M. WARD, New York City.—This invention relates to a new and useful improvement in hydrants, whereby a hydrant is produced which is simple and efficient, and is not liable to get out of order.

**WASHING MACHINE.**—CHARLES A. CODDING, Battle Creek, Mich.—This invention consists of a friction roller and a rubbing apparatus, provided with an elastic device, and used in connection with a suds box and bed of rollers, upon which the clothes are laid.

**CHILDREN'S SLED.**—N. P. LINDERGREEN, Boston, Mass.—This invention consists in arranging upon each runner of the sled a lever of such a form that either one or the other, or both at once, can be brought to bear upon the surface over which the sled is moving, according as may be necessary, to direct the sled either to the right or left, or retard or stop its movement.

**OIL DISTILLING APPARATUS.**—JAMES B. GRANT, New York City.—This invention consists in introducing heating pipes of peculiar construction into petroleum stills for the passage of heat through the mass of the oil, as well as at the bottom and sides of the still, thus largely increasing the heating surface and distilling the oil more rapidly. In connection with this improvement there is an improved condensing apparatus.

**MITER BOX.**—GEORGE KEATING, Thomastown, Me.—The object of this invention is to furnish an adjustable miter box for sawing obtuse and acute angles in bevel work or moldings for frames of rhomboidal form, by which all the corners may be cut in succession at the proper angles for fitting together perfectly.

**FILLING MOTION FOR LOOMS.**—ADAM MARCHINGTON, Upland, Pa.—This improvement relates to the filling motion of power looms, and consists in a novel arrangement of devices for unlocking the shipper and moving the belt on to the loose pulley to stop the loom.

**FRACTURE BED.**—M. M. LATTI, Goshen, Ind.—This invention was illustrated in SCIENTIFIC AMERICAN, on page 355, vol. xiv.

**TREATING ORES.**—W. L. RAHT, Baltimore, Md.—This invention relates to a new process for treating matte or regulus run from metalliferous ores containing sulphur, arsenic, or antimony, and consists in forcing atmospheric air, or other gas, through the liquid fused matte obtained from such ores, in such a manner that by the air or gases the sulphur or arsenic or antimony contained in the matte is vaporized, and a pure metal is obtained.

**RAILROAD CHAIR.**—W. M. MARTIN, New York City.—This invention consists of a chair, which when applied to the rails forms a tapering socket to receive a wedge-shaped supporter which fits the neck of the rail and rises to a level with its upper surface, in such a manner that by said wedge the tread of the rails is strengthened, and at the same time the wheels of the engine and cars are enabled to pass the joints of the rails without depressing their ends.

**FLUTING IRON.**—CHARLES A. STERLING, New York City.—This invention relates to a fluting iron, consisting of a flat, corrugated bed and a segmental corrugated presser, the corrugations of the presser being made to match with those of the bed, in such a manner that by the combined action of the bed and presser textile fabrics or other flexible materials can be fluted with the greatest ease and facility.

**SPINNING WHEEL.**—H. KOELLER, Camp Point, Ill.—This invention relates to a hand spinning wheel, which is mounted on a swivel standard, secured by a screw pivot to a screw clamp, and furnished with a forked arm, which forms the bearing for the spindle, and which is adjustable independent of the standard, in such manner that the distance between the spindle and the pulley, from which it derives its motion, can be increased or decreased for the purpose of tightening or releasing the belt; and, furthermore, the driving wheel can be adjusted to any convenient height to suit the stature of different persons, or the position in which they may desire to operate the spinning wheel.

**TICKET REGISTER.**—GEORGE R. SOLOMON, JR., and JOSEPH SOLOMON, New York City.—This invention relates to a new and useful ticket box or register for conductors on railway cars, and for ticket-selling use generally, in which the tickets, in a continuous strip, are wound upon a central drum or shaft, and the box then locked by the superintendent or other authorized person, so that the ticket strips cannot be tampered with or changed, and the conductor or seller cannot have access to the box, but is able to produce tickets therefrom as required by suitable mechanism in connection with the box.

**AIR CARBURETING MACHINE.**—HUGH L. McAVOY, Baltimore, Md. Patented August 14, 1866.—This machine is ingeniously contrived to obtain the maximum result with a given driving power. The automatic arrangements for the regulation of the flow, and the thorough carbureting of the air, will, no doubt, recommend it to the attention of the public.



**P. E. C., of Baltimore.**—We cannot tell you where you can get a piece of the Atlantic cable. There is a specimen in this city, but not for sale. The cable is one and one-eighth inch diameter.

**C. W. C., of Mo.**—We cannot give you the relative strength of stone, brick, and concrete for building purposes. The conditions of its use vary so much that no invariable rule can be given. For such a building, however, as you propose, we could not advise concrete. Mahan, in his "Civil Engineering" says: "Experience has shown that for buildings concrete possesses neither the durability nor the strength requisite for structures of a permanent character, when exposed to the action of water, or of the weather. It is very inferior in strength to good bricks, and the weaker kinds of natural stones."

**H. C. D., of W. Va.**—To make a cheap filter for your river water, take a cask provided with a stop cock, and put in the bottom gravel or pebbles to the depth of a few inches, then one or two thicknesses of flannel, next a few inches of charcoal, and lastly fill up nearly to the top with clean sand, and the filter is ready for use.

**H. M. D. of Ct.**—There are processes for bleaching vulcanized india-rubber white. We have seen such samples.

**G. C., of N. C.**—The best method of coating iron, or any other metal, with silver, is by the electro-galvanic battery, but we presume you would prefer the style which is capable of more extended and diversified use. This consists in covering the iron with soft solder, and then, with a soldering iron, or heated burnisher, attaching the foil to the solder by partially fusing the solder. Care must be taken to avoid heating the solder too much, as the silver might be melted and incorporated with it. This plating will not resist much heat, but for mere ornament is effectual and lasting. Second—We do not wish to express an opinion as to the relative merits of the engines of different makers. We do not, however, recommend the machine you refer to. A cheap engine is seldom a good one. Pay a fair price and get a serviceable machine.

**W. J. C., of La.**—We never found any difficulty in hardening and tempering planing-machine knives. Heat them in a "long" fire, so the steel will be brought, for the whole length, to the proper temperature at the same time. Be sure to have an even heat, and then with a pair of tongs at each end, dip the edge horizontally in pure cold water. After rubbing the oxide off the steel, there will be heat enough in the iron back to "draw" them. If not, use red hot iron. There is no difficulty in cutting them. The iron backs can be cut with a cold chisel, and a mark across the steel with a sharp edged file will insure a straight fracture.

**G. M., of N. Y.**—We are not aware that there is a cheaper source of pure olefiant gas than alcohol. The gas is condensed into a liquid at a pressure of 36.29 atmospheres when the temperature is maintained at 32 deg. Fah.

**A. D., Jr. of —.**—Varnish is sometimes used as an insulator upon the wire of helices, and we think it likely that collodion could be employed. Try it.

**W., of Ct.**—A rainbow is the result of the decomposition of the light of the sun on passing through the rain drops. The sun, the eye of the observer, and the center of the circle of which the bow is a part, are always in the same straight line. The colored rays which reach the eye always make the same angle with this line, and hence the circular form of the bow.

SPECIAL NOTICES.

Erasmus A. Pond, of Rutland, Vermont, having petitioned for the extension of a patent granted to him the 7th day of December, 1852, for an improvement in pill making machines, it is ordered that the said petition be heard on Monday, the 19th day of November next.

NEW PUBLICATIONS.

UNITED STATES CENSUS.

Messrs. Woodworth & Lawton, Cambridge, N. Y., have published, for the use of patent-right and business men generally, a neat volume of 174 pages, which gives the population of each State by counties, cities, and towns. It is a very convenient and useful volume. Price, in paper, 60 cents, or in tuck form, \$1, sent by mail. It contains a chapter on "How to Sell Patents."

PRACTICAL GUIDE FOR THE MANUFACTURE OF PAPER AND BOARDS. By A. Proteaux.

This treatise is a translation of Proteaux's work, which is quoted as authority in France. It contains also selections from Le Normand's "Nouveau Manuel," and a chapter on the manufacture of paper from wood in this country. It is an able and valuable treatise, giving the history of paper making, and detailing the modern processes of producing paper from various materials, illustrated by plates and plans. We commend it cordially to paper manufacturers, who cannot fail to derive valuable information from its pages. The progress of paper making in this country is such that we think our own manufacturers might furnish sufficient material for an interesting and valuable volume on the art. We would like to see the attempt made.

The work is published by Henry Carey Baird, No. 406 Walnut street, Philadelphia.

MECHANICAL PERIODICALS.

From John Wiley & Son, No. 533 Broadway, we have received Part 10 of "Locomotive Engineering," by Zerah Colburn, London; and Parts 29 and 30 of "Shipbuilding." Both valuable aids to the workman, the manager, and the proprietor of concerns in which the respective businesses may be carried on. Part 10 of Bourne's excellent "Treatise of the Screw Propeller" is also at hand. It is a repository of great value for reference as well as for practical information.

INTERNAL REVENUE LAWS, as amended and approved up to July 13, 1866. Compiled by Horace Dresser.

Messrs. Appleton & Co., No. 443 Broadway, have just issued the above very valuable compilation of laws, which are of interest to every tax-paying citizen.

**PATENT CLAIMS.**—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing \$1 as a fee for copying. We can also furnish a sketch of any patented machine to accompany the claim, at a reasonable additional cost. Address MUNN & Co., Patent Solicitors, No. 37 Park Row, New York.

**RECEIPTS.**—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona-fide acknowledgment of the reception of their funds.

**The Celebrated Needle Gun.**

We give an engraving of the principal working parts of the Prussian needle gun, which has been so much talked about in European and American journals. Shortly after its adoption by the Prussian Government we published a description, with engravings, of the arm, but in the present engravings we give in detail the working parts. Fig. 1 represents the breech piece, with its parts partly in section, contracted longitudinally. In fact, this breech piece is eleven inches long. The case, A, is screwed to the breech of the barrel, which at this point is bored out for a cartridge chamber, to the depth of the lands or grooves in the barrel proper.

when compared to our breech-loaders appear to be just and correct. The *sabot* at the base of the projectile is made of a slip of paper coiled tightly into a disk, compressed, and secured with paste. It is intended to receive the fulminating wafer, and to offer a wad of resistance between the powder and ball. It is also claimed that it cleans the grooves of the rifle at each discharge. The paper cartridge which envelopes powder, *sabot*, and bullet, frequently has to be removed from the chamber with the finger before loading. The spiral spring is liable to get set, and the needle to get bent or broken. The ignition of the charge at the front is a device well understood here, but considered of

be seen that this will give a perfect joint without soldering, when laid on the slope of a roof. The side edges of the sheets are turned vertically upward. The connected sheets being laid along the slope from ridge to eaves, side by side, a strip of wood, B, having on its under side two parallel rabbets or channels, is placed over the upturned edges of the sheets, as at C, which enter the rabbets and thus unite the parallel rows. These strips of wood are themselves previously covered with the metal, which embraces the top and sides, and is secured to the under side of the strip by means of upturned edges, D, similar to those on the sheets and entering the same grooves or rabbets. The wooden strips are

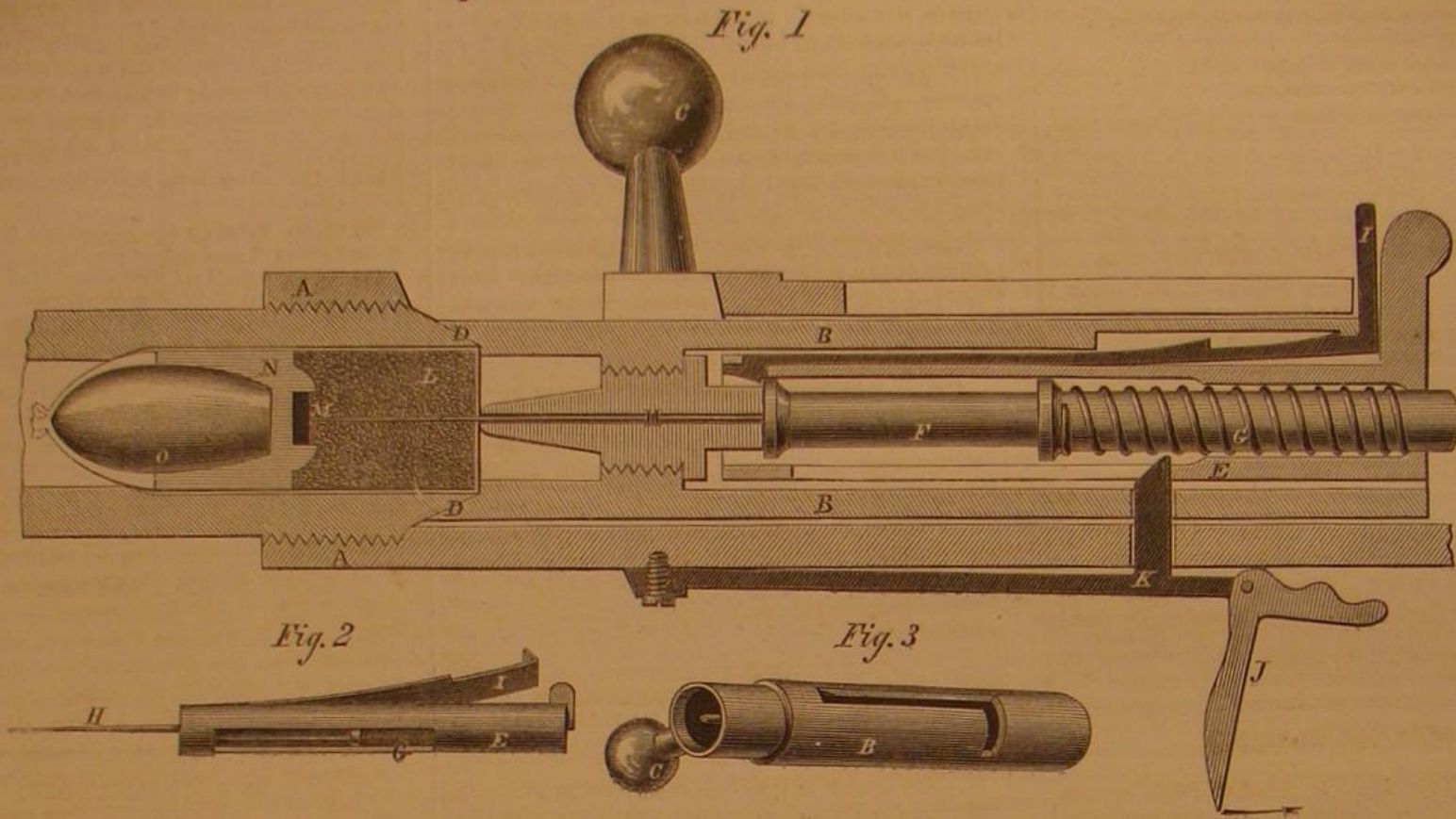


Fig. 2

Fig. 3

**THE PRUSSIAN NEEDLE GUN.**

Inside this case is a cylindrical chamber, B, furnished with a handle and knob, C, which can be moved along a longitudinal slot in the case, having a transverse slot inclining toward the forward or muzzle end. This chamber is convex or bored at the end, and fits over the conical end of the barrel at D. A sharp blow of the hand on the knob forces its shank into the spirally-transverse slot, and effectually closes the joint at D. Inside the chamber is a cylinder, E, containing the needle bolt, F, the spiral spring, G, and the needle, H. At H is also a plug, or guide, screwed to the inside of the chamber, B. On the apex of this the cartridge rests. A spring, I, with its end catch, serves to withdraw the cylinder, E, with the bolt, F. The trigger, J, is a bell crank lever, which depresses the spring, K, and allows the cylinder and contents to be drawn to the rear. L is the powder, M, the percussion wafer, N, the *sabot*, and O, the bullet, all enveloped in paper.

The operation of this mechanism is easily understood. The spring, I, being pressed, unlocks from the case, B, and allows the sliding back of the cylinder, E, so that the rear projection of the bolt, F, takes the spring, K, and the needle is withdrawn into its guide or sheath, H. The chamber, B, is then unlocked by the knob, C, and slid back so that the front projection of F catches the spring, K, thus compressing the spiral, G. The rear of the barrel is thus opened and the cartridge can be introduced.

The chamber is then moved forward and locked against the barrel, and the spring, I, is pressed down and the needle bolt moved forward, so that the rear projection rests against the spring, K, and the needle rests against the rear of the cartridge, and the piece is ready for firing. The front of the needle bolt is recessed, and receives a leather washer, designed to prevent the escape of the products of the gas combustion to the cylinder, B, an office it performs but inefficiently. The remarks of our correspondent in last week's issue, showing the inferiority of this arm

doubtful advantage. On the whole, the successes of the Prussians by means of the needle gun may be attributed rather to its qualities as a breech-loader, and the admirable drill of the men in its use, than to its peculiarities as a needle gun.

**BECKER'S METALLIC ROOFING.**

It is well known that considerable difficulty is experienced in keeping sheet-metal roofs tight, on account of the expansion and contraction of the sheets by the changes of temperature. If a roof is covered in the spring, the heats of summer will expand the metal, causing it to wrinkle and loosen.

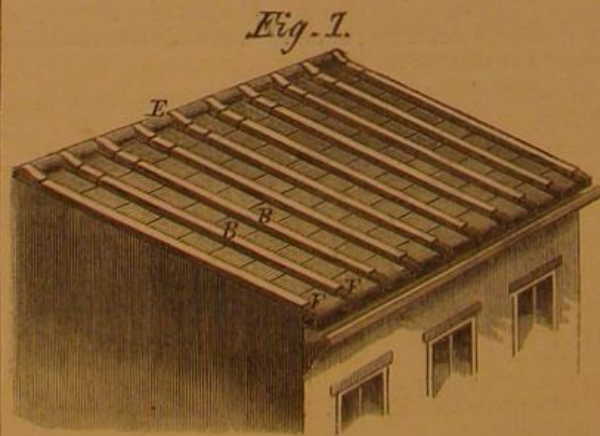


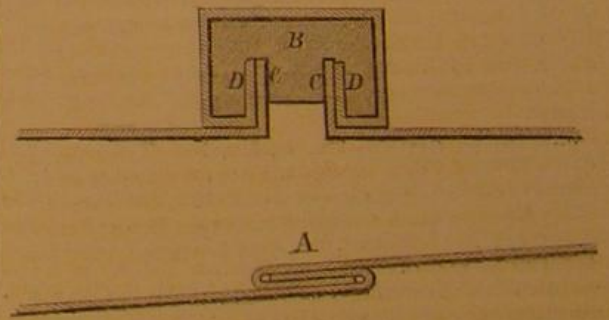
Fig. 1.

But the cold of winter does not, on the other hand, restore the former smoothness. Continual, or, at least, frequent repairs are therefore necessary to preserve such roofs from leaking. To make a tight roof, which would preserve its impermeability under all changes of temperature, is the object of the improvement illustrated in the accompanying engravings.

The sheets, of zinc or tin, are prepared in the shop ready for laying. At each end the edges of the sheets are turned over, one edge in one direction and the other in another, as at A, Fig. 2, making, when slipped together, hook or lap joints. It will

connected to the rafters by means of brass wire, and the strips of zinc which cover them, with the sheets, are fastened to the wooden strips by pins passing through the strips horizontally. The ridge is finished by means of a strip, E, covered with the metal and securing the ends of the upper tier of sheets. At the eaves, curved pieces of cast iron, or other metal, are secured to the strips, and hook securely under the eaves projection. The recesses for the side edges of the sheets and the lap joints of the ends of the sheets permit considerable expansion and

Fig. 2.



contraction, sufficient to prevent the curving and wrinkling of the zinc, and as each sheet is independent of the other, a smooth and impermeable roof is at all times assured.

An application for a patent is now pending, and for further information address Ed. Becker, 347 Central avenue, Cincinnati, Ohio.

THE idea of heating railway cars in motion by the rapid movement of air in a vessel has again been tested and brought into notice. The heating of air by rapid motion is no new idea, and where the power for producing the motion costs nothing, it may be rendered effective and practicable; but its production must be at the expense of power which can be utilized to much better effect expended on other objects.

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**MECHANICAL NONSENSE.**

The avidity with which the "popular press" seizes upon every mechanical statement, and the readiness with which it gives it a place in its columns, without ever investigating it by the light of mechanical knowledge, or even common sense, receive, frequent illustration. It seems to make no difference whether the truth or falsity of a statement, or the value of a professed improvement, can be verified by observation, inquiry, or an effort of memory, or whether the circumstances are beyond the reach of the journalist; in either case the humbug is started on its rounds, and transferred to the columns of every paper in the country. We copy one such bit of mechanical nonsense to illustrate these statements. We have before us now no less than four copies of this paragraph, which we had the curiosity to clip as they met our eye:—

An ingenious application of the process of molding blocks of concrete for building purposes was patented recently in England. The inventor proposes to erect houses by literally casting them of concrete in the place they are intended to occupy. An ordinary concrete foundation is first laid, and upon the foundation horizontal frames, constructed of boards lined with zinc or other metal, are set up on edge so as to form a kind of trough for receiving the concrete. By the insertion of suitable cores, holes for the insertion of the joists, or for other purposes, may be molded in the concrete as the work proceeds. The proprietor of the patent is now in Paris, superintending the erection of some houses on this principle, and we believe it is the intention of the French Emperor to build some laborers' cottages of this kind at one of the imperial farms. This invention will be illustrated at the Paris exhibition.

This "ingenious application, recently patented in England," is the identical method which has been used in this country ever since building by concrete came in vogue. We have heard of the manufacture of blocks of artificial stone for building purposes, but all the structures of concrete we ever knew were built by filling plank troughs, which, for the time, were external walls, with the mixture, and moving them up as the work progressed. In this way houses are built by "literally casting them of concrete in the place they are intended to occupy."

This giving notoriety to worn-out mechanical ideas, without a particle of investigation, or the exercise of discretion, we regard as a serious evil. It belittles the noble work of the mechanic, and brings

the labors of the scientific man into contempt. Neither of the classes to which these men belong spend their time or exercise their talents on nonsense; at least they intend to make progress when they apply themselves to the labors of their respective departments, and although an invention may be re-invented, or a discovery be re-discovered, the exertions of our mechanics are not directed to the rehash of old and well-known devices, or the investigations of scientists to the elucidation of physical impossibilities.

The department of the mechanical arts is a department of progress. It is not a dull, unvarying round of endeavor, ending where it began, like the serpent symbol of the Aztecs. If it proceeds in a circle, yet is the completed round a spiral—the termination of an inquiry resting on a higher plane than its beginning and affording the basis for another. But, judging from the record of discoveries and improvements in the arts furnished by our popular journals, the mechanic and the experimentalist in physical science must be little more than dolts or triflers. We protest against this abuse of the high mission of our useful men and this belittling of their work.

To form a tolerably correct estimate of the value of a professed improvement in the mechanic arts, does not necessitate an intimate knowledge of natural science, or a practical acquaintance with mechanics. The laws which govern the science of mechanics are easily learned and understood. Almost any elementary work on natural philosophy will afford the necessary information to enable the paragraphist to form a correct judgment on these matters, and this carelessness, exhibited in giving currency to old, obsolete, or impracticable devices, is really inexcusable, discreditable to the journalist and unjust to the mechanic.

**THE INFLAMMABILITY OF PETROLEUM.**

There can be no doubt that petroleum, as obtained from the earth in this country, is one of the most inflammable of substances. The numerous fires in the "oil region" of Pennsylvania, where its procurement from the bowels of the earth makes the region a text or guide to a proper estimate of the combustible qualities of this mysterious product, establish the fact that greater care and consideration should be exercised in its handling, transportation, and storage, than is usually bestowed. The destructive fire in Jersey City on the 19th, is a recent lesson. The fire was caused by the ignition and explosion of the gases from a cargo of petroleum, fired by the lighting of a match. It resulted in the destruction of about two million dollars worth of property, and the loss of a number of lives.

The concentrated and powerful heat generated by the combustion of petroleum is surprising. Some of the cars on the track at the Jersey City fire were only partially consumed, but the wheels and iron work of a car truck, on one side of the car, were melted into an indistinguishable mass, while the wheels on the other side retained their form. The rails, also, where the burning oil flowed, were crooked, twisted, and lifted from their places by the intense heat. In June, 1865, traveling over the New York Central Railroad, the train was delayed by the burning of a car load of oil in barrels. On viewing the scene we were struck with the appearance of the track wherever the oil had run along the road. The rails for several rods on either side of the car were twisted and contorted in every shape, and so nearly fused as to lose their definite form, while the flaming car could not be approached for the heat.

The constituents of petroleum are all highly combustible. Few combinations offer such uniform facilities for producing a high degree of heat. It is well known that a paraffine candle or a kerosene lamp gives more powerful results with the common blowpipe than a tallow candle, whale, or vegetable oil, alcohol, or gas. When ignited the flames of petroleum cannot easily be quenched. Water has no effect, and the only way to conquer the conflagration is to smother it with earth by excluding the atmosphere, or to allow it to burn itself out.

But there are other qualities which make crude petroleum still more dangerous. The naphtha which it contains evaporates into a highly inflamma-

ble and explosive gas, unless secured in air-tight receptacles. Mixing with the external air, this vapor is almost, if not quite, as dangerous as gunpowder. In consequence of this quality, carelessness in managing petroleum has caused some of the most serious and destructive fires.

There are two remedies for this evil. One is to store and transport the crude oil in metallic vessels hermetically sealed, which is costly and in a measure impracticable. The other is to deprive it at the wells of its explosive constituents. This, we learn, will probably be attempted. The explosive principle, naphtha, is very volatile and can be removed by a low distillation, and condensed, to be managed separate from the body of the oil. A coil of pipe placed in a suitable vessel and conveying the waste steam from the engine, could be used to sufficiently heat the oil to volatilize the naphtha, when the oil would give out no vapor, and could be safely transported or stored in barrels, if they were not perfectly air-tight.

The subject is one of great importance and should receive immediate attention. It is to be hoped that measures will be taken at once to render the management of this substance as safe as that of any other article of commercial and domestic value.

**BREATHING—OUT OF DOORS AND IN THE HOUSE.**

When a man draws a breath of air into his lungs, the numerous little cavities of the lungs are filled with the air, which is a mixture of oxygen and nitrogen. A portion of the oxygen passes, by the mysterious action of the endosmosis, through the membrane of the lungs, into the blood, which has been distributed on the opposite side of the membrane to receive it. The blood, having absorbed the oxygen, carries it, through the arteries, all over the system into the minute capillary blood vessels, and here it is brought into immediate contact with the food, which, after its digestion, had been poured into the blood. A portion of the carbon of the food combines with the absorbed oxygen, forming carbonic acid, and generating precisely the same amount of heat that the same quantity of carbon would generate if burned in the state of coal in a furnace. It is this heat which keeps up the temperature of the system, and it is the fundamental condition for all those vital actions which constitute life. Life depends upon the perpetual filling of the lungs with oxygen; hence if the windpipe is closed by a rope around the neck, or if the mouth and nostrils are immersed in water, death quickly ensues.

The air that is breathed out of the lungs is mostly nitrogen and carbonic acid, with but little of that oxygen which is the life-giving element. If a person is sitting in a room where the air is confined and still, when a volume of air comes from his lungs it fills the space about his mouth and nostrils, and the next breath that he draws in is mostly this air which has just previously passed through his lungs. As he continues to breathe the same air over and over, it becomes more and more deprived of its oxygen, and more and more surcharged with carbonic acid; consequently his vital functions become less and less vigorous.

On the other hand, if a man is walking in the street while he is breathing, when he throws out a quantity of air from his lungs, his head is carried along away from it before he draws in another breath, and he thus gets a fresh supply of air with its full richness of oxygen at every breath. Hence the vigor imparted to the system by exercise in the open air, and hence the importance of perfect ventilation to those confined in houses.

Besides combining with carbon in the blood, oxygen also combines with iron, changing it from the brown protoxide to the red peroxide—the rouge of the silversmiths. It may be that the more perfect oxidizing of the iron in the blood is one reason for the rosy cheeks of those who live out of doors.

THE "DUNDERBERG."—We publish on another page an interesting history of this formidable ironclad steam ram. She is now ready for her trial trip, and it is expected that she will be able to make 12 knots per hour. The trial of the engines at the dock has proved quite satisfactory.



ISSUED FROM THE U. S. PATENT OFFICE  
FOR THE WEEK ENDING AUG. 21, 1866.  
Reported Officially for the Scientific American.

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.

**57,271.—COATING METALS WITH METAL.**—Isaac Adams, Jr., Boston, Mass.

I claim rendering cast pipes and other similar articles anti-corrosive to heat or moisture by surfacing them with nickel, substantially as set forth.

**57,272.—BEEHIVE.**—Levi W. Abbee and Simon W. Abbee, South Charlestown, N. H.

We claim the external case or box, A, provided with doors, B, at its sides and ends, in combination with a box, D, provided with comb frames, F, and with doors, E, at its sides, and arranged so as to slide within A, substantially in the manner and for the purpose set forth.

We also claim the hanging of the comb frames, F, on hinges, G, in combination with the pins or stops, H, and screws, I, in the side doors, E, of the box, D, substantially as and for the purpose specified.

We also claim the exit passage, K, in the top plate of the box, D, in combination with the bar, H, and pivoted slats, L, provided with holes, I, and the holes, M, in the inner sides of the boxes, G, substantially as and for the purpose specified.

**57,273.—ERASER AND BURNISHER.**—S. R. Andres, Troy, N. Y.

I claim the combination of a piece of rubber or other erasive material, B, with a brush, C, both set in a suitable frame, A, and arranged in a manner to accomplish the purpose of my invention, substantially as herein specified.

**57,274.—LETTER FILE.**—Frederick Ashley (assignor to James Edgar and J. E. Cavan), New York City.

I claim securing the upper portion, G, of the hook to a plate, H, arranged in a suitable groove or guide way of the frame, A, or its equivalent, in combination with a spiral or other suitable spring, arranged and operating together, substantially as and for the purpose described.

**57,275.—MANUFACTURE OF TOBACCO BAGS.**—Guillaume Aymard, New York City.

I claim the mode herein specified of preparing bladders for tobacco bags, etc., by which they are rendered soft and pliable, as set forth.

**57,276.—VAPOR BURNER.**—W. W. Batchelder, New York City.

First, I claim regulating and steadying the flame of a coal-oil or other similar lamp in the manner and by the means herein specified, that is to say, by interposing between the vaporizing chamber and wick tube or holder of a lamp burner, constructed as above described, a movable and adjustable diaphragm, as and for the purposes hereinbefore shown and set forth.

Second, I claim the movable and adjustable diaphragm, as herein described, the same consisting of a perforated stationary plate, in combination with movable plates of segmental or other suitable shape, constructed and arranged for operation substantially as and for the purposes herein set forth.

Third, in combination with the vapor chamber and surrounding dome and the wick tube of a coal-oil or other burner as described, I claim the movable and adjustable diaphragm, constructed as herein specified, the whole being arranged for operation, substantially as set forth.

**57,277.—CIDER AND WINE PRESS.**—Charles Beach, Penn Yan, N. Y.

I claim the platen, B, with the receptacle, C, when made and used as specified and for the purpose set forth.

**57,278.—SKELETON TUMBLER.**—William W. Beach, M.D., New York City.

I claim the construction of the skeleton tumbler as the basis of a series of apparatus, described and represented in the several figures of the drawings.

**57,279.—DEVICE FOR BURYING WEEDS AND STUBBLE WHILE PLOWING.**—Joseph W. Beer and John B. Wampler, Shelbyville, Ill.

We claim the herein described devices which we denominate "a weed burier," the same being attached to a plow beam, in the manner and for the purpose herein set forth.

**57,280.—MACHINE FOR PRESSING TOBACCO.**—John Blackie, New York City.

First, I claim the apron, B, having a series of channels of varying or uniform width, for receiving and conveying the tobacco to the pressing rollers, substantially as set forth.

Second, in combination with the apron, B, constructed as described, I claim the belts, M, when said parts are arranged to operate as and for the purpose set forth.

Third, The combination of the grooved cylinder, C, adjustable roller, e', and pressing roller, D, substantially as shown and described.

Fourth, I claim a cutting apparatus, constructed and operating substantially as set forth.

Fifth, I claim the frame, H, provided with the cells, o and a, sliding bottom, I, arranged and operating substantially as and for the purpose set forth.

**57,281.—COOLER.**—George D. Blocher, Indianapolis, Ind.

I claim the central ice chamber, D, and covers, E and F, arranged as shown, and in combination therewith the milk chamber, B, and butter vessel, C, substantially as set forth.

**57,282.—WOODEN SCREW.**—Thomas Bowers, Zanesville, Ohio.

As an improved article of manufacture, I claim the wooden screw, which works in a nut or matrix, constructed with a spiral thread which has a bearing surface, d, perpendicular to the axis of the screw, a cylindrical surface, c, which is parallel to said axis, and inclined surface, b, which forms an obtuse angle with the cylindrical surfaces, c and e, all as described and represented, and for the purpose set forth.

**57,283.—CORN HUSKER.**—Thomas J. Brown, Clio, Ohio.

I claim a corn husker, constructed with a flexible band, A, to which is fastened the plate, A, covering the entire palm of the hand, and having attached thereto the curved point, C, projecting toward the fingers, substantially as set forth.

**57,284.—APPARATUS FOR SUPPRESSING EFFLUVIA FROM DRAINS.**—Walter Bryant, Boston, Mass.

I claim the combination of the top or strainer, g g, formed with

the flanges or lips, f f and h h, with the groove or gutter, e e, and basin, e e, as described and for the purpose specified.

**57,285.—APPARATUS FOR TREATING PETROLEUM.**—D. H. Burket, Halfmoon, and J. C. Gray, Putneyville, Pa.

First, We claim distributing pipes, N N, and wings, W W, when constructed and operating with pipe, M, and tank, A, substantially in the manner and for the purposes set forth.

Second, The packing box, E, when constructed and operating with F, and connection pipe, D, substantially in the manner and for the purposes set forth.

**57,286.—PLOW COLTER.**—Samuel Casebeer, Roseburg, Oregon.

I claim the application to plows of the aforesaid cutter, in the way and manner herein described.

**57,287.—FEEDING DEVICE FOR SEWING MACHINE.**—William Chicken, Boston, Mass.

I claim the said friction feed apparatus as composed of the levers, C E, the wedge, D, and the two wheels, A B, arranged and applied together, substantially in the manner and so as to operate as specified.

**57,288.—VAPOR STOVE.**—Samuel Child, Jr., Baltimore, Md.

I claim the combination with the retort pipe and heating chamber of a vapor stove of the tubular valve rod operated upon the axis of the said retort pipe, as described, under such an arrangement that the said rod, while regulating the supply of fluid to the heating chamber, shall also constitute the medium through which the fluid is conducted into the said chamber, substantially as herein shown and set forth.

**57,289.—MANUFACTURE OF BOOTS.**—John J. Christian, Yonkers, N. Y.

I claim the arrangement of the ornamental cap, A, vamp or upper leather, B, in combination with the perforations, b b b, strip, C C, forming an air passage, substantially as and for the purpose herein set forth.

**57,290.—ROOF.**—Charles S. Clark, Huntsburgh, Ohio.

I claim an improved roof having as many ridges meeting in a peak at the center, and as many gables as there are sides to the building, the lowest points of the rhomboidal parts or surfaces of the roof being at the corners of the building, substantially as described and for the purposes set forth.

**57,291.—WASHING MACHINE.**—Charles A. Coddling, Battle Creek, Mich.

I claim the horizontal spring arms, h i, in combination with the roller, D, substantially as and for the purpose described.

**57,292.—MODE OF HANGING PITMAN, ETC.**—E. H. Craig, Brooklyn, N. Y.

First, I claim forming the bearings or journals of connecting or other rods in machinery of a V or other equivalent shape thereto, substantially as herein described for the purposes specified.

Second, The adjustable slides or bars, I, constituting a portion of the bearings or journals of connecting and other rods in machinery, when arranged upon the said rods so as to be susceptible of adjustment, substantially as and for the purposes described.

**57,293.—APPARATUS FOR DESULPHURIZING ORES.**—Francis W. Crosby and Woodhull Helm, New York City.

We claim the combination of a series of sliding tables or shelves with the interior of an inclined hot-air or gas conducting flue, substantially in the manner and for the purpose set forth.

We claim also, in our improved apparatus, so combining the lower extremity of the inclined flue with the eduction flue of the furnace as that the ore or other material falling from the inclined plane shall drop in a thin sheet over the mouth of the said eduction aperture, substantially in the manner and for the purposes herein set forth.

**57,294.—BENDING CARRIAGE THILLS.**—Jesse W. Dann, Columbus, Ohio.

First, I claim, in the process of bending shafts for vehicles, the wedge, g, for the purpose specified.

Second, I claim the wedge, h, for the purpose specified.

Third, I claim the back or outer projection on the step, c, for the purpose specified.

Fourth, I claim the ears, b b, and the beveled wedge, e, together with the block, d, for the purpose specified.

Fifth, I claim broadly the means as herein set forth for tightening and holding the strap upon the shaft during the operation of bending, substantially as specified.

**57,295.—RAILROAD SWITCH LANTERN.**—Edward E. and Albert B. Dickerson, Oshkosh, Wis.

First, We claim providing a lantern, A, having glasses of different colors, with a series of tubes or blinders, E, arranged substantially as and for the purposes herein specified.

Second, We claim imparting the requisite rotatory movement to said lantern by the reciprocating motion of the switch bar, c, substantially as shown and described.

**57,296.—GLASS PRESS.**—Hiram Dillaway, Sandwich, Mass.

First, I claim the plunger or follower, L, hung on a sliding head or frame moving upon guides, E E, and connected through rods, U, with crank arms of a shaft, W, arranged in slotted bearings, U, the opposite ends of which crank arms rods, z, are connected at one end, and at their other hung upon fixed pivots, X, substantially as and for the purpose specified.

Second, The mold, B, arranged and connected with the shaft for operating the plunger, in such a manner as to be moved under and away from the line of movement of the plunger, substantially as and for the purpose described.

Third, The head plates, M and R, rods, O and Q, cross bars, P, springs, R2, when all arranged and connected together and to the plunger, so as to operate substantially as and for the purpose set forth.

**57,297.—HAND JACK FOR CONGRESS GAITER.**—Henry F. Dougherty, Monmouth, Ill.

First, I claim the bar, A, and catch, B, operating substantially as described and for the purpose set forth.

Second, The combination of the bar, A, and catch, B, with the "shoeing horn," M, substantially as described, and for the purpose set forth.

**57,298.—HYDRAULIC ENGINE.**—Jacob Dreisorner, New York City. Antedated Aug. 2, 1866.

First, I claim the arrangement of a revolving piston having a concentric groove in its circumference, divided by a partition and placed in a suitable cylinder, provided with a slide valve, and a stationary wedge (between the two parts) made to work perfectly tight in said concentric groove, in combination with a second revolving piston, placed in a suitable cylinder, and provided with a spiral groove in its circumference, in which a piston block, held by said cylinder, is made to move perfectly tight, said spiral groove communicating at each end through passages, closed by self-acting valves with the ends or heads of the cylinder as well as with a central passage provided in shaft, and communicating with a pressure box, connected with the slide valve case of the first mentioned cylinder, the whole being combined together and operating in such a manner that the piston with the spiral groove shall force water or other fluid into said pressure box, so as to produce a pressure therein, which said pressure shall act upon either the one or the other side of the partition in the concentric groove in the first mentioned piston, in such a manner as to rotate said piston backward and forward around its axis, and which said motion shall be communicated to the second piston operating the same in the manner specified.

Second, I claim the construction of the revolving piston, B, arranged with a concentric groove, F, in its circumference, having a partition, J, and placed in a cylindrical case, C, provided with a suitable slide valve and case, in combination with a stationary block, G, fitting tight in said groove, F, and held fast in the cylindrical case, C, and situated between the parts, a and b, the whole being arranged and combined in the manner and for the purpose described.

Third, I claim the construction of the revolving piston, H, pro-

vided with a spiral groove, L, in its circumference, working in a cylinder, E, and arranged with suitable passages closed by self-acting valves, N N' and P P', forming communications between the ends of said spiral groove, L, and the ends or heads, K K', of the cylinder and the reservoir, D, connected with said cylinder as well as with the passage, M, made in the shaft, A, and through the same and its connecting chamber, R, and valve, T, with a strong box or chamber, Z, and operating in combination with the piston block, Q, made to fit tight in said spiral groove, L, and held fast in a groove, h, in the cylinder, E, in the manner and for the purpose substantially as set forth and described.

Fourth, I claim the arrangement of the spiral groove, L, in the shaft, A, communicating with the chamber, R, and valve, T, with the piston, H, and through the chamber, R, in the manner as specified.

Fifth, I claim the arrangement and construction of the piston block, Q, provided with suitable packing and fitting tight in the spiral groove, L, and held fast by means of slides or friction rollers working in the groove, h, made in the cylinder, E, capable of a motion sideways or longitudinal with the cylinder and operating in combination with the spiral groove, L, in the manner and for the purpose substantially as described.

Sixth, I claim the construction of the packing rings or bands, p p', on the sides of the concentric and spiral grooves acting diagonally toward the grooves and to the surface of the piston and operated by suitable springs, and arranged in the manner and for the purpose set forth.

Seventh, I claim the manner of packing the surfaces at the ends of the spiral groove, L, as well as the surface in the partition, J, in the concentric groove, F, by means of plates, x x and n, operated by suitable springs situated below said plates as well as by springs, v, acting against the ends of the packing plates, x x, in the manner and for the purpose described.

Eighth, I claim the arrangement of a piston, B, provided with a concentric groove, F, and a piston, H, provided with a spiral groove, L, situated upon the same shaft, or its equivalent, and working in suitable cylinders, in the manner and for the purpose substantially as set forth and described.

**57,299.—FOUNTAIN LAMP.**—John P. Driver, Marango, Iowa.

First, I claim a groove or trench, g, Fig. 6, cast in the outside of a glass fount and leading from the top to the bottom of the fount to be of sufficient depth and width to neatly take in, and imbed and hold in place an external supply pipe.

Second, A fluid, or oil duct, n o, Fig. 4, cast in the side of a glass fount to be and operate substantially as the upper portion of a supply pipe, to be so enlarged and arranged at the lower end that a metallic pipe may be securely fastened in it.

Third, A fluid or oil duct, n o, Fig. 4, made by inlaying or imbedding a glass tube in the side of a glass fount, the upper end to open and enter the fount in or about the neck, the lower end terminating in the stem, y y, said duct or inlaid pipe to operate and to be to all intents and purposes as a part of the supply pipe.

Fourth, The upward extension, N O, of the supply pipe, M N O so that it shall discharge the oil or fluids forced through it into the upper side of the fount, F, whether said elongated pipe be within the fount, or curve up around the outside of it, connecting with the inside through or about the collar.

Fifth, The enlarged aperture through the stem or bottom of the fount or as the entrance of the duct, N O.

Sixth, The thimble-shaped mouth, b, the valve, l, in the air pipe, N, Fig. 3, including the said air pipe, N, or its equivalent substantially as specified.

Seventh, The combination in a fountain lamp of a reservoir, R, in the base, either an external or internal supply pipe, M N O, which shall discharge the oil into the top, or upper side of the fount, F, whether it be a separate pipe or a duct fixed in it to the side of the fount, the cork packing, C C, the cement bed, t t the bellows, D, the air pump, B, the blow pipe, P, the air pipe, N, the groove, g, and oil duct, o, or their equivalents, substantially as and for the purpose specified.

**57,300.—SHUTTLE BINDER FOR LOOMS.**—Christopher Duckworth, Mount Carmel, Ct.

I claim the shuttle binder, composed of the parts, B C, when these parts are constructed substantially as described.

Second, The construction of the removable piece, C, with a cupped receptacle for the spring which produces pressure upon the tongue, B, substantially as described.

**57,301.—EVAPORATOR.**—Augustus S. Eddy, Smithville, N. Y.

I claim the conducting spout, C, cut-off gate, b, lever, e, and strainer, f, operated by the float, D, connecting rods, g and h, balance beam, E, substantially as herein described, in combination with the receiving tub or tank, A, the evaporating pans, B B B, and siphons, K K K, for the purpose herein set forth.

**57,302.—CAPSTAN.**—Jacob Edson, Boston, Mass.

First, I claim the combination of the pawls, r r and s s, so arranged as to operate in opposite directions with each other, with the ratchet or toothed plate, o o, and q q, as herein above described and for the purpose specified.

Second, In a capstan forming the head in which the running gears are placed in two disks united by sustaining bridges, the two disks being united so as to form substantially one piece, as specified.

Third, In a capstan constructing the ratchet or toothed plate, o o, and gear, n n, in one piece as described.

Fourth, In a capstan casting the base, a a, and shaft or spindle, b b, hollow and in one piece to e, as specified.

**57,303.—HYDRAULIC PRESS FOR PEAT, BRICK, ETC.**—A. H. Emery, New York City.

First, I claim the combination and use of the rotating disk, A, in combination with the dies, 2 2 2, etc., and presses O' and C, as and for the purposes herein specified and set forth.

Second, The combination and arrangement of the disk, A, dies, 2 2 2, etc., with two or more presses, O and O', and for the purposes herein specified and set forth.

Third, The arrangement of the rotating disk, A, dies 2 2 2, etc., in combination with the three presses, O O1 and O2, or their equivalents, as and for the purposes herein described and set forth.

Fourth, The combination and use of the presses, O', and 4, or their equivalents, as and for the purposes herein described.

Fifth, The construction and use of the compound press, O', essentially as and for the purposes herein described and set forth.

Sixth, The construction and use of the beam, C', in combination with the cylinder, 4', as and for the purposes herein described and set forth.

Seventh, The construction and use of the plungers, b b', etc., with the concave ends, essentially as and for the purposes herein described and set forth.

Eighth, The combination and arrangement of the plungers, b2, sponges, 8, and oil cups, 9, as and for the purposes herein described and set forth.

Ninth, Oiling the disks, 2 2 2, etc., as and for the purpose herein described and set forth.

Tenth, The combination and arrangement of the pressures, H and O', as and for the purposes herein described and set forth.

Eleventh, The combination and arrangement of the hopper, Q, charger, R, and dies, 2 2, etc., as and for the purpose herein specified and set forth.

Twelfth, The combination and arrangement of the disk, A, wheels, u v z, and their axis, the pawl, 15, rack, W, and press, V, essentially as and for the purposes herein described and set forth.

Thirteenth, The combination of the press, 10, pin, 11, and disk, A, essentially as and for the purposes herein described and set forth.

**57,304.—PROCESS FOR PURIFYING SPRUCE GUM.**—Hiram B. Esty, Houlton, Me.

I claim the above described mode of purifying resinous gum, the same being by means of a close chamber, and one or more sieves therein, and by heat introduced within such chamber, by means substantially as described.

I also claim the apparatus for effecting the purification of a resinous gum, the same consisting of the close chamber or vessel, one or more sieves placed therein, and a means of introducing heat into such chamber, the whole being substantially as specified.

I specially claim, for the purification of resinous gum, the employment of steam in the close chamber, with one or more sieves or strainers arranged therein for straining the gum when melted and subjected to the action of the steam.

**57,305.—MACHINE FOR FORMING AND CUTTING SKIRT SPRINGS.**—J. J. Fairbank, New York City.

First, A machine for measuring and cutting off wire into

various lengths from a continuous piece, consisting of a rotating reel with attached cutters and a traversing guide combined, substantially as herein set forth for the purpose specified.

Second, The adjustable pins or screws, I, in combination with the reel, B D, substantially as herein set forth for the purpose specified.

Third, The bar, J, furnished with spurs, u, and fixed upon a handle, s, and used in connection with the reel, B D, substantially as herein set forth for the purpose specified.

**57,306.—WATER ELEVATING DEVICE.—**Daniel Flagg, Concord, N. H.

I claim the arrangement of the vessel, A, vessel, C, and tube, D, in combination with the suction pipe, B, constructed and operating as herein described.

**57,307.—FABRIC TO BE USED AS A SUBSTITUTE FOR JAPANNED LEATHER.—**John Fletcher, Newark, N. J.

I claim a fabric produced of muslin, silk, leather, or other suitable material, united with paper by means of the compound herein specified, and coated with leather, japanner's varnish as specified.

**57,308.—PAPER-COLLAR MACHINE.—**John C. Ford, Cambridge, Mass.

I claim the combination of the convex and concave rolls, c and d, and the guides or guiding surfaces, e f g and h, when arranged to operate substantially as described.

**57,309.—HOOP SKIRT.—**Lavinia H. Foy, Worcester, Mass.

First, I claim the glazed cloth supports for the bottom hoops in combination with hoops painted or covered with some insoluble coating, as and for the purpose stated.

Second, The combination with the bottom hoops of a hoop skirt of glazed cloth supports or coverings and strips of stiff paper or other suitable material, substantially as and for the purpose set forth.

Third, The combination with the bottom hoops of a hoop skirt of stiffened supports, substantially as and for the purpose set forth.

**57,310.—ESCAPEMENT IN WATCH.—**Smith D. French, Wabash, Ind.

First, I claim so constructing the pallet arms, J J, that they shall extend over and above the escapement wheel, and that the pallets shall be projected downward from their ends across the path of the teeth of the escapement, whereby I am enabled to increase the distance between the pallets and their staff, substantially as and for the purpose above set forth.

Second, The adjustable cross bar, E, in combination with the pallet arms, J, operating in the manner and for the purpose herein specified.

**57,311.—APPARATUS FOR DISTILLING OIL.—**J. B. Grant, New York City.

First, I claim the employment in apparatus or machinery for distilling and refining petroleum and other oils, of a series of heating pipes set in the form of two cones, the bases of which meet and through which the products of combustion from the furnace pass, all substantially as herein described.

Second, The employment in the same apparatus for condensing the vapors of petroleum and other oils, of a cylinder inclosed in another cylinder with a space between them for the circulation of cool water and suitable pipes for receiving and discharging the vapors and oil in and from the internal cylinder, and the water in and from the external cylinder, all constructed substantially as herein described.

Third, The general arrangement, combination, and method of operation of the apparatus or machinery, substantially as and for the purposes herein described.

**57,312.—SPRING FOR CARRIAGES, ETC.—**A. B. Greenwalt, Baltimore, Md.

I claim a spring having the general conformation represented in Fig. 2, and formed with the curved part, c', substantially as and for the purpose set forth.

**57,313.—DIE FOR BOLT-HEADING MACHINES.—**John Gribben, Allegheny, Pa.

I claim the dies for making square headed bolts constructed substantially as herein-before described, that is to say, so that when brought together they will inclose a cavity in which to form the head, of which cavity two opposite sides are removed for a space in the direction of the length of the bolt equal to the thickness of the head, but otherwise inclosing all sides both of the blank and of the upsetting punch.

**57,314.—SELF-SEALING BUTTONHOLE PATCHES FOR PAPER COLLARS.—**Thomas Griffin, Roxbury, Mass.

First, I claim the prepared, detached self-sealing buttonhole patch, for mending paper collars when they become broken at their buttonholes, as a new article of manufacture and sale, substantially as herein described.

Second, The construction of the prepared self-sealing buttonhole mender of paper and cotton, substantially in the manner described so that it shall have sufficient stiffness for the purpose intended.

Third, Mending broken out buttonholes of paper collars, by means of a self-sealing patch, substantially as described.

**57,315.—CLOCK ESCAPEMENT.—**Emile Groux, Rome, N. Y.

I claim the combination of the pendulous pallet arms or levers, with the escapement, substantially as herein shown and described.

**57,316.—BLOCK AND TACKLE CHECK.—**D. C. Cuttridge and W. F. Rogers, Canton, Ohio.

I claim the lever, E, constructed substantially as specified, and used in connection with the block, A, as and for the purpose set forth.

**57,317.—ICE AND COAL BOX.—**Robert Hagen, St. Louis, Mo. Antedated Aug. 3, 1866.

I claim the box, A, in combination with the ice tray, D, and the doors, a' b' c' and d, when constructed and operated as and for the purpose set forth.

**57,318.—UMBRELLA.—**A. A. Hardy, Pittsburgh, Pa.

First, I claim an umbrella or parasol having supporter, A, constructed and arranged substantially as shown and described.

Second, Making said supporter adjustable, as and for the purpose set forth.

**57,319.—MACHINE FOR BORING WAGON HUBS.—**Thomas Harper, West Manchester, Pa.

I claim the use of the bearing, A', for the master wheel, B', said bearing and wheel being constructed, arranged, and operating with relation to the various parts as herein described and for the purpose set forth.

**57,320.—BROOM HEAD.—**Alexander Hartoun, Jr., Onondaga, N. Y.

I claim the combination of the two metallic parts joined together by the arms, b b b, with the guides, the metallic pins, and the shank furnished with screw thread and ferrule, all constructed substantially as and for the purpose set forth.

**57,321.—FLOAT VALVE FOR CISTERNS.—**Edwin Heald, Washington, D. C.

I claim the construction and combination of the float, A, platon, B, guides, D D, valve, C, and double screw cylinder, H, forming the valve seat, C, all as herein described, and for the purposes set forth.

**57,322.—CONSTRUCTION OF WELLS.—**Garet G. Heermance, Claverack, N. Y.

First, I claim the manner of constructing the well or hole, as set forth.

Second, The construction of the strainer section with horizontal shoulder collars, d d', and vertical ribs or strips, I, the said strainer section having the wire gauze or other finely perforated material placed outside of the pipe, and above the sand chamber thereof, substantially as described.

Third, The collars, d d' or d d' d', on the strainer section, substantially as and for the purpose described.

Fourth, Trapping the water by the partition, e, filtering it in its descent by the material, g g, and discharging it through the pipe after it has entered through a strainer section which is near the lower end of said pipe, substantially as described.

Fifth, The collar, e, in combination with an apparatus such as herein described, for the purpose set forth.

**57,323.—WRECKING CAR.—**George Herrick, Nashville, Tenn.

First, I claim the crabs, F, in combination with the windlass, H, and crank, A, applied with the track, G, and operating in the manner and for the purpose herein represented and described.

Second, The arrangement of the framing, I, mast, J, with its ends, as described, and boom, K, joined thereto, tackle, L, tackle, N, and the hoisting rope, k, in combination with the car, A, constructed and operating in the manner and for the purpose herein specified.

**57,324.—ROOFING COMPOSITION.—**Benjamin Hinkley, Troy, N. Y.

I claim a roofing composition composed, applied, and coated with whitewash, as herein described.

**57,325.—MITERING MACHINE.—**Frank A. Howard, Belfast, Me.

I claim the reciprocating head, C, with its adjustable knives or cutters, g g', in combination with adjustable rests, D D', constructed and operating substantially as and for the purpose described.

**57,326.—STOP MOTION FOR BRAIDING MACHINES.—**H. B. Howe and W. J. Mackrell, New York City.

First, We claim the tappet lever, E, and hinged latch, g, in combination with the stop lever, F, of a braiding machine, constructed and operating substantially as and for the purpose set forth.

Second, The adjustable finger, e, in combination with the tappet lever, E, and with the threads of a braiding machine, constructed and operating substantially as and for the purpose described.

**57,327.—EVAPORATOR.—**William H. Isaacs, Terre Haute, Ind.

The arrangement with the fan of the holders, F F, substantially as and for the purpose specified.

The handles, D D, in combination with the skimmer and the notches, or their equivalent, in the pan, substantially as and for the purpose described.

**57,328.—HEAD DRESS FOR LADIES.—**Hannah S. C. Iverson, New York City.

I claim the foundation piece, b, carrying the length or braid of hair, and fitted in the manner specified, so as to be introduced within the natural hair, for the purposes and as set forth.

**57,329.—WATER GATE.—**Nathaniel Jenkins, Boston, Mass. Antedated Aug. 15, 1866.

For a water gate, the arrangement of a valve, consisting of a non-elastic core, O, preferably hollow, clothed with elastic material, p, and its combination with the ledges, d, of the valve seat, operating substantially as described.

**57,330.—COP WINDING MACHINE.—**Barton H. Jenks, Bridesburg, Pa.

First, The hollow spindle, C, in combination with the bobbin spindle, C', when the same are constructed, arranged, and operate in the manner and for the purpose herein described.

Second, The combination and arrangement of the hollow spindle, C, bobbin spindle, C', and blank holders, B B', substantially in the manner and for the purpose herein described.

**57,331.—HAY PRESS.—**Isaac H. Johnson, Long Reach, West Va.

First, I claim a double-acting press, consisting of a follower working in a box in either direction on three horizontal or perpendicular fixed screws, the force and velocity of which machine are capable of being varied within certain limits at pleasure, in the manner and for the purposes described.

Second, Providing a press constructed as described with a grating, g, arranged as and for the purpose set forth.

**57,332.—AUTOMATIC CALCULATOR FOR SCALES.—**John Johnson, Saco, Me.

I claim the fixed plate, F, the revolving disk, G, and the index, I, in combination with the spiral spring balance or other weighing apparatus, for the purpose of indicating the total value of any article that is weighed upon the scale.

**57,333.—LINING FOR OIL BARRELS.—**Robert V. Jones, Canton, Ohio.

I claim the within mentioned ingredients when mixed together and used as and for the purposes herein specified.

**57,334.—MITER BOX.—**George Keating, Thomaston, Me.

I claim an adjustable miter box for sawing beveled work or miters for rhomboidal figures of any desired angles, constructed and arranged substantially as herein described.

**57,335.—SKATE.—**Jacob Kinzer, Pittsburgh, Pa.

I claim as an article of manufacture a cast-iron skate, substantially as shown and described.

**57,336.—HAND SPINNING MACHINE.—**H. Koeller, Camp Point, Ill.

I claim the swivel standard, B, forming the bearings for the shafts, d e, and the bifurcated arm, C, forming the bearings for the spindle, E, in combination with the screw clamp, A, constructed and operating substantially as and for the purpose described.

Also, the driving wheel, D, and India-rubber disk, f, standard, B, arm, C, spindle, E, and screw clamp, A, all constructed and operating substantially as and for the purpose set forth.

**57,337.—HORSE HAY FORK.—**Andrew J. Laird, Middleton, Pa.

First, I claim, in combination with a sliding rod, C I, the lever, F, with its upper horizontal arm adapted to project through the ring, H, substantially as described and for the purpose set forth.

Second, I claim the combination of the bars, A A, sliding rod, C, lines, D D, link or connecting rod, E, and lever, F, all arranged and operating substantially as described.

**57,338.—BED-BUG TRAP.—**Ezra B. Lake, Bridgeport, N. J.

I claim an improved bed bug trap, the same consisting of the box with circular flange, A, partitions, E F, forming compartments, B C D, grooved block, G, cap, H, and trough, J, constructed and arranged substantially as herein described and for the purpose set forth.

**57,339.—ANCHOR.—**F. J. Latham, New York City.

I claim, in combination with the shank constructed substantially as shown, the use or employment of the stock, flukes, and crown piece, as and for the purposes fully indicated.

**57,340.—FRACTURE BED.—**M. M. Latta, Goshen, Ind.

I claim the bed having a central portion, C, consisting of the slide moving in guides, F, on rollers, G, and the sliding chamber holder, H, provided with the sections, B D, and supports, E, operating substantially in the manner and for the purpose represented and described.

**57,341.—PLOW.—**Z. W. Lee, Blakely, Ga.

I claim the combination of the shank, E, bracket, F, pivoted arm, J, shackle, K, and wedge, L, all arranged and operating substantially as and for the purposes herein explained.

**57,342.—BUTTONHOLE CUTTER.—**William Lieber, New York City.

I claim the slotted knife, d, operating in combination with the grooved bracket, a, provided with stud, f, arranged with the adjustable anvil, c, on bracket, b, substantially as represented and described.

**57,343.—JOURNAL BOX.—**Edward F. Light, Worcester, Mass.

Making the lower half, A, of a journal box with a groove or channel, b, and chamber or recess, C, in combination with the upper edges, with inclined planes, a, and the end with flanges, c and e, substantially as set forth.

**57,344.—CHILDREN'S SLED.—**N. P. Lindergreen, Boston, Mass.

I claim the brake levers, c, hung to and upon the sides of a children's sled, substantially as and for the purpose described.

I also claim connecting the rope of the sled to the brake levers, c, through short pieces, I, substantially as described and for the purpose specified.

**57,345.—CORN HARVESTER.—**Robert B. Linthicum, Lexington, Ill.

First, I claim the combination of the curved arm, J, cross bar, L, wheels, m, shock receiver, H, and curved track, K, arranged and operating substantially as shown and described.

Second, I claim, in connection with a shock receiver, H, the employment of lever, Q, with the hooks, I and g, and the compressing cord, n, as and for the purposes specified.

Third, I claim the arrangement of the pivoted wheels, W, and vibrating bar, T, with the frame, B, of a harvesting machine, as and for the purposes set forth.

**57,346.—HORSESHOE.—**William Litzenberg, Macomb, Ill.

I claim combining with the main part, A, of the shoe, the removable and reversible corks, B and C, constructed and applied substantially as herein described and for the purpose set forth.

**57,347.—FUNNEL.—**C. L. Lochman, Carlisle, Pa.

First, I claim a funnel provided at the spout with a spigot or valve, worked by the upright rod, H, for opening and closing the same, substantially as set forth.

Second, A funnel having a valve at its nozzle and a screw washer or fastener at its neck, substantially as described.

Third, In combination with a funnel, having a metallic or an elastic washer, E, E, and a valve or a stopple at the spout, an air tube, B B, and shield, D, for the purpose specified.

**57,348.—WASHING MACHINE.—**James R. Madison, Oneida, Ill.

I claim the rubbers, 1 2 3, operated by the crank, C, and the pitman, D, the cogged rock, F, in combination with the wheel, S, and fly-wheel, A, when the same are constructed in the aforesaid combination and for the purposes set forth.

**57,349.—MODE OF TEMPERING STEEL.—**Cephus Manning, Chillicothe, Ohio. Antedated Aug. 8, 1866.

I claim the use of raw linseed oil, in the manner and for the purpose specified.

**57,350.—STOP MOTION OF LOOMS.—**Adams Marchington, Upland, Pa.

First, I claim the vibrating lever, F, in combination with the wiper, K, on the shaft, B, all arranged and operating substantially as described.

Second, I also claim placing the vibrating lever, F, on a sliding bar, J, substantially as described.

Third, I also claim, in combination with the wiper, K, the lever, F, the sliding bar, J, and the levers, M and N, substantially as described.

**57,351.—RAILROAD-CAR SEAT.—**Mark M. and Frank Martin, Aurora, Ind.

First, We claim a car seat composed of two distinct parts, to wit: the body, A, and supporting frame, D, when hinged or otherwise connected together, substantially as herein described and for the purpose set forth.

Second, In combination with the body, A, and supporting frame, D, we claim the adjustable supports G G', and locking device, J J', all arranged as and for the purpose explained.

Third, In combination with the elements of the first claim, we also claim the sockets, f f, anchoring pins, K K', hook, L, and staple, N, to enable the reversal of the seat and securing it in either position, in the manner described.

**57,352.—FRICTION PULLEY.—**L. G. Mason, Worcester, Mass.

First, I claim the combination of a hinged friction lever, E, with the slide, d, frame, C, and shipper piece, G, with a cam fork, f, substantially as and for the purpose set forth.

Second, I claim making flange, F, with slots to receive the slides, d, in combination with providing arms, D, with slots, b, for the purposes stated.

**57,353.—TURN TABLE FOR RAILROADS.—**G. B. Massey, Mobile, Ala.

A railroad turn table provided with endless metallic belts, G, fitted on drums, E F, the shafts of one or more of which have pinions for their lower ends, in combination with the fixed wheel, B, at the bottom of the pit in which the turn table is fitted, and into which wheel the pinions gear, substantially as and for the purpose set forth.

**57,354.—IRON FOR CURLING HAIR.—**Hiram S. Maxim, Boston, Mass.

I claim, in combination with a hair-curling iron or rod, and so as to form a part thereof, a flame burner and chamber, and a fuel or gas chamber for heating the iron or rod, substantially as described.

I also claim, in combination with the flame chamber and curling rod, the steam-generating chamber, arranged to operate substantially as set forth.

**57,355.—ENGINE FOR REDUCING RAGS, ETC., TO FIBER.—**James McCracken, Bloomfield, N. J. Antedated Aug. 8, 1866.

First, The combination, in an engine of similar character to what is known as a rag engine for the reduction of fibrous stock, of a circular or annular stationary trough, one or more conical rollers, and a conical washer, substantially as and for the purpose herein specified.

Second, The combination of a circular or annular stationary trough, one or more conical rollers, and one or more series of stationary straight knives, b b, arranged in planes parallel with the shaft or shafts of the roller or rollers, substantially as and for the purpose herein specified.

**57,356.—STOPPER FOR BOTTLES.—**Frederick Miller, Newark, N. J.

I claim a bottle stopper composed of a metal cap or socket, D, containing a packing, E, of india-rubber, or other suitable elastic and water-proof material, and connected by metal rods or straps, c c, to a metal band, C, around the neck of the bottle, the rods or straps being attached to the band by a joint connection to admit of the packing being pressed or shoved over and off from the mouth or nozzle of the bottle, substantially as shown and described.

**57,357.—MEDICINE.—**George Montgomery, Canton, Ill.

I claim a pulmonary balsam, as herein described, when compounded of the ingredients specified, substantially as described.

**57,358.—GRATE BAR.—**Richard Montgomery, New York City.

First, I claim the fluted corrugated plates or sheets, C C, projecting from the sides of the bar, A, constructed and arranged substantially as described.

Second, The hollow tubes, d d, in combination with the corrugated fluted plates, C C, substantially in the manner and for the purpose set forth.

Third, I claim the notches, e e, in combination with the plates or sheets, C C, substantially as described.

**57,359.—CONSTRUCTION OF SHIPS.—**Richard Montgomery, New York City.

First, I claim the combination of the keel, D, ribs, E, and keelson, B, when arranged and secured together, substantially as set forth.

Second, The combination and arrangement of the keel, D, and

keelson, B, in the manner set forth, for forming the bow and stern post of vessels.

Third, Covering the frame of a vessel thus constructed, first with a sheathing of iron sheets or plates, over which is placed the planking, the three being united together by bolting or otherwise.

Fourth, Connecting the ends of two beams when they are required to be united in any other than a right line with each other to complete the required structure, substantially as described and set forth in Figs. 3 and 4.

**57,360.—CORN HARVESTER.—Charles G. Moreman, Brandenburg, Ky.**  
First, I claim the provision in a corn harvester of a cradle consisting of the rock shafts, P P', and tines, p p', arranged in relation to each other and to the cutters, F and G, and main frame, A, and operating substantially as described and set forth.

Second, In combination with the cradle, P P' p p', I claim the retaining and liberating mechanism, R R' S S', and T t, as and for the purpose explained.

**57,361.—DEVICE FOR CUTTING CORN FROM THE COB.—F. A. Morley, New York City.**  
First, I claim the four knives, C C C C, forming an elastic cutting ring, their cutting edges, c, being overlapped, each knife having its side edge, c, on the outside of lap and the opposite edge, r, on the inside of the lap, and having oblique cutting edges in connection with the bed, G, having a trough or groove, k, and sliding headblock, H, as herein shown and described.

Second, I claim gages or guides, D, in connection with the knives, C, and set screws, e, for regulating the depth of the cut and allowing all sizes of ears to be run through, as herein shown and explained.

**57,362.—BLOW PIPE.—O. A. Moses, Charleston, S. C.**  
First, I claim the slot, B, and slider, a, and the movements imparted to the same, operating in the manner and for the purpose hereinbefore stated.

Second, The forked lever, E, and set screws, G and H, or their mechanical equivalents, and the standard, F, and the movements imparted to the same, in the manner and for the purpose specified.

Third, The clamps, R S, and connecting rods, Q Q', and the application of the screw arrangements, O P' a c N M F' d and K L, or their mechanical equivalents, operating substantially in the manner and for the purpose hereinbefore specified.

Fourth, The axle of the lamp, V, the levered screw, X, and curved washer, Y, and the slot in which they play, or their mechanical equivalents, operating in the manner and for the purpose herein described, or any other substantially the same.

**57,363.—STRAW CUTTER.—J. H. Mumma, Harrisburg, Pa.**  
I claim the disks, D D', with their ribs, c c, and recesses, f, adapted for the reception of the adjustable plates, E, the whole being constructed and arranged substantially as described.

**57,364.—BEAM OF LETTER SCALES.—Richard Muddock, Baltimore, Md.**  
I claim the letter scales provided with a graduated beam having the figures upon its flat upper side, substantially as described.

**57,365.—SPRING FOR RAILROAD CARS.—John Murphy, New York City.**  
First, I claim the yielding fibrous envelope, B, so arranged around a mass of rubber, A, as to support the exterior while the rubber in its interior is free from fiber, all substantially as and for the purposes herein set forth.

Second, I claim a rubber and fibrous spring composed of the interior mass, A, and an exterior layer, C, and ends, D1 D2, of rubber, in combination with a yielding fibrous envelope or support completely imbedded in and covered by the rubber, substantially as and for the purposes herein set forth.

**57,366.—FENCE.—William Neely, Sandy, Ohio.**  
I claim an improved fence formed by the combination of the iron posts, A, constructed as herein described, with the rails, B, substantially as and for the purpose set forth.

**57,367.—CANE HANDLE.—Herman Nitzsche, Philadelphia, Pa.**  
Holding together the parts composing an angular shaped handle for canes, etc., and directing the lengths of the handle forming the angle by means of the bent screw rod, a, the nuts, b1 b2, and the angle piece, b, substantially as herein specified and described.

**57,368.—STOVE-PIPE DAMPER.—H. Ogborn and A. F. Chapin, Richmond, Ind.**  
First, The bar or rod, B, slots, I I, and sliding valve, C, when used for the purposes and in the manner set forth.

Second, We claim the plates, A and D D, in combination with the bar or rod, B, slot, I, and sliding valve, C, when arranged in the manner and for the purposes set forth.

Third, We claim the journals, n n, box, E E, bearings, K K, boxes, X X, and rod, B, in combination with slots, I I, rivets, H H, and groove, F, when the same are arranged, combined, and operated in the manner and for the purposes set forth.

**57,369.—BROOM HEAD AND CLAMP.—M. W. Owens, Waterford, Pa.**  
First, An improved broom head, formed by combining the wooden head, B, and metallic clasps, C, when constructed as herein described, with each other, and with the bars, E, bolts, F, and corns, G, substantially as described and for the purpose set forth.

Second, The clamp or packer, H, constructed as herein described, when used in combination with the broom head, B C, and corn, G, substantially as described and for the purpose set forth.

**57,370.—ERASER HOLDER.—William P. Patton, Harrisburg, Pa.**  
I claim, First, The construction of the clamping plates, as shown in Figs. 2 and 5, and their combination with an eraser, B, as shown in Fig. 4, substantially for the purpose herein set forth.

Second, I claim the subject of the first claim in combination with a rigid or non-elastic ferrule, g, substantially as and for the purpose specified.

Third, I claim the combination of the plates, Figs. 2 and 5, eraser, b, the screen, c, or its equivalent, and the ferrule, g, with a lead pencil, substantially in the manner set forth and described.

**57,371.—VENTILATING BOOT.—Samuel Perry, New York City.**  
I claim the arrangement of the perforated inner sole, B, and outer sole, C, forming the canal, E, in combination with the grooved plate, H, communicating with the said canal, and the outer air, all constructed and operating in the manner and for the purpose herein specified.

**57,372.—TEA AND COFFEE POTS.—Luke A. Plumb, Biddeford, Me.**  
I claim the flue, B, within the pot, A, in combination with the tube, E, provided with openings covered with mica, F, and the lamp, D, all arranged substantially as and for the purpose specified.

I also claim the radiator, G, in combination with the flue, B, and pot, A, substantially as and for the purpose set forth.

**57,373.—STOVE-COVER LIFTER.—Charles H. Porter, Providence, R. I.**  
I claim a lifter for stove covers, having a covering plate, or its equivalent, for its lifting hook, or end, arranged so as to be operated substantially in the manner described and for the purpose specified.

**57,374.—FOLDING AND PLAITING DEVICE FOR SEWING MACHINE.—William Preiss, New York City.**  
I claim, First, The curved bar, A, in combination with the blade, C and D, constructed and operating substantially as described and for the purposes set forth.

Second, I claim the combination and arrangement of the curved bar, N, folding blades, C and D, and the hinged holder, E, the whole constructed and operating substantially as described and specified.

Third, I claim the combination of the hinged holder, E, with the blades, c and d, and guide, . . . and 4, substantially as described and specified.

**57,375.—PISTON PACKING.—E. B. Prindle, Aurora, Ill.**  
I claim, First, The combination of the sectional beveled packing rings, a a, and wedge rings, b b, placed within annular recesses formed in the circumference of a piston, so that steam, acting through perforations, c c, through the followers of the piston, shall effect the uniform expansion of the packing, substantially as described.

Second, The combination of the two sets of packing rings, a a, the wedge rings, b b, and springs, g g g, with the skeleton rim, A, of the piston, and the perforated followers, B B', substantially as described.

**57,376.—TREATING METALLIFEROUS ORES.—William L. Raht, Baltimore, Md.**  
I claim the within-described process of expelling from metalliferous ores sulphur, arsenic, or antimony, by treating the matte or regulus run from such ores, in the manner set forth.

**57,377.—MANUFACTURE OF ELASTIC SPRINGS.—Silas G. Randall, Providence, R. I. Antedated Aug. 8, 1866.**  
I claim the use of flexible tubing, brought into the form and acting in the manner herein described, and for the purposes set forth.

**57,378.—BROOM AND BRUSH HEAD.—George T. Reed, Philadelphia, Pa.**  
I claim the combination of the handle, F, headlock, H, clamp, I, in two parts, containing one or more ribs, dovetail slides, A A, and connection by two screws, B B.

**57,379.—POLE-IRON SOCKET FOR CARRIAGES.—Uel Reynolds, New York City.**  
I claim the clasp, d, fitted as specified, in combination with the socket, for the pole of carriages, etc., as and for the purposes set forth.

**57,380.—GOLD-BEATING APPARATUS.—Thomas C. Robbins, Philadelphia, Pa.**  
We claim the vertically-guided hammer, d, in combination with reciprocating cross-head, G, or its equivalent, the whole being constructed and operating, substantially as and for the purpose described.

**57,381.—HOP-VINE SUPPORT.—Norman C. Roberts, Burlington, N. Y., and Ezra W. Badger, Otsego, N. Y.**  
We claim the use of two or more wooden rods, A B, to each hill of hops, the rods, B, being placed horizontally, or at an angle, as described, and connected to the rods, A, by means of the wire, c, and staple, d, or connected to the parts, A, by the loops, b, and to the supporting or bracing wire No. 2, by means of the loops or bands, a, which are capable of sliding upon the said supporting wire, so as to allow said rods, B, to adjust themselves in conformity with the depth to which the main rods, A, are driven into the ground.

**57,382.—BOTTLE STOPPER.—George W. Rogers, New York City.**  
I claim the rectangular recessed valve seat, c c, in the bottom of the screw-threaded cavity, in combination with flange plate, g, also used as a valve seat, substantially as described.

**57,383.—CHUCK.—Robert and Thomas Ross, Middleburg, Vt.**  
We claim the long pinions, g, or their equivalents, in combination with the nuts, b, screws, c, and jaws, B, of a chuck, constructed and operating substantially as and for the purpose described.

**57,384.—FLY FLAPS.—Tobias Royer, Lancaster, Pa.**  
I claim the manufacture of fly flaps, or nets, when made by plaiting or braiding the horizontal and longitudinal cords or braids with or into each other, substantially in the manner specified and shown.

**57,385.—CAR COUPLING.—Jesse B. Rumsey, Washington, D. C.**  
I claim the eccentric spring, B, spindle, C, coil spring, F, plate, H, bracket, G, and pin, D, together with a metal case, A, when constructed and arranged in the manner herein set forth.

**57,386.—STEAM ENGINE.—William H. Sangster and Justin C. Ware, Titusville, Pa.**  
We claim the steam chest, the steam cylinder, and the sliding pipe, G, constructed and arranged to operate in the manner and for the purpose herein specified.

**57,387.—STAVE JOINTER.—James F. Sayer, Macomb, N. Y.**  
I claim the double-acting knife, B, in combination with the table having the curved side, a, groove, r, plane, c, and clamp, f, attached, when constructed to operate substantially as described and for the purposes set forth.

**57,388.—ROLLING IRON OR STEEL.—Joseph S. Seaman, Pittsburgh, Pa.**  
I claim, First, Giving the grain of iron or steel a twist by rolling it on its axis, under compression, in the manner and by means substantially as and for the purposes hereinbefore described.

Second, Subjecting metallic bars to rolling compression between parallel bearing surfaces, of greater length than the tangential bearing point given by rolls when the metal is passed between them at right angles to their axes, such bearing surfaces being obtained by causing the metallic bar to pass between grooved cylindrical rolls at an angle to their axis other than a right angle, said rolls being constructed substantially as and for the purposes hereinbefore described.

**57,389.—EGG TESTER.—Frank B. Seeley, Johnson's Creek, N. Y.**  
I claim the combination of the slide, C, with the holes, a a, of the cover, B, and the mirror, c, the whole arranged and operating substantially in the manner and for the purpose specified.

**57,390.—BURNING FLUID.—E. D. Seely, Brookline, Mass.**  
I claim, First, The within described compound, which I term "red kerosene," as a new article of manufacture.

Second, Also the within described process of rendering naphtha non-explosive by treating the same substantially in the manner herein set forth.

**57,391.—APPLE PARER AND CORER.—Henry Seleck, Lewiston, Pa.**  
I claim, First, The combination of the slides, C and F, the fork, E, the block, D, and lever, G, with each other, and with the sides of the box, A, the parts being constructed and arranged substantially as described and for the purpose set forth.

Second, The circular rest, M, in combination with the arm, M, arranged in the manner and for the purpose specified.

Third, The combination of the coring knife or tube, H, and quartering knives, I J K and L, constructed as described, with the box, A, fork, E, and block, D, and slide, C, substantially as and for the purpose set forth.

**57,392.—MACHINE FOR CLAMPING AND STRETCHING LEATHER.—Elijah Shaw, Milwaukee, Wis.**  
I claim the clamping and stretching of fabrics and other articles connected by sewed or stitched seams, for the purpose of burishing and trimming the seams, by means of a bed, I, and jaws, g g, arranged in such a manner that by the action of a treadle or its equivalent the jaws, g g, will first clamp and hold the article firmly, and the bed then rise in order to stretch the article on the same, substantially as set forth.

I further claim the arrangement of the pivoted arms, K K, with jaws, g, attached, cross bar or slide, M, treadle, H, and springs, L L N, substantially as and for the purpose specified.

I further claim the slide, D, provided with the inclined surfaces, a a, and connected to the treadle, H, by the strap, G, in combination with the inclined surfaces, c c, at the under side of the bed, I, substantially as and for the purpose set forth.

I also claim the combination of the bed, I, provided with the inclined surfaces, c c, slide, D, provided with the inclined surfaces,

a a, and connected to the treadle, H, by the strap, G, the pivoted arms, K K, provided with the jaws, g, and the cross bar or slide, M, connected with the treadle, and arranged to operate in connection with the arms, K, all substantially as and for the purpose herein shown and described.

**57,393.—CORN SHELLER.—E. F. Sherman, Chicopee Falls, Mass.**  
I claim the combination of the cylinder, A, bonnet, C, teeth, a, belt, F F, pulley, G G, and trough, M, arranged and operating substantially as described.

**57,394.—APPARATUS FOR REDUCING ORES.—George B. Simpson, Washington, D. C.**  
First, I claim the apparatus consisting of the crucible, tube, or vessel, in combination with the fire-brick, soap-stone, or other material resistant of heat as a covering for top and bottom, and the frame of similar materials to hold the parts together as a whole.

Second, The gas pipes with the gas burner, in combination with the crucible, frame, and gasometer.

Third, The process of resolving metallic ores in an air-tight crucible, tube, or vessel heated externally in combination with common coal gas, petroleum gas, spirit gas, or any other known inflammable gas.

Fourth, The use of salt, borax, saltpeter, soda, potash, or any other known salt or alkali, either dry or in solution as a flux, in combination with the crucible, metallic tube, or vessel, the frame, gas pipes, and the gases for the purposes and uses specified.

Fifth, The process of resolving the metallic ores in the absence of the oxygen of the atmosphere and in the presence of superabundance of carbon by means of heat externally applied, the gases, salts, and alkalies internally applied, in combination with the galvanic or electric current, if necessary, and the apparatus substantially as hereinbefore described.

**57,395.—BED BOTTOM.—Edmund Smith, Jr., and Alonzo Chase, Worcester, Mass.**  
We claim the triangular braided form of the coil springs, connected at one point to the slats, S S, and the base to the bar or frame, B, substantially as above set forth and described.

**57,396.—GRATE.—George L. Smith, Brooklyn, N. Y.**  
First, I claim a grate which is composed of a number of sections, each one of which is made up of reversible plates, so constructed that when one surface is burnt out another surface can be presented, substantially as described.

Second, A grate which is composed of a series of vertical plates applied to an oscillatory bearer, substantially as described.

Third, The construction of triangular grate plates, a a, with guards, H H, or the equivalent thereof, for protecting the bearer, k, substantially as described.

Fourth, Arranging reversible right-angled grate plates upon movable bearers, k, with spaces between them for allowing of a free circulation of air over the bearers, substantially as described.

Fifth, The construction of the end plates, G, with arms, in combination with the oscillating bearers, and connecting link or rod, d, substantially as described.

**57,397.—CAR COUPLING.—D. B. Snyder, Millville, N. Y.**  
First, I claim the buffer, B, with its socket, x, and lever, E, constructed and adapted for the reception and retention of the bar, D, substantially as described.

Second, The shaft, G, with its cam, c, combined with the lever, E, and with the within described operating devices or their equivalents, substantially as and for the purpose described.

**57,398.—TICKET REGISTER.—George R. Solomon, Jr., and Joseph Solomon, New York City.**  
We claim the ticket box, A B, with a slit, e, and elastic delivering rollers, G G, spring pawl, j, and roll holding shaft, f, all arranged and operating substantially in the manner and for the purpose described.

**57,399.—CARPET BAG FRAME.—Albert Sonnekalb and John W. Seib, Newark, N. J.**  
We claim, in a traveling-bag frame, made with box jaws of equal size and closing into each other, the miter-jointed elbows, b b, in combination with the hinges, when constructed and arranged as described.

**57,400.—COMPOSITION FOR ROOFING, ETC.—Chauncey Spear, Hopewell, N. Y.**  
I claim the composition for roofing, paving, or other purposes, consisting of peat, gypsum, coal ashes, or vegetable mold, combined with clay and tar, substantially in the proportions set forth.

**57,401.—BLACKING BOX.—Thomas H. Spencer, Providence, R. I.**  
I claim the combination of the box with the handle, A, joined at B, and furnished with a short arm, C, for holding the cover, all as described and for the purpose set forth.

**57,402.—TOBACCO PIPE.—A. F. Strayman, M. D., Baltimore, Md.**  
I claim a tobacco pipe bowl or stem composed of cork, substantially as described.

**57,403.—FLUTING MACHINE.—Charles A. Sterling, New York City.**  
I claim a fluting machine composed of a corrugated bed, A, and a correspondingly corrugated segmental presser, B, substantially as set forth.

**57,404.—SAFETY CAR TRUCK.—Ezra Stiles, Springfield, Mass.**  
I claim, in combination with an ordinary car truck, the inside wheels, C C C, and the central axle, D, and wheels, E E, when arranged and operating substantially in the manner and for the purpose set forth.

**57,405.—SHINGLE MACHINE.—Owen Stoddard, Busti, N. Y.**  
First, I claim the sliding frame, f, lever, E, arms, I and P', in combination with eccentric, d', and knife, D, arranged as and for the purpose set forth.

Second, The slide, m m, spring, l, arms, t t, and cam, v, in combination with the dogs, i i', ratchet wheels, n n', and feed rollers, g h, substantially as and for the purpose set forth.

Third, The lever, L', head, K, provided with vertical and diagonal grooves, 1 2 3 4, and shifter, X, in combination with the arms, t t, and cam, v, substantially as and for the purpose described.

Fourth, The set screw, o', arm, k', guides, g g, lever, L', and arms, t t, arranged and operating in the manner and for the purpose specified.

**57,406.—HOMINY MACHINE.—Henry Taylor, Goose Creek, Va.**  
First, I claim so arranging the beaters upon a rotating shaft, as to sweep the entire surface, or nearly the entire surface, of the shell or hollow cylinder, substantially in the manner and for the purposes set forth.

Second, I also claim the combination of the heaters, B, and screen, C, for discharging the meal from the machine, substantially as described.

**57,407.—COMBINED SCREEN AND WEIGHING DEVICE.—W. H. Taylor, Pittsburgh, Pa.**  
I claim the inclined screen, D, in combination with the trough, E, suspended from scales platform, c, and provided with the door, F, all arranged with a suitable framing, A, to operate in the manner substantially as and for the purpose herein set forth.

**57,408.—FENCE.—Daniel Terry, Wakeman, Ohio.**  
I claim a fence, constructed with a frame, A B C, sustaining the wire, F, having the posts, A, inserted in the ground, or supported upon foot pieces, D, and attached to one another by pins, E, the said several parts being respectively constructed, and the whole arranged for use, substantially as set forth.

**57,409.—PROCESS OF PREPARING RAW HIDE FOR THE MANUFACTURE OF VARIOUS ARTICLES.—William H. Powers, New York City.**  
I claim the treatment of raw hide with sulphur, or any combi

nation of, or equivalent to, sulphur, for the purpose of producing the material and the effects before described.

**57,410.—TIRE-SHRINKING MACHINE.**—Thomas Tully, Litchfield, Ill.

I claim the combination of the curved grooves, G G, eccentric dogs, H H, eccentric lever, D E, and fixed and sliding blocks, F and B, when constructed and arranged to operate as and for the purpose herein specified.

**57,411.—GRATE BAR.**—Lorenzo B. Tupper, New York City.

I claim the grate bar, formed with a straight, or nearly straight surface, for the fuel, and with a supporting rib having compound corrugations, as and for the purposes set forth.

**57,412.—MODE OF SUPPLYING AIR TO AIR CHAMBER.**—P. H. Vander Weyde, Philadelphia, Pa.

I claim the combination of air chambers, H and F, the valve, P and N, and stop cock, R and G, all arranged in the manner described, so as to supply the constant loss of air taking place in the air chambers of force pumps.

**57,413.—NECK YOKE.**—N. H. Vosburgh, Coxsackie, N. Y.

I claim the metal bar or strap, and eye, connected by a joint or hinge, and applied or secured to the leather loop of a neck yoke, substantially as and for the purpose herein set forth.

**57,414.—SPICE HOLDER.**—A. J. Walker, Lowell, Mass.

I claim the combination of the chambered wheel, A, and holder, G, provided with lid, I, and having drawer, J, and box L, arranged therewith, substantially as described, for the purpose specified.

I also claim the wheel, A, having partition plates, C, slotted center tube, D, and spindle, E, with stud, b, in combination with the stand or holder, G, substantially as and for the purpose specified.

**57,415.—BRICK MACHINE.**—Robt. L. Walker, Globe Village, Mass.

I claim the reciprocating piston or plunger, H, fitted within a box or tube, G, placed underneath the cylinder or case, A, of the mud or pug mill, and communicating therewith, and having its ends beyond the part in which the piston or plunger works, of taper form, so as to cause the clay to be compressed as it is forced out through and from the box or tube, substantially as shown and described.

I further claim the rollers, f, applied to the ends of the box or tube, G, and arranged to operate substantially as and for the purpose specified.

**57,416.—CRUTCH.**—R. W. Ware, Chicago, Ill.

I claim the combination of the sliding tube, C, provided with the spur, E, the spiral spring, F, and the adjustable tube, A, when said parts are arranged to operate as herein shown and described.

**57,417.—WAGON BRAKE.**—James Weathers, Greensburg, Ind.

I claim the arrangement of the bar, F, pivoted or bolted to the hind hound with the rod, G, block, H H, cord, J, shaft, K, provided with wheel, a, and lever, L, constructed and operating as and for the purpose herein specified.

**57,418.—STEAM-ENGINE OIL CUP.**—Nelson J. White, (assignor to Samuel C. Woodward), Lawrence, Mass.

First, I claim the arrangement of two cups, one within the other, substantially as described.

Second, I claim the arrangement of the cup or casing, A, cup, B, aperture, D E and C, whereby to inject oil or other substance into a steam chest, or other part occupied by steam, through the same aperture by which the steam is taken to the top of the oil or other substance.

**57,419.—HARVESTER.**—William N. Whiteley, Jr., Springfield, Ohio.

First, I claim the reversible, adjustable driver's seat with an adjustable, reversible standard, located on the main frame between the driving wheels, substantially as described.

Second, I claim the plates, C, on the pinion shaft provided with two or more handles or arms, and also provided with an eccentric slot or edge in combination with the pawl, for the purpose of releasing and holding the pawl from the ratchet, and releasing the pinion when desired.

Third, I claim the arrangement in combination with a harvesting machine having a hinged cutting apparatus and removable self-raking attachment of the raker's stand, substantially as described, whereby the attendant is enabled to remove the gavels by hand, when the self-raking attachment is removed, as specified.

Fourth, I claim a harvester frame mounted on two driving wheels, in combination with the divider, K', platform and finger bar hinged to the frame and combined with a reel which acts independent of the rake, which rake is arranged substantially as described, so as to move the grain heads forward at intervals, sideways, and backward over the platform.

Fifth, I claim the combination of a rake, and reel independent of the rake, on a harvesting machine, with a hinged finger bar, substantially as described, the rake moving the grain heads forward, sideways, and backward, independent of the reeling mechanism.

Sixth, I claim, in combination with a reel arranged to traverse on its shaft, the sleeve, B, and connecting rod, S, which adjusts and holds the reel properly over the cutters throughout all the vibrations of the finger bar.

**57,420.—HORSESHOE.**—Albert S. Wilkinson, Pawtucket, R. I.

I claim forming a horseshoe of a narrow upper plate, and a broad lower plate attached one to the other by tapering rivets, substantially as shown and described.

**57,421.—MACHINE FOR RAKING AND LOADING HAY.**—Hosea Willard, Vergennes, Vt.

First, I claim the hay elevator, composed of the endless chains, F F P P, having rods, K Q, attached, provided with teeth, f m, in combination with the guide frame, R, all arranged in connection with, or applied to the frames, A D, mounted on wheels, substantially as and for the purpose set forth.

Second, The toothed shaft, s, in combination with and arranged relatively to the endless elevators, and guide frame, substantially as and for the purpose specified.

Third, The adjustable plates, L L, in which the shaft, H, is fitted, arranged to vibrate upon the axle, C, and applied as shown for adjusting the teeth, f, of the chains, F, higher or lower, as may be required.

**57,422.—INSTRUMENT FOR OPENING TIN CANS.**—John Willard, Norwich, Conn.

I claim the can opener constructed of one piece of metal with a blade, B, transverse shoulders, b b, and a handle, as herein specified and shown.

**57,423.—LOCK.**—Geo. M. Wood, Decatur, Ill.

First, The combination of the slide latch, B, with friction rollers, D E E, in order to admit of the free movement of the slide, or to obviate friction, constructed substantially as shown and described.

Second, The combination of the roller, C, roller, D E E, roller, C', and slide latch, B, operating with the arbor, G, with oblique projector, I, substantially as described for the purpose specified.

Third, The locking device composed of the sliding bar, K, working in a mortise, a', in the spindle or arbor, and operated in the manner shown, or in any equivalent way, substantially as and for the purpose herein set forth.

**57,424.—STEAM VALVE.**—James B. Wood, Lansingburgh, N. Y.

I claim the outer casing, H, inner and independent nut, G, having projections interlocking, with the notches in the said outer casing and valve stem, F, when combined together, substantially as and for the purpose described.

**57,425.—GAS REGULATOR.**—Joseph S. Wood, Philadelphia, Pa.

I claim, First, Passing the gas into the floating receiver, C, by the bent pipe, E, and valve, h, n, and out by the bent pipe, F, arranged and operating substantially as described.

Second, I claim using the pipes, E and F, as guides for the rising and falling of the receiver, C, substantially as described.

Third, I claim the combination of the vessel, A, pipes, E and F, receiver, C, and valve, h, arranged and operating substantially as described.

**57,426.—SUSPENDER.**—A. Woodard, Bangor, Me.

I claim the arrangement of spring, a, a, stirrup or loop, C, and sheath, B B', when constructed and arranged to operate in manner substantially as and for the purposes specified.

**57,427.—PROCESS FOR EXTRACTING OIL FROM FISH.**—Edward H. Woodward, New York City.

I claim submitting fish to the action of a digester, as herein set forth, and extracting the oil therefrom without pressure, substantially as herein described.

**57,428.—WINDING APPARATUS FOR INCLINED PLANE.**—J. E. Wooten, Philadelphia, Pa.

I claim the drums or pulleys, F and F', and pulleys, G and H, the whole being arranged for the reception and guidance of the rope in the course, substantially as described, for the purpose specified.

**57,429.—APPARATUS FOR BURNING LIQUID HYDROCARBONS.**—A. J. Works, Fair Haven, Conn.

I claim, First, The apparatus, B, when composed of three departments, Q S and T, with its branch pipes, one above and the other below the perforated plate, t t'.

Second, The reservoir, H, pipe, T, cock, I, and pipe, J.

Third, The pyrodynamic apparatus, Z, in connection with the cock, X, for the purpose specified.

**57,430.—APPARATUS FOR DESULPHURIZING QUARTZ.**—Thomas D. Worrall, Central City, Col. Ter.

I claim, First, Operating a blow-pipe in a confined space or flue, up which flame is passing for the purpose of intensifying the heat through which metal-bearing substances in a pulverized or partly pulverized condition are passing, for the purposes set forth.

Second, I claim operating blow-pipes up flues that form a juncture, so that when the flames meet they may be condensed upon each other, and thus intensified, for the purpose of desulphurizing and oxidizing metalliferous ores passing through said flames, as set forth.

Third, I claim an X-shaped flue, so constructed that the fire starting from the extreme points at the base must meet in the center of the flue, and this whether used with or without blow-pipes, for the purpose set forth.

Fourth, I claim the furnace, A, with open sides communicating with flues, in connection with the blow-pipes, H H H H, and the X-shaped flues, substantially as set forth.

Fifth, I claim the V or diamond-shaped receiver, with perforated base, for the purpose of heating quartz or other metal-bearing substances when passing over its inner surface while the fire is passing over the outer surface, and of delivering the same either into flues below on to heated plates through simple flues, through flame condensed upon itself by means of two or more blow-pipes playing from opposite directions, or upon a hearth upon which flame has been condensed by blow-pipes.

Sixth, I claim the revolving fan distributors in the V or diamond-shaped receiver in flues in a muffle furnace or in an open chimney stack, for the purpose of suspending pulverized quartz and other metal-bearing substances in their downward descent, and of distributing the same in or upon the heated surfaces or through flues, for the purposes set forth.

Seventh, I claim, in combination with the V-shaped receiver, D D, and the spiral furnace, L, a continuous muffle furnace of any shape or dimensions, horizontal, semi-horizontal, or perpendicular, through which ores containing sulphur or other volatile agents may pass, for the purpose of simple desulphurization or for the purpose of driving off sulphur, arsenic, or any other chemical agent which it may be desirable to save for scientific or commercial purposes.

Eighth, I claim one or more inverted V-shaped plates, either firmly built in the flue or suspended by hinges, at the distributing end of a muffle or other furnace or ordinary spout, for the purpose of distributing pulverized quartz falling upon it, in the manner and for the purposes set forth.

Ninth, I claim the V or diamond-shaped receiver, D D, in combination with the inverted V-shaped distributor, E, for the purpose set forth, or any similar purpose.

Tenth, I claim the spiral furnace, with either a double or single flue, for the purpose of securing a slow and gradual descent of pulverized quartz or pyrites while fire is ascending in or under said flues.

Eleventh, I claim so constructing said spiral furnace and the conducting flues connected therewith that while heat and flame are ascending one flue and the quartz, sulphurets or other metal-bearing substances are descending the other, said substances shall not only be freed from their sulphur for the purpose of metallurgical success, but the sulphurous gases and other volatile agents may be collected and converted into any chemical or commercial agent of which they may be made to form parts.

Twelfth, I claim desulphurizing ores, and driving from them arsenic and other chemical agents, for the purpose of securing successful amalgamation and chlorination or smelting, and simultaneously with this converting the sulphurous gases, arsenic, or other agents, into useful articles for chemical or commercial purposes.

Thirteenth, I claim conducting the gases arising from the combustion of carbonaceous substances which have been used to supply heat for the desulphurizing furnace, into a receiver, to be united with the sulphurous gases, for the purpose set forth.

Fourteenth, I claim the gases, for the purpose of supplying any deficiency of carbonaceous gases that may be lacking from furnace, A, for the purpose set forth.

Fifteenth, I claim the use of carbon oil for the purpose of supplying the equivalents of carbon necessary to the manufacture of the chemical compounds, as set forth.

**57,431.—COMBINED TONGS AND POKER.**—Silas D. Yerkes, Downingtown, Pa.

I claim, First, A combined fire or cinder tong and stove, or range cover lifter, substantially as set forth.

Second, A combined cinder or fire tong and poker, substantially as described.

Third, A combined cinder or fire tong and stove or range cover lifter, substantially as described.

**57,432.—GATE.**—Wilber J. Armstrong (assignor to himself and Solomon Dwight), Rockford, Ill.

I claim the combination of a gate, opened and closed on parallel levers, with balance weights to assist it in opening and prevent its receiving injurious jars in closing, substantially as set forth.

**57,433.—HORSE SHOE.**—John Austin (assignor to Alexander Austin) Rockford, Ill.

I claim, First, The band, B, constructed and attached to the shoe, in the manner substantially as shown and described.

Second, I claim the clip, C, having its upper end provided with a curved hook for taking hold upon the hoof, with its lower end and screw threaded, as set forth, in combination with the nut, as shown and described.

Third, I claim the enlarged hole or recess, r, in the upper side of the shoe, in combination with the band, B, or clip, C, to permit the flat portion of the band or clip to be drawn down therein, in tightening up the shoe, as described.

Fourth, I claim the guards, d, for protecting the nuts which secure the rear ends of the band, as shown and described.

**57,434.—DOUBLE-ACTION PIANO.**—John Joseph Bender (assignor to himself, Henry J. Bangs, and George Miller), New York City.

I claim the above construction and arrangement of an instrument combining two pianofortes, which are played together at one and the same time, and by one set of keys, substantially as described and set forth.

**57,435.—BRAIDING MACHINE.**—William Darker (assignor to himself and Josiah B. Thompson), Philadelphia, Pa.

First, I claim the vibrating thread carriers, e, for carrying the

threads of the lower set of bobbins, made and arranged substantially as described.

Second, I also claim the rock shafts, d, their side arms, f, g, and the cam, j, for rocking the said shafts, substantially as and for the purpose above described.

Third, I also claim the application to a braiding machine of the reciprocating bolts, P, and cams, R, for driving the upper set of bobbins, substantially as described.

Fourth, I also claim lubricating the bolts, P, by means of the circular grooves, b, one or more in the disk, L, substantially as described.

Fifth, I also claim the lubricating tube, i, suspended from the disk, L, for applying a saturated wick to the arms, g, of the rock shafts, substantially as described.

**57,436.—PLOW CLEVIS.**—G. P. Darrow, Cincinnati, Ohio, assignor to himself and Joseph Hargrave.

I claim forming the clevis and bolt by casting the same with interrupted threads, in the manner and for the purpose set forth.

**57,437.—HAT-IRONING MACHINE.**—Mahlon S. Drake (assignor to himself and David Thompson), Newark, N. J.

I claim, First, In a machine for ironing hats an oscillating frame, B, to which is attached the hat block and hat in such manner that the side of the hat shall as it revolves be kept in contact with a stationary iron, substantially in the manner set forth.

Second, In combination with the face plate, X, I claim the spring catches, t, t', for securing the hat block to the face plate, substantially as set forth.

Third, The oval holder, g, when used as a cam and in combination with the wheel, b, and oscillating shaft, h, substantially as and for the purpose set forth.

Fourth, In combination with the reciprocating iron, F, I claim the plate, d, for supporting the brim of the hat against the pressure of the iron, when arranged substantially as set forth.

Fifth, In combination with the oval hat block holder, g, I claim the spring f, and set screw, e, for securing the hat, substantially as set forth.

Sixth, So arranging the mechanism for actuating the reciprocating iron, F, and face plate, H, supporting the hat block that the hat block shall be turned as the iron is ascending, and remain stationary while the iron is traversing the brim, substantially in the manner set forth.

Seventh, The iron, F, when attached to an oscillating frame, E, and pitman, J, moved by a crank, K, and actuated by mechanism so arranged that the iron, F, shall traverse one part of its course away from and return in contact with the hat, substantially as set forth.

Eighth, I claim the guide block, S', of the same oval as the hat, attached to a shaft on the oscillating frame, B, and guided by a stationary adjustable arm, u, in such manner as to retain a stationary iron attached to the adjustable arm, m, in constant contact with the hat, substantially as set forth.

Ninth, So arranging the irons that the iron for the side of the hat, shall be attached rigidly to the main frame when in operation, and the irons for the upper side of the brim and crown, the latter, of which, at least, is attached to the oscillating frame, shall be adjustably controlled by cords and weights, substantially in the manner set forth.

**57,438.—FRAME FOR TRAVELING BAGS.**—Louis Fruhinsfeld (assignor to himself and Wm. O. Headley), Newark, N. J.

I claim the combination of the jaws, A A', curved as shown, with the taper ends, b, in the manner and for the purpose herein specified.

**57,439.—LIFTING JACK.**—Joshua F. Hammond, Providence, R. I., assignor to Henry Staples, Barrington, R. I.

I claim the combination of the two upright posts, A and B, the one fixed and the other movable vertically, the lever, D, stirrup, E, and the pin, F, the whole arranged, combined and operating as above described.

**57,440.—SCYTHE.**—Charles M. Hodges (assignor to himself, Willard O. Capron, and Nathaniel Whitmore), Mansfield, Mass.

I claim a scythe in which the blade or cutting portion, A, and the block or holder, B, are made in separate pieces secured together by screws which pass through holes in the two back pieces and open slots in the blade, as set forth.

**57,441.—HAIR CRIMPER.**—Benjamin Mannon, Newport, Ky., assignor to himself and Isidor Kann.

I claim, in the described combination with a hair pin, A A', the bearing bar, B b, and clasp, C c c' c' for the purpose set forth.

**57,442.—APPARATUS FOR CARBURETING AIR.**—Donald McDonald, Albany, N. Y., assignor to himself and Noel E. Sisson and Henry Q. Hawley.

I claim the combination of a cylinder or drum constructed like the drum of a wet gas meter, with fine wire gauze or its equivalent attached to said drum and covering the outlet openings of its measuring chambers, substantially as above described and for the purpose above set forth.

**57,443.—BILLIARD GAME KEEPER.**—George Miller and John Reichert, New York City, assignors to John Reichert and Dominicos Rottkamp.

First, I claim the combination of the ratchet wheels, f m, pawls, i, g, thereto attached, arms, k k', and operating levers, h h', on either side of the division plate, arranged and operating substantially as and for the purpose herein described.

Second, The combination of the ratchet wheels, pawls thereto attached, operating levers, and the arms, hammers and bells, or their equivalents, on either side of the division plate, arranged and operating substantially as and for the purpose herein described.

Third, The levers, h h', with their toes arranged and operating substantially as and for the purpose herein described.

Fourth, The combination of the ratchet wheel, f, pawl, g, and lever, h, either with or without the bell attachment, arranged and operating substantially as and for the purpose herein described.

Fifth, The combination of the ratchet wheel, f, pawl, g, arm, S', lever, h h', either with or without the bell attachment, arranged and operating substantially as and for the purpose herein described.

**57,444.—LOOM.**—Levi Scofield (assignor to himself and Justin B. Waite), Farmington, Wis.

First, I claim a cam shaft, provided with longitudinal slots or mortises to be filled with cams and blanks, or their equivalents, in combination with cams and blanks for the purpose of adjusting the cams in the shaft for weaving different kinds of cloth, substantially as and for the purpose set forth.

Second, A treadle which has one end pivoted to the frame work of the loom, while the other end has a combined, lateral and vertical movement, when used to throw a shuttle from a right to a left and from a left to a right direction alternately, substantially as described.

Third, Stepping bar, M, or its equivalents, when used to impart motion to a cam shaft, and cams, and to the leaves of a harness, when the whole are constructed and operated substantially as and for the purpose described.

Fourth, Stepping bar, M, or its equivalent, in combination with a sliding bar, S, and treadle, R, when constructed together and operated substantially in the manner and for the purposes described.

Fifth, Stepping bar, M, or its equivalents, in combination with guides, g, or their equivalents, when the whole are constructed, connected together and operated substantially as and for the purposes described.

Sixth, Sliding bar, S, or its equivalent, in combination with treadle, R, elbow lever, K, and lever, l, or their equivalent mechanism, when constructed, connected, and operated substantially as and for the purposes described.

Seventh, A combination and arrangement of the hatten stepping bar, rack, and pinion pawl and ratchet, cam, shaft and cams, and bases for the leaves of the harness, when the whole are constructed and arranged substantially as and for the purposes described.

Eighth, A combination and arrangement of the cam shaft, having motion imparted to it substantially as described. A treadle having a vertical and horizontal motion imparted to it, substantially as and by the mechanism described, or its equivalent, when the whole are connected together and operated as and for the purpose described.

57,445.—GRAIN GATE.—G. Seitzinger, assignor to himself and John Armstrong, Ottawa, Ill.

I claim the arrangement of the catch, b, of the rod, C, and gate, B, with the recesses, d, e, of the frame, A, and operating in the manner and for the purpose herein described.

57,446.—EYELETING MACHINE.—George Shipman, assignor to Azel Howard, West Bridgewater, Mass.

I claim the application and arrangement of the two levers, E F, together, and to the standard, A, the eyelet punch, the magazine and chute, substantially as and for actuating such magazine and chute, substantially as described.

I also claim the application and arrangement of the spring, a, with the standard, A, and the two levers, E F, applied together and to such standard, and the punch, magazine and chute, substantially as specified.

I also claim the combination as well as the arrangement of the three adjustable stops, h i m, with the levers, E F, when arranged and applied together, and to the frame of the machine, the punch, the magazine and its chute, substantially in the manner as specified.

I also claim the combination and arrangement of the elastic buffer, X, with the standard, A, lever, E, and the magazine and chute applied to such lever.

I also claim the combination and arrangement of the adjustable guard, K, with the eyelet magazine and its ports, the chute and rotary bush, arranged together as specified.

57,447.—HAND VISE OR CLAMP.—Alexander C. Stockmar, New York City, assignor to himself and William S. Lee.

I claim, in combination with the limbs, to which are attached the jaws, the use or employment of the nut, screw, and toggle, when the same shall be constructed and operated substantially as and for the purposes set forth.

57,448.—REVOLVING FIRE-ARM.—John H. Vickers (assignor to the Bacon Arms Company) Norwich, Conn.

I claim the pivoted bracket, G, arranged and operating in combination with the band, H, encircling the barrel loosely, and with the axial pin, E, in the manner and for the purpose herein specified.

57,449.—HYDRANT.—James M. Ward (assignor to himself and John D. Gilbert) New York City.

I claim the sliding valve, F E, elevating nut, D d, diaphragm, 11 k, and ports, 1 h g, arranged and operating substantially in the manner and for the purpose set forth.

57,450.—BRICK FOR CEILINGS.—Maurice Abord, Paris, France.

I claim, First, Constructing ceilings of tubular or hollow bricks supported or suspended on beams or girders, and strung thereon to form a continuity of surface, essentially as herein set forth.

Second, A tubular or hollow brick having recesses, d, whereby to suspend it on the beams or girders, the upper and lower lips of said recesses being so proportioned that the under capping ones will meet those of the adjacent row and conceal the girder, substantially as shown and described.

Third, Grooving or indenting the lower surfaces of the bricks to facilitate the hold of the plaster thereto, substantially in the manner specified.

57,451.—SEWING MACHINE FOR STITCHING BUTTON-HOLES.—James Moore Clements, Birmingham, England.

First, I claim the vibrating hooks, 15 16, arranged and operating substantially as described, and employed for the purpose of drawing the needle silk into a horizontal position in order to supply the barbed hook, as and for the object set forth.

Second, I claim the combination of the eye pointed needle, the circular grooved hook, d3, and the barbed hook, e1, constructed and operating as and for the purpose set forth.

Third, In combination with the above, I claim the detaching hook, g3, arranged and operating substantially as described.

Fourth, I claim the pendulous bar, k3, employed in conjunction with the hooks, 15 16, to feed the needle silk to the barbed hook, as set forth.

Fifth, I claim the arrangement of the circularly feeding device, O2, spring, O4, arm, 4, pin, 8, shouldered lever, O', and hand lever, O, as and for the purpose specified.

Sixth, I claim the plate, r, which carries the needle slide, pivoted to the frame, and adjustable by means of a set screw, r2, in combination with a barbed hook, as and for the purpose described.

Seventh, I claim the combination and arrangement of the several mechanical parts herein described and represented, and mentioned in the preceding claims, or the mere equivalents thereof, forming improved machinery to be employed for sewing, stitching, or embroidery, substantially as herein set forth and specified.

57,452.—MACHINE FOR STRAINING CREAM.—H. Baker, G. F. Holmes and R. D. King, Cortland, N. Y.

We claim, First, The flange for sustaining the strainer on any given size churn.

Second, We claim the cone-shaped strainer and center pivot, in combination with the scroll rubbers, substantially as set forth.

Third, The scroll rubbers in combination with the shaft, crank, cross bar, and fastenings, as herein described and for the purpose set forth.

57,453.—SAFETY BRIDGE FOR RAILROAD CARS.—Lorenzo Hempstead and Lester S. Hills, Hartford, Conn.

We claim, First, The combination of the lattice work floor, c, and railing, f, to constitute an expansion bridge for railroad cars, when the same is constructed substantially as described.

Second, We claim the combination of the swing table, b, with the floor, c, substantially as described.

Third, We claim the combination of the hinge plates, e, with the expanding railway, as and for the purpose described.

REISSUES.

2,339.—MACHINE FOR PARING APPLES.—James F. Monroe, Fitchburg, Mass., assignee by mesne assignments of John D. Browne, Cincinnati, Ohio. Patented May 6, 1856.

I claim the combination with the apple-revolving mechanism, the knife-moving and controlling mechanism, and the frame of a clamp, B C, for temporarily attaching the apple-paring machine to a table or support, substantially as and for the purpose herein specified.

2,340.—CAR SPRING.—John G. Pugsley, New York City. Patented Aug. 4, 1863.

I claim, First, the use or employment of a cylindrical spring case, having a central flange that sustains the springs on either side, and toward which they yield, as specified.

Second, I claim a series of perforated spring disks, or annular metallic plates, in combination with a central and flanged distributor, and with concave rings or bearings, against which the spring disks rest, substantially as and for the purposes specified.

2,341.—BALANCES.—Reuben Shaler, Madison, Conn. Patented Nov. 23, 1865.

I claim the combination of the supports, E and F, the parallel bars, G G, arranged substantially in the manner described, with a spring, S, or its equivalent, so as to operate substantially in the manner and for the purpose specified.

DESIGN.

2,427.—PLATES OF A STOVE.—Samuel W. Gibbs, Albany, N. Y.

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The shank, A, of the plug is screwed through the boiler plate in the crown plate or over the fire surface. The spaces, B B, are filled with a fusible alloy, which retains the cone, C, in place. Openings, D, are made in the sides of the shell, which are also filled with the fusible metal, and communicating with the interior and through that to the fire box. The cone, C, being held in place by the soft metal and the pressure of steam in the boiler being exerted on its top; too heavy a pressure on the cone will drive it out even if the heat caused by lowness of water does not soften the fusible material.

It will be observed that in this instrument the mode of applying the fusible alloy is quite different from any former application. The internal cone is held to its place and resists the pressure within the boiler, only so long as the fusible alloy which unites the two cones remains solid. As soon as the temperature of the cone, determined by the temperature within the boiler, rises to a point sufficient to soften the alloy, the internal cone is driven out, and the steam and water escape. The plug is easily replaced in proper condition again, by simply reuniting the two cones by the proper fusible alloy.

This valve, or plug, has several advantages over the former applications of fusible alloy, in the form of rivets or disks. First, the deposit, either upon the fire or water side, does not in any manner retard or affect the proper operation. Second, by the form of the valve any desired amount of water can be allowed upon the highest fire surface before the valve gives way, and thus, though the operation of the boiler is stopped, not only is explosion prevented, but damage to the plates of the boiler is guarded against.

This plug has obtained extensive use in England, and with the best results. It is used by at least two of the boiler insurance

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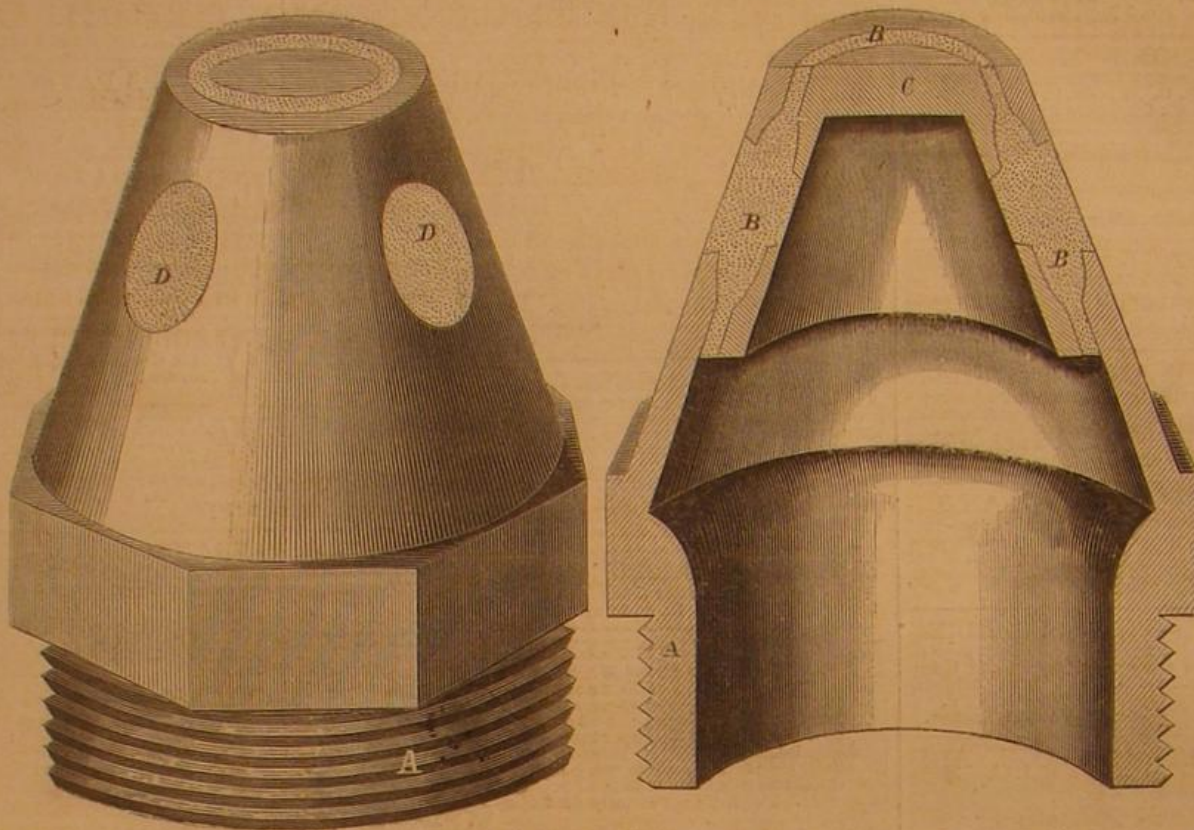
The inventor, John Smith, is a resident of England, and patented his invention in this country,

March 28, 1865. It has been examined by many prominent engineers and government inspectors, and without exception has received their unqualified approval.

C. W. Copeland, No. 171 Broadway, New York City, is sole agent for these plugs in this country, from whom any further information may be obtained.

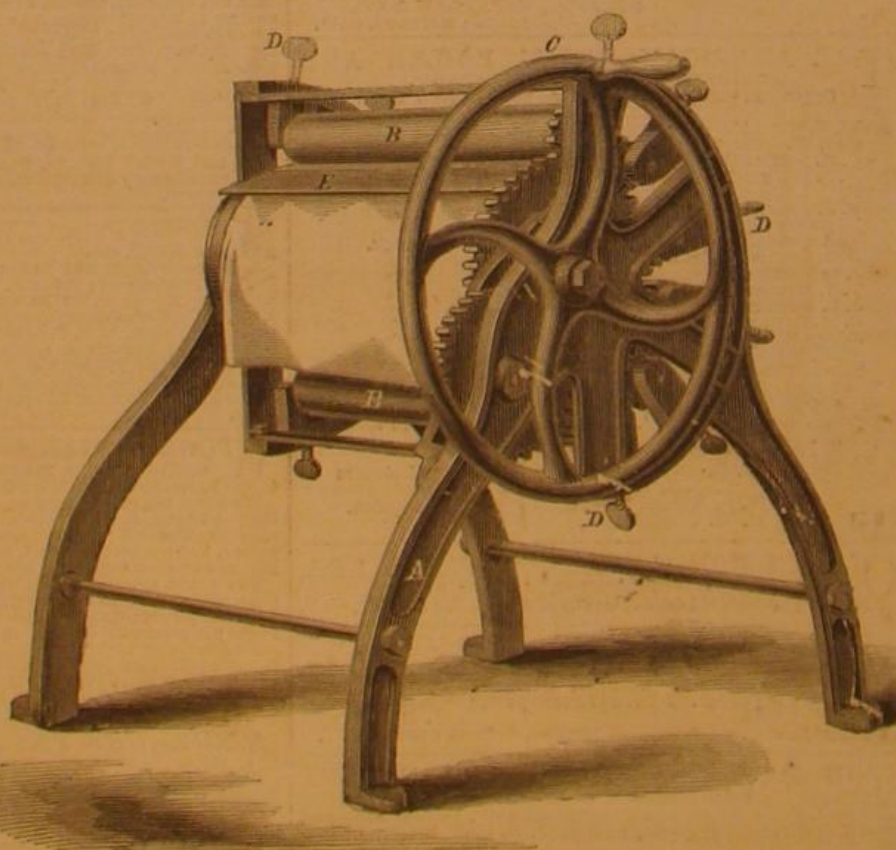
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**IMPROVED MANGLE.**

this as a substitute for the heavy machines heretofore built, and intends to have it placed within the reach of families.

It consists of a frame, A, carrying a large central roller, on the periphery of which revolve six other small rollers, B, geared into a large wheel, which, by means of the wheel and crank, C, and intermediate pinions and gears is rotated. The pressure of the small rollers is graduated and governed by rub-

ber springs, the tension of which is increased or diminished by means of thumb-screws, D. The clamp, E, over the central roller, is raised or depressed to admit the insertion of the clothing according to its thickness. By this contrivance there is no danger of catching the fingers between the rolls on entering the goods.

The principal advantages claimed for this machine are its portability and cheapness, and the use of a series of rollers disposed around a central drum, so that the garments are not subjected to undue pressure, to the detriment of buttons and other appliances, as is the case in mangles having only two rollers. It is claimed that the clothes leave this machine in a more finished and glossy state than when run through the ordinary mangle.

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