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Improved Boiler Feeder.

This feeder presents some new features which seem to commend it to the attention of engineers. It is claimed to effectually prevent the collection and deposition of sediment in the boiler from impure water. The California Steam Navigation Company has run boats three thousand miles with tubular boilers, using this heater, without cleaning boilers, although the water contained as much mud as that of the Missouri river.

The case, A, Fig. 1, is of sheet iron or other suitable material, cylindrical, or in any other convenient form, closed at the ends by the heads, B and C, and having, at a short distance from the ends, transverse partitions, which support the ends of the tubes, D. The water to be heated enters the shell by the pipe, E, and passes through the tubes, entering the boiler by the pipe, F. The exhaust steam enters at G and leaves at H. The pipe, I, discharges the condensed steam in the form of water. The head, C, is provided with a chamber, J, from the inner plate of which small tubes, or nozzles, K, project into the water tubes D. The sediment which may gather in the water tubes is blown out and through the pipe, L, by steam admitted at will through the pipe, M, from the boiler. The steam and water from the boiler being discharged through the nozzles, K, into the tubes, D, effectually washes them, thus preventing the collection of sediment in the boiler.

Fig. 1

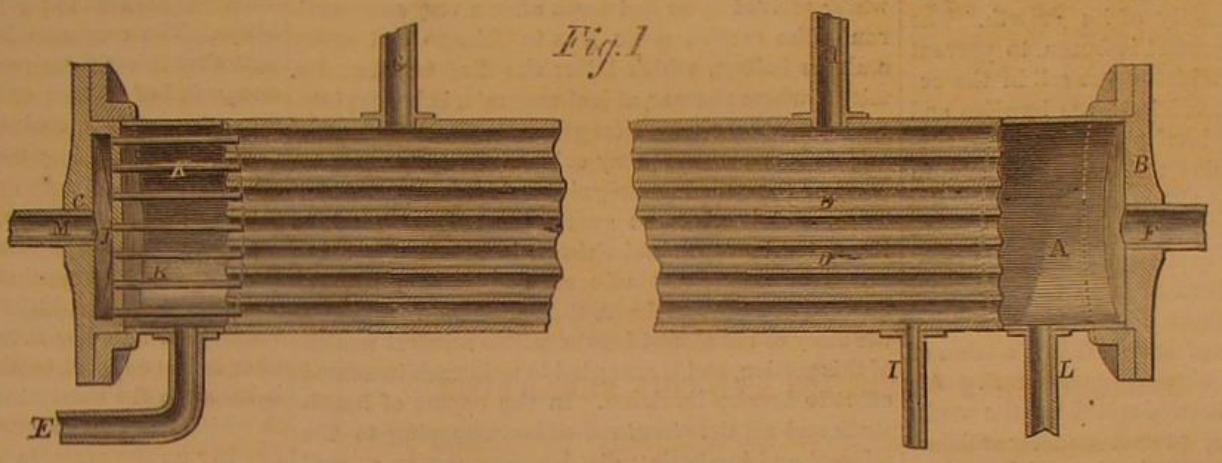


Fig. 2

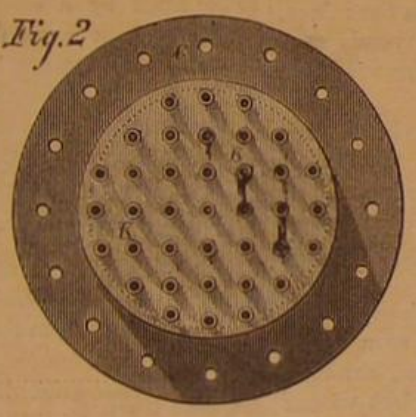
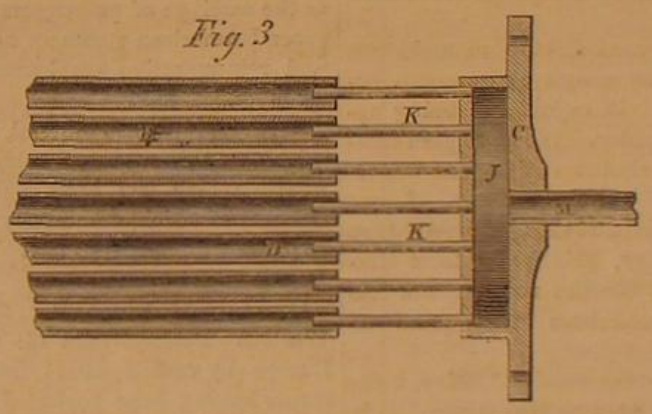


Fig. 3



CROSS'S BOILER FEEDER.

It will be seen that the exhaust steam traverses the length of the heater surrounding the water tubes, and thoroughly heats the water before its admission to the boiler. The gradual circulation of the water through the cluster of pipes favors the deposition of the sediment mechanically suspended in it, which can be readily removed by injecting the steam from the boiler through the pipe, M, and the nozzles, K.

This improvement was patented through the Scientific American Patent Agency Oct. 17, 1865, by William B. Cross, of Sacramento, Cal., who will furnish all necessary information.

An Iron Mountain in Sweden.

From the London *Mining Journal* we learn that a company, formed in England for the development of Swedish iron mines, from failure to pay their men, have stopped their works. A meeting of the stockholders has been held in London and it is hoped something will be done to start the undertaking on a firm basis. It was reported at that meeting that the company own a "mountain of iron," containing, by assay, seventy-two per cent of pure metallic iron. The principal drawback to the realization of the wealth of the region is its locality and the climate; a long road over a vast plain being necessary, and the long winters disheartening the laborers. The construction of an easily-traveled road, it was thought, would, by frequent communication, be an inducement to the employés to make permanent engagements.

The Palliser Gun.

Last August four Palliser guns were tested with perfect success at the proof butt in the Royal Arsenal at Woolwich, under the superintendence of Lieutenant Colonel Freeth, Assistant Superintendent of the Royal Gun Factories. These guns were formerly cast-iron 32-pounders and 24-pounders, and have been converted into 64-pounders and 56-pounders, at Elswick. Twenty more of these guns arrived the same day at Woolwich, and will at once be sent to proof. A 64-pounder Palliser gun has also undergone a most severe test of endurance. This was a 32 pounder, weighing only 58 cwt. According to the *Times*, the test was as follows:—Two rounds, with charges of 16 lbs. of powder and 150 lb. cylinders; 10 rounds, with charges of 20 lbs. of powder and 100-lb. cylinders; and, finally, 10 rounds, with 16 lbs. of powder and 64 lbs. shells. The shells were loaded with their fuse holes toward the powder, and, as the fuses had been taken out, the flash of the discharge set fire to the powder in the shells and burst them in the gun. It was generally expected that this test would have burst the gun, or, at all events, that it would have blown off the muzzle or otherwise have rendered it unserviceable; but beyond the one fact of the bore being scratched by the splinter of the shells no injury was perceptible, and the gun was loaded with the same facility and fired as before. It appeared from a subsequent examination that some of the shells had burst before they had moved, and that others had burst close to the muzzle of the gun. A number of 64-lb. shot were then fired with 16-lb. charges, but, instead of the shot being rammed home, they were only pushed down to certain positions in the gun, so as to leave vacant spaces of 5 inches, 10 inches, 15 inches, 20 inches, and 25 inches between the powder and the shot. To the astonishment of every one present the gun had not sustained the slightest injury. It was therefore decided by the Ordnance Select Committee to put the gun through a supplementary trial to ascertain its maximum or highest power of endurance, when it will have to fire 20-lb. to 25-lb. and 30-lb. charges, with cylinders of 150 lbs. weight. Major Palliser has expressed great confidence in the strength of the gun, and states that he has no fear of the result of any reasonable amount of proof, even beyond what is absolutely necessary. The trial, it is admitted, has already borne out the anticipations of the inventor and manufacturers, and has fully justified the recommendation of the Ordnance Select Committee and their introduction of these guns for the consideration of the War Department to use up the heavy stock of guns on hand. On account of their weight, their service charges will be only 6 lbs. or 8 lbs. of powder. Sufficient evidence, it is stated, has already been obtained to prove that we have thus a most efficient and reliable addition to our stock of rifled ordnance—a fact which, in the present difficulties with which the Government is embarrassed for want of serviceable guns, will be hailed with much satisfaction, more especially as the two new guns now pronounced successful—those of Major Palliser and Mr. Frazer—will be produced at a cost far below that of the present guns, in which the country have long since ceased to have any confidence.—*Mechanics' Magazine.*

Manufactures as a Means of Wealth.

The manufactures and commerce of England have made her the richest country on the globe. Her commerce is a consequence of her manufactures, which have also swollen the value of farming lands to a proportion unsurpassed by those of any other nation. New England, with a sterile soil and unfavorable climate, although boasting some of the finest farms in the country, owes her remarkable prosperity to her manufactures and the trade and commerce which they foster and sustain. The Middle States also sustain their importance by this source of wealth, rather than by their agricultural productions. But this interest is vastly improved in value by the establishment of manufactories. It is estimated that when the agricultural capital of England was £3,311,000,000 and the investment in manufactures £218,000,000, the profits on the former were only 13 per cent while the latter produced 120 per cent. In her manufactures, therefore, must we look for the main source of England's wealth.

THE total value of prizes to be given at the Paris Exhibition is $190,000 in gold. In the department of arts there are seventeen grand prizes valued at $400 each; thirty-two first prizes valued at $160 each; forty-four second prizes, $100 each; and forty-six third prizes, $80 each.

CULTIVATION AND MANUFACTURE OF OSIERS.

A writer in the Boston *Advertiser* says that the osier, or basket willow, is a very profitable crop, and can be grown upon lands too wet and cold for ordinary crops. He says it will yield from two to four tuns, green, per acre—worth $40 per tun—and, peeled, it has been sold as high as $200 per tun within two years.

Without indorsing entirely his statements, it is an indisputable fact that the osier can be made a very profitable product of the farm, even when the manufactory is distant from the place of production. After being once fairly started it will almost take care of itself, requiring only the attention necessary to its cutting and preparation for the manufacturer. It is tenacious of life, is not frost killed, and, after the second year, continues indefinitely to yield an ever-increasing amount. It is easily cultivated from cuttings, and, keeping the soil mellow and free from weeds and grasses the first two or at most three years, it asserts its supremacy and adheres as tenaciously to the soil as the Canada thistle.

The principal obstacle to its general cultivation is the labor of peeling it, a work that must be performed at or near the locality of its growth. The shoots are cut after the ground is frozen, to prevent the roots from being pulled from the soil in the act of cutting. They are bound in large bundles and placed in a tank, or on a level piece of ground, supported in an upright position, and water to the depth of two or three inches is allowed to flow over the buts. After standing until spring, the stem has absorbed water enough, by capillary attraction, to render the removal of the bark easy. This is done by drawing the shoots through a split sapling or between two upright pieces of iron. This is a labor of patience and cannot be slovenly performed. Although machines have been devised for the work, they have not, we believe, proved entirely satisfactory. The attention of our mechanics and inventors is directed to this fact.

The osier is largely used in the manufacture of chairs, settees, baskets, sleigh and wagon bodies, and even tables, and is capable of being applied to a diversity of purposes. We have seen summer cottages furnished almost entirely of willow ware—chairs, tables, sofas, lounges, etc. Large amounts of the raw material and the manufacture are imported into this country, principally from Germany, but within a few years the manufacture has been successfully prosecuted here on quite an extended scale.

One of the largest, if not the most extensive, manufactories of the osier, is at Hartford, Conn. It is one of the enterprises of the late Col. Samuel Colt, and consists of several large buildings for the work, and a village, the houses of which are imitations of Swiss cottages, giving a very picturesque aspect to the locality. The osier is grown upon the sloping sides of the dykes, built by Col. Colt to resist the annual floods of the Connecticut, upon the banks of which the manufactory stands. The osiers were first planted there principally as a protection to the earth work, a service they admirably perform, their roots forming a close network on the surface and penetrating the soil several feet, binding the whole mass completely together. For this property osiers are largely cultivated on the Holland dykes and sub serve a very useful design. In England they are employed in the formation of hedges, the pliability of the shoots rendering the formation of an impenetrable wattle feasible.

Direct Trade with Europe.

The experiment of direct trade between Europe and the Upper Lakes has proved so successful that it is now being constantly repeated, and, did our Provincial canals admit of it, would be carried on on a much more extensive scale by vessels of the largest tunnage. The mineral regions along the shores of Lakes Huron and Superior are even yet but partially known and tested; and we are satisfied that their full development in the process of time will give rise to an immense trade, much of which will be direct with Europe. Already we observe that the proprietor of the Bruce and Wellington Mines, on the north shore of Lake Huron, has decided on having a large share of the copper shipped directly from the mines to England. A Mr. Taylor, of London, England, who is, we believe, proprietor of the Bruce and Wellington Mines, has been working them with such vigor of late, that the ordinary means of sending the copper from them to Europe *via* the Northern Railway steamers and road to Toronto, proves altogether insufficient. The steamer *Algoma* has been making regular trips all seasons (three times a month) between Collingwood and the principal points on Lakes Huron and Superior; and another steamer, the *Wabuno*, has also partially traversed the same route, but limiting her trips to the Sault Ste. Marie; and these two boats have, we are informed, had a very successful season, being loaded down with freight and passengers. The *Algoma*, which only accommodates some fifty passengers properly, has had to carry as many as ninety; and her freight, particularly on the return trips, is altogether more than she is able for, even with the aid of the *Wabuno*. The Bruce mines alone could frequently, we are told, load her with eight times the quantity she takes. This state of things has induced Mr. Taylor to open up direct trade with England. He has, we are informed, dispatched three vessels from London to the mines, the first of which arrived there last week after a very successful run. She carried some iron to Chicago and some coals as ballast, which latter she discharged at the mines, where she was, at last accounts, being rapidly loaded with her copper cargo for England.

This is one of the many evidences which come to hand of the growing magnitude of this Upper Lake trade, and it gives us great pleasure to chronicle the extension—gradual though it be—of the commerce of this great mineral and lumber region. Successive explorers have, time and again, repeated the story of the almost inexhaustible mineral wealth of this section, and we are glad to note each increased effort to develop its riches. In the export of breadstuffs and all the *et cateras* of housekeeping to the mineral and lumbering districts hereabouts, as well as the carriage of passengers to and from the mines, several American steamers and sailing vessels now find remunerative employment, and there is room for more.

With its immense mineral, fishing, and lumbering interests, this upper country possesses a mine of wealth which has been hardly touched, and the richness of which, when fully developed, can scarcely be over-estimated.—*London Weekly Report on the Iron Trade.*

[It might be added that the productions of the Western Pennsylvania oil wells will soon reach Europe by vessels direct from Erie, Pa., arrangements having been perfected in Europe last winter by a committee of gentlemen from that city for the conveyance of the crude and refined petroleum direct from Erie to Liverpool and Bremen.—EDS.

Newspaper Enterprise.

THE NEW YORK DAILY SUN, the pioneer of cheap newspapers, comes to us in a much enlarged and improved form, with new type, etc. Its time-honored motto, "It shines for all," is handsomely realized in its present appearance. There are few newspapers that enjoy so large a measure of the public favor, or that are so truly adapted to the wants of the great industrial classes—the bone and sinew of the country. Its extremely low price, *two cents*, places it within reach of the humblest citizen, to whom it daily brings the latest and most interesting intelligence from all parts of the world. The same telegraphic news, word for word, including the dollar-a-letter Atlantic cable dispatches which are published with so much parade in the larger papers, is to be had for two pennies every morning in the *New York Sun*. This lively paper is a shareholder in the famous New York Associated Press, and therefore receives for publication duplicate copies of the telegraphic dispatches which appear in the other city papers. Who would pay four cents for news which they can always have for *two* in "*The Sun?*" Not the intelligent working people.

We observe with pleasure that Mr. Joseph P. Beach, long and favorably known in connection with the public press, is announced as Editor-in-chief of the *Sun*. Mr. Beach is one of the actiive, ndustrious workers who are always to be found at the post of duty, making their mark for good in the community, and striving to help forward, with noble vigor, the cause of humanity and truth.

Three Processes for Preserving Meat.

The perfect preservation of fresh meat in warm countries offers such a remunerative field to the successful inventor, that many methods have been proposed for its accomplishment. In an official report laid before Parliament on the preparation of beef in South America, for the English market, three methods, proposed by Prof. Morgan of the Royal College of Surgeons in Dublin, Baron Von Liebig, of Munich and Mr. Sloper, of London, are to effect this end.

Mr. Morgan's process is based on forced infiltration, using the circulatory system of the body as a means of introducing in the tissues of the animal, by injection, a preparation the constituents of which have not yet been made public. The process is simple and efficacious; by it an ox can be preserved in ten minutes, using from twelve to fourteen gallons of the fluid.

Liebig's process differs essentially from the former, for the meat, instead of being preserved whole, is reduced to an essence to be used in making soups. The concentration is carried to such an extent that thirty-three pounds of meat are reduced to one pound of essence, and the alimentary matter of an entire ox is contained in eight pounds of this preparation, making over one thousand basins of good, strong soup.

The remaining process, patented by Messrs. McCall & Sloper, professes to preserve meat in its fresh or raw state, arriving at market in the exact condition of butchers' meat just killed, but with an additional advantage of keeping twice as long as ordinary meat, after being exposed to the air. The curing process is based on the extraction of oxygen from the vessel in which the meat is packed. Tin cans are used in putting up the meat, in which a vacuum is formed to be filled by a certain gas, the composition of which is kept a profound secret. The only difficulty of this process, in some respects superior to either of the preceding, is, that the smallest opening in the tin case proves destructive to its contents, by allowing the gas to escape and the air to get in.

The Volume of Paper Money.

As there appears to be a conflict of opinion as to whether the volume of paper money afloat in the United States is increasing or not, we give the comparative figures from the latest authentic data:

	June 1, 1866.	Sept. 1, 1866
Legal Tenders	$564,140,458	$555,115,732
National Bank Notes	278,905,675	289,915,828
Fractional Currency	27,354,965	26,483,998
Total	$870,381,098	$871,515,559

It will seen from these figures, that while the legal tender currency has been reduced $9,024,726 and the fractional currency $850,967, during the last three months, there has been an increase of $11,010,154 in National Bank notes. The amount of National Bank notes to be issued, before the $300,000,000 prescribed by law shall be reached, is now about $10,000,000, after which we shall witness a gradual reduction in the volume of paper money, a consummation devoutly to be wished, as the decrease in volume will be accompanied by a corresponding increase in value of the circulating medium. The reduction in legal tenders since June 1st has been mainly in the compound interest notes, which, three months ago, stood at $162,012,140, and are now down to $155,512,140. The plain greenback circulation on June 1st, was $402,128,618, and Sept. 1st, $399,603,592. Fully one-sixth of the entire legal tender circulation lies in the vaults of the banks of this city, which at present hold the heaviest reserve in this legal tender form ever before controlled by the local banks. A year ago the legal tender circulation of the Treasury was up to $684,138,959. It has since been reduced nearly $136,000,000, or at the rate of close on eleven millions a month. The National Bank note circulation has been increased, during the year ending on the 1st of September from $177,487,220 to $289,915,829, or absolutely, $112,428,609, which increase is at the rate of less than nine and a-half millions a month, showing conclusively that, during the past year, the legal tender circulation has been diminished far more rapidly than the volume of National Bank notes has been augmented. A very considerable portion of

the issue of National Bank currency through the year has superseded the circulation of State Banks, converted into National Banks or wound up altogether,so that it is safeto assume that the volume of paper money of all kinds in circulation has been materially lessened since Sept. 1, 1865. The compound interest legal tender notes have ceased to circulate from hand to hand, as money, and have now no other function to perform in our financial system, except that they are held as a reserve by the National Banks. On the whole, we think we have reached the maximum amount of paper money cirlation.—*Shipping and Commercial List.*

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening, Sept. 21, 1866, the President, Prof. S. D. Tillman, in the chair.

LIME IN THE PURIFYING OF COAL GAS.

When the approach of cholera was apprehended many complaints were made against the gas works of this city on account of the noxious odors arising from their premises, caused by emptying, for removal, the lime which had been used for purifying the gas. The evil was apparently remedied by inclosing the lime and conducting the odor through a pipe into the upper air.

The paper on this subject proposed the more effectual plan of thoroughly incorporating dried peat with the lime, thus absorbing the odors, when the composition might be sold as a fertilizer. It was remarked by the members that in London, during the prevalence of cholera, the workmen in the gas houses preferred taking their families there for safety, as no case of cholera had ever occurred among any employed there.

DYEING OF WOOD.

A communication to the Institute was read, describing a process for expelling air from the tissues of common pine wood, and injecting any of the aniline dyes. By this means lumber can be uniformly dyed throughout, in imitation of the valuable woods, and then wrought into articles of furniture.

VENTILATION AND RESPIRATION.

This was the regular subject for the evening, having been continued from the last meeting. The principle was then stated, that the rising of a balloon, and the draught of chimneys were owing simply to differences in gravity.

When the air comes in contact with the fire, the oxygen unites with the carbon, the nitrogen is released, it expands and becomes the vehicle by which the products of combustion are carried off, and this produces the draught of the chimney.

In the same way, the air is taken into the lungs, the increase of temperature expands the nitrogen, and this, again, carries off the products of the internal combustion. When the thermometer stands at 98 degrees, the difference between the external and internal temperature is not sufficient to produce breathing except under difficulty from the necessity of making use of some muscular exertion, and this causes the difficult breathing, particularly noticeable in young children.

In relation to ventilation, the trouble was not so much how to get the foul air out of a room, as how to get the fresh air in without incommoding any by having a current blowing upon them.

Where the top of the window is lowered, a comparatively solid body of cold air comes in and mingles with the heated air only to a limited extent; by dividing up this column of air, the mixing would be much accelerated, while no decided current would be produced. To accomplish this it was proposed to insert into the open window a board having a number of tubes connecting with the air outside. The subject was discussed pretty fully, but the hour for closing having arrived, further debate was adjourned till the next meeting.

By an imperial edict, native Japanese artisans wishing to visit any of the various countries beyond the sea, for the purpose of learning any science or art, will receive permission from the Government on application.

[From the American Journal of Photography.]

Porcelain Process and Developer.

BY WILLIAM HADDOCK.

Porcelain Process.—Some time since, I sent for this Journal an account of the use of a chloride collodion for negatives; and I now make another application of this chloride—for porcelain, that I wish you would try, and if it suits, give it to the fraternity.

Ether, 4 ozs; alcohol, 3 ozs; gun cotton, 40 grs; nitrate of silver, 32 grs.

Dissolve the silver salt in the water, and add to the collodion; then add the chloride a few drops at a time, shaking until it becomes quite milky. Then add twenty-four grains of chloride of uranium, and eight grains of citric acid, dissolved in alcohol.

After coating the plate, and when dry, fume it, the same as paper, and you will find that it prints about as fast as paper, and is rich in tone.

I have an impression that it can be used for solar work in making large porcelain pictures. Why not?

For the preliminary coating, I use the following:

Albumen, 1 oz; ammonia, conc., 2 drms; water, 12 ozs.

And by the way, should you want to use this for negatives, put five grains of iodide of potassium in it, and you have a fine coating for negatives that will keep a long time, and will dry as hard as flint

Developer.—I see by the Journal, that a quick developer is wanted. I believe that the developer is one of the most important requisites of picture making.

I send you one, and also a print from a negative made with it. My aim has been to cheapen every thing I use, and at the same time to get good results.

I am using twenty-five grains of silver to the ounce for my paper.

The print sent was made with twenty-five grains. The paper had A. S. B. brand; you will see that the albumen is not affected in the least.

No. 1.—Water, 1 quart; sulphate of iron, 4 ozs; nitrate of potash, ½ oz.

Dissolve and add pure cider vinegar, 12 ozs., and 1 oz. sulphuric acid.

No 2.—Water, 1 quart; white of two eggs; and four drams ammonia conc. Shake up thoroughly and mix with No. 1.

Give about half the time you generally do in the camera; you can push a negative as far as you want without fogging, and it comes out promptly.

In using it for ambrotypes, I add a few grains of acetate of soda to four ounces of the solution, which takes out the free acid and removes the tendency to metallic luster.

It should be made about twenty-four hours before using it; then filter through cotton six or eight ounces at a time.

Circleville, O., Sept. 6, 1866.

The Throttle Valve.

Romancers are fond of contrasting the power of the locomotive with the apparently inadequate means of managing and governing that power. It is popularly supposed that a child can start and stop a locomotive. Possibly it may be so; but it is not the belief of those who have occupied the driver's position. Apart from the immense responsibility of the engineer of a train, a responsibility greater and more exacting than that of the conductor, there is a large amount of hard labor to be performed. Even the starting of a train is a labor. It requires something more than the "weight of a child's finger," as we have heard it expressed, to pull the throttle of a locomotive. It requires the exertion of considerable muscular power; and it seems as though the throttle valve might be balanced, so that it would not demand such a strain upon the wrist and the biceps muscle, to open the passage to the steam chests. The subject is worthy of attention, although it may appear trifling. It is no easy job to run one or two hundred miles every day, on a route where the stations are but a few minutes apart, as every engineer of a train knows.

The expenses of the London and North Western Railroad are 67 cents per mile, those of the Great Western, 70 cents. There are 150,000 men employed upon the railroads of the United Kingdom.

MISCELLANEOUS SUMMARY.

A great fire is reported from Corsica, where the magnificent forest of Vizzabona caught fire a week before the last advices, and had been burning ever since. The vast forest, consisting chiefly of pine trees, celebrated for their immense yield of rosin, is now one vast sea of fire. Millions of valuable trees are destroyed, and as yet the efforts of the neighboring population have been ineffectual to arrest the progress of the flames. The damage is estimated at several millions of francs.

M. Audiger, a French chemist, has invented or discovered a new mode of embalming, which dispenses with all the repulsive details of the ordinary system. It consists in pouring down the throat of the corpse two glasses of a liquid, whose composition is still a secret. The operation lasts but twenty minutes, and in two or three months the corpse becomes as stone. Experiments have been made with this new method at Marseilles, Algiers, and in the public hospitals, with complete success.

At the recent meeting of the British Association, a paper was read upon the introduction of a new gunpowder for heavy ordnance, in which nitrate of barytes is substituted for saltpeter in composition, the consequence being that the powder, when ignited, consumes more slowly, and the gases are developed less rapidly, while the same effect is produced upon the projectile as regards its ultimate velocity.

The small crabs found on our Northern Atlantic shores, which are so largely used for bait for the blackfish and bass, are allied to the blue upland crabs of the tropical regions. They are said by some to be a delicious morsel. They seldom reach over one-and-a-half inches in length, and are known by the fishermen as "fiddlers."

At present the copper mines of Arizona are attracting abroad more attention than the deposits of more precious metals. At Williams' Fork on the Colorado river, many valuable copper leads are located and a great deal of work has been done.

The oil of the menhaden fish, which is caught in immense quantities on the coast of Rhode Island and the southern shores of Massachusetts, is coming largely into use as a substitute for the dark whale oils for curriers' use.

Matrices for punches originally cut by William Caslon, in 1725, are now in daily use, as the old-faced type has again come into fashion.

The stock and gold reports by the Atlantic cable to London, are first sold to subscribers, and only published in the papers two or three days after.

The inventor of the needle gun has constructed a new rifle, a fac-simile of the old, but three pounds lighter, and made wholly of iron.

A railroad is about being constructed between Chicago and Port Sarnia, C. W., to connect with the Grand Trunk Railroad at the latter place.

Nearly five million letters and papers came to the United States from Great Britian in 1865.

A new iron truss bridge is to be erected at Pittsfield, Mass., across the Housatonic River.

A vessel has recently been constructed in Oregon having but one knot in her whole structure.

Submarine Photograph.

A French artist, M. Bazin, has been experimenting lately, with the design of obtaining photographs of sunken vessels, so that in attempting to raise the same positive knowledge can be had of their relative positions. To accomplish this M. Bazin descends to the necessary depth, in a strong sheet-iron box, which he calls his "photographic chamber." Thick glass windows afford every facility for making the necessary preliminary observations, and the picture is taken by the aid of a strong electrical light.

An unpleasant feature of the apparatus, and one which would not recommend it to pleasure seekers, is, that the operator is absolutely hermetically sealed, for no means are provided for supplying air, the chamber being constructed of a proper size to contain the quantity required during the ten or twelve minutes occupied in obtaining a negative.

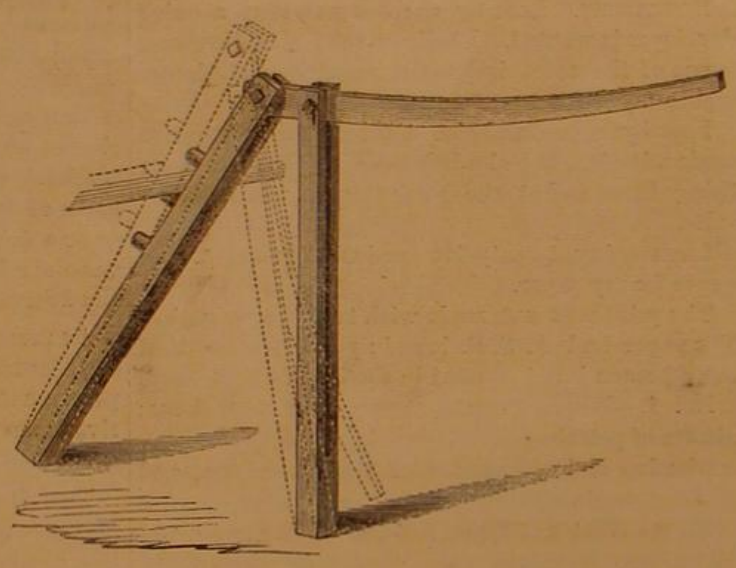
New Material for the Production of Gas.

A Mr. McKenzie, of Glasgow, Scotland, as we learn by Rylands' *Iron Trade Report*, has been experimenting by mixing the coal dust (bituminous) at the mines with crude petroleum, as a basis for the manufacture of illuminating gas. The result of his experiments is said to be very encouraging. The idea is that in the distilling of petroleum alone, a large quantity of the vapor is re-condensed into oil; but by combining the coal with it this waste is prevented, and a coke is left as a residuum which is superior to that from coal alone.

All this may be true, but as the same process has been fairly tested in this country without success, we take the liberty to doubt the professed result. What advantage there can be in the presence of the "coal gum," or siftings, for the production of gas, beyond that afforded by the oil alone, we cannot discover. If, as is stated, a portion of the vapor from oil in the process of distillation is re-converted into oil, "on coming in contact with a cool surface," the remedy is plainly a low distillation. As the oil alone is considered, in the article from which we derive these statements, as the gas producing material, the coal is no better than any other substance to retard the condensation of the gas to an oleaginous liquid.

DUNN'S IMPROVED WAGON JACK.

A lifting jack that is light, portable, and self-retaining, when the weight is imposed upon it, is a desideratum. Most, if not all, of those in general use, must be secured by a pin or otherwise, when the axle of the carriage is raised, but the jack shown in the engraving is in this respect self-operating.



The two uprights are pivoted to the lever, and when the lever is depressed the position assumed is that shown by the dotted lines, the lever shutting into the mortise or channel of the main standard, and the weight of the axle and carriage holding the jack in position. Pins placed at varying distances receive the axle and support the weight. The operation of the implement can be easily comprehended by the aid of the engraving.

Patented July 24, 1866, by Albert Dunn, Plainfield, N.J. For territorial and manufacturers' rights, address Albert Dunn & Co., as above.

[From our own Correspondent.]

FOREIGN SCIENTIFIC NEWS.

The scientific societies of London have now all closed their sittings for the season, after the performance of no inconsiderable amount of valuable work. The recent discovery in Egypt of another stone, with an inscription in three different languages and styles of writing, including Egyptian hieroglyphics, has proved a great boon to philologists. It consists of a vote of thanks from the Priests of Memphis to one of the Ptolemies, in which respect it resembles the Rosetta stone in the British Museum—the stone which first threw light upon the inscriptions upon the monuments of ancient Egypt. On the newly-discovered stone the inscription is longer, and proves that Eastern scholars have been right in the interpretations they have fixed upon many unknown characters, in the absence of direct evidence. Such is the advance in this branch of knowledge that, in past numbers of *Good Words*, *Chambers's Journal*, and other periodicals, may be found translations of fairy tales written in the time of the Pharaohs.

M. De Waldeck, an old gentleman more than 100 years of age, who served under the first Napoleon, has recently returned from Mexico and Peru, where, for a long time, he employed a staff of Indians in excavating some of the remains of the ruined cities of Central America. He has brought back and exhibited at the Ethnological Society many exquisitely-executed drawings and paintings of the grotesque pieces of sculpture dug up under his supervision. Some of the scroll work of the sculptures is very Grecian in its style, and the head of the elephant is frequently reproduced. Mr. Mackie, one of the members of the Ethnological Society, is strongly of opinion that some of the characters cut upon these remains are of Assyrian origin, but is little supported in his views by his colleagues.

All the numerous telegraphic cables between England and the continent of Europe are constantly so full of work, that the experience thus gained created great fears that the Atlantic cable, when laid, would be choked with messages, and thus be a slower method of communication than by post. For this reason there is little or no complaint in England about the charges of the Atlantic Telegraph Company, since "high charges" are synonymous with "great speed." Again, the Company for twelve years has had to fight with great disappointments and difficulties, and sunk nearly £2,000,000 of capital, with interest, in the undertaking. As the iceberg season off Newfoundland begins in February next, and lasts till August, during the whole of which time the icebergs yearly ground on the banks off the coast, the public can scarcely complain that the shareholders try to reimburse themselves before the time of greatest danger to the cable begins. The "certainty" of the apparatus used for transmitting messages by the cable is now a matter of public interest. Mr. Varley, considering the delicate nature of the receiving instrument, produces wonderfully sharp and unmistakable signals; still they have not the certainty of the Morse telegraph, which prints its messages; or of the needle telegraph, where the ear assists the eye in the work of reading. The little ray of light, like a bright vertical tongue of fire, sways to and fro upon the ivory scale of the galvanometer, and from its vibrations the messages are read, yet it is very desirable to test the certainty of the apparatus by sending through it a large number of figures and proper names, so that no aid in reading may be afforded by the context, and the reliability of the method of signaling be fairly tested.

On reference to the map of Great Britain, your readers will notice that at the extreme west of England is a magnificent harbor, Milford Haven, opening to the Atlantic as if to welcome visitors from America. Yet its shores are deserted, the great tide of traffic passes outside the mouth of the harbor, and bears northward to Liverpool, to encounter all the dangers of channel navigation, and to add to the number of black spots upon the wreck charts. The natural advantages of Milford Haven have never been economized, because the counties in its neigborhood are poor, without power to develop its resources, and, till lately, there has been little railway accommodation in the district. Within the past five years, two new lines have crept down to its shores, and the direct railway from Milford Haven to Manchester is in progress. The country in the neighborhood of the harbor is rich in anthracite coal, and the steam coal from the great Aberdare carboniferous basin is within easy distance by rail. At present the only signs of life at the Haven are a Government dockyard, and the town of Milford, which is nothing more than a miserable village, with a large percentage of uninhabited houses. The late First Lord of the Admiralty, the Duke of Somerset, declared that the great want of Milford Haven was dock accommodations, which private enterprise is now taking some steps to provide. Some of the Panama line of steamships have been sent by their owners to coal in the harbor, which, from its natural advantages, will probably, in the course of years, prove a great boon to all engaged in trade between England and America.

In my last, it was mentioned that a great body of archæologists, headed by the Marquis Camden, K. G., the Bishop of Oxford, and other gentlemen, had just invaded London to examine its ancient ruins and antiquities. They visited Windsor Castle, where Queen Victoria threw open to inspection every part of the building of interest, including some subterranean passages leading from the interior of the fortress, through the chalk rock, to the bottom of a shaft 35 feet deep, opening in the park, outside the outermost walls of the royal residence. The date of construction of these passages is not known. The archæologists also explored the Tower of London, under the guidance of Mr. G. T. Clark, the trustee and manager of the Dowlais Iron Works. Mr. Clark proved a most efficient cicerone, and in the course of his remarks narrated an unpublished anecdote of the late Duke of Wellington. At the time that His Grace occupied the position of High Constable of the Tower, he kept the public records in a room above the powder vaults. A literary gentleman, on making this discovery, hastened to the Duke, and asked him, "Whether he did not think it a very dangerous thing to keep the records on the top of the powder magazine?" The listener, who regarded the question purely from a military point of view, seemed startled at the suggestion, and replied, "Oh, I never thought of that before." He then mused for a minute, and brightening up he told the querist—"Well, perhaps it is not so dangerous after all, for I really don't think they will hurt the powder!" Mr. Clark piloted his party all over the ancient building, and at last, in the chapel in the White Tower—the chapel in which William the Conqueror and his rapscallions once knelt at their devotions, such as they were—the archæological students listened to perhaps the most instructive and eloquent discourse ever delivered within its walls. He told how Lady Jane Grey, Sir Walter Raleigh, and many others, had knelt before the rude altar in that chapel, and afterward dared to suffer and to die for the sake of opinions which they believed to be true. On the Tower Green, just outside the door, the noblest blood in Englnnd had been shed, and beneath a neighboring staircase had been dug up the bones of the two murdered princes. The whole atmosphere of the place seemed heavy with crime. Mr. Clark concluded with a few remarks about the Tower as a royal residence of the Plantagenets, who having lived out their lives of virtues and crimes, were carried forth to Westminster Abbey, where now they lie upon their altar tombs, with their weapons by their sides and their hands uplifted to heaven, peacefully awaiting the final resurrection.

W. H. H.

London, Tuesday, August 28, 1866

The Bremen Rose-Wein.

A correspondent to the *Nation* gives an estimate of the value of the famous Bremen rose-wein, which, in the year 1624, cost $165 per cask, and is now two hundred and forty-two years old. Calculating the original outlay at ten per cent compound interest, he states that in 1865 the value of each cask was $231,883,905,000, or nearly ninety times the present debt of the United States, while each bottle was worth $161,039,499, very nearly the sum realized from duties on imports in the United States last year. Each glass was worth $20,000,000, and each drop $20,000. We should think that this wine had been kept almost too long, and the owners had better "realize" soon, unless they want to lose on it.

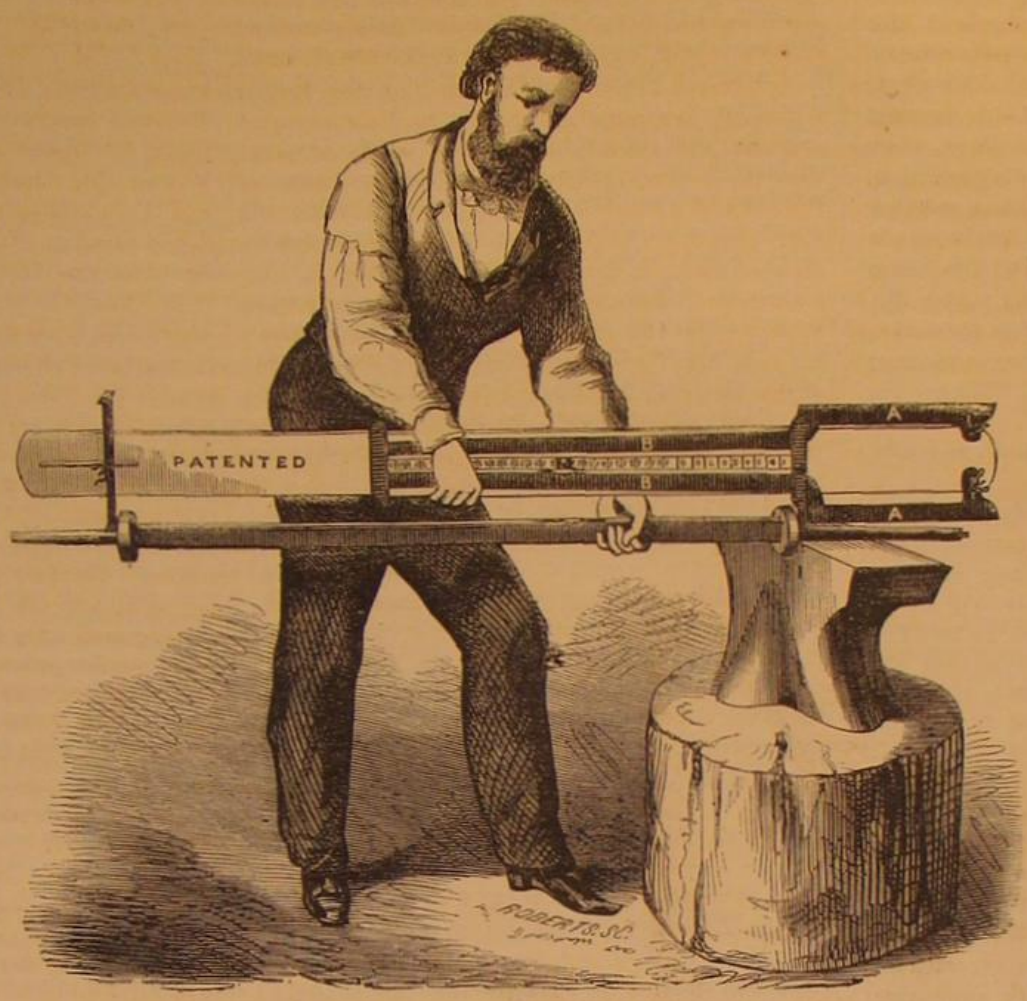
A NEW system of small coinage, invented by Mr. Hall, of Buffalo, is now under consideration by the Government, with prospect of being adopted for future coins. The plan consists in having upon the center of the one-cent pieces a raised star, the nucleus of which is represented by a hole through the coin, the two-cent coins are to have two perforated stars, the three-cent coins, three.

IN Turkey, the income of the sovereign absorbs ten and eight-tenths per cent of the entire revenue. In England six-tenths per cent are applied for supporting royalty.

Improved Axle Gage.

It is surprising how much of the work on implements and machinery, the perfection of which depends upon exactness and absolute operation, is still intrusted to the unreliableness of manual dexterity, or determined by conjecture and guessing. "Practice makes perfect," is a generally received axiom, but not entirely and always correct. The most skillful workman sometimes makes a mistake, but where work is done by an unvarying gage there is no excuse for errors.

The engraving represents an implement designed to take the place of the guess-work by which carriage axles are now generally set. It is very important that the "dish" and "gather" of carriage wheels should coincide with the set of the axles, and this result is now attempted by repeated trials of heating, bending, and cooling the axle arm or journal, and swinging the wheels. It is claimed by the proprietors of this patent that, by the use of this gage, two axles can be set in the time now required for one, and that the work will be done much more accurately. The gage is simply a board, corresponding in length to the longest axles, and having two flat levers of thin iron, pivoted at a point representing the collar or washer of the axle. These levers are slotted at the end of the arm, A, through which slots pass bolts, having thumb-nuts designed to secure either in a fixed position. Opposite the arms, B, of the levers, on the board, is a graduated scale of inches and their fractions. At the other end is a cross arm, b, which, by means of a bolt and thumb-nut, can be moved through a slot in the board and secured at any point, the margin of the slot bearing a scale of inches.



BAMBERGER'S AXLE GAGE.

The operation is simple. The taper of the arm, or journal, is ascertained by calipering at the ends, and the long arms of the lever are moved inward a distance corresponding to the whole taper of the journal, at a point twice the length of the box or journal. This shows the taper of the journal. Then, at a distance corresponding to half the diameter of the wheel, set the lever out to a point equal to the "dish" of the wheel, and secure it by the thumb-nut. Now apply the gage to the axle, the dog, or cross arm, b, at the other extremity, resting against the opposite journal, at the collar or washer. This will show how much the axle journal is to be set, the short arm of the iron lever bearing against the surface of the journal when bent to position.

For the "gather" proceed with the lever on the opposite side, except that the second movement should be out toward the edge of the gage for the front of the wheel, and in for the back of the wheel. A movement of one eighth of an inch will give a "gather" of one-quarter, bringing the wheels one-half an inch nearer together in front than rear. Practical carriage makers will easily comprehend the advantages of this gage, which is absolute in its movements and always reliable.

Patented by W. C. Bamberger, Nov. 15, 1859. For territorial and manufacturing rights apply to Wilson & Dougherty, Box 623, Newark, N. J.

The Doctrine of the Correlation of the Physical Forces.

There are signs of some reaction against that doctrine of the correlation of the physical forces which for the last twenty years has so dominated scientific thought, or, at least, against that interpretation of it which makes it teach that all forces are modifications of one force, and are mutually convertible into each other. Thus, in the last number of the "Quarterly Journal of Science," a mention, in an article on "De la Rue and Celestial Photography," of the appearance in the photographs of the solar eclipse of 1860 of solar prominences invisible to the human eye, calls forth the following very noteworthy remarks:—"A curious question arises from the consideration of the chemical power evidently possessed by these prominences, be they flames or clouds. We never, as we have already stated, under ordinary circumstances *obtain* an impressed image of the sun without finding the indications of a protected circle—that is, one which proves a paucity of chemical power—surrounding the photographic disk. Yet, when the light of the solar disk is interrupted by the body of the moon, the radiations proceeding from the edge, or rather, perhaps, from beyond it, have a strong photographic power. What is the cause of this most remarkable difference? Why is it that the photographic tablet is impressed during an eclipse by objects which do not give light enough to be visible even at the period of totality, and that they do not effect the required chemical change upon our sensitive plates when the sun is unobscured? The only reply which we are at present in a position to give is that the diffused light when the sun is shining is sufficiently powerful to overcome the weaker chemical radiations of those solar clouds or flames. If this reply approaches correctness, we have additional evidence confirming the view that the two principles existing in the sunbeam, light or luminous power, and actinism or chemical power, are not modifications of the same 'energy,' to use the accepted term of the day, but rather forces balanced against each other, acting indeed in antagonism." Are our men of science coming round to the doctrine of Swedenborg and other "mystics," that there are two primary forces, and not one only—one attractive and the other repulsive.—*Mechanics' Magazine.*

Whence Comes Indigo?

There are some fifty or sixty species of plants of the order *leguminosæ* and genus *indigo-fera*, which, by undergoing a process of fermentation, yield the beautiful dye known as indigo. These plants are indigenous in Asia, Africa and America, and in some of the East and West India islands. The discovery of the dye was very ancient, its use being mentioned by more than one of the ancient Latin writers, and in terms which make it very certain that it was the same that is now so well known by the name. It was very early produced in India, from which country the name was derived, as it was called Indicum, and this is the country in which it is now most extensively cultivated and prepared. Its importation into several European countries was for a long time prohibited, for various reasons; in England and France because it was thought to injure the texture of the cloth in dyeing. In Germany it was prohibited for the sake of protecting the native woad, a miserable substitute for the genuine article—a distinguished instance of the wisdom of those who are desirous of protecting home productions without any regard to their comparative value. On the same principle the advocates of this system ought to exclude from our own country yellow dyes, for the sake of protecting the well-known native dye made from butternut bark. The plant from which indigo is commonly produced grows to the hight of from four to six feet. It contains the coloring principles in the leaves and stems in a colorless fluid, which is changed to the dye by fermentation and oxidation. The seeds are sown in March or April, and before the plants attain their full growth, the same season, they are cut early in the morning, before the sun has fallen upon them, and carried to the factory, where they are laid in great stone cisterns, some twenty feet square and about three feet deep. Heavy weights are placed upon them by which they are kept down below the surface of the water, which is let in so as to cover the plants, and fermentation is allowed to go on for ten to fourteen hours, according to the condition of the plants, the temperature, etc. The liquor is then in an active commotion, very much as if it were boiling. Bubbles of air continue to rise, which assume a purple hue, indicating that the fermentation has had the effect of producing from the limpid water the color desired. When this process is complete, the water is drawn off into another vat, where it is violently agitated by artificial means for an hour or two, until the coloring matter begins to be precipitated, and it is then left to settle. The water is drawn off again, and the indigo is taken out, dried and prepared for commerce.

The cultivation of the plant and the preparation of indigo, wese commenced in South Carolina about the middle of the last century, and have been kept up ever since until the commencement of the late war, which interrupted so many of the Southern productions. At one time the finest indigo in the world was made in that State, and it was greatly sought after by dyers, calico printers, and leather dressers, but both the quality and quantity fell off many years since, and the yield, for some time past, has been inconsiderable. The finest quality now comes from Bengal and the adjacent provinces. There are many grades, according to commercial language, such as superfine, pure blue, ordinary blue, fine purple. The finest quality has the least specific gravity, and floats upon the water; the poorer qualities having an admixture of earthy substances which add to their weight. The finest indigo may also be tested by its not readily leaving a mark on drawing it when dry across a piece of paper, and also by the clear blue which it imparts to water when dissolved. The culture of the plant is quite precarious, and the amount produced varies greatly from one season to another. The total shipment from the East Indies averages 12,000,000 lbs. per year. Last year there was imported of this first quality into the United States 415,575 lbs. valued at $324,207—its foreign gold cost.—*Exchange.*

THE British mint has ceased to coin half-crowns for some years past. In like manner, the four-penny piece is made to give place to the three-penny, no coin of the former denomination appearing in the returns since March, 1855.

Correspondence

The Lightning Rod Question.

MESSRS. EDITORS:—In No. 11, current volume, SCIENTIFIC AMERICAN, is an article entitled "Insulation of Lightning Rods." I am surprised that you allowed such an article to appear in your paper, as it is a subject that should not be laid blindly before your readers, for it may cause a great deal of mischief. S. D. C. says lightning rods must not be insulated. But where are his proofs? I say a rod that is not insulated is worse than useless; my proof is that several houses that have been struck in this city, although armed with rods, showed, on examination, that the insulation of the rod was imperfect; and, on the other hand, where the rod that was put up to protect the building was well insulated, when struck by lightning it proved a complete protection. The Burnett House here, for instance, has a rod that was struck, and the platinum points with which it was armed were completely melted, but the house was safe, the rod was well insulated. Also Mr. Diehls' establishment for manufacturing fireworks, situated on Mount Adams, received a heavy charge; the rod was insulated and saved the building. No rod should be put up without being insulated, and Franklin says so, S. D. C. to the contrary notwithstanding.

S. D. C. says rods should be in connection with gutter spouts. That is a very good arrangement when the rain is falling and the water running through the spout, for then the water will carry off the electricity that would otherwise go into the house, as likely as anywhere else; but as rods often receive a charge before any rain falls, it is best to trust to the rod alone, for if the rod is in connection with anything else which is a good conductor, that does not lead to the ground, the lightning will be compelled to take some other course to get to the ground, and then there is no telling where it will go, or what damage it will do before it is spent. In proof of this, I will give an instance. The cross which surmounts the steeple of the Cathedral in this city, was put together with an iron rod that passed through it. The conductor was well insulated all the way down, but one of the fastenings that held it to the cross came in contact with the iron rod that held the cross together. This rod was struck, the lightning ran into the cross, on the iron rod running through it, but it could go no further. The consequence was that the cross was split into fragments, and as the steeple is one of the highest in the city it was no easy thing to replace it.

The whole trouble is that people will get the cheapest rods that can be had. It is better to pay for a rod that is large enough to conduct any amount of electricity that it is likely to get, and have it well put up by some one that knows his business. S. D. C. talks of safety valves. The comparison is not at all analogous. F. F. S.

Cincinnati, Ohio.

[Our correspondent's strictures on the publication of contributions, are not entirely just. We are in no way responsible for the opinions of correspondents, and on this subject of insulation, men equally well experienced hold opinions diametrically opposed. Our object is to allow both sides to present their differing views, and thus by a courteous discussion eliminate the truth.—EDS.

Mechanics Needed.

MESSRS. EDITORS:—Owing to natural and accidental causes, mechanics are many times compelled to move their base of operations to some more eligible point, where they can get supplies at more reduced prices and in greater abundance. To such, I would say that this point offers extraordinary inducements, and invite their attention to the following facts: We are situated about midway between St. Louis and Cairo, on the east bank of the Mississippi, with an immense extent of the finest farming land in the United States back of us. We have large beds of coal within fourteen miles of us, from twenty to one hundred feet below the surface, and from three to seven feet vein. The St. Louis and Iron Mountain Railroad strikes the mine some 40 miles above here, and the ore could be brought by barges to this point very cheaply. We have an abundance of the finest kind of timber—such as oak, black walnut, ash and all kinds of hard wood. Land is cheap, the climate is healthy, and all kinds of fruits abundant. For a manufactory of agricultural implements, or a machine shop and foundery, this place offers superior inducements.

Any further information in regard to the subject will be willingly given. We need mechanics and we are willing to do all we can for them.

C. B. COLE.

Chester, Ill., Sept. 4, 1866.

Effects of Sunshine on Fire.

MESSRS. EDITORS:—In reading your article on the "Effects of Sunshine on Fire," in your issue of Sept. 8th, I notice in the summary of Prof. Horsford the following:—

"Sixth, That the very diminished draft of chimneys in very hot weather, when the general atmosphere is at rest, and the sunshine intense, is due to upward currents on the outside of the house, arising from the heated surfaces of the roof and walls; which currents, by friction, draw outward through cracks and open doors and windows, the air from the interior of the house, and so lessen the pressure within and overcome the draft of the chimney." In describing the circumstances, he mentions that "the roof of the house was of dark slate" and exposed to the heat from 11 A. M. till 3 P. M.

Could not this occurrence be accounted for as follows? The draft of a flue or chimney being caused by the difference in weight of hot and cold air, did not the heated air rising from the roof surround the chimney? And was there not so little difference in temperature between the air from the range rising within the chimney, and the air from the roof rising without the chimney that a sluggish draft was the consequence; until, later in the day when the roof became cool and a better draft would result?

J. WENDELL COLE.

New York, Sept. 17, 1866.

Concrete for Building Purposes.

MESSRS. EDITORS:—In the SCIENTIFIC AMERICAN of Sept. 1st, C. W. C., of Mo., under the head of "Notes and Queries," is wrongly informed as to the relative strength of stone, brick and concrete for building purposes. You will see in "Gillmore's Report on Hydraulic Cements and Mortars," at page 225, article 447, the following, which I think would be the correct reply to your correspondent:—

"Concrete is admirably adapted to a variety of most important purposes, and is daily growing into more extensive use and application. For foundations in damp and yielding soils, and for subterranean and submarine masonry, under almost every combination of circumstances likely to occur in practice, it is superior to brick work in strength, durability and economy, and in some exceptional cases, is considered a reliable substitute for the best stone, while it is almost always preferable to the poorer varieties."

The work of Mahan, which you quote in your reply to C. W. C., is strangely incorrect on the subject.

R. K. D.

New York, Sept. 18, 1866.

[In the case alluded to, C. W. C. inquired as to the relative strength of stone, brick, and concrete for a church, 40 by 80 feet and 25 feet high to the eaves. It will be seen by the quotation from "Gillmore's Report" that he does not recommend it for open air structures, but for "foundations in damp and yielding soils, and for subterranean and submarine masonry." For these purposes the value of concrete, made of stone and cement, is indisputable.—EDS.

THE Italian gold mines are producing gold to an extent that has justified the introduction of new and improved machinery. In July last the product of three mines amounted to 1,511 ounces, valued at about $20 per ounce, all of which was transmitted to London.

THE Geographical Society, of St. Petersburg, is making preparations for a scientific expedition, for tracing the course of the river Yenisei up to its mouth in the icy sea.

NEW INVENTIONS.

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

CULTIVATOR.—ANDREW STARK, Topeka, Kansas.—This invention relates to a new and improved cultivator for cultivating those crops which are grown in hills or drills, and it consists in a novel arrangement of a seat frame with the plow beams of the device, whereby the plows are placed under the complete control of the driver. The invention also consists in a novel manner of constructing and arranging the frame of the device and the draught pole, whereby a very simple, strong and durable device is obtained.

TRUNK.—A. V. RYDER, New York City.—This invention relates to a new and improved trunk, of that class which are provided with drawers, and it consists in constructing the trunk in such a manner that the drawer is rendered very accessible and, when the trunk is open, the drawer will not interfere with the other portion of the trunk. This invention, it is believed, is superior to other trunks provided with drawers, in consequence of all the portions of the trunk being accessible when the trunk is open, all the drawers being exposed, so that they may be drawn out, and the lid of the other portion raised without the necessity of removing or detaching any parts.

CAR COUPLING.—HOMER ADKINS, Plymouth, Ill.—This invention relates to a new and improved car coupling, of that class which are commonly termed self-acting or self-coupling, and it consists in a novel means for holding up the coupling pin in one drawhead, whereby the other drawhead, which contains the link, may, when the two drawheads came in contact, release the coupling pin, so that it may drop through the link, provision being also made for holding the link so that a coupling of the two drawheads may be effected or not, as desired.

MACHINE FOR CUTTING THE CORNERS OF PAPER FOR THE MANUFACTURE OF PAPER BOXES.—DANIEL WHITLOCK, Newark, N. J.—This invention relates to a new and improved machine for cutting out the corners of rectangular pieces of paper for the manufacture of rectangular paper boxes. The invention consists in a novel construction of the knife or cutter, whereby the same is made to work in proper position at all times, being prevented from getting out of place under the resistance offered to it by the paper. The invention also consists in the employment or use of an adjustable bed and in graduating the bed so that by means of adjustable gages, used in connection with the bed, the openings at the corners of the pieces of paper may be cut larger or smaller, as occasion may require.

PUMP FOR DEEP WELLS.—J. W. SUMMERS, Tarr Farm, Pa.—This invention consists, among other things, in suspending or attaching the piston of a pump to its rod by means of a ball and socket joint, or its equivalent, in contradistinction from a rigid or fixed joint, whereby the piston is allowed lateral play in the pump cylinder so that it can easily yield in any direction when the pump tube or the cylinder is deflected from a right line.

STITCHING CLAMP FOR HARNESS MAKERS.—W. M. MCCOY, Bloomingdale, Ind.—This invention is designed for the use of harness makers for holding rolled work while stitching the same; and it consists in a device provided with a grooved bed for the work to lie in, and at either end with a band, or its equivalent operated by a set screw for holding the work firmly while being stitched.

BLOW PIPE.—JOSIAH MCFARLAND, Clinton, Ill.—This invention consists in applying an air chamber to a force pump, and to a flexible pipe with a fine-pointed mouth piece, in such a way that by means of the pump the chamber is filled with compressed air or gas of any character, when, by closing suitable cocks, the same can be confined and retained therein and the air chamber taken off and carried to the place where the blow pipe is to be used and by the action of the air or gas a powerful blast obtained without the labor or agency of the operator.

SKATE.—M. FLEISHER, Philadelphia, Pa.—This invention relates to that class of skates in which the skates are secured to the boots by means of clamps brought to bear against the edges of sides the sole and heel, and it consists in a novel arrangement of the said clamps.

MACHINE FOR BORING OR CUTTING KEY SEATS.—JOHN K. DIENER, Honesdale, Pa.—This invention consists in a novel manner of arranging the cutting tool of the machine, whereby the tool can be so adjusted or set in position and so regulated as to cut a key seat with an inward or outward incline or in a parallel line with the central axis of the car wheel, crank, or other device in connection with which it is being used.

HOISTING APPARATUS.—GEORGE L. HOWLAND, Topsham, Me.—This invention relates to an improved hoisting apparatus, by means of which weights may be raised or lowered to or from any desired elevation; which will occupy but little space, and be easily transferable from one place to another.

SAFETY POCKET.—JAMES T. CHAMBERS, Utica, N. Y.—This invention consists in so constructing a pocket, that a watch or any other article placed in it cannot be abstracted or removed without the knowledge of the possessor or wearer.

SHIRT BOSOM.—C. F. PIDGIN, Boston, Mass.—The objects of this invention are to increase the flexibility of the bosom so as to allow it to yield or give to the backward or forward motion of the wearer; to diminish its cost; and to make it lighter.

WELL.—D. P. CHESBROUGH, Lansingburgh, N. Y.—This invention consists in so attaching to a well-tube, below its waste-water pipe, a reservoir or receptacle for the waste water escaping or flowing from the pipe, that such water can be reconveyed or conducted back into the well-tube.

SAW MILL.—GEORGE W. CODDINGTON, Middletown, Ohio.—This invention has for its object to furnish an apparatus for supporting the middle part of the log while being sawed, so that it may be prevented from bouncing and jumping, enabling the saw to be run at full speed from one end of the log to the other without its being necessary to check the speed of the saw, or alter or take off the feed when approaching the middle of the log or carriage, as is now the case.

SADDLE.—JACQUES MEYER, Williamsburgh, N. Y.—This invention relates to the construction of saddles, and consists in combining new materials in the manufacture of the article for securing greater strength and durability, and hanging the stirrups and straps in a convenient manner for shifting lengths and detaching them readily from the saddle.

SHOVEL PLOW.—WILLIAM H. LUCE, Hampton, Ill.—This invention consists in providing a shovel plow for the purpose of eradicating weeds and loosening up and pulverizing the ground around corn, potatoes, and other crops, which are sowed or planted in drills or rows.

WATER-PROOF COMPOSITION.—SAMUEL B. B. NOWLAN, New York City.—This invention relates to a new and improved water-proof varnish, which is to be applied to all kinds of textile fabric, paper and other substances. The said varnish is said to have no injurious effect on the fabric to which it may be applied, and not to be liable to spontaneous combustion. The claim was published in our last week's issue.

MACHINE FOR CLEANING WHEAT AND OTHER GRAIN.—BENJAMIN BARNEY, Time, Ill.—This invention relates to a new and useful machine for cleaning wheat and other grain, and it consists in the employment or use of a rotary fan, vibrating shoe containing a riddle, cockle screen, and a chute, and a suction blast spout, provided with a valve, and arranged with the fan and shoe in such a manner that wheat and other grain may be cleaned very expeditiously and in a perfect manner.

ALARM MOVEMENT.—J. E. BUERK, Boston, Mass.—This invention consists in an alarm movement, from the escapement of which extends a stop lever, which bears against a segmental disk mounted on a shaft, to the upper part of which is secured a serrated segment in such a manner that by turning the serrated segment either by hand or by the action of a watch or other mechanism, until the flat part of the segmental disk faces the stop lever, the escape wheel is released, and the alarm begins to sound.

FEED-WATER HEATER.—GEORGE HASECOSTER and JACOB STEPHENS, Richmond, Ind.—This invention has for its object to furnish a means by which the water to feed steam boilers may be heated, and the lime which may be in it be deposited before it is introduced into the boiler.

DRILLING MACHINE.—ROBERT NUTTY, New York City.—In the machine embraced in this invention the drill or drills are so hung and arranged that whether to operate or work against the face of the quarry or rock in a vertical, horizontal, or in any plane between the two, it can be readily adjusted and brought to the proper position therefor, and, when in any of such positions, be operated in the desired manner.

CULTIVATOR.—SAMUEL P. ETLER, Scotland, Pa.—This invention consists in so constructing a cultivator that by means of compound levers the plows may be shifted from side to side between the wheels, and by means of other levers the plows may be elevated out of the ground so that the cultivator may be conveyed from place to place without the teeth or plows coming in contact with the ground.

PLOW.—F. M. MCMEEKIN, Morrison's Mills, Florida.—This invention relates to a new and improved plow, and it consists in a novel construction of the same, whereby a very strong and durable plow is obtained—one which may be manufactured at a reasonable cost, and be capable of having different molds attached, as circumstances may require.

CULTIVATOR.—D. J. NOBLE, New Boston, Ill.—This invention relates to a new and improved cultivator of that class designed for cultivating crops grown in hills or drills, and it consists in a novel arrangement of the two inner or laterally moving plows, and also in a novel adjusting device for the plow frame, whereby it s believed that the laterally moving plows may be operated with greater facility than hitherto, and all the plows made to penetrate the earth at a greater or less distance as may be required, and retained or held down in the ground the required distance, and at the same time be capable of being adjusted with the greatest facility.

ARCHED IRON BRIDGE.—JOHN H. GILBERT, Roxbury, Mass.—This invention has for its object the production of a much stronger bridge out of a much less amount of material, and, consequently, at a much less cost than has heretofore been done.

CHURN.—WILLIAM BURSON and D. C. BURSON, Salineville, Ohio.—This invention consists in the peculiar construction of the dasher, and in the combination of a perforated gathering board with the box and dasher of the churn.

MECHANISM FOR SEPARATING GRAIN AND OTHER SUBSTANCES.—JOHN S. BODGE, La Porte, Ind.—This invention is designed as an improvement on that kind of separators the screens or sieves of which are provided with covers constructed and arranged in such a manner and in such relation with the screens or sieves as to prevent the longer or broader grains, seeds, or other particles or substances to be screened or sieved, from assuming an oblique or perpendicular position while passing over the screens or sieves, and thereby compelling said longer or broader grains, seeds or other particles to pass over the screens or sieves flatwise while the shorter, smaller and narrower grains, seeds, and other particles are permitted to pass through the screen or sieves when the latter are in motion.

MACHINE FOR POUNCING HATS.—EMILE NOUGARET, Newark, N. J.—This invention relates to a machine by which the operation of pouncing the brim and also the body and crown of a hat can be performed with the greatest ease and facility and with very little hand labor. The brim of the hat is secured between two conical pressing rollers which carry the same through between two spring jaws, the faces of which are covered with emery or sand-paper, or other suitable material, and the hat is guided in its motion by an angular guide-piece, in such a manner that by imparting to the conical pressing rollers a rapid revolving motion, the brim of the hat is carried through between the spring jaws, and the operation of pouncing the same is effected without exertion, and in a short time.

FASTENING FOR GATES.—POMPEIUS PHILIPPI, Beardstown, Ill.—This invention consists in having the upper bar of the gate extend a suitable distance beyond the batten or upright at its free or unhinged end, or, having a bar extend from the batten or upright, to catch into or over a hook attached to the gate-post, and using in connection therewith a lever or levers and a rod, arranged in such a manner that, by adjusting or operating the levers, the unhinged end of the gate may be raised and lowered with the greatest facility, and the projecting bar made to catch into the hook, or be raised out of it in order to fasten or unfasten the gate, as may be required.

MOLDER'S FLASK.—E. C. LITTLE.—This improvement consists in a cast-iron frame for molder's flasks, constructed with hinges and pins peculiarly fitted for connecting the cope and drage so that they are adapted to a match-plate, without producing any lateral movement to disturb the pattern.

CORN HARVESTER.—S. SECRIST.—This invention is designed as a labor-saving implement for cutting and gathering indian corn and sugar-cane, and leaving the stalks standing in shocks as the machine travels over the field, making clean and expeditious work.

STRAW CUTTER.—S. PETTIBONE, Corruna, Mich.—This invention consists in the combination of a fly-wheel with the lever to which the knife of a straw cutter is attached, and by which it is operated; also, in the adjustable bearing in which the shaft of the fly-wheel runs, which is constructed in such a manner that it may be moved up or down, as may be desired.

COMPOSITION ROOFING.—JAMES G. HOLLIDAY, Wheeling, W. Va.—This invention consists of a composition roofing, formed by combining coal tar, still bottom of petroleum, acid tar, finely-ground brick clay, and refuse lime from gas house, with each other.

STEAM GENERATOR.—E. P. CHASE, Rockland, Me.—This invention relates to a steam boiler, in which a water-heater and a series of steam superheating pipes are combined with the generator. The water is drawn from the heating tank and injected into the generator by means of a pump of any desirable construction, and a self-acting regulator governs the supply of water drawn by the pump, according to the pressure of steam existing in the generator. After having been drawn from the tank the water is injected in the form of a fine spray into an annular generator which is exposed to the direct action of a fire, and by these means the water instantly flashes into steam, which passes through a serpentine pipe, or through a series of pipes, in the space or flue surrounded by the annular generator, where the same is superheated, and whence it passes off to the engine or to the spot where it is to be used.

BURIAL CASE AND COFFIN.—JULIAN A. FOGG, Salem, Mass. Patented Sept. 4, 1866.—This invention consists in an improved manner of constructing coffins, whereby the same are made very durable and are prevented from falling to pieces before the wood is decayed, and the invention consists further in a new manner of securing a glass plate to the cover of the coffin, whereby the face of the corpse is displayed, and also in an improved manner of arranging the plates. In the claims of this case, which were published in our last week's issue, the inventor's address is given at Cheshire, England, but it should be Salem, Mass.

PETROLEUM TANKS.—Much attention has been directed to contriving vessels for the storage and transportation of petroleum, and a score of patents have been issued for compositions for rendering barrels impermeable to the liquid, while other inventors have devoted themselves to contriving metallic tanks, which are easily rendered impervious, but are subject to casualties from the expansion and contraction of their contents. When tanks or large vessels are used, it becomes necessary to provide against the "swashing" of the liquid therein, and about a dozen patents have been issued in which inventors have endeavored to reconcile two apparently opposite conditions: a full tank in which the liquid would not "swash," and one which would not be injuriously affected by expansion and contraction of the liquor. In the patent of Church & Knight, Sept. 11, 1866, an auxiliary chamber is provided, into and from which the liquid of the main chamber flows under alternate expansion and contraction. The means of communication between the two chambers is a bent tube whose open ends are beneath the surface of the liquid in the respective chambers, so that the liquid may flow from the full chamber to the smaller one as it expands and return when it contracts, without the admission of any air to the main chamber. A single plate and a pipe as long as twice the diameter or depth of the tank is all the addition required to provide tanks with this safety arrangement. Address Jas. L. Ewin, Lock Box 39, Washington, D. C.

COMPASS SCALE.—JOHN REID, Knoxville, Md. Patented Sept. 11, 1866.—A scale is furnished with a compass, which will indicate, by the needle, the position of the ruling edge of the scale. The compass is capable of rotation in a horizontal plane, and has an index and vernier to permit its adjustment to correspond to the variation.

Notes and Queries

A. L. W., of N. Y.—Vulcanized india-rubber cloth will bear a temperature of 160 deg. for a time. The kerosene stoves with a chimney at one end, operate very well. We have tried one thoroughly. They are for sale on Broadway.

———, of Mass.—For keeping the valves of a fire engine from freezing in winter, we know of nothing so efficient and unobjectionable as that which you suggest—glycerin. From some experiments made, we believe it will serve your purpose. Try it next winter.

G. A. H., of Ind.—Your small steel collars can be polished as well as "tried" after hardening, by the use of "blue stone," or "Scotch gray" stone, secured in a support which will not allow it to follow the depressions of the roll. Holding a piece of the stone firmly on a rest will suffice. Any fine grained stone that does not scratch will do to bring the rolls to a surface. The lathe should not run fast enough for polishing. The whole secret is patience. This is what makes these fine rolls cost.

W. R. and A. E. H., of C. W.—To give you a diagram for setting your slide valve, would necessitate the preparation of engravings, which would entail too much expense. Full directions in regard to this subject can be found on pages 51 and 70 of Vol. XIII, SCIENTIFIC AMERICAN, current series. We think, however, you are striving after a mechanical impossibility, if we understand your query.

F. M. R., of Pa.—The Atlantic cable of 1858 is known to be imperfect. We are not informed whether the Company intend to raise it. It is not expected that it would prove to be in a serviceable condition for an ocean cable.

W. H. S., of Pa.—Coke is generally supposed to be capable of producing a hotter fire than anthracite. The intensity of heat is proportioned to the amount of combustion in a given space. The fuel which burns the quickest should give the hottest fire.

E., of Md.—If an empty bottle be corked and then sunk in deep water, the pressure will force the water into the bottle so as to fill it. But the water will enter through the neck, the cork will be condensed and generally will be inside of the bottle when it is drawn up. Glass is impervious to water. . . . . The water at the bottom of the ocean is as quiet as the grave.

A. P. L., of N. Y.—Emery for coating a polishing wheel needs no preparation. Select the grades you need, spread the emery on a board, or table, coat the periphery of the wheel with hot glue, and, by means of a stick through the center, roll it back and forth over the emery. You can, however, purchase a vulcanite emery wheel, which will be superior to any you can make.

J. C. E., of Ohio.—Coat your cast iron screws with plumbago, or black lead, instead of molding sand, and you will probably find little difficulty in casting a nut upon them.

J. H. L., of Wis.—After years of experience as an editor, testing gum arabic and gum tragacanth, we think nothing is better for paper pasting than common starch. It should be macerated, or dissolved, in hot water, and will keep longer than anything else we know.

SPECIAL NOTICES.

Warren W. Dutcher, of Milford, Mass., and Sarah Dutcher, administratrix of the estate of Elihu Dutcher, of Waukesha, Wisconsin, having petitioned for the extension of a patent granted to the said Warren W. Dutcher and Elihu Dutcher, on the 28th day of Dec., 1852, for an improvement in temples for looms, it is ordered that said petition be heard on Monday, the 10th day of December next.

Jearum Atkins, of Mokena, Ill., having petitioned for the extension of a patent granted to him the 21st day of December, 1852, for an improvement in rakes to grain harvesters, it is ordered that said petition be heard on Monday, the 3d day of December next.

Interesting Decision--Combination Tools are Patentable.

BEFORE THE EXAMINERS-IN-CHIEF ON APPEAL.

Foote for the Board.

Application for a Patent for a Combination Tool.

The Examiner, in denying the application in this case, states: "The tool, as described and shown, is an aggregation of four distinct tools answering to four different purposes, some widely dissimilar and others analogous; but in no particular does any one of these tools add any value to either of the others, or co-operate therewith to effect a common purpose, and hence no combinable relationship exists between them."

In Beach's application for a patent for combining a sharpener with a fork, we came to the conclusion that the principle above referred to did not apply to such a case; and the present one, we think, is like it. It is often a matter of great convenience and utility to combine several tools in one, or, more properly perhaps, make the same tool perform their different offices; and invention directed to that object is entitled to the reward of a patent, as much so as any other subject of invention. A great many patents have been granted for such combinations, as a sword and pistol, a bureau and a bedstead, a theodolite and a compass, a saw and a square, that have no co-operative action, and we are not aware that any of them have been held invalid for that cause.

The Examiner refers also to another ground of objection, as follows: "The same patent cannot be for a combination of different machines, and for distinct improvements in each."

The words quoted are from the decision of Judge Story, in Moody vs. Fiske, et al. (1 Mason, 119), and are in accordance with an opinion by the same learned Judge in the previous case of Barret vs. Hall (1 Mason, 447). These cases were under the act of 1793, and in both, the language quoted was rather a general remark than the decisions of the cases. The language was explained and qualified in the subsequent case of Wyeth vs. Stone (1 Story, 291), in which Judge Story says:—"It is, perhaps, impossible to use any general language in cases of this sort, standing almost upon the metaphysics of the law, without some danger of its being found susceptible of an interpretation beyond that which was then in the mind of the court. The case intended to be put in each of these cases was of two different machines, each applicable to a distinct object and purpose, and not connected together for any common purpose."

And afterward in Pitts vs. Whitman (2 Story, 621), the same Judge decided directly—"There is, in my judgment, no difficulty in maintaining the validity of a patent (as in the present case) for a machine combining several distinct improvements, each of which is the invention of the patentee, and also of including in the same patent a right to each of these several and distinct improvements. In other words, the patentee may, in such a case, take out a valid patent for the combination, and also include therein a right to each distinct improvement severally contained in the same machine."

The same principle was affirmed by Mr. Justice McLean in Root vs. Ball (4 McLean Rep., 180), "the same patent may include a patent for a combination and an invention of some of the parts of which the combination consists."

Since the decision of these two cases it has been a very common practice to include in the same patent claims for the combination and for the parts of which it is composed, and suits upon such patents have been carried through every stage of litigation, and been sustained by the highest courts without objection from that cause, and the law must now be regarded as entirely settled on that subject.

We apprehend, therefore, that the Examiner has not investigated this case with reference to the principles that properly govern it, and we overrule his decision with a view to its re-examination. We express no opinion in reference to any of the claims.

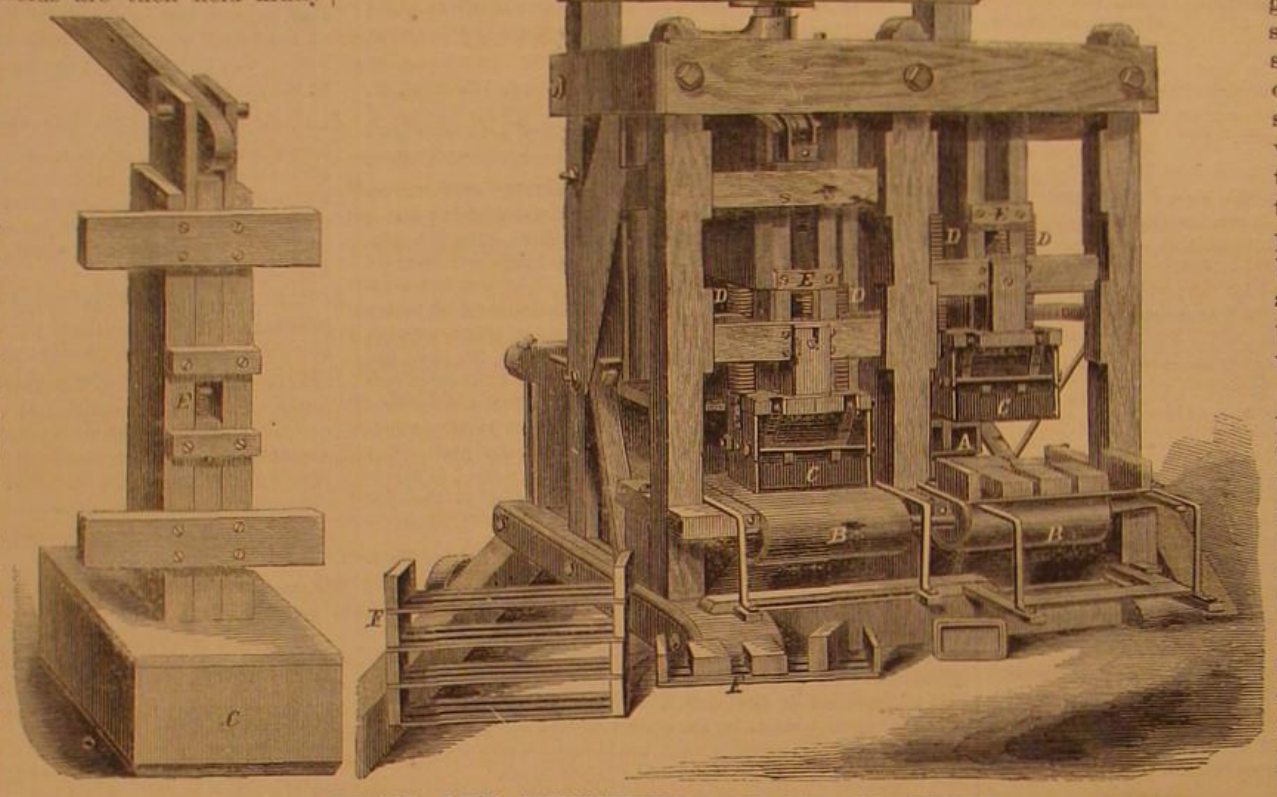
The decision of the Examiner is reversed.

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.

Improved Brick Machine.

This engraving represents a new brick machine of that class where the clay is placed in the pug mill and forced down by the mixing knives to the bottom, and then into the openings, A, in the mud boxes. From the mud boxes, by means of plungers operated by a crank on the main shaft, it is forced through openings in the front of the boxes on an endless band, B, the strips of clay corresponding in size to the bricks. The thickness of the strips of clay is varied by set screws raising or depressing the hinged die plate.

The molds, C, descend as soon as the strips of clay cease to move, and cut through them on to the endless band, underneath which is placed a strong stationary table. The molds are then held firmly down on the table. In case the molds strike a stone or other hard substance, in cutting through the clay, the springs, D, are so arranged that they yield and prevent any part of the machine from being broken. While the molds are held down on the table the followers are forced down and press the bricks. The pressure on the bricks is varied by set screws, E.



CAPRON AND WINCHELL'S BRICK MACHINE.

The molds and bricks are then all raised together, and the bricks are forced out of the molds by the followers on to racks, F, to be removed. The molds are operated up and down by levers connected with an inclined circular track on the main shaft, so that it requires but little power to produce a great pressure on the bricks.

The machine is so constructed that while one set of molds are forming and pressing bricks, the other set are delivering the bricks on racks.

The bricks are pressed sufficiently hard to be handled without marring, so that only racks for one day's work are required.

The machine is also well adapted for making drain tile; the only changes required are to disconnect and remove the molds and place dies of any suitable size in the front of the mud boxes, then arrange a bed of rollers for conveying the tile to be cut into suitable lengths.

The machine is simple in construction, weighing about 2,500 lbs. It is worked by two horses, and will make from 20,000 to 30,000 bricks per day.

Patented July 30, 1866, by E. P. H. Capron and James F. Winchell, Springfield, Ohio. For rights or further information address Capron, Winchell & Co., Springfield, Ohio, or Baker & Short, General Agents, Columbus, Ohio.

Belladonna an Antidote for Opium.

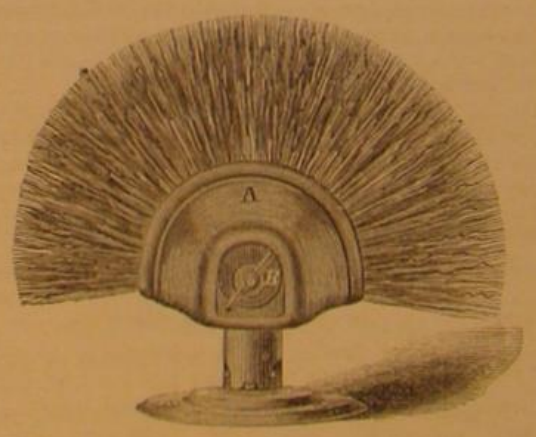
A correspondent, a professional physician, in a letter to the *Medical and Surgical Reporter*, details the circumstances of a case where the patient had taken three ounces of opium tincture, or laudanum, which had exerted its effects three and a half hours. Fluid extract of belladonna was then administered in doses of twenty drops every ten minutes, which, in twenty minutes, arrested the progress of the opiate, and in about eight hours the patient was so far recovered as to sit up and converse. The writer says he is sure that belladonna saved this man's life.

Inflammability of Coal Gas.

Numerous accidents have occurred, especially in the destruction of vessels carrying bituminous coal, from the generation of an explosive and inflammable gas. An English exchange, in noting the fact, recommends thorough ventilation of the cargo as the proper remedy. It is a suggestion worthy of attention. A lantern taken into the hold of a vessel loaded with bituminous coal, which has been kept for days and weeks confined, not unfrequently sets the ship on fire and causes the destruction of life. If a combustible gas, similar to the "fire-damp" of the miner, is generated by the confinement of coal in a ship's hold, the proper remedy is certainly proper ventilation, which can be easily secured by the introduction of pipes, perforated where they pass through the mass, and extending above the deck. If these vertical pipes are connected near the bottom by a horizontal tube, and the forward opening is provided with a funnel like that of a wind-sail, the mouth opening forward in the direction of the vessel's course, and the other pipe having an opening astern, a current would be generated which might safely convey the deleterious gases to the external atmosphere. The subject is worthy more attention than has heretofore been bestowed upon it.

NEWBURY'S SHOE CLEANER.

Every person has experienced the inconvenience of not being able to remove, by the usual means, the dirt and mud adhering in the crevices between



the upper and sole of a boot or shoe. The simple apparatus shown in the engravings is designed to obviate this trouble. It is a clamp of cast iron, A, the two jaws hinged, and the whole secured to the door step or the floor of the entry by screws. A brush or broom of semicircular form is placed between the jaws and secured by the thumb nut and bolt, B. When worn, the brush can be easily replaced by another. No further explanation is necessary, as the contrivance will commend itself to the approval of every housekeeper.



Patented through the Scientific American Patent Agency July 10, 1866, by L. M. Newbury, of Black River Falls, Wis., to whom apply for further particulars.

The Influence of Science.

The address of Gov. Andrew, before the Agricultural Society of Vermont, will well repay perusal, characterized as it is by the depth of investigation and exactness of information which we should be led to anticipate when emanating from such a source. His statements in relation to the agricultural and mechanical interests of our country are worthy the consideration of every one. The statistical information is of great value; figures are stubborn facts which no subtlety of argument can overthrow, their possession furnishes a power which no opponent is able to gainsay or resist, while the acquisition of such power cannot fail to be both pleasant and profitable when presented in the engaging manner of the address before us.

Among the important points brought forward, the following remarks on the value of improvements in machinery seem eminently just: "The activity, the ingenious cunning and the aspiring enterprise of American mechanical inventiveness—have made mankind its debtors, increasing supply, cheapening cost, relieving the hardships of labor, and doing its part toward the amelioration of man's estate. Our own manufacturers introduced the production of heavy cotton fabrics, by the application of the least amount of labor to the greatest quantity of raw material, producing a description of goods cheaper to the consumer than any before existing. They were followed in this, not led, by the manufacturers of England, by whom even the characteristic name of the American article was adopted for their own imitations spun from the cheaper cotton of India. They have assisted in the reduction of the cost of fabrics to the consumer, so that cottons, selling in 1816 for 30 cents the yard, cost but eleven cents in 1846, since which, until the rebellion, they have vibrated with the price of cotton, between seven cents and nine cents the yard.

"One single cause, namely, the application of science to the arts, is seen in the development of manufactures by the highest mechanical agencies. It has brought together the remotest parts of the land; it has restored waste land and bogs, by drainage, by agricultural machinery, and the intelligent adaptation of crops and fertilizers. It is seen in manufacturing and agricultural machinery, in civil engineering, in the construction of bridges, locomotives, cars, steamers, and railways, in the treatment of soils, the management of breeding, the rotation of crops, and the composition of fertilizing materials, and in all the thousand manipulations of practical husbandry.

"I deem it not too much to affirm that the national existence is due this day to our agricultural and mechanical strength as developed by the science of modern times. At any previous stage of the world, I see not why an enterprising and obstinate foe, operating on interior lines, and within a territory so vast and so defensible, might not have maintained himself with ultimate success against an invading army three times as numerous as his own. Bringing to our aid the appliances and enginery of modern science and art, these conquered, by overcoming the obstacles of space and time."

AT the late Nottingham meeting, the British *savans* gravely listened to the reading of a paper by a certain Lord, on the raising of weights by the swelling of soaked peas.

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USEFUL IMPROVEMENTS NOT OPPOSED TO THE HARMONY OF NATURE.

That so-called romantic but morbid taste which assumes to itself a peculiar refinement, manifested by sneers at the utilitarian, and talks of desecration when man's ingenuity and needs compel the forces of nature to pay him tribute, is unworthy the thoughtful and judicious mind.

The roaring waterfall, the flowing river, the restless sea, only half subserve the purposes of their creation, when they appeal alone to the eye and exact our admiration or wonder. The useful is intended to be mingled with the beautiful. The two are in absolute and perfect harmony. Whatever in nature appeals to our sense of beauty is useful, at least indirectly, in educating the mind and refining the tastes.

Nature unadorned is not its highest type of beauty. The rocky and barren mountain may excite our wonder, the apparently unbounded plain and the impenetrable forest may arouse our surprise and anxiety but none of them are pleasingly beautiful. We look upon them perhaps as necessary adjuncts to the great plan of nature, but not as contributing directly to human uses. He who has sailed for days and nights over the ocean without meeting a sail, knows the sense of desolation which comes over him as he is forced to believe he is alone. Contrasts highten our enjoyment. A scene of wildness appeals more powerfully to the senses when it is relieved by the sight of a monument of man's ingenuity in a magnificent bridge or centipedal aqueduct. An addition to our enjoyment is afforded when we know that these works assist in the progress of the race. All well-balanced minds look upon every step of progress in mechanical improvement as a means of adding to human happiness, and therefore do not feel a regret because the original wildness of nature is intruded upon by the works of man's ingenuity. Man is the improver of visible nature as well as of the latent forces of natural laws. Nature exists for man. It is for him to study her laws and find the means of executing them. She is the Sphinx whose riddles the inventor will unravel. His improvements are in no wise the antagonists of the beauty and the harmony of nature's laws, uninterfered with by the daring attempts of her latest child. The employment of a waterfall for driving machinery, although it may detract from the original beauty of the fall, does not necessarily disturb the harmony of nature. Utility is not opposed to beauty. Without the mechanical ingenuity of man, the face of nature would be in a measure a waste; for where there is no benefit to man, the purposes of the creator are but half fulfilled.

We prefer to see the raging torrent bridged, the obdurate and impassable mountain tunneled, the valley cultivated, the stream utilized by being compelled to contribute to man's wants, by dams and machinery, and the forest made to yield before his improving footsteps, rather than to view them in all their native wildness and savagery. Man, and not the unaided forces of nature, is the civilizer. The aborigines of this continent held it from time immemorial, but existing as savages, they never improved upon the generation that preceded them. To day, after only two hundred years occupancy, the improving race has multiplied to forty millions, living pleasantly and comfortably, on the soil which gave a meager and miserable support to less than five millions of naked savages, gorged in times of plenty, and who starved and died by thousands in times of scarcity.

He who travels five hundred miles over our railroads, spanning half a continent, and at each mile in his progress sees prosperous villages where but a few years ago was an uninhabited wilderness, who visits prosperous towns or populous cities where but a decennary before was an agricultural hamlet, knows that the improvements of inventors and mechanics add to the beauty of the landscape, as well as contribute to the advancement of the race, and he will not be inclined to believe that the improvements of mechanical and engineering science really infringe upon the domain of the natural.

The truth is, in a nutshell, that the "mission" of this generation, at least, is that of improving—of pushing forward the march of the human race—and it will not do for us to attend to the obsolete and effete ideas of the generations which preceded us, nor to accept the notions of those who would see in the practical Yankee and Anglo-Saxon opinions, an element that would destroy all poetry, romance, and sentiment. For ourselves, we do not despair of seeing the poetry of steam, the romance of steamship voyages, and the sentiment of a sewing machine yet embodied in poetry and story.

THE TOY BUSINESS IN THIS COUNTRY.

The manufacture of toys and "playthings," until within a few years, has been almost wholly confined to Europe. The Germans and Swiss have furnished the rising generation with the most of these necessary adjuncts to the pleasures of childhood. But lately the facilities of the Patent Office have stimulated production in this direction, and now our most amusing toys are those of American manufacture. And it is a profitable direction for inventive genius.

Everybody has seen the comical dancing Ethiopian, cruelly impaled upon a wire, and forced to respond, with every joint in his supple body, to the rattle of the fingers on his pivoted platform. This ridiculous device, being patented, has brought its proprietor a fortune. Then there is the crowing cock, his intestines a tin whistle, able to excite the envy of the monarch of the barnyard by his clear, shrill, and natural challenge. This, also, is a paying investment. The Dervishes and Zouaves, fantastically dressed, suspended by an elastic cord, perform feats of leaping which put to shame the Buislays and Hanlons. On the same principle is the return ball, which, like the Australian boomerang, comes back to the hand that projected it. A top of thin metal, hollow, and gayly lacquered, when started by means of the coiled spring in the handle, will continue its revolutions for ten minutes at a stretch. The flying top is a good illustration of the propeller screw. Released from the shaft on which it is made to revolve, it flies whirling at an angle through the air until its momentum is lost, when back it comes, returning to the operator for a new start. We saw the other day a whistle, a mere gland of kid or thin leather, of a crescent form, holding, stretched between the two horns, a thin membrane, by the vibrations of which, aided by the operator's tongue, a great variety of sounds could be produced. The grunt and squeal of the pig, the warbling of the canary, the whistle of the quail, the piping of the curlew, and many other calls of animated nature, can be perfectly reproduced. This is a useful implement for the sportsman, and affords unlimited delight to incipient manhood.

Almost all these can be used as illustrations of natural laws. Philosophy may yet be taught in our schools by toys. The wonderful resemblance to life of our American toys in many instances, makes a broad distinction between them and those heretofore furnished from Europe. These last are usually caricatures, and are misleading to the young mind, which receives ideas through objects and not through words mainly. Take our rubber toys. Some of them are worthy to rank with the productions of the artist. They are marvels of beauty and natural expression. The dolls made here of this material do not wear that appearance of corpse-like waxiness, or inanity, which the traditional doll from time immemorial has borne. They are pleasing to look at and wonderful in endurance. Some by hidden machinery can walk, others cry and move their eyes, but none are hideous and repulsive in expression.

This toy business may be considered by some as unworthy of notice by scientific journalists; but as we are more or less educated by our surroundings, and as the toys of the child are a prolific source of ideas which will cling to him through life, it is important that they do not convey false impressions. These improvements in our children's playthings are additonal helps toward their education, and while their projectors realize fortunes from their introduction, young humanity and the world at large are pleased and benefited.

THICKNESS OF BOILER PLATES.

In No. 2, current volume of the SCIENTIFIC AMERICAN, we stated, in reply to a correspondent, whose boiler of five feet diameter and sixteen feet long, failed under a pressure of sixty pounds, that the plates of the boiler—five-sixteenths of an inch—were too thin, and quoted Bourne and Fairbairn as our authority, who give three-eighths as the proper thickness for a boiler of those dimensions.

A correspondent writing from Santa Clara county, California, says he has in his mill one of precisely the same size, which he has used for seven years, carrying sixty-five pounds steadily, and that it has never leaked nor strained. It is made of Lowmoor iron, five-sixteenths of an inch thick. Another, which is in his propeller boat, of the same dimensions, made of Pennsylvania iron, five-sixteenths thick, has been running eighteen months, carrying from sixty to seventy pounds of steam, and is certified by the United States Inspector to be able to bear a pressure of ninety pounds. The writer attributes the failure of the boiler mentioned to having too much fire surface and too little steam room, so that not enough of solid or undisturbed water could be kept over the crown sheets to keep them from heating. The steam space being contracted, the suction of the engine probably kept the water in a foam. His boilers, our California correspondent states, have eight-inch water space between the bottom and the lower row of tubes, which are placed in regular rows up and across the boiler, leaving two inches of space between the tubes across the boiler and one inch vertically. Steam drums two feet diameter traverse the whole length of the boiler, connecting with the top at each end with cast-iron pipes. The boilers contain, respectively, one thousand and one thousand and eighty feet of fire surface.

In the case of the defective boiler we think no facts in regard to the steam room were furnished us. It certainly is an important matter that sufficient steam space is given, and that a sufficient depth of water should be maintained over the fire box to preserve the crown sheets from undue heating and consequent weakening. The Lowmoor and Pennsylvania charcoal iron are undoubtedly unrivaled for tenacity, but still we are of the opinion it is better in the manufacture of boilers to err on the safe side. It would be hardly wise to recommend five-sixteenths of an inch as a safe and proper thickness for boilers sixty inches in diameter, however strongly braced, for carrying sixty pounds of steam.

LUCK slips downward to indigence, Labor strides upward and to independence.

Patent Claims

ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING SEPT. 18, 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.

58,040.—BOLT.—David E. Adams, Alleghany City, Pa.

I claim staving up or enlarging and forming into an oval or elliptic form (when viewed in cross section) that part of the rod of iron intended for the head and square of the neck of bolts, said staving or enlarging into said oval or elliptic form being done previous to the formation of the squaring of the neck and forming of the head of the bolt, which squaring and heading is performed at a subsequent operation.

58,041.—CAR COUPLING. — Homer Atkins, Plymouth, Ill.

I claim the adjustable frame, K, with cross bar, h, and cross rod, g, attached, in combination with the rack bar, I, spring, J, and link, G, all arranged and applied to the draw head, A', to operate substantially as and for the purpose set forth.

58,042.—GLOBE STEAM VALVE.—James O. Attick, Dayton, Ohio.

I claim the arrangement of the shouldered valve stem of the valve, B, with reference to the packing nut, D, nut, C, and valve seat, F, for the double purpose of packing the stem and holding the valve against its seat, in the manner substantially as described.

58,043.—ALARM LOCK.—Seth A. Andrews, Farmer's Valley, Wis.

First, I claim the combination of the sliding barrel, X, the trigger or dog, I, the lug, M, of the barrel, and the spring, P, substantially as described.

Second, I also claim the bolts, Z Z', constructed substantially as described, one being a short bolt, in combination with the claims, J, of the trigger-arm, H, substantially as described.

Third, I also claim forming a magazine, S, in the lock, at one side of the barrel chamber, substantially as described, with a priming orifice, R, in the path of the sliding barrel, substantially as described.

Fourth, I also claim covering the magazine with a cover, J, weakened by grooves or their equivalents, substantially as described.

58,044.—APPARATUS FOR THE MANUFACTURE OF VINEGAR.—Ernest Arleth, Cincinnati, Ohio.

First, I claim the tub, A, having a chamber, C, in combination with tubes, F, and conveying pipe, J, all constructed as above described and for the purpose set forth.

Second, The adjustable cold-air pipe, E, constructed as above described.

Third, The cold-air pipe, E, in combination with tub, A, as above set forth.

58,045.—COMBINED SEED DRILL AND CULTIVATOR. Aaron Armstrong, Gillespie, Ill.

First, I claim the combination of the roller, D, with the sliding plate, K, and lever, E, as and for the purpose set forth.

Second, I claim the roller, B, in combination with the corn planter, C D K F, the stalk cutter, M, and the seed drill, G I H, when the same are all constructed upon one common frame, A, from which any of the parts except the roller, B, may be removed at pleasure.

58,046.—SPINDLE FOR SPINNING FRAMES.—John E. Atwood, Mansfield, Conn.

First, I claim the inclined tube, D, provided at its upper end with a reservoir, g, in combination with the socket, B, and spindle, a b, when said socket is surrounded by a sleeve carrying the whirr, substantially as herein set forth for the purpose specified.

Second, The bar or rod, E, suspended within the tube, D, and in relation with the annular shoulder, r, formed around the lower end of the spindle, a b, substantially as herein set forth for the purpose specified.

58,047.—CHURN.—John A. Balzart, Piqua, Ohio.

I claim the combination with the suspended dasher of the pivoted arms, F F, forming a collar in the groove of the shaft, D, and the slide, G, for retaining the said collar in position, substantially as described.

58,048.—MACHINE FOR CLEANING GRAIN.—Benjamin Barney, Time, Ill.

I claim the rotary fan, C, hopper, D, shoe, E, provided with the riddle, K, chute, L, and cockle screen, M, and having a longitudinal shake motion communicated to it by the cam or eccentric F, and spring, H, in combination with the suction blast spout, N, all arranged substantially as and for the purpose set forth.

I also claim the valve, O, applied to the spout, N, and provided with the adjustable or sliding weight, g, substantially as and for the purpose specified.

I further claim the extension support, J, formed of the two parts, d d, connected by the screw, e, for the purpose of varying the inclination of the shoe, E, as set forth.

58,049.—CANE STRIPPER.—William N. Barr, Richmond, Ind.

First, I claim the combination of several sets of strippers in one frame, when constructed, arranged, and operating in such manner, substantially as herein described, that one spring acts upon two stripping edges or cutters.

Second, The arrangement of the parallel guide pieces, f' h h', in combination with strippers, B C D E, and springs, F G H, all constructed and operating substantially in the manner set forth.

58,050.—GRAIN SCREEN.—C. F. Baylor, Trenton, N. J.

I claim the combination with the sieves, A B, and chute or conducting board, C, of the conductors, E E, all arranged to operate in the manner and for the purpose herein set forth.

58,051.—PAPER-MAKING MACHINERY.—Edward B. Bingham, Newark, N. J.

I claim the arrangement of two felts and four pressure rolls, as herein described, whereby the web is pressed three times between the two felts, in combination with the arrangement of the doctors, P Q, within the felts, to remove the water from the rolls, D E', as herein set forth.

58,052.—GRAIN SEPARATOR.—John S. Bodge, La Porte, Ind.

First, I claim the construction of covers, E E' E'', of suitable thickness, covering the screens or sieves, B B' B'', with chutes, H, between, corresponding in number with the smooth or imperforated surfaces, C, and opening obliquely or sloping downward nearly or quite their entire length, said chutes being so located that when grains, seeds, or other substances shall pass downward through them, they will fall or be precipitated directly upon the smooth or imperforated surfaces, C.

Second, Constructing and locating the covers, E E' E'', in separate sections, with barriers, F, at their upper angles, and rectangular slips, G G', attached to the ends of said covers to elevate them the requisite height above the screens or sieves, B B' B'', and to keep them the proper distance apart to allow the passage of grains, seeds, or other substances, in such manner that the oblique or sloping chutes, H, through which the grain finds its way upon the smooth or imperforated surfaces, C, above each screen or sieve, will retain their proper proportions and positions relative to the surfaces, C, and above each screen or sieve.

Third, The flaps or aprons, L, composed of flexible, textile, or other fabric, such as rubber, rubber cloth, oil cloth, painted cloth, or any preparation or fabric, so attached to the covers, E E' E'', or to separate pieces to occupy their places, as to adapt themselves to the inequalities of the screens or sieves, B B' B'', and to grains, seeds, or other substances which may be passed between said flaps or aprons and the screens or sieves, in such a manner as to prevent the longer and broader grains, seeds, or other substances from assuming an oblique or perpendicular position while passing over the screens or sieves, thus compelling said longer or broader grains, seeds, or other substances to pass over the screens or sieves flatwise, while the shorter, narrower, and smaller grains, seeds, and other substances are permitted to pass through them when the screens or sieves are in motion.

Fourth, The building or constructing of covers, E E' E'', substantially as herein shown and described, so that they will expand or contract as equally in all parts as possible, and not be liable to warp or twist, thereby preventing the irregularities in their form which would otherwise occur.

Fifth, Securing the flaps or aprons, L, to the covers, E E' E'', by means of the clip plates, A', as shown and described.

58,053.—SKIRT ELEVATOR.—P. J. Boris, Boston, Mass.

I claim the combination and arrangement of the clasp, B, the tape, C, and the sheath, D, with a lady's skirt, substantially as described.

58,054.—LIQUID FOR CARBURETING AND ENRICHING GASES USED FOR ILLUMINATING AND HEATING.—John F. Boynton, Syracuse, N. Y.

First, I claim the improved liquids for carbureting or enriching gas or air products by combining one or more hydro-carbons, derived from the petroleum, or its equivalent, with one or more hydro-carbons of the coal-tar series.

Second, I also claim carbureting or enriching coal-gas, water-gas, or air, by combining with them the vapor of a liquid, made by combining hydro-carbons of the coal-tar series with those of the petroleum series, substantially as herein described.

Third, I also claim the method or process herein described of manufacturing liquids for carbureting or enriching gas or air, by combining one or more hydro-carbons derived from petroleum, or its equivalent, with one or more hydro-carbons of the coal-tar series.

58,055.—SAFETY APPARATUS FOR GAS MACHINES AND CARBURETORS.—John F. Boynton, Syracuse, N. Y.

I claim a safety device, composed of a body of cooling material, as metal or other good conductor of heat, interposed between the burner and carburetor, and so arranged as to present an extensive surface or series of surfaces to the carbureted air on its passage to the burner, thereby keeping it at a temperature below the point of ignition.

58,056.—T SQUARE.—Austin Bronson, New York City.

First, I claim the bevel stock, D, so constructed and applied to the T square that its sides will project beyond each side of the said square, and thus enable the instrument to be employed for making right or left-hand angular lines without interfering with the head, B, of the square, substantially as herein set forth.

Second, The tangent screw, e, sliding frame, g, and adjusting screw, f, arranged with reference to each other, and with the square, A B, bevel stock, D, and sector, C, substantially as herein set forth for the purpose specified.

58,057.—HOT-AIR FURNACE.—Benjamin Brownell, Chicago, Ill.

I claim the gradually enlarged flues, E, arranged and combined with the dome-shaped casting, G, in a hot-air furnace, substantially as and for the purpose herein set forth.

58,058.—ALARM CLOCK.—J. E. Buerk, Boston, Mass.

First, I claim the arm, l, and segmental disk, i, in combination with the stop lever, e, of the alarm movement, constructed and operating substantially as and for the purpose set forth.

Second, The serrated segment, m, in combination with the tooth of the watch-key, o, and with the alarm movement, constructed and operating substantially as and for the purpose described.

58,059.—CHURN.—William Burson and D. C. Burson, Salineville, Ohio.

First, The dasher, C, when constructed as herein described, in combination with the shaft, B, gear wheels, H and G, crank, J, frame, F, cover, D, and box, A, the said parts being constructed and arranged substantially as and for the purposes set forth.

Second, The combination of the perforated gathering board, M, with the box, A, and dasher, C, substantially as described and for the purpose set forth.

58,060.—PLANTER.—William F. Caldwell, Oxford, Me.

First, The combination and arrangement of the hopper, e, spring, f, pawl, d, ratchet, c, lever and link, m, all constructed, applied, and operating as herein set forth and described.

Second, Connecting the plow and coverer to the carriage body, in the manner described.

58,061.—COOKING STOVE.—James Chambers, Booneboro, Md.

The combination of the parts, D and E, when the latter is constructed and arranged in relation to the former, as shown and described and for the purpose set forth.

58,062.—SAFETY POCKETS.—James F. Chambers, Utica, N. Y.

First, The pocket, A, provided with a spring arm, G, upon its inside, leaving a sharp pointed or needle arm, H, hung to its upper end, when combined together and arranged so as to operate substantially in the manner and for the purpose described.

Second, In combination therewith, the springs, O, upon the inside of the pocket, A, for the purpose specified.

Third, Also in combination therewith, the perforated spring or flexible band, E, secured to the pocket, A, for the purpose described.

58,063.—RECEPTACLE FOR WASTE WATER OF WELL TUBES.—Daniel P. Chesbrough, Lansingburgh, N. Y.

The receptacle, A, having float, I, and valve, G, in connection with the waste water pipe of a well tube, when arranged with regard thereto and connected with the well tube, substantially as and for the purpose described.

58,064. — MANY-BARRELED FIRE-ARMS. — W. J. Christy, Philadelphia, Pa.

First, The application to the trigger, E, of a vibrating arm, d, and lever, d', constructed in such a manner as to effect the release of the hammers in succession, substantially as described.

Second, The application of a guard, G, to the trigger, E, in combination with a contrivance which will lock this guard in front of the trigger when the breech of the barrel is exposed, substantially as described.

Third, In combination with a barrel which has an end play and which is pivoted to the frame of the piece, I claim the spring latch, b, slides k and s, and a trigger guard, G, arranged so as to operate substantially as described.

58,065.—SHEEP RACK.—M. C. Clark, Appleton, Wis.

The combination of the trough, B, feed receptacle, D, and covers, E and F, with each other and with the frame, A, of the rack, when said parts are constructed and arranged substantially as herein described and shown and for the purpose set forth.

58,066.—HANDLE FOR SAD IRON.—Henry Clarkson, Peekskill, N. Y. Antedated Sept. 5, 1866.

The lever, D, with its toe, d, and nose, e', in combination with the stirrup, e, handle, B, flange, b, socket, a, and iron, A, all combined and operating substantially as and for the purpose described.

58,067.—BOOT HEEL.—Frederick Closs, New Haven, Conn.

A revolving heel for boots and shoes, when the same is constructed with a metallic piece, B, and ring, D, said parts being respectively formed, combined with the other portions of the heel and arranged for use as and for the purpose set forth.

58,068.—SAW MILL.—Geo. W. Coddington, Middletown, Ohio.

First, The trestle, D, constructed and arranged as herein described in combination with the carriage, C, and operating substantially as and for the purpose set forth.

Second, The combination of the spring, F, catch, G, chain, H, and trestle, D, with the carriage, C, substantially as described and for the purpose set forth.

58,069.—CAPSTAN WINDLASS.—Z. E. Coffin, Newton, Mass.

First, I claim the employment of the capstan, a, and its system of gears, j k l, in combination with gears, r s, and the windlass barrels, t u, substantially in the manner and for the purpose set forth.

Second, I claim the arrangement of the barrels, t u x x, and the gear, S, to turn upon the shaft, V, this shaft being a fixed one and not allowed to rotate, substantially as described.

Third, I claim the two or more rollers, y, in combination with and to support the windlass barrels and shaft, t u and V, substantially as described.

58,070.—SAD IRON.—Elisha T. Colburn, Boston, Mass.

I claim the heat reflecting guard, C, made substantially as described so as to be applied to the sad iron in manner and for the purpose specified, such guard being composed of the plates, a a, the standards, b b, and the legs, c c, and having the notches, d d, formed in the parts, a a, as explained.

57,071.—WAGON SHACKLE.—Lucius M. B. Coleman, Danby, N. Y.

First, I claim the use of washers or metallic cylinders in the ears of a wagon shackle, and transfer as far as possible the wear in the shackle joint to the surfaces made by the periphery of the same and the said ears, when virtually made as described.

Second, I claim the described beveling of the washers and of the corresponding holes in the ears of the shackle for the purpose of tightening the shackle from time to time as described.

Third, I claim the combination of the described device or devices, for preventing motion about the iron bolt, but allowing the same about the washers or cylinders, and of the washers or cylinders in the eyes of the ears of the shackle with the wearing surfaces in the said ears, the same making a whole as described.

58,072.—TOBACCO PIPE.—Malcolm M. Coppuck, Philadelphia, Pa.

I claim a tobacco pipe consisting of the open bottomed fire and tabacco chamber, A, neck piece, d, exhaust chamber, B, and stem, C, the same being arranged and combined together as and for the purposes described and set forth.

58,073.—HORSE RAKE.—Nicholas C. Decker, St. Louis, Mo.

First, I claim the construction and arrangement of the rock shaft, c, and its springs, c3 and c4, its levers, c1, and the bar c2, as described and set forth.

Second, I claim the arrangement of the segmental grooves, b, in the post, B, for the purpose of rendering easy the revolution of the rake.

58,074.—VALVE GEAR FOR STEAM ENGINE.—William Dennison, Washington, D. C.

First, I claim the cam, H, arranged to operate in such a way as to cause the valves of steam cylinders to move continuously, while the piston of the steam cylinder be in motion by a stud or pin on the piston rod or other attachment producing the same result, substantially as set forth.

Second, A steam cylinder having its openings and valves arranged on a line with the axes of the cylinder, substantially in the manner set forth.

Third, I claim the cam, H, the rock shaft, F, and the steam cylinder with its steam valves, E E', combined and operating as and for the purpose set forth.

58,075.—HORSE RAKE.—Joseph Dillier, Greensburg, Ind.

I claim a horse rake having the teeth, E, attached to a hinged beam, F, retained when down by a hook, G, and disengaged and raised by a lever, I, the said several parts being respectively constructed and combined for use by intermediate mechanism arranged substantially as set forth.

58,076.—MACHINERY FOR CUTTING KEY SEATS.—John K. Dirner, Honesdale, Pa.

I claim the spindle, X, in combination with the plate, P, pivoted to the flanges, O, and adjusted by set screws, R R, constructed and arranged substantially as described for the purpose specified.

58,077.—TWEER.—Levi A. Dole, Salem, Ohio.

I claim a tweer which is composed of blast pipe, A, and a chambered portion, B, cast in one piece, substantially as described.

58,078. — ICE BREAKER. — Charles. W. Dunlap, Brooklyn, N. Y. Antedated Sept. 5, 1866.

I claim the ice breaker formed with a metal band around the larger portion of the wooden handle of the ice pick, as and for the purposes specified.

58,079.—RIFLE BOX.—Rhesa H. Dunning, North San Juan, Cal.

I claim the rifle box, C, damwall, D, or their equivalents, to be employed for saving gold at any point where there is a divide of waters, substantially as described.

58,080.—STRAW CUTTER.—J. Eiberweiser and R. Weber, Cincinnati, Ohio.

We claim the arrangement of a knife, H, suspended by two arms, F F', pressure board, I, bent lever, T T', feeding mechanism, C D E V W X, and cam, S and U, for the purposes explained.

58,081.—PROTECTING ANIMALS FROM THE HEAT OF THE SUN.—Charles Elveena, New York City.

I claim the method herein specified of protecting animals from the heat of the sun by a shield, constructed substantially in the manner specified.

58,082.—CULTIVATOR.—Samuel P. Etter, Scotland, Pa.

First, I claim the compound levers, R and Q, connected to the plow beams by the braces or rods, V V, when constructed and operated for the purposes and substantially as described.

Second, I claim the compound levers, R and Q, rods, V V, and plow beams, H H, in combination with the pendants, G G, and pendent guides, J J, substantially as and for the purposes shown and described.

58,083.—HAND PROPELLER FOR SMALL BOATS.—John Fehrenbatch, Ind.

I claim the combination of the bevel wheels, 3 and 8, the ratchets, 2 and 11, the dogs, 4 and 10, and springs, 5 and 9, with the upright shaft, 1, and lever, 17, and with the pinion, 7, on the shaft, 13, which propels the screw, all applied for the purpose of propelling small boats.

58,084.—SKATE.—M. Fleisher, Philadelphia, Pa.

First, I claim the notched foot rest, C, for holding the end of the lever, K, combined with the clamps, J G, of the heel rest, B, substantially in the manner, and for the purpose represented and described.

Second, The combination and arrangement of the clamps, O, bar, Q, straps, R, notched rest, C, lever, K, clamp, G, heel rest, D, constructed and operating in the manner and for the purpose herein represented and described.

58,085.—PUMP.—A. F. Fletcher, Athol, Mass.

First, I claim a pump box constructed in two or more parts so arranged and combined as to secure the parts to each other and the packing of leather or other suitable material to the pump box, in the manner substantially as and for the purposes described.

58,086. — ROTARY STEAM ENGINE. — Matthew Fletcher, Louisville, Ky.

First, I claim the method of reducing the side strain on the rotative shaft through the connection of cylinder with eccentric ring flyers, flyers ends and half rounds, c c c c c, in drum, m, substantially as described.

Second, I also claim the arrangement and combination of the brushes, P P, and small metal packer rings, f f, by which means soft or elastic packing is avoided from pressing on the revolving shaft.

58,087.—APPARATUS FOR GENERATING AND BURNING VAPOR OF HYDROCARBON OILS.—Henry R. Foote, Oil City, Pa.

I claim, First, The combined retort and gas holder, constructed substantially as described.

Second, I claim the coil of metallic tubing charged with iron filings, or their equivalents, and the heaters connected with the gas holder for the purpose of generating hydrogen gas by the decomposition of steam, substantially as and for the purpose set forth.

Third, I claim the tubes at the bottom of the retort with supply pipes elongated so as to extend into the gas holder, as described.

Fourth, I claim the arrangement of burners connected with the gas holder, substantially as described.

Fifth, I claim the hood attached to the bottom of the retort, for the purpose of protecting the lower burners, as described.

58,088.—AMALGAMATING GOLD WITH MERCURY.—M. Foreman and J. R. Mathewson, Philadelphia, Pa.

First, We claim the amalgamation of gold with mercury by circulating pulverized ore, combined with water, upward through a body of mercury, substantially in the manner described.

Second, We also claim heating the mass of auriferous ore and water by a jet of steam, which induces the above-mentioned circulation, substantially as specified.

58,089.—ORE QUARTZ CRUSHER.—Joseph Fowler, Rahway, N. J.

First, I claim the yielding eccentric bearing shaft, f or f', and weighted lever, g or g', applied in substantially the manner specified, to keep the jaws at their lower ends toward each other, but allow them to open or yield, as and for the purposes set forth.

Second, I claim the combination of the jaws, d and k, connecting rods, l l, and cranks, 1 and 2 2, when the jaw, d, is connected directly to the crank, 1, and receives the movement specified, for the purposes set forth.

Third, I claim the links, e, in combination with the eccentric yielding bearing, f, and moving jaw, d, as and for the purposes set forth.

58,090.—CAR COUPLING.—Robert G. Fowler, Olney, Ill.

I claim the jointed coupling bars, G G, having springs, I, and wedge-shaped heads, g g, which slip upon and catch behind each other, permitting the automatic uncoupling by lateral or vertical deflection of one car relatively to the other, under the circumstances described.

58,091.—CLASP FOR MAIL BAGS.—Leander Fox, New York City.

I claim the adjustable metal clasp, B, with permanent raised letters, operating on a joint, C, and swivel, D, as herein described and for the purposes set forth.

58,092. — APPARATUS FOR INSERTING FUSIBLE PLUGS IN STEAM GENERATORS.—Joseph French, Pittsburgh, Pa.

I claim the combination of the ring, c, for holding the fusible plug in the flue, the tubular rod, e, and screw, f, for closing the bore of the rod, e, constructed and arranged substantially as and for the purposes hereinbefore described.

58,093.—WATER ELEVATOR.—James Freret, New Orleans, La.

I claim the combination of the double or compound valves, C' D', and C'' D'', with the cisterns, G and F, and simple valve, C, when these several parts are constructed and conjointly operate, substantially as described for the purpose set forth.

58,094.—BRIDGE.—John H. Gilbert, Roxbury, Mass.

I claim the combination of the angle plates, D, pierced side plates, C, floor beams, E, flanged arched plates, B, constructed and operating substantially as described for the purpose specified.

58,095.—APPARATUS FOR SEPARATING GUM FROM CANE JUICE. — Henry Gortner, Deavertown, Ohio.

I claim an improved apparatus for separating the gummy substance from cane juice, formed by the combination of the disks, B, and pipes, b', with the partitions, a', of the apparatus, the various parts being constructed and arranged substantially as herein described and for the purposes set forth.

58,096.—BOLT-HEADING MACHINE.—Chas. Hall and Emil Hubner, New York City.

First, We claim the combination in a bolt-blank machine of the following instrumentalities, viz.; the tubular die, carriage, preparing dies and set of finishing dies, consisting of an upsetting die and side dies, substantially as set forth.

Second, The combination in a bolt-blank machine of the following instrumentalities, viz.; the upsetting die, side heading dies, turning tubular die, and cam tappets which operate the side heading dies twice for each operation of the upsetting die, substantially as set forth.

Third, The combination in a bolt-blank machine of the following instrumentalities, viz.; the heading die or dies, turning tubular die, and carriage, substantially as set forth.

Fourth, The combination in a bolt-blank machine of the following instrumentalities, viz.; the tubular die, upsetting die, gage and cam, substantially as set forth.

Fifth, The combination in a bolt-blank machine of the following instrumentalities, viz.; the tubular die, side dies, gage and cam, substantially as set forth.

Sixth, The combination in a bolt-blank machine of the following instrumentalities, viz.; the tubular die, upsetting die, side dies, gage and cam, substantially as set forth.

Seventh, The combination in a bolt-blank machine of the following instrumentalities, viz.; the heading die or dies, tubular die, gage and cam, and carriage, substantially as set forth.

Eighth, The combination in a bolt-blank machine of the following instrumentalities, viz.; the heading die or dies, turning tubular die, gage and cam, substantially as set forth.

58,097.—LAMP BURNER. — Thomas Hall, Bergen, N. J.

I claim the connections, A and B, and stop, C, substantially as described for the purposes set forth.

58,098. — GRANULATING AND DRYING SUGAR. — Jesse Hanford, Lexington, Mass.

I claim the combination of the rotary hollow drum or cylinder, I, and the tubular heater, arranged and connected substantially as described.

I also claim the combination of the rotary or hollow cylinder, I, the crushing roller, K, and the tubular heater, arranged and applied together substantially in manner and so as to operate as and for the purpose described.

I also claim the combination of the journals, c c, and their supporting standards, B B, of the tubular heater with such heater and the rotary cylinder, or the same and the crushing roller, applied and arranged together, substantially as specified.

I also claim the combination and arrangement of the series of helical wings, I I, with the cylinder and the heater, applied in manner and so as to operate as specified.

58,099.—FEED-WATER HEATER.—Geo. Hascoster and J. Stephens, Richmond, Ind.

We claim the combination of the rod, B, flanged shelf, C, flanged perforated plates, D E F, constructed and arranged as described; the receiving cup, f, and washers, I, with the cylinder A, substantially in the manner and for the purpose herein specified.

58,100.—DESULPHURIZING ORE. — John A. Hitchings, Denver City, Colorado.

First, I claim the arrangement of the crucible with its dome-covering sectional lid and discharge openings, M P, substantially as and for the purpose described.

Second, I claim the combination with the crucible of the water supply tank, K, as and for the purpose described.

58,101.—SPINNING MACHINE.—Charles B. Hoard, Watertown, N. Y.

First, A removable tube or spindle for twisting roving while being drawn, when the twist is imparted from one side of the tube or spindle and the roving is conveyed to the bite of the draw rollers from the center of the tube or spindle, substantially in the manner described.

Second, The combination of a removable twisting tube or spindle, constructed substantially as described, with a revolving tube driven by a whirl, substantially in the manner set forth.

Third, The combination of a removable tube or spindle with the whirl tube and drawing rollers, when constructed, arranged, and operating substantially in the manner and for the purpose set forth.

58,102.—PENCIL HOLDER.—Henry W. Holly, Norwich, Ct.

The holding stem or tube, A, provided with a single slit, c, formed longitudinally in one side thereof, in combination with the sliding ring or collar, C, substantially as herein set forth for the purpose specified.

58,103.—HOISTING APPARATUS.—George L. Howland, Topsham, Me.

I claim an improved hoisting apparatus formed by combining with each other the bars, A B, the levers, D H, the pawls, C I, the spring, K, and the stop, L, the parts being constructed and arranged substantially as described and for the purpose set forth.

58,104.—MACHINE FOR MAKING NUTS.—W. W. Hubbard, Philadelphia, Pa.

First, I claim the revolving disk, J, with its recesses, Z, in combination with a series of punches and dies arranged in a circle, the whole being constructed and operating substantially as and for the purpose described.

Second, The cross head, E, and its arm, L, in combination with the shaft, H, and its rib, w, the whole being constructed and operating substantially as and for the purpose specified.

Third, The combination of the boxes or casings, c, punches, d, and gibs and keys, the whole being arranged substantially as and for the purpose set forth.

Fourth, The carriers, M and M', with their adjustable hammers, the whole being arranged in conjunction with the rotating disk, J, to operate on the blank, substantially as and for the purpose described.

Fifth, The combination of the carriers, M M', lever, T, and arms and levers, p q, the whole being arranged and operating substantially as and for the purpose set forth.

Sixth, The slide, 7, and spring, 5, or its equivalent, in combination with the cutters, d k.

Seventh, The slide, m, operating in combination with the punch, d3, hammers, S S, and disk, J, substantially as and for the purpose described.

58,105.—MAGNETO-ELECTRIC APPARATUS.—Jerome Kidder, New York City.

First, I claim the construction and arrangement of an electro-magnetic apparatus, whereby the primary current through two helices or systems of helices is thrown successively in opposite directions, or so as to develop induced currents successively in opposite directions, substantially as herein described.

Second, The arrangement of the parts of an electro-magnetic apparatus, whereby the currents from two helices or systems of helices are made to flow in succession, one immediately after the other, in a uniform direction, substantially as herein set forth, such currents being either of the same character, made thus more rapid in succession, or of different degrees of tension or concentrative or diffusive influence.

Third, I claim for adjusting the screw opposed to the vibrating spring of an electro-magnetic apparatus the use of the arrangement as represented by v y, operating substantially in the manner described.

58,106.—MEDICINE.—N. Kieffer, New Orleans, La.

I claim the medical compound composed of the ingredients herein named and mixed together, in or about the proportions named.

58,107.—OILER.—Parley Lafiin, Warren, Mass.

I claim the bifurcated guide, F, in combination with the tube of an oiler, substantially as and for the purpose set forth.

58,108.—RACK FOR HAULING WOOD.—Abraham Landis, Colesburg, Iowa.

I claim the woodrack herein described, the same consisting of the sills, A, sleepers, B, and stakes, C, all secured together by the loops or stirrups, D, in the manner and for the purpose explained.

58,109.—ANTI-FRICTION JOURNAL BOX.—Henry M. Le Duc, Washington, D. C.

I claim the rims or projections, G F, within the hub or box, and around the axle respectively, extending into annular grooves in the concentric series of larger rollers to maintain them in position longitudinally, substantially as described.

58,110.—HORSE HAY FORK.—Thomas Lloyd, Muncy, Pa.

I claim the employment, in combination with the main bar, A, of pivoted fingers, D D', and arms, E E', operated by means of a vertical rod, C, and lever, B, the whole arranged substantially as set forth.

58,111.—APPARATUS FOR UPSETTING TIRES.—Levi W. Loomis, Homer, N. Y.

I claim the movable plate, B, provided with the notched strip, C, and operated by a shoulder of the lever, D, and arms, Z Z, to force said plate against the body, A, to upset the tire when held between cams and ratchets, substantially as herein set forth.

58,112.—SHOVEL PLOWS.—William H. Luce, Hampton, Ill.

I claim the general construction and form of the beams, A, and handles, C C, in combination with a double concave mold board, B, substantially as described.

58,113.—APPARATUS FOR DISTILLING PETROLEUM, ETC.—Orazio Lugo, New York City.

First, I claim the admission of air or gas into the goose-neck or exit pipe of the still, substantially as and for the purpose herein specified.

Second, Varying the point of admission of the air or gas, B, into the still and goose-neck or exit pipe as the process of distillation progresses, substantially as and for the purpose herein set forth.

58,114.—SPIRIT METER.—Wm. Magrowitz, New York City.

First, I claim the arrangement and construction of the wheel, A, provided with chambers or cavities, in combination with the roller, E, and float, G, operating in the manner substantially as described.

Second, I claim the arrangement of the levers, D, with the roller, E, in combination with the lever, F, and float, G, and operated by set screws, C and D, in the manner and for the purpose set forth.

Third, I claim the arrangement of the paper rollers, P P', and the manner of operating the roller, P, by means of the friction roller, O, for the purpose substantially as set forth.

Fourth, I claim the manner of operating the friction roller, O, from the shaft of the wheel, A, by means of the gearing, 2 and 3, flanch wheel, 4, pin, 8, and pawl lever, R, when arranged and combined in the manner and for the purpose specified.

Fifth, I claim the box, K, in combination with the pipe, g, and cylinder, I, the hydrometer, M, with the needle, N, at its upper end, for the purpose substantially as set forth.

Sixth, I claim the frame, S, in combination with the needle, N and the manner of operating said frame, S, and needle N, substantantially as and for the purpose described.

Seventh, I claim, in combination with the hydrometer, M, and its needle, N, the endless paper wound on roller, P' and P, and lined in the manner described, and operating together substantially for the purpose specified.

Eighth, I claim the friction pulley, k, with its lever, K, in combination with the measuring wheel, A, for the purpose set forth.

Ninth, I claim the combination of the measuring wheel, A, with its registering device, the hydrometer, M, provided with a marking needle, N, the paper rollers, P and P', with paper lined in the manner described, the friction rollers, O and O', and the frame, S, when arranged and operating together so as to mark the quantity and the weight or specific gravity of alcohol or other liquid which is made to pass through the box, V, or through the machine, substantially in the manner as set forth and specified.

58,115.—CAR BRAKE.—Samuel McCambridge and Edward G. Martin, Philadelphia, Pa.

We claim the combination of a series of coil springs with a train of cars and the continuous chain, which operates the brake levers, by means of the cylinders, B, shafts, C, and chains, F, the several parts being arranged and operating substantially in the manner described and for the purpose specified.

58,116.—ORE OR QUARTZ CRUSHER.—E. P. McCarthy, San Francisco, Cal.

I claim the use of a rubber tappet, A, steel shod, the steel shoe, B, plate, E, and bolts, F F, combined in the manner and for the purposes set forth.

58,117.—DEVICE FOR HOLDING ROLLED WORK WHILE BEING STITCHED.—Wm. M. McCoy, Bloomingdale, Ind.

I claim a device for holding rolled work while being stitched, constructed and operating substantially as specified, that is to say: I claim the bed piece, A, having a groove, a, along its upper face, and provided with a tightening band, B, operated by a set screw, C, substantially as shown and described.

58,118.—BLOW PIPE.—Josiah McFarland, Clinton, Ill.

I claim in blow pipes, a detachable air chamber, A, in combination with the flexible tube having a suitable mouthpiece for directing the current of air or gas, and a force pump, all constructed and operated substantially as described.

58,119. — PLOW. — F. W. McMeekin, Morrison's Mills, Florida.

I claim the standard, C, constructed of a single metal bar, doubled and bent so as to have two diverging arms, a a', and an inclined loop, b, in combination with the land side and mold board, all arranged to form a new and improved plow, as set forth.

58,120. — SAFETY ATTACHMENT FOR POCKETS.—John Metzendorf, New York City.

I claim a watch pocket protector, composed of two jaws, A and B, flexibly connected together at one end, and furnished with a catch at the other end, and provided with eyelets or other means of attaching it to the pocket, all substantially as herein described.

58,121.—SADDLE.—Jacques Meyer, Williamsburgh, N. Y.

I claim the device formed of the case or thimble, c, inclosing the spiral spring around the pin, d, for the purpose of attaching and detaching stirrup straps to a saddle, constructed and applied in the manner herein described.

58,122.—LANTERN.—F. Meyrose, St. Louis, Mo.

First, I claim inclosing the wick elevating rod or shaft, a3, with a tubing or casing, a2, for the purpose of conducting any moisture or fluid that may escape on the said rod outside of the guard of the lamp or lantern.

Second, I claim the cap, F, either with or without the ventilators, substantially as described.

58,123.—EDGE PLANE.—S. Miller, Urbana, Ohio.

I claim the exposing of the cutting edge of bit, B, always evenly and securely at one operation, as described, or any other way substantially the same.

58,124.—SNOW PLOW.—Robert B. Nevens, Lowell, Mass.

I claim, First, The combination and arrangement of the fence, A, and facing, d, sides, B B, leveling beam, C, and mold boards, E E, substantially as and for the purpose set forth.

Second, And in combination with a snow plow constructed and arranged as above stated, I claim the employment of the auxiliary brace chains, F and H, connected with the entire draught chain, G, substantially in the manner and for the purpose specified.

58,125.—CORN CULTIVATOR.—D. I. Noble, New Boston, Ill.

I claim the adjustable foot-pieces, L L, connected to the plow standards, I I, and arranged with brace, K, in combination with the mode of attaching said standards to the frames, C and F, substantially as and for the purpose herein specified.

58,126.—MACHINE FOR POUNCING HATS.—Emile Nougaret, Newark, N. J.

First, I claim the swivel disk, B, carrying the block, D, in combination with the adjustable disk, F, carrying the pouncing rollers k k, constructed and operating substantially as and for the purpose described.

Second, The gears, l m, and revolving shaft, F, in combination with the pouncing rollers, k k, and block, D, constructed and operating substantially as and for the purpose set forth.

Third, The brake, p, in combination with the disk, F, spring, n, pouncing rollers, k k, and block, D, all constructed and operating substantially as and for the purpose described.

Fourth, The rollers, G G, and supporting brackets, t, constructed and operating substantially as and for the purpose set forth.

58,127.—LOCOMOTIVE.—John C. Parker, Chicago, Illinois.

First, I claim providing the nozzles of the exhaust pipes of a locomotive engine with valves which shall be allowed to close by a movement of the reversing lever, substantially as described.

Second, The combination of the draw rod, D, and valves, d d, with the spring, f, and a contrivance which will effect the tripping of said rod when the engine is reversed, substantially as described.

58,128.—ANCHOR.—G. C. Pattison, Baltimore, Md.

I claim providing the flukes of an anchor having pivoted arms with stationary guards, substantially as and for the purpose herein described.

58,129.—STRAW CUTTER.—S. Pettibone, Corunna, Mich.

First, I claim the application of the fly-wheel, B, in combination with crank wheel, C, pitman, D, and lever, E, substantially as and for the purposes described.

Second, The adjustable box, or bearing, F, in combination with the lever, E, gage, G, and throat, I, for the purposes and substantially as herein shown and described.

Third, The mode of securing the gage plate, G, to the lever, E, as and for the purposes and substantially as herein set forth.

Fourth, The mode of securing the lever, E, to the pivot, by means of mortise and key, substantially as herein shown and described.

58,130.—FASTENING FOR GATE.—Pompeius Philippi, Beardstown, Ill.

I claim the arrangement of the hooked rod, J, and lever, K, in combination with the bar, B, posts, E F, and pin, D, constructed and operating in the manner and for the purpose herein specified.

58,131.—SHIRT BOSOM.—C. F. Pidgin, Boston, Mass.

I claim a shirt bosom, cut or hollowed out at its sides, B, and end, C D, in combination with the strips, F, substantially as and for the purpose described.

58,132.—ASH SIFTER.—Charles L. Pierce, Buffalo, N. Y.

I claim the inclosing case, A, and removable charger, D, the said case being fitted to receive and support the charger, and the

charger having a hinged bottom so that its contents may be discharged into the sieve, the inclined open-end sieve, B, the operating gearing, and the ashes box E, combined as herein described.

58,133.—Dental Mallets.—Chandler Poor, Dubuque, Iowa.

I claim the sliding mallet, i, piston, a, spring, f, and socket, b, by means of which to apply force to a common plugger or point in filling teeth. My claim has no reference to said plugger or point except in the manner of applying force to the same.

58,134.—Machine for Making Screws.—Treat T. Prosser (assignor to himself, G. W. Gillet, J. A. Eastman, D. Rimbark, J. R. and D. H. Wells), Chicago, Ill.

I claim the method of forming the threads on screws by means of revolving swages or dies, constructed and operated substantially as and for the purpose set forth.

Second, I claim the grooved rollers, a, when arranged and operating as described, for the purpose of forming threads on screws.

Third, The combination of the revolving swages or dies, a a, with the anvil or rest, u, substantially as set forth.

Fourth, The chuck, E, constructed and operating as herein described.

Fifth, The combination of the hollow shaft, F, chuck, E, and rack shaft, d, provided with the arms, f and c, when arranged to operate as and for the purposes set forth.

Sixth, In combination with the shaft, F, and hopper, H, I claim the follower, I, arranged to operate as described, for the purpose of feeding the blanks into the shaft, F, as set forth.

58,135.—Corn Planter.—A. Putnam, Owego, N. Y.

First, I claim the drill tooth, G, wheel, F, and adjustable slide bar, E, arranged and operating as described.

Second, In combination with the above I claim the arrangement of the cams, D, bar, A, spring, K, and valve, g, as and for the purpose specified.

58,136.—Car Brake.—J. Wyatt Reid, New York City.

First, I claim the combination of chains, rods and pulleys, for operating the brakes, the whole substantially as described.

Second, The combination with the car brakes of the guards, r r, constructed and applied in the manner and for the purpose set forth.

58,137.—Machinery for Making Nails.—Samuel G. Reynolds, Bristol, R. I.

First, I claim giving lateral support to that portion of the nail blank which is to be upset to form the head, during the operation of heading the nail, by means of the radial supporting bar, A, arranged to co-operate with the header, H, substantially as herein described, for the purposes specified.

Second, Combining and arranging the gripping die in a nail-making machine with the movable cutting shear, as described, so that the former shall change its position relatively to the latter, for the purpose of lowering the blank during the swaging and heading operation below the cutting edge of the shear, in the manner and by the means substantially as herein set forth.

58,138.—Flat Iron.—E. B. Robinson, Portland, Maine.

I claim the combination and described arrangement on a flat iron of the glass or porcelain handle, H, and the hinged guard and reflector, D, as and for the purposes herein set forth

58,139.—Surcingle.—D. P. Rood, Warsaw, N. Y.

I claim an elastic, B, made of rubber or other suitable material, in combination with the webbing, A, so as to cause the surcingle to adjust itself to the varying size of the horse, for the purposes and substantially as herein described.

58,140.—Machine for Harvesting Beans.—D. C. Rosier, Clarkson, N. Y.

I claim the arrangement of the L-shaped cutters, C, in combination with the elevating or adjusting devices, in the manner and for the purposes set forth.

58,141.—Trunk.—Alfred V. Ryder, New York City.

I claim a trunk provided with a hinged portion, A, formed by the vertical and horizontal cuts, a b, in the main portion and hinged to the part, B, so that it may when turned up or opened, rest upon B, the parts A B being provided with drawers, and the other parts, D, provided with a lid or cover, substantially as shown and described.

I further claim, in combination with the hinged portion, A, the metal stays or plate, E, applied to the ends of the trunk and having the handles, F, attached, substantially as set forth.

58,142.—Hook for Davit-fall Block.—William R. Satterly, Port Jefferson, N. Y.

I claim the combination, with the davit-fall block, of the hook, D, link, H, and cord, I, operating substantially as described.

58,143.—Corn Harvester.—Samuel Secrist, West Liberty, Ohio.

I claim, First, The reels, j j, with their arms engaging with each other, in combination with the box, G, substantially as described for the purpose specified.

Second, I claim the reels, k k, in front of the sides, G G, for gathering up the leaning and broken stalks, and passing them on to the cutters, constructed substantially as herein described.

Third, The arrangement of the revolving platform, H, hoop, o, discharging gate, half-hoop, r, spiral spring, t, constructed and operating substantially as and for the purpose specified.

Fourth, The lever, b, and the clamp, g, suspended by the standard, J, over the platform, H, to gather the shock together at the top and set it off, standing upright on the ground, constructed substantially as herein described.

58,144.—Washing Machine.—Henry Sidle, Minneapolis, Minn.

I claim the box, A, with its vertical rollers, B B, arranged with the top, C, and shaft, E, with its oblique arms, F F, substantially in the manner and for the purpose herein specified.

58,145.—Tweer.—Thomas Sinnott, Brooklyn, N. Y., and James McIntyre, New York City.

We claim, First, A series of wings, or divisions, around the blast pipe, with openings at alternate opposite ends to cause the air or blast to travel back and forth within the tweer, for the purposes and as set forth.

Second, We claim the valve, l, attached to the block, m, in combination with the blast pipe, a, for the purposes set forth.

Third, We claim the movable nozzle, n, in combination with the tweer, as and for the purpose specified.

58,146.—Brick Kiln.—Francis H. Smith, Baltimore, Md.

I claim the middle flue, A, beneath the floor, extending outside the walls to connect with furnace, F, and having lateral communications with ash pits.

I claim the furnace placed at the mouths of said flue, heating all the air that passes into the kiln, creating the hot blast.

I claim the middle door, e, in combination with the flues, A and C, and the furnace, F.

58,147.—Cultivator.—Andrew Stark, Topeka, Kansas.

I claim the pivoted bars, L L, having the driver's seat, N, attached to them, in combination with the plow beams, H H, connected at their front ends to the front part of the frame of the machine, and the plow beams and bars connected by chains, h, or their equivalents, substantially as and for the purpose specified.

58,148.—Roofing Cement.—Jesse Stow, Geneva, Ohio, and James White, Cleveland, Ohio.

We claim a plastic roofing cement composed of the ingredients herein named and compounded, as specified.

58,149.—Amalgamator.—Stephen G. Sturges, Newark, N. J.

I claim the flute or pocket, t, when attached to a reciprocating or revolving cylinder, in the manner and for the purpose substantially as shown,

Also, the bolts, w, extending across as supports to the cylinder, when used in combination with the pocket attached to the cylinder.

58,150.—Deep Well Pump.—J. W. Summers, Tarr Farm, Pa.

First, I claim suspending the piston of a pump from the pump rod by means of a ball and socket joint, substantially as described.

Second, I also claim the cylindrical stop, G, having its upper edge leveled as shown, for the purpose of catching rivets and other objects, and directing them into the piston, substantially as described.

58,151.—Saw-filing Machine.—Alvah Sweetland, Syracuse, N. Y.

I claim the swing bar, the adjustable table, the rag, the dog, the lever, the rag wheel, the straight file, the cylinder, the clasps, and the connecting rod, the whole being arranged and combined substantially as as and for the purpose set forth.

58,152.—Chuck.—Royal H. Thorn, Syracuse, N. Y.

I claim clamping the jaws, C C', by the screw, D, and allowing the same to play freely through the body of the chuck, for the purposes set forth.

58,153.—Bottle Stopper.—Samuel H. Timmons, Lafayette, Ind.

I claim, First, A cup, graduated or otherwise, fitting a base piece to be attached to the cork or neck of a bottle of any size.

Second, The base piece, provided with an entering shank, for insertion into a cork, and with a flange for the reception of the cup, substantially as described.

Third, I claim a graduated cup attached to the stopper or neck of a bottle, for the purpose described.

58,154.—Artists' Stretcher.—Joel E. Todd, Middletown, Conn.

Making the angle of artists' stretchers self-adjusting by means of springs, F, or equivalents therefor, substantially as herein described.

58,155.—Machinery for Making Railroad Chairs.—William Van Anden, Poughkeepsie, N. Y.

I claim, First, The dies, G G, arranged to take hold of the metal plate at its edges, and constructed and operating so as to form the lip flanges and a projecting base on said plate, all substantially in the manner and on the principle herein set forth.

Second, The devices, c' c', in combination with a plunger, for curving or slightly bending the plate of metal, the same being arranged and operating substantially as described.

Third, Forming on a metal plate, which has been previously curved or bent, and from which a rail chair is to be made, a projecting base, and flanges standing at right angles, or nearly so, with the base of the plates, ready for the action of the finishing dies, by means of swaging dies, G G, in combination with an anvil, a, and a former, e, substantially as described.

Fourth, The combination with the anvil, a, and dies, G G, of the elevated pieces, a3 a3, so as to form a box die conforming to the shape of the base of a chair blank, substantially as and for the purpose described.

Fifth, The combination of the plunger or former, e, swaging dies, G G, and finishing dies, J J, working in a manner and for the purpose of forming a metal chair having a continuous lip, substantially as described.

Sixth, Making from a plate of metal, by one machine, and by a succession of operations in the said machine, a chair, substantially as represented in fig. 8, the means for doing this being constructed and operating substantially in the manner and on the principle herein set forth.

Seventh, Discharging a chair by means of the discharger, D, passing from the rear to the front of the chair, and then drawing the chair from the former on its backward motion, the said discharger being arranged and operated substantially as described.

Eighth, As a new product, I claim a swaged rail-chair, such as represented in fig. 8, the fibers of said chair being transverse to the length of the rail, which is to be supported by it, substantially as described and for the purpose set forth.

58,156.—Machinery for Coiling Springs.—Richard Vose and Wm. Toshoch, New York City.

We claim the inclined edged stationary guide plate, S, or its equivalent, in combination with the cylindrical mandrel, D', and one or more swaging and forming wheels and rollers, revolving in unison, all substantially in the manner and for the purpose herein set forth.

58,157.—Oil Can and Oiler.—James E. Weaver, Temperanceville, Pa.

I claim the arrangement of the division, d, and tube, c, when used in connection with the body, a, and conductor, b b', as herein described and set forth.

58,158.—Hay Rack.—D. N. Webster, Geneva, Ohio.

First, I claim the sliding bar, H, spring, P, cross sills, G G', the levers, f and i, in combination with the sections, F F', as arranged in the manner and for the purposes set forth.

Second, I claim the sides, A, as hinged and arranged in combination with the sections, F F', and ends, D, for the purpose and in the manner herein described.

Third, I claim the ends of the rack, D D, the catch, b, spring, c, and the loops, a, as arranged and in combination with the sides, A, and sections, F F', in the manner and for the purpose as substantially set forth.

58,159.—Ventilating Pipe for Stoves and Heaters.—A. A. Wilder, Detroit, Mich.

I claim the arrangement of the supplementary pipe, B, with its portion, a a, as described, with the elbow joint of a stovepipe, combined and operating in the manner and for the purpose specified.

58,160.—Toys.—Job T. Williams, Philadelphia, Pa.

I claim constructing rocking toys out of single pieces of tin or other metallic plates, substantially in the manner above described.

58,161.—Gate.—James F. Winchell, Springfield, Ohio.

First, I claim the combination with the pivoted bars, a, the slotted brace, C, secured by the bolt, n, and nuts, l, when arranged to operate as and for the purpose set forth.

Second, I claim the rubber washer, i, when used in combination with the brace, C, and gate, as and for the purpose set forth.

58,162.—Improved Machine for Wiring Sheet-metal Pans.—F. M. Woods, York, Ill.—Antedated Sept. 2, 1866.

I claim the sliding section, C, in combination with the adjustable grooved wheel, D, arranged in a suitable framing, to operate in the manner substantially as and for the purpose herein set forth.

58,163.—Disinfectant.—Lucy Broad (assignor to Charles A. Broad), St. Louis, Mo.

I claim the combination of the materials herein described in the proportions specified, or their chemical equivalent, for the purpose of producing a fumigating disinfectant.

58,164.—Steam Generator.—E. P. Chase (assignor to himself and John Eaton), Rockland, Maine.

First, I claim the arrangement of an annular steam generator, C, substantially as and for the purpose set forth.

Second, The combination of the annular generator, C, with the heater, B, substantially as and for the purpose described.

Third, The superheating pipe or pipes, P, in combination with the annular generator, C, and situated in the flue formed by the inner shell of said generator, substantially as and for the purpose set forth.

Fourth, The cap, g, weighted lever, F, and diaphragm, l, in combination with the generator, C, and pump, E, constructed and operating substantially as and for the purpose described.

Fifth, The slide, M, channels, t, chamber, u, and additional smoke pipe, L', in combination with the grate, D, and generator, C, constructed and operating substantially as and for the purpose set forth.

58,165.—Egg Beater.—Charles McDrennan, Boston, Mass., assignor to Wm. P. and Isaac Gannett, Roxbury, Mass.

I claim the gauze diaphram, c, when supported and inserted by the wires, d d, attached to the cover, as and for the purpose specified.

58,166.—Combined Corn Planter and Broadcast Seeder.—Andrew J. Edgett (assignor to himself, John W. Ferry and A. Graves), Hornellsville, N. Y.

First, I claim the construction and combination of a corn planter with a broadcast seed sower, so that either machine can be used, substantially as described.

Second, I also claim the distributing wires, I, in combination and arrangement with the grain box and slide of a broadcast seed sower, for the purpose and substantially as set forth.

58,167.—Clamp for Planking Floors.—H. B. Gregg (assignor to himself and James Gable), Camden, Ohio.

I claim the clamp, A, the bar, B, the guide, b, the press block, c, the lever, M, the bar, N, the pawl, f, and the plate, P, the whole constructed, arranged, and operating as and for the purpose herein described.

58,168.—Necktie.—Ira W. Hamlet (assignor to himself and Henry J. Chapman), Nashua, N. H.

I claim the new manufacture or necktie as made with hooks, B B, applied to and arranged with the part or cravat, A, substantially as set forth.

I also claim the combination of the hook, B, the cravat, A, and the stiffener or plate, C.

I also claim the combination of the cravat hook and stiffener, the same being for the purpose set forth.

58,169.—Composition Roofing.—James G. Holliday (assignor to himself, Wm. Hastings, J. Harlan and R. A. McCabe), Wheeling, West Virginia.

I claim an improved composition roofing, formed by combining coal tar, acid tar, still bottom of petroleum, finely ground brick clay and refuse lime from gas house, in the proportions and in the manner substantially as herein described and for the purposes set forth.

58,170.—Attachment for Pumps.—Thomas J. Jones, Summit, N. J., assignor to Charles J. Eames and Wesley Welty, New York City.

I claim a suction attachment by which a pump may be constantly supplied with water, and the introduction of solid substances to choke its action may be prevented, all substantially in the manner above described.

58,171.—Covering for Floors.—Clement Keen (assignor to Keen & Co.), Philadelphia, Pa.—Ante-dated Sept. 2, 1866.

I claim a floor covering consisting of burlap or other equivalent textile fabric and paper or paper pulp combined, substantially as set forth.

58,172.—Weight.—Daniel B. Lacy, Mott Haven, N. Y., assignor to himself, Isaac A. and Thomas T. Lacy, Jersey City, N. J.

The construction of weights with an outer case of sheet metal and a filling of "slag," and a malleable or wrought metal ring or shank, around which the slag is cast, all substantially as herein set forth, for the purpose specified.

58,173.—Molder's Flask.—E. C. Little (assignor to Eveline Little), St. Louis, Mo.

The combination of the hinges, B B, and the pins, C C, with the protecting frames, D D, when cast together in one piece, and so arranged and applied in connection with the cope and drage of molder's flasks as to permit a match plate pattern, a, to be placed between them without derangement by side movement, substantially as herein described.

58,174.—Bottle Stopper.—John Mulchahey (assignor to himself and Charles Mulchahey), Springfield, Mass.

First, The arrangement of a safety valve in the stopper of a bottle, substantially in the manner and for the purpose set forth.

Second, The use of a rubber or similarly elastic stopper, when the same is fitted in a case, A, which is hinged at one side, and fastened by a catch or latch at the other, substantially as set forth.

Third, I claim holding the latch or catch, b, by means of the pivoted bar, H, which is also held in place by means of the spring, K, or other suitable means, substantially as described.

58,175.—Drilling Machine.—Robert Nutty (assignor to himself and John Scott), New York City.

First, I claim the piston cylinder of a steam, atmospheric, or other suitable engine, with the piston of which a drill rod is suitably connected, so hung that it can be adjusted to enable the drill to be brought to bear against the surface of the rock or other surface to be drilled, in any desired situation, whether in a vertical or horizontal plane or in any intermediate plane, substantially as described.

Second, A piston cylinder through which a drill rod is operated, hung upon the boom or supporting beam therefor, in such a manner that it can be moved thereon and set at any desired position according to the point of the rock or other surface against which the drill is to act, substantially as and for the purpose described.

Third, The tongued lever, I5, hung to the outer end of the drill boom, and having an extension arm, P5, swiveled or pivoted to it, substantially as described and for the purpose specified.

Fourth, The piston cylinder hung by trunnion pins, to and in a frame, W, that by trunnion pins is suspended in the eyes of screw rods, S, having screw nuts, T2, said screw rods passing loosely through the boom, K, or its equivalent, substantially as and for the purposes set forth.

Fifth, The extension frame, C2, secured to the bottom of the piston cylinder, in which frame slides a cross head, E2, carrying the drill rod, N, and connected with the piston head of the cylinder, in connection with which it moves, substantially as and for the purpose described.

Sixth, The arrangement of the bevel pinion, H2, on the drill rod ratchet pinion, I2, hung in stationary bearings of the frame, C2, and spring pawl, L2, secured to sliding cross head, E2, when arranged and connected together so as to operate upon the drill rod as the cross head moves forward and backward, substantially as described and for the purpose specified.

Seventh, The tappet wheel, G4, walking beam, J4, having drill rod, B4, suspended in its outer end, connecting link or piece, M, double crank shaft, O4, rod, Q4, connected with crank arm, S4, carrying a pawl which engages with the ratchet wheel, V4, of the said drill rod, B4, when the several parts are combined and arranged together so as to operate upon the drill rod, substantially in the manner and for the purpose described.

Eighth, The arrangement and construction of the framework of the machine, the same consisting of the parallel horizontal slotted platforms, D and H, connected to a common center post, G, and supported at suitable points by uprights, J, for holding the drill booms, the whole being supported upon suitable wheels or friction rollers, and arranged and connected together, substantially in the manner described and for the purpose specified.

58,176.—Piston Packing.—William A. and Thomas F. Powers (assignors to William A. Powers), Brooklyn, N. Y.

First, We claim the packing rings, e g, constructed with annular grooves or rebates, c, in their outer sides, and combined with the bull ring, A, and perforated flanges, B, substantially as herein set forth for the purpose specified.

Second, The annular groove, c', formed at the innermost edge of the rebate, c, and arranged in combination with the rebated packing ring, e g, and the perforated flange, B, substantially as herein set forth, and for the purpose specified.

Third, The packing pieces, m, constructed as described in combination with the tongues, t, on the rings, e, substantially as and for the purpose herein specified.

58,177.—Plow.—John A. Quick (assignor to himself and Charles R. Holliday), South Danville, N. Y.

I claim the combination with the plow having mold board and land side, of the conical rotating point, H, shaft, F, gearing, I, M, and supporting wheel, J, operating substantially as described.

58,178.—Shoe Shanking.—Timothy K. Reed, East Bridgewater, assignor to Samuel J. Shaw, and Thomas Corey, Marlboro, Mass.

I claim so combining and arranging a knife or knives and bed and guide pieces that in scarfing one edge of each piece of the shanking, the opposite scarf of the next piece is formed thereby, substantially as described.

Also, combining with a bed which holds the stock in position to be cut square or at one angle to its supported edge, a bed which supports the stock in position to be cut at an angle to the opposite side, substantially as described.

Also, conjointly and specifically the provision for cutting stock of various thicknesses and into various widths for scarfing the material to a greater or less degree, and for inclining one of the scarfed edges more or less, all substantially as specified.

58,179.—Low-water Detector for Steam Generators.—Thomas Savill (assignor to C. Jones and Cadbury), Philadelphia, Pa.

I claim the hollow spindle, C, with its valves and openings in combination with the valve chest, A, its valve seats and openings, b, the whole being constructed and operating substantially as and for the purpose specified.

58,180.—Burning Fluid.—John B. Scott, Hyattsville, Md., assignor to himself, Geo. Hall, Prince George Co. and S. Mop, Baltimore, Md.

I claim the use of the above described ingredients, composed as and for the purpose herein specified.

58,181.—Sewing Machine.—Sidney M. Tyler, Brooklyn, N. Y., assignor to The Empire Sewing Machine Company, New York City.

I claim the rocking shaft, g, crank, k, link, l, and shuttle driver, m, arranged and acting on the shuttle in the manner specified, in combination with the needle bar, m, and cam, q, for giving the specified motions to the needle, as and for the purposes set forth.

58,182.—Sewing-machine Shuttle.—Sidney M. Tyler, Brooklyn, N. Y., assignor to The Empire Sewing Machine Company, New York City.

I claim the tapering rearward projecting point, 3, of the shuttle, in combination with the spring thread detainer, c, extending to the rear of the heel of the shuttle, as and for the purposes set forth.

58,183.—Machine for Cutting the Corners of Paper in the Manufacture of Boxes.—Daniel Whitlock (assignor to himself and J. M. Seymour), Newark, N. J.

First, I claim the providing of the knife or cutter, I, with pendent bars, g g, to serve as guides for the same, substantially in the manner as and for the purpose set forth.

Second, The adjustable bed piece, F, in combination with the knife or cutter, I, substantially as and for the purpose set forth.

Third, The graduating of the edges of the opening, d, in the bed piece, F, in combination with the adjustable gages, G G, substantially as and for the purpose set forth.

58,184.—Railway Chair.—Thomas Whittemore (assignor to Edmund G. Lucas), Cambridgeport, Mass.

I claim the combination and arrangement of the two wedged jaws, C C, and the wedge socketed base plate, F, constructed, arranged and applied together, substantially as and so as to operate as specified.

58,185.—Fruit Jar.—J. F. Winchell (assignor to himself and Joseph Leffler), Springfied, Ohio.

First, I claim the circular bead, b, on the under side of the cap, B, for the purpose herein described.

Second, The pressure lever, D, having projections, c, cam-lever, E, in combination with the bridge, C, and cap, B, when arranged to operate substantially as described.

58,186.—Instrument for Cutting Teeth.—Eugene Bourguard (assignor to himself and Pierre Boisset), Paris, France.

I claim a perforated tube in connection with a handle or any other contrivance for closing the open end of the tube, together with a sponge or other porous substance to be used as above described. The sponge may be dispensed with and the perforated tube filled with sugar or any other sweet substance of such consistency as will not require a sponge to hold it.

58,187.—Cotton Gin.—Frederick T. Ackland and Henry G. Mitchell and Mustapha Mustapha, Zagazig, Egypt.

We claim the application and use to and in the Macarthy cotton gin, or other cotton gins of a like character, of a feeding bar or surface having a rectilinear reciprocating motion along the grid or grating, for the purpose of pushing the cotton up to the gumming roller and "doctor," substantially as hereinbefore described and illustrated by the annexed sheet of drawings.

58,188.—Cultivator.—Alexander Anderson, London, C. W.

First, I claim the mode of suspending the cultivator frame beneath the axle by means of the chains, G G, rods, R R, and levers, J K K, so arranged, as described, to give it the necessary lateral and vertical play.

Second, The slotted extension axles, F' F', counterpart central portion, F, and bolts, S S, constructed and operating as described and represented.

58,189.—Apparatus for Indicating the Speed of Vessels.—Thomas Walker, Birmingham, Eng.

I claim the adaptation or combination of means forming apparatus for indicating the speed of vessels whereby the wheelwork and index are placed in front of the vanes of the rotator and they are definitely acted upon to have motion given to them in the rotation of such vanes and in which the rotating vanes and the chamber containing the wheelwork are immediately connected, substantially as explained.

58,190.—Machine for Slicing and Drying Peat.—A. H. Emery, New York City.

First, I claim the combination for cutting peat to facilitate its drying of a knife or slicer attached to or carried by a wheeled vehicle and breaker, set in motion by the draught, for operation together, substantially as specified.

Second, The combination with the knife or slicer, 9, and its pronged stock or cover, of a revolving toothed breaker, arranged and operating together essentially as and for the purpose or purposes herein set forth.

Third, Connecting the knife stock with the frame of the vehicle by means of slotted side uprights made capable of vertical adjustment through the frame, as specified.

Fourth, The combination with the sliding uprights of the knife stock, of the levers, 2 2, screw nut or box, 2 3, and its adjusting screw, for action together, as shown and described.

Fifth, In combination with a revolving toothed breaker, the hangers, 5, supported by or on the axle of the running wheels also carrying the revolving shaft of the breaker with its gear and made adjustable relatively to the frame of the machine, substantially as specified.

58,191.—Rotating Harrow.—Silas Grenell, Mokena, Ill.

I claim a revolving harrow, when constructed with a frame, A, and circular plate or ring, C, upon which the draught is applied by the wheel, I, attached to the tongue, the harrow turning upon a wrist pin, E, and having an arm, G, carrying a weight box, K, resting upon the track, B, on the friction wheel, K, said several parts being respectively constructed and arranged for use, substantially as set forth.

58,192.—Churn.—John R. Mickey, Chicago, Ill.

I claim the combination of the cog dashers, B and B', when constructed substantially as and for the purpose set forth.

58,193.—Fence.—Benning Rowell, Elmira, N. Y.

I claim a portable fence so constructed that the boards or rails, A1 and A2, supporting the panels shall be interlocked and sustained upon posts, B, and be held in place by intermediately placed hooks, C, fastened to short posts, D, and arranged to operate substantially as set forth.

REISSUES.

2,357.—Process and Apparatus for Carbureting Gases for Illumination.—John A. Bassett, Salem, Mass, assignor to Thomas D. Worrall, New York City. Patented March 4, 1862.

First, I claim the combination, substantially as herein described, of the vessel, A, in which the gas passes circuitously over the surface of the hydro-carbon liquids to be partly carbureted and cooled by the evaporation of the liquids, and the vessel, B, containing a porous substance, and saturated with such liquid, through which the gas subsequently passes, as herein set forth and described.

Second, The gas regulating valve, j, and float, k, combined with a gas naphthalizing or carbureting apparatus, substantially as herin specified, that is to say, with the float floating in the naphtha or other hydro-carbon liquid used for the carbureting processes.

Third, I claim, in combination with a carbureting apparatus, a regulator to govern the flow of gas to the burner, substantially as described.

Fourth, The use of carbon-spirit or light products of petroleum for the purpose of carbureting air or of enriching and carbonizing any kind of gas.

2,358—Preventing Rattling in a Carriage.—William S. Chapman, Baltimore, Md. Patented Aug. 8, 1854.

First, I claim the employment of blocks of india-rubber, or other equivalent elastic material, so shaped as to be self-sustaining in position when interposed between the ends of the carriage shafts or poles and the "clip" to prevent rattling, substantially as above described.

Second, I also claim the use of india-rubber blocks, or other equivalent elastic material, interposed between the ends of carriage shafts and the "clips," in such a way and under such strong compression as to hold the bolts in place independently of the nuts, and also to prevent the rattling of the parts, substantially as above described.

Third, Finally, I claim as a new manufacture a block of india-rubber, or other equivalent elastic material, intended to be used as herein contemplated, when made substantially in the form described, that is to say, when so shaped that it will remain permanently in place, and perform its functions without the aid of any other special contrivance for that purpose, in the manner above set forth.

2,359.—Operating Slide Valves in Direct-action Engines.—G. W. Hubbard, Brooklyn, N. Y., and William E. Conant, Little Falls, N. J. Patented Jan. 9, 1855.

We claim, First, So combining a main engine or motor, a supplementary valve-working engine and their induction and eduction valve or valves, that the movement of the valve or valves of the main engine or motor is commenced and partly effected by the piston of said engine, and completed by the piston of the supplementary or valve-working engine, substantially as herein described.

Second, When two direct-action engines are so combined that the movement of the induction and eduction valve or valves of one is produced by the movement of the piston of the other, we claim the arrangement of the cylinder and piston of one engine within the valve chest of the other, substantially as herein described.

Third, In operating the slide valve in one direct-action engine by the piston of another, we claim so connecting the said slide valve with a tappet-rod operated by an arm on the piston-rod of its own engine, that the said rod and valve may have each a certain amount of motion independently of the other, substantially as and for the purpose herein specified.

Fourth, The arrangement of the valves, E and k, the tappet-rod, F, and its connections with the said valves, and the cut-off plate, j, and stops, l l, substantially as described for the purpose set forth.

2,360.—Hay-hoisting Machine.—John S. Lloyd, Salem, N. J. Patented April 24, 1860.

First, I claim an elevated way or railroad, A, in combination with a hoisting or horse hay fork, F, arranged to operate in the manner substantially as herein shown and described.

Second, The construction, combination, and arrangement of the fork, cords, levers, pulleys, springs, and railway, the arms, E E, to the block, D, and the mode of attaching and supporting the railway to the barn or frame, so as to allow the wheels, B B, with the attached blocks and fork, to pass freely along the length of the rail.

Third, The post, P, as constructed in combination with the pulley, lever, slide, spring, and cord.

2,361.—Knob Latch.—Wallace T. Munger and J. A. Leggat (assignees of Wallace T. Munger), Branford, Conn. Patented April 3, 1866.

First, I claim the follower, E, recessed in its rear side, in combination with the bar, a, of the yoke, H, attached to the latch bolt, substantially as and for the purpose specified.

Second, The horse shoe, F, link, I, and spring, M, in combination with the lock bolt, D, substantially as and for the purpose set forth.

2,362.—Wagon-shaft Shackle.—H. D. Smith, G. F. Smith, and Edward W. Twichell (assignees of James P. Thorp), Plantsville, Conn. Patented May 1, 1860.

We claim the improved manufacture of carriage-shaft shackle blank, constructed ith the projections, d d, arranged at or about at the junctions of the arms and body of the blank, substantially as and for the purpose specified.

Also for making the said blank, the die as constructed with the projection forming recesses, arranged with respect to the portion for swaging the body and arms of the blank, substantially in manner as specified.

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Kensington, Philadelphia, Aug. 13, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—I will say in reply to yours of the 9th inst., that I have had one of your Boilers almost in constant use over one of my Puddling Furnaces for over eighteen months, and in all that time it required no repairs, with the exception of changing a few light bolts for heavier ones, and it is now running without any signs of leaking or want of repair, apparently as good as when first put up. I think I have just grounds, from the experience I have had, to recommend them as a good and safe boiler, and one that generates steam very fast. I feel confident that I get nearly double the quantity of steam from this boiler that I do from any other Puddling Furnace in my Mill that has two Cylinder Boilers over them. I believe the day is not far distant when they will be in general use in Iron Manufacturing establishments.

Yours respectfully,
STEPHEN ROBBINS.

Artisan Hall, 611 and 613 Sansom street, Philadelphia.

Mr. Joseph Harrison, Jr.:
Dear Sir:—We take great pleasure in testifying to the merits of your Boiler, as a generator of steam, the confidence we have in its safety, its economy of fuel, and also of space for its erection. It has now been in successful operation more than a year, without the necessity of any repairs, and our confidence increases with its use. We shall always consider it a privilege to exhibit and explain its merits to any who may wish to examine it.

Respectfully, etc.,
GEO. W. SIMONS, BRO. & CO.

Philadelphia, Aug. 9, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—In reply to your communication respecting our opinion of the "Harrison Boiler," we would state as follows: We have had one of your Boilers in constant use for twenty-two (22) months, during which time it has supplied steam to a 6-horse Engine, driving about seven lathes and several other power tools. It is perfectly tight and free from leakage; takes up less room than an ordinary Boiler; and as to its economy in fuel, you can best judge for yourself, from the following statement: During the past year it has burned from 50 to 60 tons Pea Coal, each week averaging 6½ to 7 days. We can truly recommend said Boiler, from our own experience, as safe, reliable, and economical.

Truly yours,
TAWS & HARTMAN, 1237 North Front street.

Office of the Salem Coal Company,
Philadelphia, August 16th, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—After having your cast-iron Boiler in use at the Colliery of this Company for more than a year, it gives me pleasure to state that its operation has been very satisfactory. In the important point of economy of fuel it is reported to be superior to any other Boiler we have in use, and as regards its safety from destructive explosion, it certainly has no equal among all the various forms of boilers that have come under my notice.

Very truly,
JNO. C. CRESSON, Pres't.

Germantown, Aug. 16, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—About four months ago, we put in one of your "Harrison Boilers," and it gives us much pleasure to be able to state that, as a safe steam generator, in its general economy in fuel, time, etc., we consider it the best Boiler now in use. Our Boiler is 50 horse-power; our Engine has a 10-inch cylinder, with a 36-inch stroke: the cost of running this, and almost always at its utmost capacity, is about two dollars per day. In fact, we consider your Boiler so excellent in its services, aside from its safeness from explosion and its real economy, that we could not and would not do without it. It will afford us much pleasure to show the "Harrison Boiler" to any one who may call at our Works, where they can daily see it in practical operation.

Very truly yours, etc.,
SELSOR, CROOK & CO.,
Manufacturer of Edge Tools, Hammers, etc., Armat-st.,
Germantown, Philadelphia.

New York, August 15th, 1866.

Mr. Joseph Harrison, Jr., Philadelphia, Pa.:
Dear Sir:—We take pleasure in informing you that the Boiler purchased from you, which we have had in use about five months, has given the best satisfaction, and has borne out everything you claimed for it. As a steam generator we have never seen anything equal to it. We consider the saving of fuel as being very great compared to ordinary boilers. If we had need of more steam capacity, we should most certainly use your Boiler in preference to any other. You are at liberty to use this, if it will be of any service to you.

Yours truly,
UNITED STATES WATCH CO., F. A. GILES, Pres't.

Pennsylvania Hospital for the Insane,
Philadelphia, August 11, 1866.

My Dear Sir:—In my annual Report of this Institution, for 1865, I stated my high estimate of your Boiler, for safety, economy, and general efficiency. Additional experience has tended to confirm all that I then said, and if we required additional Boilers, for any purpose, I should certainly recommend yours.

Very truly yours,
THOMAS S. KIRKBRIDE.
Jos. Harrison, Jr., Esq., Philadelphia.

Philadelphia, Aug. 10, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—The "Harrison Boiler" we bought of you, some four months ago, has given us perfect satisfaction. The Boiler is placed over one of our heating furnaces, and, in consequence of the steam-pipe connections with our main steam pipe, we have no means of testing its economy in fuel. We believe it to be safer and more economical than the Cylinder Boiler, and have no hesitation in recommending it as admirably adapted for Rolling Mills. Its length, the same as the length of a heating furnace, enabled us to place it immediately over the furnace, requiring no additional space, thus avoiding the necessity of locating the furnaces at an inconvenient distance from the machinery, which the ordinary Cylinder Boiler requires.

Very truly yours,
VERRAE & MITCHELL.

Philadelphia, Aug. 15th, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—Before ordering one of your Boilers, we sought information respecting them from several of our friends who were using them. Their testimony was of such a character that we felt no hesitation in adopting it, and it has more than answered our expectations. We recommend them as safe, very economical, and easily managed; they possess fully all the advantages you claim for them.

Very respectfully yours,
L. MARTIN & CO.,
Manufacturing Chemists, City Office 140 South Wharves.

Atlantic Mills, Ellwood, Atlantic county, N. J.,
August 13th, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—We have had one of your Six-slab Boilers in use in our Paper Mill for five months. We consider it unequaled by any other make of boiler now in use. With less than one-half the fuel it produces more and drier steam than any boiler we ever used. It is simple, easily managed, and perfectly safe. Our Boiler bleaches the stock for, and dries one ton of paper daily, with one cord of pine wood per day.

Very truly,
McNEIL, IRVING & RICH.

Mercantile Printing Rooms, Franklin Building,
Philadelphia, 14th Aug., 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—I am very much pleased with the Boiler you put in for me some nine or ten months ago. It has been in constant use—no trouble—no repairs—no stopping to clean out, and steam can be "got up" in about twenty minutes. It requires less coal than the Cylinder Boiler formerly used here, although it is doing a great deal more work. I cheerfully recommend it as being and doing all that you claim for it.

Yours very respectfully,
JAMES B. RODGERS.

Daily Evening Bulletin,
Philadelphia, Sept. 1, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—We have one of your 51 Horse-power Globular, Five-Slabbed Boilers, known as the "Harrison Boiler," in use now nearly five months, and as a safe, reliable steam boiler, and for economy of fuel, we think it cannot be equaled.

We have a ten horse-power engine, running eight hours per day, with an average saving of 50 per cent in the use of fuel over the old-style boiler. Our Engineer, Mr. George Lodge, has had over thirty years' experience in the management of boilers, and he has no hesitation in pronouncing the Harrison Boiler the "Best" he ever worked.

Very respectfully yours,
EVENING BULLETIN ASSOCIATION, 607 Chestnut-st.

Earle Stove Company,
Worcester, Mass., Sept. 3, 1866.

Joseph Harrison, Jr.:
Dear Sir:—Before purchasing your boiler, we examined with much care the various kinds now in use, determined to get "The Best." After eight months' trial, our experience conclusively confirms the correctness of our judgment in making choice of yours. Our President (T. K. Earle), and Treasurer (Edward Earle), who have in their Card Factory, one of the best of tubular boilers, are now putting in one of yours. We refer you to our Engineer, Mr. Frederick Edwards.

Truly yours,
EARLE STOVE CO., SIDNEY SMITH, Supt.

Worcester, Mass., Sept. 3d, 1866.

After an experience of twenty years in running the most approved boilers and engines in use, I regard the Harrison Boiler, made by Joseph Harrison, Jr., of Philadelphia, the most economical for fuel, safest, quickest working, and one that will give the steadiest motion to the engine with the least attention.

EREDERICK EDWARDS, Engineer,
Earle Stove Co., Worcester, Mass.

Worcester, Mass., 9th mo., 6th, 1866.

Joseph Harrison:
Dear Sir:—We received your letter, and in answer will say, we are highly gratified with Boilers. The one we are using at the Earle Stove Co. has been in operation, since the first of the year, in perfect order. We have just got in operation the last sent, at our Card Factory, and are running it beside a Tubular of about the same capacity: so far we find a saving of about one-half by actual measurement.

Truly yours,
T. K. EARLE & CO.

Alpine Mills, Howards, Center county, Pa.,
September 8, 1866

Joseph Harrison, Jr., Esq.:
Dear Sir:—It gives me great pleasure to be able to inform you that your Boiler comes up to the most sanguine expectations; in fact, all that you can possibly claim for it: being economical, safe, and a speedy generator of steam. Since they were first put up in the spring (which, by the way, was done without having a mechanic on the ground, except the mason), according to your plans, sent gratis, the first leak, trouble, or delay has yet to make its appearance. Steam is kept up from 75 to 90 lbs. for Wm. H. King's [illegible] Sansom street), 25 horse-power Oscillating Engine, with saw dust, there being but a 25-feet iron stack of 2 feet djameter. . . .

I am, dear Sir, yours very respectfully,
PERCY H. WHITE, Agent.

Lincoln Mills,
S. W. cor. 25th and Spruce streets, Philadelphia, Sept. 10, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—In reply to your letter of the 9th ult., I would say that I have been using the "Harrison Boiler" for more than two years, and it gives me great pleasure to state that I find it entirely satisfactory. I have had both Cylinder and Tubular Boilers in use, and have consequently been able to compare each of them with yours. I have two of your boilers of 75 horse-power each in use, and my engine is 70 horse-power. I do not require more than 50 lbs. of steam, but would not hesitate to run up to 250 lbs., if necessity required me to do so. I had each of the slabs tested in my presence to 600 lbs. to the square inch. I know that it requires less fuel than the best of either the Cylinder or Tubular Boilers. My neighbor, with about the same machinery, using the steam for power generally, and heating his Mill with exhaust steam, informs me that he burns four tuns of coal per day under his Cylinder Boiler, while I used less than two tons per day, during the coldest days of last winter, and heated my Mill with live steam, in addition to the amount required for power. The question of durability is one of time. I think that in consequence of the ease with which it can be cleaned or repaired, that it will last far longer than any other kind now in use. It is perfectly safe. There is no danger whatever of explosion. I do not hesitate to recommend it. If I ever need another boiler, I will get one of yours in preference to any other that I now have any knowledge of.

Yours truly,
SAMUEL W. CATTELL.

Superintendent's Office, Camden and Atlantic Railroad,
Camden, N. J., Aug. 21, 1866.

Joseph Harrison, Jr.:
Dear Sir:—You ask our opinion of the safety, economy in fuel, and general merit of the Harrison Boiler we have in use. I deem it a safe Boiler; from its construction I do not think it possible that a disastrous explosion can occur. It is a rapid generator of steam, and requires less fuel than any boiler that has come under my notice. . . . . .

Very respectfully yours,
G. W. N. CUSTIS, Supt.

Philadelphia, Aug. 10, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—Having charge (as administrators) of the Worsted Mills of the late Mr. Samuel Yewdall, at which the recent terrible explosion of a wrought-iron boiler occurred, we have decided to avoid a recurrence of such a calamity in the future, and, believing your Boiler to be the only one absolutely free from danger from explosion, and at the same time equal, if not superior, as a generator of steam, and in economy of fuel, to any boiler now in use. You will please accept our order, to furnish us for said Mills, two fifty horse-power Boilers, to be used separately or in conjunction. By complying quickly with the above order, you will very much oblige,

Yours truly,
JAMES HUNTER, }
N. R. SUPLEE, } Administrators.

Rock Island Manufacturing Company,
Charlotte, N. C., August 23, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—Our experience with your Boiler warrants us in bearing testimony to its superiority over any other with which we are acquainted. Ours is a 100 horse-power boiler, and drives six sets of woolen machinery, and furnishes steam for our dyeing operations, and for heating the mill. Our fuel is wood, and we use three cords per day to do all our work, whereas, we formerly used that quantity under Cylinder Boilers, merely to furnish steam for our dye house, and heating the mill. Our experience is, that in fifteen minutes after applying the fire in the morning, we have on a full head of steam, and our machinery at work. We have had it in use only a few months, it is true, but we presume long enough to test its adaptation to our fuel and our work, and have found it in every respect to come up to your representations. Our Boiler was set up and put to work by a man who never had seen it done, without the the slightest difficulty. Your Boiler commends itself for economy in fuel, and its merits need only to be known to render it universally popular.

Very respectfully yours,
14 4] JOHN A. YOUNG, President.

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We can furnish from our Stock nearly all Sizes of Square, Flat, Octagon, or Round Tool Steel, from ¾ to 4 inches, of Superior Quality. Warranted equal to any imported or produced in this country. SWEET, BARNES & CO.,
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P. O. Box 1,057, Boston, Mass.
N. B.—This detector is covered by two U. S. patents. Parties using or selling these instruments without authority from me will be dealt with according to law. [11 tf

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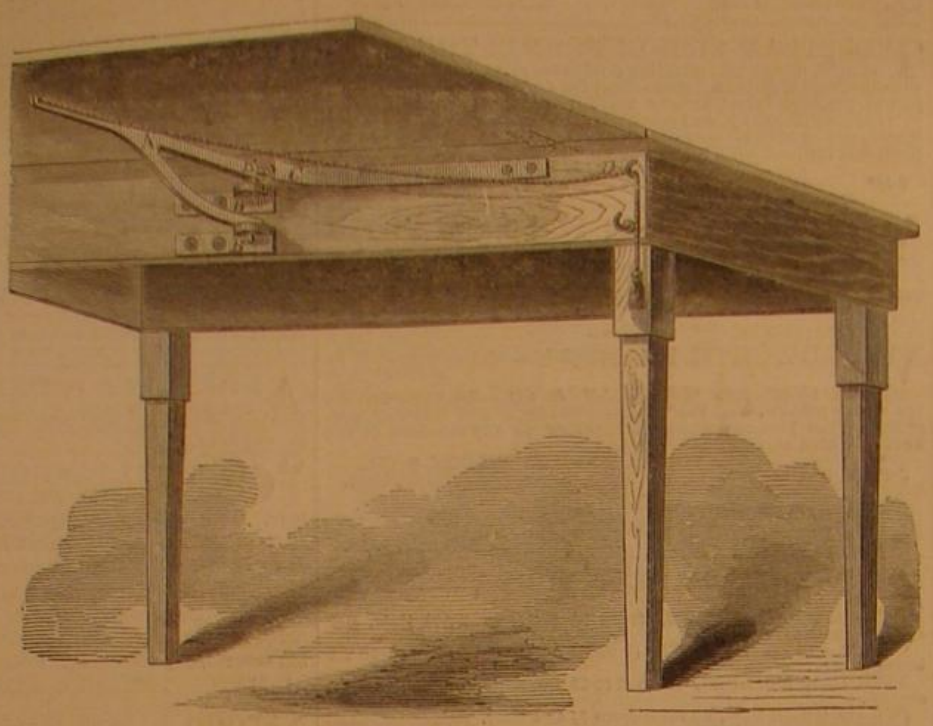
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Improved Table-leaf Supporter.

The engraving of this improved table-leaf supporter represents the device so plainly that but little explanation is necessary. It is designed to obviate the necessity for the stooping and lifting required in spreading heavy table leaves. The support, A, is of metal, swiveled to the table by the pivot pieces, B, and held in position by the spring, C. When the leaf is to be lowered, the cord, D, is pulled, and the spring is depressed by the lug, E, allowing the support to shut against the table frame. The simple raising of the leaf to a horizontal position allows the support to spring out without the intervention of the hand.

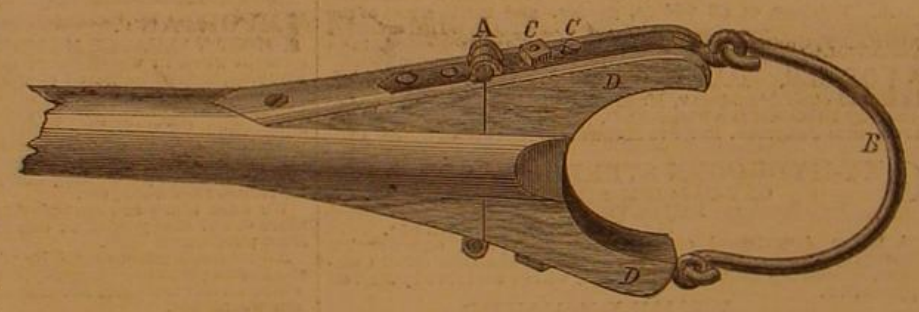


CAVENDER'S TABLE-LEAF SUPPORTER.

Patented through the Scientific American Patent Agency July 3, 1866, by L. R. Cavender, Eureka, Woodford county, Ill., to whom apply for rights to vend and manufacture.

Improved Boom and Gaff.

The object of the improvement here illustrated is to allow a worn jaw of a boom or gaff, to be conveniently removed and replaced by another, without injuring or removing any other portion. The jaws are bolted to the boom in the usual way, but at A, the straps terminate in hinges to allow of the removal of either jaw. The hoop, B, hooks into eyes at the ends of the straps. By driving out the bolts, C, the jaws, D, may be taken off and new pieces fitted. The advantages of this device will be seen by practical navigators and seamen.



MANNING'S BOOM AND GAFF.

It was patented May 1, 1866, by Alfred Manning, Fair Haven, Conn., to whom all letters on the subject should be addressed.

Gas Odors.

A director of a gas company recently wrote to the London *Times* that the excessive impurity of London gas has a beneficial effect in keeping away the cholera, and that none of the workmen in the metropolitan gas works have ever died of that disease, although their duties expose them to great alternations of heat and cold, and they are notably intemperate. The director, however, is directly contradicted by two different writers. Mr. Simcox Lea, incumbent of one of the churches at Bow, declares that no class of men in his neighborhood have suffered so heavily from the cholera as the class employed in the gas works, and the engineer of the Commercial Gas Company says that his company lost five workmen in the first seven days of the present attack.

If the director of the gas company is correct, it might be said "that the remedy is worse than the disease." It may be, however, that the gases which the workmen at a gas-making establishment are compelled to inhale will have some effect in keeping away the causes of cholera; but it is a statement that requires corroboration. As yet there have been no circumstances of position or employment that have proved specifics against the cholera.

Pressed and Cast Bullets.

Machines have been made, and, we believe, are still in use, to press leaden bullets; but we have been told by those who have had much experience with fire-arms that the pressed balls are unreliable. The complaint is that the lead being closely compressed is heavier than a bullet which is run in a mold, and also that in time the pressed bullet expands until the metal regains its natural porosity, and thus becomes too large for the bore of the rifle. Whether these objections have any better foundation than whim or prejudice, or not, it is certain that some large establishments make only cast bullets. This is the case at Colt's pistol factory and Sharps's rifle works. The bullets are cast in metallic molds with lead at a high heat. Each bullet, when cold, is tested by an expert and all the light ones rejected. This is not determined by weighing, but simply by handling the balls, long experience enabling the workman to detect at once those which contain blow holes.

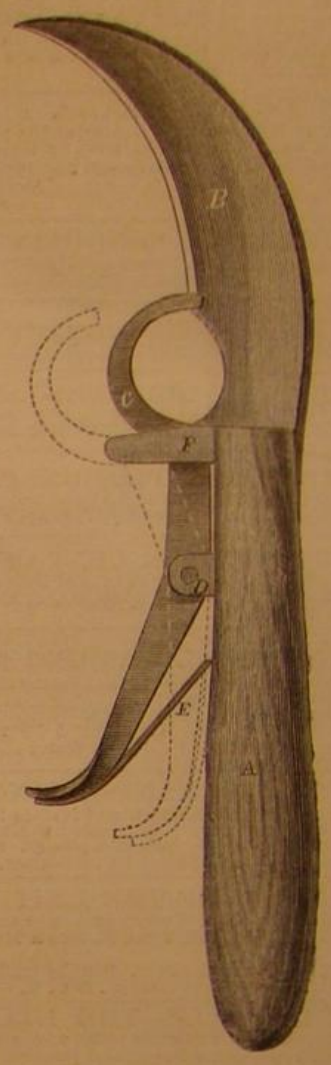
Test for Acids.

AN exceedingly sensitive test for ascertaining the presence of acids has been suggested by Schönbein; this is simple cyanine blue, easily produced by the action of iodide of amyl on lepidine subsequently treated with soda. One part of the cyanine dissolved in one hundred parts of alcohol is further diluted with twice its volume of water. The merest trace of an acid is promptly shown. Distilled water simply blown upon shows by this test the presence of carbonic acid from the lungs. The solubility of oxide of lead, which is so slight as to be unrecognized by sulphureted hydrogen, is clearly discovered by this test. By carefully adding acid to the solution till the blue color is destroyed, a very delicate test for the presence of bases may be procured.

CONARROE'S CANE KNIFE AND STRIPPER.

In crushing sorghum and other canes for the extraction of the saccharine matter, if the cane is not properly stripped, the leaves absorb the juices, and thus a portion of them is wasted. The improvement illustrated in this engraving is a device for combining a cutter and stripper for the cane.

A, is the handle and B the blade of the knife, which latter is hollowed, so that in connection with the jaw, C, the cane can be closely grasped. This jaw is pivoted at D, and held in place by the spring, E, the end of the jaw being notched to receive the edge of the blade, B. Two guides, F, assist to retain the jaw in position.



The operation, after topping the cane, is to open the jaw by the thumb, then, as the thumb is removed, the jaw and blade grasp the cane and a downward motion of the hand strips it of its leaves, and the stalk is cut by drawing the knife toward the operator. The value of the device is seen at a glance.

Patented through the Scientific American Patent Agency July 3, 1866, by Robert Conarroe. For State and county rights address R. Conarroe & Co., Camden, Preble county, Ohio.

MECHANICS

INVENTORS, MANUFACTURERS.

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Vol. XV.---No. 15. [NEW SERIES.] NEW YORK, OCTOBER 6, 1866. $3 per Annum, [IN ADVANCE.]

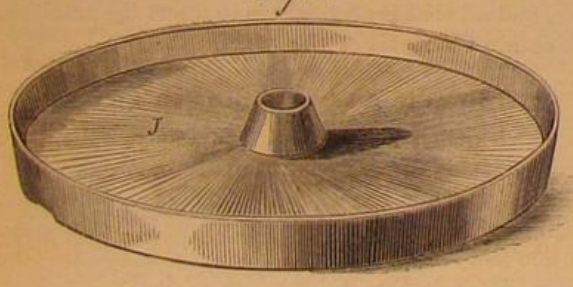
Improved Cooking Apparatus.

The primitive method of cooking meats has never been really improved. All meats are better, more healthy, juicy, and palatable when roasted than when prepared in any other way. Those who have pursued hunting as a sport, or a means of living, can testify to the delicacy of flavor imparted to specimens of the smaller varieties of game, when spitted and roasted before an open fire in the woods. In our homes we easily detect the difference between a broiled and a fried steak, and are compelled to award the meed of praise to the first. But in broiling, the house is often filled with the fumes of the meat and the kitchen dimmed with smoke. To remedy these inconveniences is one object of the device here illustrated, and to lighten the labors of the cook another.

The engraving represents a circular box of sheet metal, or cast iron, the bottom having an aperture at a point between the center and the periphery, which fits over the hole on the top of a stove, instead of an ordinary cover. Attached to this bottom is a cover with a handle sliding in guides, which projects beyond the box at the back, and by which the stove top can be covered or uncovered, without removing the whole apparatus. This device is not shown in the engraving.

A perforated circular disk, A, is suspended by the shaft, B, and is revolved by clock machinery contained in the drum, C, the connection being made by the clutch, D. By winding the clock spring at E, the disk, A, can be made to revolve at a steady and moderate speed for one hour. It may be stopped at any time by turning the screw head, F, and started by the same means.

Fig. 2.



The central shaft, B, has, just above the perforated plate, a milled disk, G, which serves to give motion to either or both the drums, H and I, which can be removed at will. H is an open and I a closed roaster for coffee. The berries are introduced at the ends of the drums, the heads being made double, and one sliding or rotating past the other.

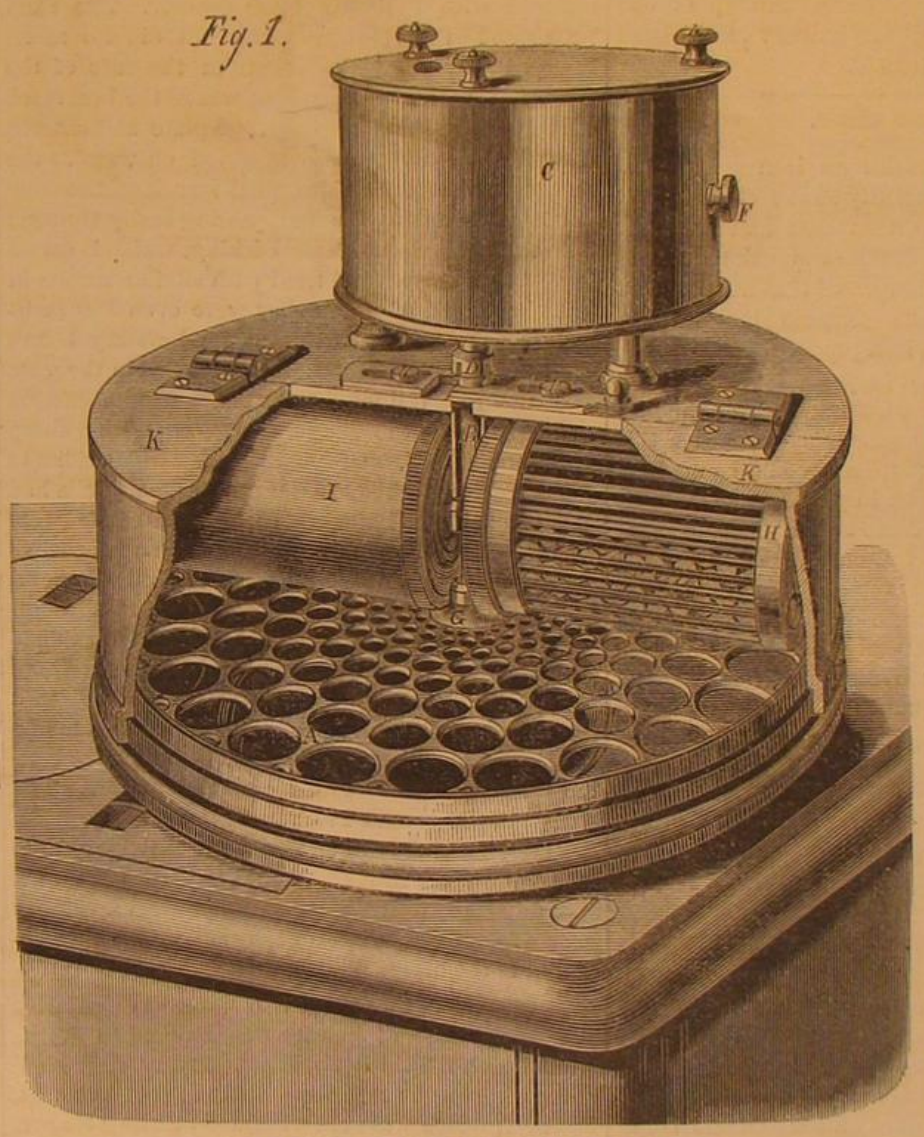
For baking pies, cakes, or bread, the plate, J, Fig. 2, is placed over the perforated disk, the upper part or shell of the box being removed for this purpose. The shell can then be replaced, the door, K (broken away in the drawing), closed, and the apparatus becomes an oven, as close and perfect as could be desired.

It can be readily seen how convenient and efficient such a contrivance would be when applied to a cooking stove, range, or even a parlor stove which had an aperture at the top. Perfect evenness of cooking can be assured by the uniform movement of the disk, A, and the apparatus can be used either for the broiling or roasting of steaks, birds, poultry, joints, etc., or as an oven for baking of cakes, bread, pies, or any of the concoctions of the pastry worker. The cover, K, can be left open, or kept closed, as may be desired. When open the fumes from broiling or roasting will all follow the draught through the stove, as the contrivance sits close to the stove top.

The clock-work is sufficiently removed from the fire to be unaffected by the heat, and is of the simplest character, not liable to get out of order. The whole contrivance is as ornamental as it is useful.

Patented through the Scientific American Patent Agency, July 10, 1866, by A. C. Kasson, Milwaukee, Wis., to whom or to N. C. Gridley, Box 3,354, St. Louis, Mo., apply for rights or additional information.

Fig. 1.



KASSON'S COOKING APPARATUS.

The First Ship Building in this Country.

From the "History of American Manufactures," we learn that New York was the first locality of ship building in this country. The account is as follows:—

The first vessel, with the exception of a few open boats, built by the followers of De Soto, ever constructed by Europeans in this country, was a Dutch yacht, named the *Onrest* or *Restless*, of 38 feet keel, 44½ feet long, 11½ feet wide, and 16 tuns burden. She was built by Capt. Adriaen Block, at Manhattan (now East) River, in 1614, to supply the place of one destroyed by fire, which, with four others, arrived there that year from Amsterdam. In her, Captain Hendrickson, in August, 1616, discovered the Schuykill River, and explored nearly the whole coast from Nova Scotia to the Capes of Virginia, after which he returned to Holland; and having presented a finely executed map of the coast, he asked a grant of the country, which was not conceded, however. During the same year (1614), Captain John Smith sailed for "North Virginia" with two ships and forty-five men and boys, to make experiments upon a gold and copper mine. They reached the island Monahigan, on the coast of Maine, latitude 43 deg. 30 sec., in April, where they made some attempt at the whaling business; but failing in that, they built seven boats, in which thirty-seven men made a very successful fishing voyage. Thus the first humble attempt at the fishing business was made in American bottoms.

In 1624, within four years after the landing, the Colony at Plymouth received an accession of a carpenter and a salt maker, sent out by the Company. Of the former, Governor Bradford says, "He quickly builds two very good and strong shallops, with a great and strong lighter, and had hewn timber for ketches (a much larger description of vessel), but this spoilt; for in the heat of the season, he falls into a fever and dies, to our great loss and sorrow." The salt maker—for whom the lighter appears to have been built—selected a site and erected a building, and made an attempt to manufacture salt for the fishery, first at Cape Ann, and the next year at Cape Cod, both of which essays were, through his ignorance and self-will, unsuccessful.

At Monamet, now Sandwich, near Cape Cod, whither the settlers removed about that time, a pinnace was built by the Plymouth people in 1627, for the purpose of fishing. But the first vessel of any size constructed there was a bark built by subscription in 1641. She was of about fifty tuns burden, and was estimated to cost two hundred lbs. It appears by the records of Plymouth, there were thirteen proprietors, of whom William Paddy, William Hanburry, and John Barnes, owned each one-eighth part, and William Bradford, John Jenny, John Atwood, Samuel Hicks, George Bower, John Cook, Samuel Jenny, Thomas Willets, Stephen Hopkins and Edward Bangs, each one-sixteenth part.

The building of this vessel, though small, it has been truly remarked [see Mass. Hist. Coll.], "was an undertaking at that period of exigency and privation, surpassing the equipment of a Canton or Northwest ship with our means at the present day." John Drew, from Wales, who settled at Plymouth, as early as 1660, is believed to have been a ship carpenter, and a number of his descendants, in that and other times, pursued the business—one of them at Halifax, on the Winetuxet, a small branch of Taunton River.

Ship-Building in Massachusetts.—In the records of the Governor and Company of Massachusetts Bay, it is stated, April 17, 1629, that they had "six shipwrights, of whom Robert Molton is chief;"

and in May following it was recorded that provision had been sent over "for building ships, as pitch, tar, oakum, tools, etc," and it was proposed to set apart a house for such stores, to make an inventory of them, and to give Molton the charge of the whole. Fishing vessels were to be built on shares. The first vessel ever built in Massachusetts—Plymouth being then a separate colony—was a bark launched at Mystic (now Medford) on the fourth of July, 1631, and named by Governor Winthrop, to whom she belonged, *The Blessing of the Bay*. In the course of the season this vessel made several coasting trips, and soon after visited Manhattan and Long Island. On this occasion, Mr. Winthrop says, the sailors were surprised at seeing, at Long Island, Indian canoes of great size. Some of these specimens of aboriginal boat building were capable of carrying eighty persons. The natives were no doubt equally amazed at the proportions and novel architecture of the largest vessel, probably, that had yet floated on the waters of the Sound. Another vessel of sixty tuns called the *Rebecca*, was built in 1633, at Medford, where Mr. Cradock, the first governor chosen by the Company, had a shipyard. A ship of one hundred and twenty tuns was built at Marblehead by the people of Salem in 1636.

CHILLED SHOT.

Mr. Fairbairn, in his treatise on iron ship building, which appeared so recently as the close of last year, records his opinion that cast and wrought iron were not materials calculated to make a serious impression upon armor plates, and that nothing had been found to answer the purpose better than hardened steel. The cast iron prepared by Dr. Price, and the case-hardened shot prepared by Major Palliser, Mr. Fairbairn considered, might answer the purpose in some cases, but he questioned whether this material, however well prepared, could be made to hold together, and not break in pieces when the shot struck the plates. So he came to the conclusion that steel shot and shell were the only projectiles suited for attacking iron-plated vessels. Major Palliser, however, has recently succeeded in demonstrating most thoroughly and practically that, by his method of chilling the shot when cast, he obtains a metal possessing a hardness equal to that of steel and a toughness approaching very closely to that of wrought iron. He has thus solved one of the most important questions of modern gunnery—that of penetrating armor with shells which do not explode until they have passed through the plate and backing—or, in other words, completely through a ship's side. Major Palliser is by no means the first to accomplish this object; the credit of that is due to Mr. Whitworth, who effected his purpose with comparatively small projectiles and low charges of powder. Following the latter gentleman, others have done the same thing, but two serious drawbacks to success were always present. The shells for the most part exploded backward on contact, and being made of steel, were very expensive, their cost for large ordnance ranging from £7 to £20 each projectile. So, on the score of imperfection and of costliness, absolute success was not attained by any, nor until Major Palliser had perfected his chilled shot, which are both cheap and efficient, was it considered attainable. But the question was set at rest by a series of experiments which were carried out last week, at Shoeburyness, with various kinds of shell.

These experiments were instituted for the purpose of testing Major Palliser's chilled shells against those of the best steel projectiles, and in their results proved most valuable. The principle upon which Major Palliser manufactures these shells is worthy of notice as being something more than the old process of chilling. As the shells are required for a particular purpose, they must have something more than a mere chilled surface; a definite and carefully-determined hardness must be imparted throughout the metal. This condition is attained by a selection and combination of those brands of iron which have been found by experiment to chill to the exact extent required, a careful mean being observed between iron which it is difficult to chill and that which chills too hard. Added to the principle of manufacture is the principle of construction, which goes far toward the success of the projectile. The form given by Major Palliser is such as will convert the sudden shock of impact as much as possible into a uniformly increasing pressure. In other words, the projectile has an elongated-pointed head, which is as essential an element in it as is the perfect chilling of the metal. Upon the occasion in question the firing was from an ordinary 7-inch wrought-iron muzzle-loader, with full battering charges of 22 lbs. of powder and a range of 200 yards. The shells were directed against a "Warrior" target, which was built of the ordinary 4½-inch plate with 18 inches of teak backing and an inner iron skin, the whole well braced and strengthened. Half the target was bolted on Mr. Bascomb's plan of india-rubber pads, the other half of the bolts being secured by Mr. Paget's steel cup washers. At the conclusion of the experiments it was found that Mr. Bascomb's system had stood better than Mr. Paget's, but then it appears that the shots almost invariably struck that part of the target bolted on Mr. Paget's principle, while that portion fastened with Mr. Bascomb's washers was scarcely touched. The experiments were commenced by firing a steel shell on Major Alderson's plan, having a screwed base, and being charged with 3 lbs. of loose powder. The shell penetrated the 4½-inch plate, but did no more, except to explode backward from the face of the target. The next shell, which was of the best steel, of Mr. Firth's, passed through the plate and entered the wood backing, but it exploded outward as the first had done. The third shell struck on the edge of the hole made by the first, passing easily through and exploding in the teak backing, which it set on fire. Other shells were tried with similar results in some instances, in others they were even less satisfactory, some of Mr. Firth's shells bursting before they reached the target; a few exploded in the gun. Three of Sir William Armstrong's conical-headed shells, made on the Belgian pattern, with a sharp cone, were fired, and produced a similar effect to those previously fired. After all the steel shells had been tried, Major Palliser's chilled-iron shells were tested, and the first shot proved the superiority of the system over all the others. The shell struck an uninjured portion of the target and went through the plate and backing so quickly as not to explode until it had passed beyond. The backing where the shell had passed through was splintered into fragments, and had the object been the side of a ship instead of a target, the results would have been most damaging to a gun's crew at quarters. The charge of the second Palliser shell did not explode, but after passing through the target the projectile broke itself up into fragments, which were sent spinning about in all directions with a velocity nearly as dangerous as an explosion would have imparted to them.

The results of these two shots were so conclusive that the charge of powder was reduced to 18 lbs., with which the third shell was fired. This shell missed the target and went away to sea; the next, however, which was fired without a bursting charge, went through the target, breaking up and scattering its fragments as before. The charge was then further reduced to 16 lbs. of powder, which was nearly equal to increasing the range from 200 yards to 1,000 yards, while the velocity of each shot on striking was less than 1,300 feet per second. But for all this, the next shell penetrated the plate and backing and was only stopped by coming in contact with one of the heavy struts which supported the target from behind, and which it broke. At this stage of proceedings the Ordnance Select Committee ordered the firing to cease, considering a continuation would only be a waste of time and powder. This will be the more apparent when we state that a few weeks since Major Palliser's projectiles were tried against the "Bellerophon" target, which has 6 inches of iron with 22 inches of teak, and an inch iron inner skin. The results, however, were precisely similar to those with the "Warrior" target, the shells passing through quite as easily. The results therefore constitute a victory for guns over armor plates, and this long pending question may be considered for the present as definitively settled. For the present we say, because, although the *Warrior's* strong sides afford but little more protection against Major Palliser's shells than would those of a wooden ship, it is possible that we may in time find some means of neutralizing the damaging effects of these projectiles. It always has been so; throughout the history of the question victory has always alternated between the guns and the plates. But unquestionably Major Palliser has gained such a victory as will not easily be reversed, and has inaugurated such a condition of things as will require a long time and a considerable amount of scientific and engineering skill to render obsolete. The gallant officer's labors in perfecting our artillery system and in economizing this branch of our national expenditure are worthy of every praise, while the success he has recently achieved in producing a projectile before which an enemy's armored broadside would be no longer impregnable, entitles him to special distinction.—*Mechanics' Magazine.*

Extracting the Metals from Auriferous Quartz.

The following, from the *Alta California*, details a process of extracting the precious metals from quartz rock, which posesses some novel features:

"The rock is dry crushed, and afterward submitted to the action of balls in a drum to insure full pulverization, it being desirable that the powder should approach as near wheat flour as possible. A charge of this powdered quartz is then placed in an air-tight cylinder, the interior of which is furnished with a worm of pipes to convey superheated steam therein. Added to the charge is a given quantity of quicksilver, which is first heated by the introduction of ordinary steam; the superheated steam is then turned on, or the whole seethed or boiled for an allotted period. On the top of this cylinder a water bath is placed, and as the mercurial vapors rise they become condensed. Thus the system of thoroughly impregnating the crushed rock with quicksilver is carried out with efficiency. After thus cooking, the cylinder door is opened, and the whole mass discharged upon a novel shaking table, which is worked by the power of the steam employed in the previous operation. This table is built of copper, on a wooden frame, with rollers and riffles of peculiar construction, which, when it is in motion, give the water, amalgam, and dust the same action of the ocean surf—an undertow. As the mass descends, the amalgam, from its metallic weight, gradually clears itself from the quartz dust, and the result is that it is all collected in the troughs of the riffles, containing every particle of metal, be it precious or base, the quartz holds. The mode of applying superheated steam to the crushed rock desulphurizes it, freeing the metals, and all that is necessary is to retort the amalgam to obtain the result of the yield.

Monitors and Heavy Guns in Sweden.

The Swedish Government has lately built three iron-clad ships of the monitor pattern, two of which, the *Ericsson* and the *Thunder* are afloat. The third, still on the stocks at the Motala works in Norrköping, is 250 feet long, with great breadth of beam. The turret is of twelve thicknesses of inch-plate iron, beautifully fitted together, and inclosing two 15-inch guns. The main wheel for the turret is of cast iron, which must be acknowledged to be a signal defect in this important feature of the plan. The Swedes disapprove the system of coil twist for guns, and declare that the iron from Dannemora, of which the Armstrong guns are made, is not suitable for the more solid-made guns adopted by Sweden. Two of these are shown in the exhibitions at Stockholm; one is a rifled breech-loader, the other a smooth bore. The engines of the new monitor are also in the exhibition, and are wonderfully compact trunk engines of 150 horse-power, with the two cylinders end to end and across the keel.

At Motala also there is a very peculiar iron-clad gunboat, which is more like a canoe than anything else. The bow or "nose" is depressed, so that the water line, when on war service, will be almost at the summit of the arched deck. The single gun carried by this formidable craft is in a mailed gun house, fore and aft, in the center of the deck, and the gun cannot be separately trained, but the whole boat must be directed so as to point it. Thus the only aperture for hostile entry into the gunboat is that of a few inches for the shot to issue from the muzzle of the gun. The boat is about 100 feet long, and it looks like a great whale with a cannon on its back.

BURNING OF A FRICTION MATCH.

Among the varied operations of the arts there is perhaps no other involving so many chemical and physical changes, and so many philosophical principles, as the burning of a friction match.

First in importance is the intense affinity of phosphorus for oxygen, as it is this property which makes a friction match possible. This affinity is so strong that when phosphorus is exposed to contact with the oxygen of the atmosphere at ordinary temperatures, the two substances combine slowly, generating light which is visible as a faint glow in the dark; and if the temperature is raised to about 120 deg. the combination goes on with that rapidity which we call combustion. It is easy to produce this degree of temperature by friction—hence the possibility of the friction match.

It is necessary, indeed, to modify the inflammability of phosphorus for its use in a friction match, and this is done by mixing it with a little gum. The gum also protects it from slow combustion in the atmosphere.

The flame of phosphorus, though intensely hot, will not set fire to pine wood; it is, therefore, necessary to interpose some substance more readily inflammable than wood; the substance usually employed is sulphur. Pine wood ignites at a temperature of about 600 deg., and sulphur at 450 deg. to 500 deg. The phosphorus in burning kindles the sulphur, and the sulphur flame sets fire to the wood.

The refusal of the phosphorus flame to kindle wood is fruitful of suggestions. The quantity of heat generated by the burning of any substance is in proportion to the quantity of oxygen with which the substance combines. One atom of phosphorus in burning combines with five atoms of oxygen, producing phosphoric acid, $P O_5$. The atom of phosphorus weighs 32 and the atom of oxygen 8, so the proportion by weight is 32 pounds of phosphorus to 40 of oxygen. Sulphur, in burning, combines with oxygen in the proportion of one atom of sulphur to 2 of oxygen, $S O_2$, and as the atomic weight of sulphur is 16 the proportion by weight is 32 of sulphur to 32 of oxygen, consequently phosphorus should generate more heat in burning than sulphur.

Again, this law is modified by either the oxygen or the combustible undergoing a change of form in combining. If a substance is changed from the gaseous to the solid state, heat is evolved; if from the solid to the gaseous, heat is absorbed. Now, phosphoric acid is a solid, while sulphurous acid is a gas. Phosphorus, in burning, changes the oxygen with which it combines from the gaseous to the solid form, thus increasing the quantity of heat generated; while sulphur, in burning, is changed from the solid to the gaseous state, thus absorbing heat, and diminishing the quantity produced by the combustion.

These theoretical views have been confirmed by careful experiment. The results obtained by Andrews from his elaborate investigations were, that 1 pound of phosphorus in burning to phosphoric acid generates sufficient heat to raise the temperature of 5,747 pounds of water one deg. centrigrade; while 1 pound of sulphur, in burning, raises the tem perature of only 2,220 pounds of water 1 deg.

But it is not the quantity of heat that is to be considered in this case, but the intensity; which is in proportion to the quantity contained in a cubic inch or other given volume. This, however, only increases the difficulty, for the phosphorus flame being condensed to a solid, while that of sulphur is diffused as a gas, the intensity of heat ought to be still more in favor of the phosphorus than the quantity.

The usual explanation given for the failure of wood to ignite in a phosphorus flame is, that the surface of the wood is instantly covered by a film of phosphoric acid, which protects it from combustion. As we have no better explanation to offer, we raise no objections to this.

The products of combustion, then, in the burning of a match, are, first, phosphoric acid from the burning of the phosphorus; then sulphurous acid, from the burning of the sulphur, and, finally, carbonic acid and water from the burning of the wood.

This is far from being an exhaustive examination of the subject. The hydrogen and carbon of the wood do not combine directly with the oxygen of the air, but the wood first undergoes destructive distillation, with the production of several hydrocarbon gases, which rise in the air and produce the flame by their combustion; and after the wood is burned the ash that is left behind is made up of some sixteen elements, combined with oxygen in various proportions. The activity of the burning, also, is increased byadding to the paste some substance containing oxygen which is held by feeble affinity, and which is, therefore, readily given up to the sulphur, phosphorus, and wood. Among the substances employed for this office are saltpeter and the peroxides of lead and manganese. In a complete examination of the reactions of the combustion, the decompositions of these oxidizing agents, with the resulting compounds or elements, would demand consideration. All that might be said in relation to the burning of a friction match would fill a large volume.

TARGET TEST WITH LARGE GUNS.

Some experiments were made at Fortress Monroe on the 21st instant, which, from the data so far at hand, appear to possess some interest. The trials were made with the design of ascertaining the advantage of iron plating as a defense to fortifications of masonry.

The guns used in the test were a 15-inch smooth-bore, and a 12-inch rifled piece, both of the Rodman patent. They had been well proved before the trial. The target was a wall of granite blocks, six feet thick, the blocks secured with iron dowels and clamps, covered with rolled plates, four inches thick, of the best iron. These were bolted directly to the face of the stone, except at one point, where a backing of six inches of sand was interposed between the plate and wall. The resul's, in tabular form, are these:

Gun.	Charge.	Projectile.	Initial velocity.	Penetration.	Target.
Smooth-bore.	46lbs.	432lbs.	1,155ft.	3in.	Granite.
"	"	"	1,113ft.	8½in.	Sand.
Rifle.	55lbs.	620lbs.	1,020ft.	4⅝in.	Granite.
"	"	"	1,079ft.	5⅝in.	"
"	"	"	1,103ft.	7in.	Sand.

The experiments show that iron constitutes a defense against the penetration of shot, although the shock of the projectiles in this trial shattered the granite wall. The charges of powder used were less than it was popularly believed the 15-inch guns were capable of sustaining. The placing of the plates in close connection with the wall may be an error, as the effects of the concussion would be transmitted directly to the work itself. It would appear, from the stated initial velocity of the shots, that the powder used was the "cake," or large powder, and not that sometimes employed in tests for guns. We forbear, however, commenting on the results of this trial until we have the official record of the experiments.

HONOR TO WHOM HONOR IS DUE.

The first rail cars were mounted on four wheels, which turned on axles fixed rigidly to the body of the carriage. Mr. Richard Imlay, of Philadelphia, in 1832, invented the "vibrating plate" of car trucks and applied it, in 1834, to cars on the Germantown and Norristown Railroad. In 1837 he patented his improvement, and in 1851 secured an extension of his patent. From adequate authority it is certain he was the first, at his manufactory in Baltimore, to build cars with independent trucks, by which cars of any length now used could be run on roads with sharp curves. Mr. Imlay's invention is in general use throughout the country, and has been for many years. Indeed, no invention or improvement in railroading is of so much importance as this. He is now over eighty years of age, totally blind from cataract, with a wife who is suffering from the most acute form of cancer. The friends of this suffering family ask that the railroad corporations throughout the country shall recognize his claims, the justice of which can be fully substantiated, so that he shall not be left dependent upon charity, where he is entitled to compensation justly due.

Mr. Imlay is physically and financially incapacitated to recover for infringements and to enter into legal prosecution, and he desires, simply, that railroad companies make him a small compensation for an invention that has, more than any other, made their enterprises a success.

He is, indisputably, the originator of the independent trucks, by which long cars can be run with safety at a high rate of speed, and round, with security, curves impossible to be turned with the old-fashioned car. We call the attention of railroad corporations to this case, believing that they will see, as well as we, the justice of Mr. Imlay's claim, and the duty of making a suitable return for the value of his improvement.

Mr. Imlay resides at 138 West 16th street, New York City.

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular meeting at its room at the Cooper Institute, on Thursday evening, Sept. 28, 1866.

AN IMPROVED CAR.

Several inventions of minor note were introduced, and their merits thoroughly discussed. One, however, received with special interest, was a plan for a street car, designed to transfer the traction from the ground to the metallic bottom of the car, which thus takes the place of a rail. The wheels are mounted on a number of pedestals attached to an endless band encircling the car. This is, perhaps, the best application of the old principle of a portable track that has been invented, but its practical value remains to be tested.

BARYTES, AND ITS USES.

A recent application of sulphate of barytes has been made in preparing the so-called "perspiration-proof" paper collars, in place of white lead. It is also used for giving the fine gloss to visiting cards, and wall paper, and in England, cotton collars are made by its use, having all the appearance and finish of linen.

VENTILATION.

The regular subject being introduced, the remarks seemed to take a practical turn, and the actual necessity and means for ventilating our dwellings were dwelt upon at some length. The method of ventilating sleeping cars in use on one of our railroads was explained, where the air is made to pass through an air chamber, into which water is forced as a fine spray, thus cleansing it of any impurities. In the ice cars, used for bringing dressed meat from the West, the impure air is passed over ice, placed near the top of the car, then is conveyed to near the floor, where it again enters the car, thus keeping up a continuous current of pure air. The same principle has been used in our hospitals for fever patients with good results.

Cooper Union Free School.

The session of this school commenced Oct. 1st. The school is open every evening except Sundays, free to all. The courses of study comprehend all the useful and some ornamental branches. It offers an excellent opportunity for clerks, apprentices and others, whose means, or avocations, do not permit them to employ paid teachers, or to attend day schools. The schools are under the charge of Prof. J. G. Fox as Principal, and the department of Physics is managed by Prof. Charles S. Stone, whose reputation as a chemist and a lecturer is well known. Ladies are admitted to any of the classes of the school of science for which they are fitted.

Important to Southern Inventors.

The order promulgated from the Patent Office some time ago, that all applicants for patents from States late in rebellion must furnish certificate of allegiance, has been rescinded, and hereafter inventors from the Southern States can obtain patents on the same conditions as citizens of the Northern States.

AN accident occurred at the Naval Academy, Annapolis, a few days ago, which, but for timely aid, might have proved a most serious affair. One of the decks of the *Winnepec* having been painted with gum shellac, one of the sailors accidentally dropped a lighted lantern on it. The shellac, becoming ignited, enveloped the deck in flames. By prompt action the fire was extinguished. Rumor says there was a large quantity of powder on the vessel at the time.

Corn Husker, Harvester, and Stacker.

The operations of farm work are so facilitated by the labor and time saving machines which have replaced the slow efforts of unaided muscle, that few could be found now who would, under any circumstances, voluntarily return to the old beaten path. The work of harvesting corn is one entailing the expenditure of much hard labor, and to save a portion of this labor is the design of the machines herewith illustrated.

Fig. 1 represents an apparatus for forming corn or cane into shocks, and delivering them in an upright position. The frame is supported on wheels, one of which carries a geared wheel, which, by means of suitable devices, gives a reciprocating motion to the cutters, A, for cutting the stalks. The guard, B, projecting beyond the cutters is intended to raise any stalks which may be bent or broken down. As the stalks are cut they are thrown by means of the revolving arms, C, upon an endless belt, carrying teeth and bars, D, which deposit them upon a table, E, connected to the frame by a universal joint. Bands for securing the stalks lie upon the table, which, when a sufficient quantity of corn is thrown upon the table, are tucked around the stalks, making a shock, which, by revolving the table horizontally and then tilting it vertically, is discharged upon the ground in an upright position, the larger ends of the stalks on the ground.

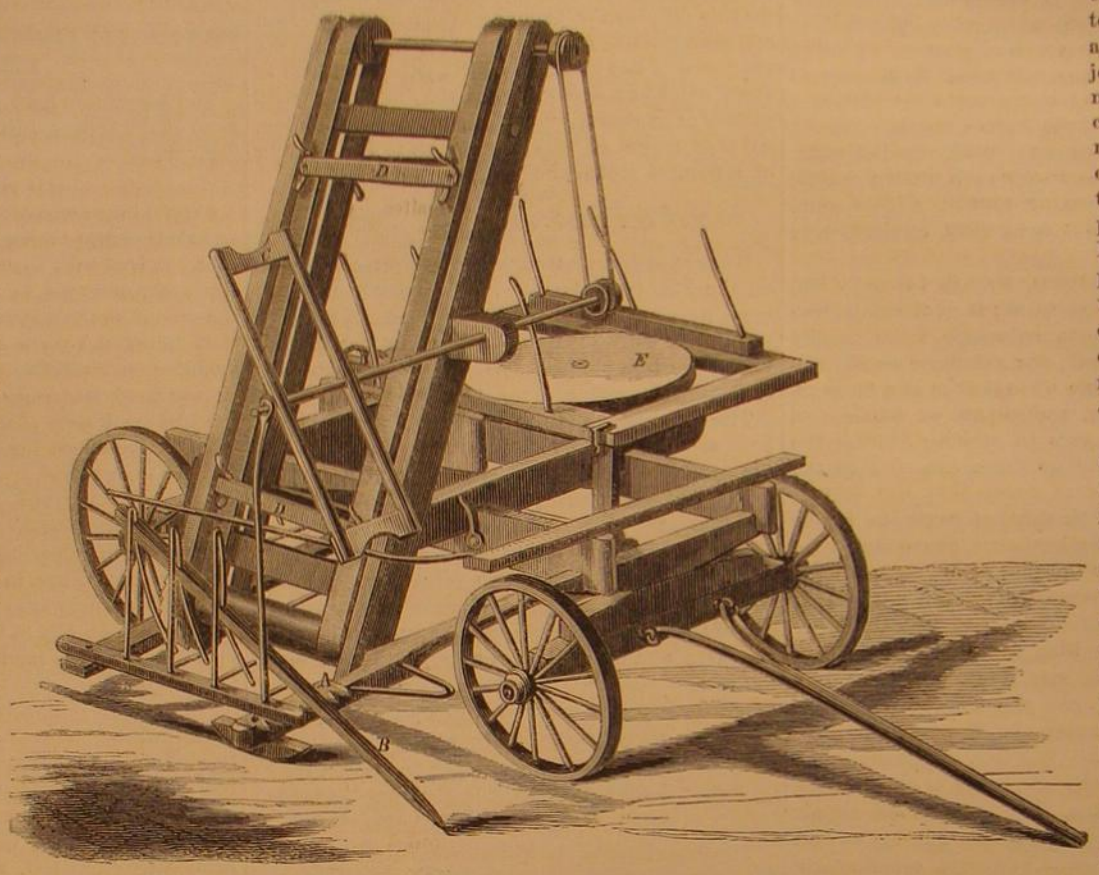
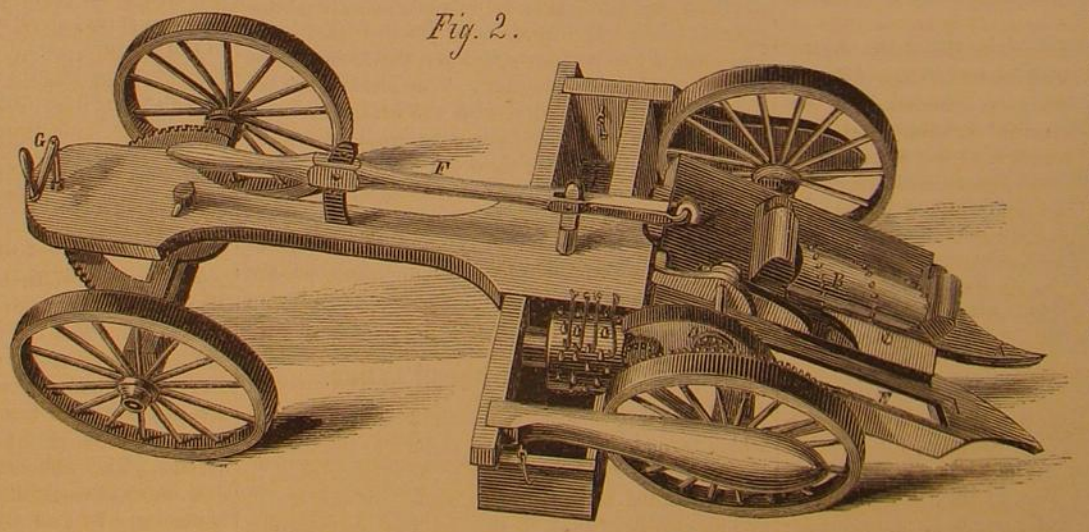


Fig. 2.



MANLOVE AND GREEN'S HUSKER, HARVESTER, AND STACKER.

Fig. 2 is a machine for gathering and husking corn in the field. The stalks are received between two curved arms, A, mounted on the fore wheels, and are supported by two rollers on the under side, not shown. The roller, B, presses the stalks against a cutter, C, which receives a reciprocating motion by means of a crank, the pinion, D, and the cogs on the periphery of one of the fore wheels. The cutter, C, severs the ears from the stalk and they are thrown upon the endless belt, E, which conveys them to the wire guards over the toothed wheel that strips the husks from the ear, and deposits the ears in the box underneath.

The frame, A, can be raised or lowered to accommodate itself to depressions in the soil by the lever, F, which is operated by the driver, who sits on a seat placed at the rear of the machine. By the toothed segment and a pinion worked by the crank, G, the vehicle is steered.

Both of these implements were secured through the Scientific American Patent Agency, by George H. Manlove and Jonathan P. Green, assignors to the former. Patented Sept. 25, 1866. Address George H. Manlove, Drawer 6,068, Chicago, Ill.

Concerning American Steel.

Our Newark, New Jersey, correspondent, P. McC., in speaking of the cast steel made in this country, says there can be as good an article produced here as anywhere, if the proper means are employed. Unless a proper quality of iron is used, purified by refining, converted to blister steel in a suitable furnace, where it receives its carbon, before it is put in the crucible to be melted, it cannot be relied upon. He says:—"I do not think it can be for want of knowledge that our steel is inferior, for two companies I know of sent to England and brought over workmen, who made no better steel than the hands previously employed. One concern tried hammering the blooms until they were made flat, then cut or broke them up, the iron being 'red short,' and put the fragments, with a portion of 'medicine,' into the crucible for casting. Some steel I have tried, the iron from which it was converted having been rolled. It was 'red short.' Some of our manufacturers say they cannot afford to use the best iron, nor the expense of processes employed in Sheffield. I say, if this is the case, they should not claim, as they do, that American steel is equal if not superior to English, nor that there is some mystery in the process. When blooms are made from old scraps, cast, or wrought iron, it cannot be expected that double refined steel will result, nor that the product will equal that made from Norway or Lowmoor refined iron."

THE POWER FOR CIRCULAR SAWS.—A correspondent, J. V. A., desires to know the horse-power needed for driving circular saws from 50 to 80 inches diameter, with a cut of from one to one-and-a-half inches; the size of pulley required and width of belt.

Railway over the Alps.

The pass over Mont Cenis, joining the fertile fields of Sardinia and Savoy, has always been the favorite of Alpine passes. Although the military route for ages, the road was in a deplorable condition till, by the enterprise of Napoleon, a substantial carriage way was constructed at an expense to the Government of seven million francs. For a number of years past this road, in connection with the French and Italian railroads and the Adriatic steamers, has formed the most direct and expeditious mail route to India and the East. The slow and tedious mountain passage, originated the project of completing the missing link of railway communication by tunneling the Alps. Whether this gigantic undertaking will ever be completed, admits of doubt. In the meantime, a company has been started with the design of accomplishing this same object by constructing a railroad over the summit of the mountain.

Mr. Fell, an English engineer, read an interesting paper on this subject before the British Association, and his statements leave no doubt as to the feasibility of the plan. Both the French and Italian Governments favor the enterprise, operations have already begun, and in all probability the road will be completed by March next From the difficulties to be overcome, the work must fairly be ranked as one of the greatest in the records of engineering. The inclines to be traversed by this road—without exception the steepest ever attempted—require a special construction both in the railway itself and locomotive.

The variations of climate during the year—always an important consideration in allowing for adhesion, or bite of the driving wheels on the rail—constitute here an important element, and necessitates the employment of a third or center rail. By this means not only is the proper amount of adhesion produced, but the additional advantage is obtained of furnishing means for applying an increased amount of brake power, and also preventing all possibility of either car leaving the track.

The engines and carriages have each, in addition to the usual vertical wheels, four horizontal wheels, having flanges underlapping the center rail, connected with brakes so as to grip the rails; these, in connection with the usual sets, give a brake pressure of 60 tuns in an engine weighing 16 to 17 tuns.

This principle of obtaining the adhesion required, in order to develop tractive force on railways, is equally applicable to a even much steeper gradient, than any found on the Mont Cenis road, and that consistently with the economical expense of mechanical power.

THE harbor of Galveston is becoming gradually filled up with sand.

Correspondence

Preservation of Wood against Decay.

MESSRS. EDITORS:—In your issue of Sept. 15th I noticed an article containing, in a condensed form, the views of a correspondent in regard to the preservation of wood. This subject is so interesting and of such importance, that I regret that want of space prevented your publishing the communication in full.

In some respects I fully agree with your correspondent as to charring wood. The advantages of charring a post do not consist, as scientific men have supposed, in the capacity of charcoal to absorb the gases from decaying substances. But the application of heat to such an extent as to create charcoal on the outside of wood, will drive out the surface moisture and coagulate the albumen of the sap, and render it insoluble in water. While this treatment, as a seasoning process, is of great benefit, no one at this day will contend that it is essential to the preservation of wood. Neither Kyan, Burnett, Payne, Boucherie, Bethell nor Robbins, ever charred wood, in order to preserve it. Still, in my opinion, a certain degree of heat is necessary, if it be properly applied, and with it and through it vapors may be infused into wood, which will render it indestructible.

But your correspondent asserts that the microscope reveals the cause of decay in wood as due to parasites feeding upon albuminous substances, and he recommends the use of hot air or superheated steam as a means of destroying the parasitic germs or albuminoids, which, he says, cause the decay of wood. There is something very new and original in this idea, and it raises several important questions for consideration.

First, Are the parasites the cause of decay in wood?

In botany we learn that a parasite is a plant without the proper organic means or instruments to enable it to draw its nourishment directly from the organized elements, but which derives its support from other plants to which it attaches itself. In entomology and zoölogy the parasite is represented as some insect or minute animal which lives on the superior forms of animated nature. According to Ehrenberg and other scientific authorities, while these creatures exist wherever organized matter is undergoing decomposition, it does not appear that the decomposing process is due to their presence. "Wherever organic matter exists in a decomposing state, there they abound, acting as scavengers in devouring, in the state of comminution and decay, those particles of decomposing matter which, if left to be diffused throughout the atmosphere, might be productive of the most pernicious malaria." [See Ehrenberg and Leeuwenhock; also Redfield's "Nature in Living Forms," p. 690.]

Brande, in his "Encyclopedia," says, It is not certain that dry rot is caused by parasites; on the contrary the terms are applied to "spontaneous decomposition without the presence of fungi;" or where these parasites appear long after the commencement of the disease in the wood. We doubtless mistake the effect for the cause when we assume that parasites produce the decay of vegetable and animal substances. It would rather seem that they are generated in and are a product of the process of decomposition, and they live but to consume and assimilate those elements which would render the earth and air unsuited to the essential conditions of health and life. To this end, according to Ehrenberg, they multiply at the rate of millions daily. If the parasites had any active or vital existence before the albumen of the wood was in a state of putrefaction, they might possibly be destroyed, to some extent, by the application of heat or some other means. But they are chiefly distinguishable after the process of decomposition has fairly commenced. They are only found in animal and vegetable infusions after the same have been kept a sufficient time to develop their existence in and through the decomposition of such substances. [Orr's "Circle of Science," vol. i. p. 87.] Parasites may, therefore, be regarded as a result, and not as the cause of decay in wood.

Second, Can these parasites be destroyed by the application of heat, as proposed?

We are assured by the best authorities that the polygastic infusoria are very tenacious of life; while they are injuriously affected by strong poisons, they are capable of enduring great extremes of heat and cold, and are found alike beneath the snows of the highest peaks of the Alps, and in the hot springs that perpetually boil from the heat of volcanic fires. [Redfield's "Zoölogical Science."]

But for the sake of argument let us suppose that the parasites, parasitic germs, or albuminoids may be destroyed by heat; will not the wood, after they have been destroyed, be again infested with new and similar formations which will be equally destructive? These germs exist in water and in the air, as well as in organized substances, and may be readily deposited on the surface and in the pores of the wood even after it has been subjected to superheated steam. If vegetable decomposition is due to the presence and action of the parasites, heat can protect the wood from their influence no longer than it is subjected to the temperature requisite for their destruction. As soon as it is exposed to air and moisture, at ordinary temperature, parasites may be again developed, and very rapidly; for, according to Ehrenberg, the *hydatina seta* increased in twelve days to sixteen millions, and another species, in four days to one hundred and seventy billions. Besides, scientific experiments have already fully established the fact that any infusion of vegetable or animal substance may be boiled for hours, and if subsequently exposed to the atmosphere, it will soon swarm with myriads of microscopic creatures. By placing the wood in an exhausted receiver and thus excluding the air and establishing a condition incompatible with the laws which determine their existence, this regeneration or re-formation of parasites may be prevented. So it might be prevented by the continued application of heat at its boiling point, or at a sufficiently destructive degree of temperature. It is very evident that wood which has been treated with heat only, when no longer under its influence and not protected by an exhausted receiver, may, by exposure to the oxygen and moisture of the atmosphere, be in a short time covered in surface and have its pores filled with infinitesimal germs and forms of life, which may cause it to decay. [Orr's "Circle of the Sciences," vol. ii. p. 217.]

But suppose it is true that the parasitic germs or albuminoids are co-existent with the wood, that they are the cause and not the result of decay, the next question of importance is, how can they be destroyed, and their re-formation and re-infestment prevented in the cheapest and most effectual manner?

The application of heat, simply, either in hot air or in superheated steam, may destroy them, as your correspondent claims, and it will also coagulate the albumen of the sap, etc., but it cannot protect the fiber against the effect of oxygen and moisture, nor can it prevent the regeneration or re-attachment of the parasites after the wood is again exposed to the air. Besides, this treatment will empty the pores to some extent and leave the ligneous fiber unprotected. The capillary tubes, being left open and exhausted of the vital elements of the living tree, will readily take up an increased quantity of water. This water will escape by evaporation when the wood is exposed to the action of the sun. And by the constant vicissitudes of temperature and the ever-varying degrees of moisture, the elasticity of the fiber will be diminished, and in time the integrity of the wood destroyed.

Hence it is that the celebrated Dr. Ure, in his dictionary of the arts, affirms that, "although the albumen contained in the sap of the wood is the most liable and the first to putrefy, yet the ligneous fiber itself, after it has been deprived of all sap, will, when exposed in a warm, damp situation, rot and crumble into dust. To preserve wood, therefore, that will be much exposed to the weather, it is not only necessary that the sap should be coagulated, but that the fibers should be protected from moisture." This necessity of further protecting the wood from atmospheric influence, after the albumen has been coagulated, becomes greater if, according to the theory of your correspondent, decay is caused by parasites, which the atmosphere furnishes so abundantly. Now the question recurs, and your correspondent has done well in raising it, what is the best means of driving out the surface moisture, of coagulating the albumen, of destroying the parasites, parasitic germs, or albuminoids, and of preventing all parasitic influence upon the wood thereafter?

In one of your issues of February I saw a very able article upon the process of preserving wood, invented by our American genius, Louis S. Robbins. According to my recollection, he proposes the use of coal tar and other oleaginous substances in vapor. It seems to me that these vapors will be found as hot as hot air or as superheated steam, that they will permeate the wood as readily, and more effectually destroy the parasites, parasitic germs, or the albuminoids referred to.

Now, coal tar is about thirty per cent creosote—which, as its very name imports, is an antiseptic, that is, preservative against putrefaction and decay. This creosote, in superheated vapor, will permeate the wood thoroughly, and destroy, not only by its heat but by its inherent poison, all the destructive parasites and other infusoria, and, at the same time, prevent putrefaction, and, besides, the wood, being thus saturated with a deadly poison, will be protected against any attack from the parasitic infusoria which might originate after the treatment.

Then, by the heavier oils eliminated by distillation, the wood is saturated and completely primed, and the fiber is thus protected from the oxygen and moisture of the atmosphere, as recommended by Dr. Ure. The ancients were accustomed to preserve both vegetable and animal forms and substances by a process that rendered them so far imperishable that many of them, in spite of parasites, have come down to us in a surprising state of preservation. Specimens may be found in museums of Egyptian and other antiquities, in which even three thousand years have neither obliterated the outlines of mortality, nor destroyed the cerements that inclose them. They employed bituminous substances in their embalming or preserving process, and, as we believe, in the shape of vapor, while others have vainly attempted the same results with metallic solutions. Bethell, of England, and Louis S. Robbins, the American inventor, are the only two who have resorted to the application of bituminous substances, Bethell using them in liquid form, while Robbins applies them more effectually in the shape of vapor.

So far as we are able to judge, the process of Mr. Robbins is the nearest approach to the treatment resorted to by the ancients.

New York, Sept. 20, 1866.

Chimney Drafts.

MESSRS. EDITORS:—Some facts in my experience compel me to believe that Prof. Horsford, as quoted in your issue of Sept. 8th, page 160, has not given the true reason for the diminished draft of chimneys in very hot weather. As foreman of mining claims in Grass Valley, in 1855, the question of fresh air for the workmen, often a serious one, involving heavy expense, compelled me to familiarize myself with the conditions on which increased or diminished draft depends. The air from our adit level, one-fifth of a mile long, was stopped off from the hoisting shaft, 120 feet deep, and conveyed in a large wooden pipe to the work, several hundred feet further under the hill, and 200 to 230 feet below the surface. In this way the hoisting shaft was made to act as a chimney; now what made it draw? The temperature in the "diggings" was nearly constant the year round. During the night (the nights are very cold in California), a candle held at the end of the pipe indicated a strong current of cold air flowing along the level back through the works and up the shaft. After sunrise the draft became less and less, and ceased entirely whenever the temperature outside was the same as that in the diggings. During the heat of the day a current flowed down the shaft and out at the level, and the hotter the day the stronger the current.

Our supply of fresh air was best when the thermometer indicated the greatest difference of temperature between the air in the diggings and on the outside; the draft being up the shaft when the air was coldest outside, and down when it was warmest.

The interior of the house is often cooler during the heat of the day than it is outside, hence a current naturally flows down the chimney and out under the door. This downward current often gives trouble when the fire is being started. If the "upward currents on the outside of the house, arising from the heated surface of the roof and walls, draw the air outward by friction through cracks, open doors, etc.," why do they not draw it out of the chimney also, thus increasing rather than diminishing the draft?

It seems to me that the diminished draft of chimneys in very hot weather is due, first, to the tendency of the air in contact with the cooler surfaces within the house, to flow out under the doors, thus creating a draft down the chimney; second, to the diminished relative difference between the specific gravity of the air outside and that of the rising column of hot air within the chimney—the force of the draft depending entirely on such difference. Just as, other things being equal, a balloon will rise with the greatest force when there is the greatest difference between the specific gravity of the inclosed gas and that of the outside atmosphere.

J. W. Pike.

Windham Station, Ohio.

Fire and Sunshine Experiments.

Messrs. Editors:—Our furnace No. 1 weighed 11 lbs., 6 oz. No. 2, 11 lbs., 10 oz. They were both of the same pattern and by the same maker. We dried in an oven 24 lbs. of charcoal, allowed 12 lbs. to each furnace, used 12 oz. of wood and shavings, and half an ounce of spirits of turpentine to each furnace for kindling. The furnaces were open on the top. We started the fires simultaneously at 11 o'clock, A. M.; thermometer 96 degs. in the shade; the day was calm. Furnace No. 1 was placed in the direct rays of the sun, and No. 2 in the shade. Both furnaces were placed on benches 14 inches from the ground.

No. 2 was re-weighed at 11 o'clock and 27 minutes. No. 1 at 11 o'clock and 29 minutes. No. 2 consumed 15 oz. more fuel in the shade in 27 minutes than No. 1 did in the direct rays of the sun in 29 minntes.

The next day being favorable, the experiments were reversed. Thermometer 96½ in the shade. No. 1 furnace was placed in the shade, and No. 2 in the direct rays of the sun, and the experiments were carefully repeated, with the same results.

We conclude, therefore, that the cause of the difference in the consumption of fuel arises from the rarefaction of the air, there being even less oxygen in a given bulk in the sunshine than in the shade. The electrical state of the air may have something to do with these experiments, but we have no facts at present to prove it.

It is often said that when the fire burns brightly the family of the house are cheerful and happy. These two effects are produced by one cause, viz., the density of the air. Our lungs are physical furnaces; and the health and natural heat of our bodies depend as much upon the consumption of oxygen, as they do upon the consumption of food. The lungs, therefore, receive more oxygen with every inspiration in cold weather, than in warm. When, therefore, the air is cold, dry, and dense, fires will burn brightly and freely, and man will feel cheerful, and be more genial in his conduct.

As you published Prof. Horsford's experiments on this subject, I am induced to beg the same favor, so that we may draw out similar facts from other experimentalists. James Quarterman.

New York City, July 18, 1866.

[From our own Correspondent.]

FOREIGN SCIENTIFIC NEWS.

London, Aug. 18, 1866.

Scientific news during the past week has been at a minimum. The Nottingham meeting seems still to absorb public interest, and in the general paucity of such information we are anxiously looking forward to the Congress of the Social Science Association, to be held at Manchester in the early part of next month. Great preparations are being made for this meeting, and highly interesting proceedings are anticipated.

The complete success of the Atlantic cable has occasioned the formation of several rival companies, designed to break up this monopoly, as it is even now characterized by many. In addition to the projected line over Behring's Straits, and another from Spain to Florida, via the West Indies, both of which are owned by Americans exclusively, there is the new English enterprise of completing telegraphic communication by means of several short lengths of cable between Scotland, the Faroe Islands, Iceland, Greenland, and Labrador. The route has been thoroughly and efficiently surveyed, and a contract has been made for duplicate cables for the whole distance of nearly four thousand miles.

One of the results incident to the successful recovery of the lost cable, is the fact lately published that the *Great Eastern* is thereby entitled to a large amount of salvage money, so that at last even she may prove a profitable invention and enrich her stockholders.

It is stated that the directors of the cable company are about completing a contract for a term of years with the Associated Press whereby the American papers are to be furnished with a daily telegram of forty words, for which the neat little sum of $110,000 in gold is to be paid annually, that is, $350 is daily to be paid for what can easily be printed in five lines.

The project of Mr. Hawkshaw, for tunneling the channel—which plan, by the way, is nothing new, but has been regularly proposed at intervals for many years past—meets with a counter project in a proposed international railway bridge, composed of pontoons, reaching from Calais to Dover, a distance of twenty-two miles. The bridge is to have several draws to allow the passage of vessels, is to be two hundred and fourteen feet in width, and to be constructed at a cost not exceeding sixteen millions of pounds sterling.

The water supply of London justly occupies a large share of public attention, for it is a most important subject for public consideration. The most feasible plan for furnishing the city seems to be the one proposed by Mr. Fuller, an English engineer of note. By his plan water is to be conveyed from near the source of the river Wye, in North Wales. The area of water shed of this river is one hundred and eighty thousand acres, with an available rainfall of sixty inches per annum. Mr. Fuller estimates the total cost at seven millions of pounds sterling.

M. A. C.

An Opportunity for American Gun Makers.

From our foreign advices we learn that Victor Emanuel, having failed in obtaining the Prussian needle gun for his army, has decided to invite inventors and manufacturers of fire-arms throughout the world to present their systems and specimens for trial, whether they relate to an entirely new weapon, or the conversion of the present musket. A special commission is to be appointed to test, examine and report upon the models, and decide which shall be adopted.

This is certainly an excellent opportunity for our inventors to achieve a fortune for themselves and reflect credit upon American enterprise and ingenuity. This trial, in connection with the great French Exposition, will furnish a means of introducing to Europeans many of our improvements, and of giving us the position, as a mechanical and manufacturing people, which our progress deserves. Probably the details of the applications will soon be made public, and we hope to see our inventors and manufacturers improve the opportunity.

The Grasshopper Scourge.

The Kansas farmers in Brown county and the adjacent territory, appear to have been lately subjected to a plague similar to those inflicted on Pharaoh. The obstinate grasshoppers appeared in countless numbers, covering a track twelve miles in width, and consuming almost all vegetation. The Marysville *Enterprise* says:—

"They alighted upon fields, gardens, fruit trees, and everything green or eatable, and, like a march of two hundred and fifty army corps, devoured every thing they touched. This whole country has been taken by them, and the rear guard is still with us, guarding what vegetables and green leaves the army has left. Farmers are seriously alarmed lest the corn will be totally devoured. They seem to be passing in a southwest direction."

Notes and Queries.

S. N. T., of Md.—The adhesion of the metal in electroplating, depends mostly on the careful cleaning of the matrix. Some electro-platers give the article to be plated a thin coating of quicksilver before immersion in the cyanide. For coating with quicksilver, the carefully cleaned article is immersed for a moment in a weak solution of nitrate of mercury, and is then well rinsed in water. Failures in plating are often due to a want of harmony between the strength of solution, intensity of the battery, etc.

M. C. B., of Ill.—Shellac will probably prove to be the best cement for your purpose. If you can use it without dissolving, the joint will be more perfect.

S. M. H., of N. Y.—The substitute for nitric acid in Grove's battery, to which you refer, is a strong solution of bi-chromate of potash to which has been added sulphuric acid.

W. S. P., of N. Y.—First, We prefer to express no opinion in regard to the reliability of the paper to which you refer. Second, Brass, if burnished after polishing, will retain its luster better than if only polished. Still, it will tarnish in time, however close the particles of the surface. Third, Eight ounces of madder, four of fustic, and three ounces of logwood infused in one gallon of water applied hot; then an infusion of two ounces of nutgalls in one quart of water, after the first application is dry, will stain an imitation of black walnut. The proportions may be varied at will. Fourth, A dealer in metals could furnish you the number of the thinnest steel of commerce

———, of N. Y.—Send to Henry Carey Baird, 406, Walnut street, Philadelphia, stating the sort of mechanical books you need, and he will furnish you with what you want.

T. M. R., of Ala.—A vessel filled with hydrogen gas is heavier than one whose interior is a perfect vacuum.

R. C. N., of Ky.—Coal oil, or petroleum, is totally unfit for a hair dressing. By reference to page 397, Vol. XIV, current series, you will find a reply to a similar query.

A. V., of Pa.—We know of no depilatory preparation that is not injurious to the skin. Sulphuret of arsenic, a rank poison, is sometimes used, and so is lime, perfumed. Both are hurtful.

G. A. A., of Mass.—If you wish to convey steam 175 feet under ground, protect your pipe with hair felt and inclose the whole in a board box, packing the pipe in spent tan, sawdust, straw, or fine charcoal.

R. E. C., of vt.—The advertisement you refer to appears to be a catch-penny affair. Send to H. C. Baird, 406 Walnut street, Philadelphia, for catalogue of books.

W. E. S., of Conn.—In our issue of Sept. 15th, we gave all the information we possessed in relation to the "Zopissa iron cement." At present its ingredients are a secret.

NEW INVENTIONS.

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

Card Case.—F. A. Lamontagne, Montreal, Canada.—This invention consists in the construction of card cases with a combination of springs and slides for the discharge of a card at a time without opening the lid, by simply pressing a slide on the top with the finger. It is designed for the use of ladies especially.

Machinery for Washing Wool.—John Petrie, Rochdale, Eng., and James Teal, Towerby, Eng.—This invention relates to that class of machines for washing wool and other fibrous materials, in which the said materials are placed upon a feed apron by which they are delivered into a vat or other vessel and are agitated therein, at the same time being moved forward to the other end of the said vessel, where they are lifted out of the fluid by a drum, armed with movable prongs, which at the proper moment retreat so as to deliver the material unto an endless apron, from whence they are taken by a pair of squeezing rollers.

Ciphering Machine.—Samuel J. Kelso, Detroit, Mich.—This invention relates to a machine which can be used for adding, subtracting and multiplying figures of any desired magnitude, with the greatest ease and facility.

Pump.—Louis Drescher, Matanzas, Cuba.—The object of this invention is to construct a pump which can be used in a very deep well, and which is so arranged that it is not liable to burst from the high pressure to which it will be exposed, and that it does not become choked by stones or other material dropping down in it. It is also so constructed that it can readily be raised out of the pump, and that easy access can be had to its valves.

Artificial Limb.—Joshua Monroe, New York City.—This invention consists in the arrangement of elastic straps in combination with an artificial leg or arm, to be secured to a stump below the knee or elbow joint in such a manner that the side irons can be dispensed with, and thereby the weight of the limb is reduced, and furthermore said straps can be readily so adjusted that the limb is drawn up tight in any position to which the joint is brought.

Boring Attachment to Turning Lathes.—C. E. McBeth, Hamilton, Ohio.—This invention is an improvement in boring attachment to turning-lathes, by means of which holes can be made round, smooth and straight. And it consists in combining a thimble, bush, and cap with each other, with the hollow spindle, and with the mandrel of the lathe.

Manger.—Jonathan Johnson, Kent, Ind.—This invention has for its object to furnish an improved manger, which may bekept

free from short hay, chaff, etc., and by which the grass seed may be separated from the short hay and chaff, so that it will be ready for sowing when taken from the manger.

BUTTON AND FASTENING.—ARTHUR WM. BROWNE, Brooklyn, N. Y.—This invention has for its object the construction of a button and fastening, in such a manner that the button may easily be attached to a dress, and be firmly held thereon, without the use of sewing; and that it may be detached at will from the cloth by simply pressing upon a small stud projecting above the surface of the button, thus preventing the tender and fine wire spring fastening from being easily destroyed.

SADIRON HANDLE.—FR. REHORN, New York City.—This invention relates to a movable handle for sadirons, said handle being attached to the iron by a dovetail socket, and held in position by a lever catch which is pivoted to one of the standards of the handle, and which, when the handle is in position, catches over a cam and locks the handle firmly to the body of the iron. The main part of the handle is cast in one piece, the standards being united by a cross-bar, to which the wooden handle is secured by simple pins, whereby the construction of the whole is greatly simplified and its cost is reduced to proper limits.

LAMP BURNER.—GEORGE J. CAPEWELL, West Cheshire, Conn.—This invention relates to that class of lamp-burners which are provided with draft chimneys, and has for its object the lighting of the wick without the necessity of removing the chimney from the burner, and at the same time have the wick tube, when the lamp is lighted and in use, in the proper relative position with the cone or deflector, so that a proper illuminating flame may be obtained.

GAS APPARATUS—N. TREADWELL, New York City.—This invention relates to a method of fitting dry diaphragm gas holders, and distributing the gas throughout a boat. It consists in pumping the gas directly into the holder without the use of atmospheric air, and by a simple change of valves use the same pipe for forcing the gas to the burners throughout the boat, so that the pump acts as a regulator as well as a pump, and thereby the possibility of the lights being put out by any motion or jar of the boat is prevented.

STEAM VALVE.—DAVID SEXTON, San Gabriel, Cal.—This invention consists of a thimble-shaped valve, provided with a transverse partition and fitted on a central spindle, which is held in position by a suitable temper screw, in combination with a cylindrical valve chamber and with suitable steam and exhaust ports situated on opposite sides of the transverse partition in such a manner that by said partition the pressure is separated from the exhaust end of the valve and thrown entirely on a center or pivot, and a valve is obtained which works free and easy, and the position of which can be regulated from the outside.

BROADCAST SEEDING MACHINE.—W. S. COFFMAN, Coldwater, Mich.—This invention relates to a broadcast seeding machine of that class which are designed to be carried by the operator and worked by him while being carried.

BALING PRESS.—C. C. CONVERSE, New York City.—This invention relates to a press designed for compressing substances for baling, more especially cotton. The object is to obtain a press which will be simple in construction, economical to manufacture, and quite portable or of limited dimensions, and still operate with great power and efficiency, without injuring the fiber of cotton or other substances operated upon.

DEVICE FOR SOWING MANURES.—H. S. PALMER, Norvell, Mich.—This invention relates to a device for sowing plaster and other pulverulent manures, and it consists of a shaft provided with a right and left screw, and fitted in a suitable box, having a slide at its bottom for the purpose of regulating the discharge of the manure, a hopper being placed on the box, and the latter secured to the rear end of a wagon, whereby the manure, as the wagon which contains it is drawn over the field, may be sown or distributed upon the soil in an even manner, and with very little labor.

RESPIRATOR.—T. A. HOFFMAN, Beardstown, Ill.—The object of this invention is to provide a convenient and economical article or apparatus for filtering the air which is inhaled in breathing.

PRUNING INSTRUMENT.—G. F. WATERS, Waterville, Me.—This invention consists in the employment, in connection with a proper shaped hook for catching hold of the twig or branch, of an eccentric cutter operated by a hand lever suitably connected therewith.

ROOFING.—WM. GILBERT, Detroit, Mich.—This invention consists in the employment of a layer of long fibers of swamp grass, hemp, straw, or any other tough, fibrous material placed between the layers of felt, the raw fibers not to be woven into cloth, but spread in so as to form a net work, and put together by a cement. It also consists in the employment or use in the making of roofs of a cement consisting of distilled coal tar and common slacked lime.

REFLECTOR FOR LANTERNS.—W. A. BUTLER, New York City.—This invention consists in a novel combination and arrangement of reflecting surfaces for lanterns, whereby the reflection of light through the glass or open front of the lantern case is greatly augmented and more concentrated than with the ordinary mode of arranging such reflecting surfaces.

HAY AND STRAW KNIFE.—DANIEL FASIG, Rowsburg, Ohio.—This knife or cutting device is for cutting hay and straw from the stack, and is designed as an improvement over the angular knives now in use for such purpose.

BRICK MACHINE.—COLLINS B. BAKER, Troy, N. Y.—This invention relates to a mechanism for scraping off and leveling their upper surfaces after the molds have been shoved from underneath the press box. Its object is to obtain a simple device for the purpose and one which may be operated rapidly and in a perfect manner; the clogging of the strike, which has a reciprocating movement, being effectually prevented and the strike only allowed to act upon the molds in one direction so as to scrape the superfluous clay off from the molds at the end of the machine.

DEVICE FOR MOVING CARS ON THE TRACK.—J. W. PETTENGILL, Rockford, Ill.—This invention relates to a device for moving cars on the track, and is designed to supersede the pinch bar, the implement now used for such purpose.

CORN PLANTER.—J. S. RINKEL, Genesco, Ill.—This invention relates to a device for dropping and covering corn, and it consists in a corn-dropping mechanism applied to a coverer, in such a manner that by a simple manipulation on the part of the operator the seed may be dropped and covered at the points where the furrows intersect each other, the field being furrowed both ways previous to the dropping or planting of the corn.

WATER WHEEL.—SIMEON SHERMAN, Weston, Mo.—This invention relates to a horizontal water wheel of that class which are operated under the direct and reacting power or force of the water, and it consists in a peculiar construction of the scroll and buckets, and in the manner of applying the buckets to the wheel.

CAR WHEEL.—E. S. ROBINSON, New York City.—This invention has for its object the obtaining of a strong and durable car wheel by a very simple and economical mode of construction. It consists in having the body or main portion of the wheel of cast iron and composed of two plates of disk form, the convex surfaces being at the outer side, said plates being connected at their peripheries by cross pieces, the two plates and cross pieces being all cast in one piece. The tire or tread of the wheel is of wrought iron or steel, and is secured up on the body or main portion by means of rivets.

SHEEP HOLDER.—D. R. REED, Orangeville, N. Y.—This invention relates to a machine for holding sheep while being sheared. It consists in using, in connection with a stationary or fixed bed piece, on which the body of the animal rests while being sheared, two clamp wheels placed on screw shafts and a head rest, whereby the sheep may be readily adjusted in proper position and turned as required during the operation of shearing.

SEEDING AND SOD-CUTTING MACHINE.—J. M. CARR, Omaha City, Neb. Ter.—This invention relates to a combination of a seeding and sod-cutting machine, whereby the seed may be sown and the sod cut and the earth pulverized so that a fine friable mold will cover the seed.

TWEER IRON.—BENJAMIN FISH, Mechanicsburg, Pa.—This invention furnishes an improved tweer iron for blacksmiths' use, by means of which the size of the fire may be regulated, according to the requirements of the work; to which the cinders will not adhere, and which will not leak.

LADY'S SKIRT.—DWIGHT M. CHURCH, Derby, Ct.—The object of this invention is to furnish a lady's skirt the lower part of which may be detached when soiled, and replaced by a clean part, without its being necessary to wash the entire skirt every time its lower part becomes soiled.

STUFFING BOX AND PISTON-ROD PACKING.—CHARLES P. BENOIT, Detroit, Mich.—This invention relates to the packing of the piston and valve rods, plungers, etc., and consists of an arrangement of several novel devices which operate together effectively in preventing the escape of steam, water, or air, by keeping the packing next the rod smooth and in good order, while in constant use for a long time, without the trouble and expense of the frequent renewal of the packing generally required.

PAPER SHIRT COLLARS.—L. M. CRANE, Ballston Spa, N. Y.—This improvement consists in having a thin layer or sheet of guttapercha or other material impervious to water, interposed between the layers of paper of the collar, whereby moisture is prevented from striking through the same, and the tearing of the fabric or material around the button-holes prevented in putting on and taking off the collar.

MACHINE FOR WASHING AND WRINGING CLOTHES.—EDWIN CHESTERMAN, Roxbury, Mass.—The object of this invention is to produce a machine for washing and wringing clothes which shall be compact in form, simple in operation, and easily operated. The invention embraces several particulars, one of which relates to the form of the cam by which motion is communicated to the working or pressing rollers of the machine.

ROTARY CULTIVATOR.—ANDREW THOMPSON, Ottumwa, Iowa.—This invention consists in so constructing a pulverizer that the teeth revolve upon the ground, and is so constructed that the cylinder in which the teeth are secured can be elevated or lowered, thus gaging the teeth to any desired depth.

ATTACHMENT TO PLOWS.—WILLIAM VEBER, Shingle Creek, N. Y.—The nature of this invention consists in constructing a device and attaching it to a plow, so as to prevent it from clogging under the beam, or in front of the colter.

COMBINED BOOT-JACK AND BLACKING CASE.—BERNARD DOUGLAS, New York City.—This invention relates to a very simple apparatus which will especially recommend itself to travelers, as it confines within a very small area a blacking box and brush, and when opened receives the shape and properties of a boot-jack of the common style.

Inventions Patented in England by Americans.

[We intend publishing hereafter a weekly report of all English Patents taken out by American citizens, all applications for the same, and such matters of interest as we may obtain from the "Commissioners of Patents' Journal."]

APPLICATION FOR LETTERS PATENT.

2,115.—METHOD OF STORING PETROLEUM AND OTHER OILS, NAPHTHA AND OTHER PRODUCTS OF DISTILLATION CONTAINING ESSENTIAL OILS.—A communication by Seth Haskell, New Bedford, Mass. August 27, 1866.

2,215.—MODE OF PREVENTING OXIDATION OF LEAD BALLS IN FIXED AMMUNITION.—A communication from Barton Howard Jenks, Bridesburg, Pa. August 28, 1866.

2,224.—REPEATING FIRE-ARM.—A communication from Oliver Fisher Winchester, New Haven, Conn. August 29, 1866.

2,229.—LOOM.—A communication from Thomas Robjohn, of New York City. August 29, 1866.

2,231.—BREECH-LOADING FIRE-ARM.—A communication from Barton Howard Jenks, Bridesburg, Pa. August 29, 1866.

2,235.—LIFTING JACK.—A communication from Augustus Bryant Childs, Rochester, N. Y. August 30, 1866.

2,236.—SOFTENING, DISINTEGRATING, AND BLEACHING VEGETABLE FIBERS.—James Montague Mellor, New York City, chemist. August 30, 1866.

2,242.—MACHINERY FOR HULLING AND CLEANING COFFEE AND OTHER BERRIES OR SEEDS.—A communication from William Van Vleck Lidgerwood, a citizen of the United States, now Charge des Affaires at Rio de Janeiro, in the Empire of Brazil. August 30 1866.

2,247.—APPARATUS FOR BORING BOILER TUBE HEADS, DRILLING ANGLE HOLES, OR CUTTING CIRCULAR GROOVES IN METALLIC SUBSTANCES.—A communication from James Miller, New York City. August 31, 1866.

2,251.—MACHINE FOR MAKING EYELETS.—Thomas Garrick, Providence, R. I. September 1, 1866.

2,261.—DETACHING BOATS FROM THEIR DAVITS.—A communication from Thomas Huntingdon, New York City. September 3, 1866.

2,264.—HOOP SKIRT.—A communication from Augustus James Colby, New York City. September 3, 1866.

PATENTS SEALED.

696.—ROTARY STEAM ENGINE.—Aaron Charles Baldwin, Boston, Mass. March 7, 1866.

704.—DREDGING AND ELEVATING MACHINERY.—Sylvester Franklin Schoonmaker, New York City. March 8, 1866.

719.—PUMP.—A communication from Asher Burr, Middletown, Conn. March 9, 1866.

720.—WEIGHING SCALES.—A communication from Daniel Hand Wilcox, New Haven, Conn. March 9, 1866.

837.—PROCESS OF AND APPARATUS FOR DISTILLING PETROLEUM AND OTHER MINERAL OILS.—A communication from Edward Braggins, Matthew Patrick Ewing, and Hiram Bond Everest, Rochester, N. Y. March 20, 1866.

874.—HOISTING APPARATUS.—A communication from Samuel Munson Longley and Andrew Conkey Getty, Hudson, N. Y. March 24, 1866.

1,164.—MACHINERY FOR MAKING TWIST DRILLS.—A communication from Andrew Reynolds Arnold, Newark, N. J. April 25, 1866.

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,958.—ROTARY ENGINES.—A communication from Truman Merriam and James Cushing, Waterloo, Wis.

1,995.—IMPLEMENT FOR THE USE OF BOOT AND SHOE MAKERS.—A communication from David Henry Barber, Cambridge, N. Y., and George Mellen Wells, Chicago.

1,997.—APPARATUS FOR RAISING AERIFORM AND OTHER FLUIDS.—A communication from Jeremiah William Foard, San Francisco, Cal.

2,001.—MACHINERY FOR CUTTING DOVETAIL JOINTS.—A communication from Frederick Woolcot Armstrong, Plainfield, N. J.

2,007.—MODE OF SECURING CORKS AND STOPPERS IN THE NECKS OR MOUTHS OF BOTTLES, JARS, AND OTHER VESSELS.—A communication from Arthur Barbarin, New Orleans, La.

2,017.—SEWING MACHINE.—A communication from George Lynden Jenks, Florence, Mass.

2,033.—APPARATUS OR MACHINE FOR REMOVING SEEDS OR STONES FROM RAISINS OR OTHER DRIED FRUIT.—A communication from William Emerson Baker, Boston, Mass.

2,156.—PROCESS FOR BLEACHING WITH THE AID OF HYDROSTATIC AND PNEUMATIC PRESSURE, CONJOINTLY OR SEPARATELY, WOOD, STRAW, AND OTHER FIBROUS MATERIAL, FOR THE MANUFACTURE OF PAPER PULP, AND FOR BLEACHING FLAX, HEMP, THREAD, YARN, FELTS, CLOTHS, AND OTHER FIBROUS AND TEXTILE MATERIALS.—A communication from Henry Jones and Duncan Farquharson, Rochester, and Isaac Cowles Cotton, Buffalo, N. Y.

PATENTS HAVING BECOME VOID.

1,941.—MACHINERY OR APPARATUS FOR CUTTING CORK, PART OF WHICH IS ALSO APPLICABLE TO CUTTING PAPER, CAOUTCHOUC AND OTHER SUBSTANCES.—Amos Pierce Chamberlain, New Orleans. August 25, 1859.

2,072.—MANUFACTURE OF CARTRIDGES.—Communicated from Albert Hook, New York City. August 20, 1853.

THE MARKETS.

The continued inflation of the currency, with the consequent want of confidence in the permanence of present values, and the knowledge that the governmental deposits of gold are increasing, have tended to delay the expected activity of the Fall trade. Purchasers confine their demands to stocks for immediate use, as do the people at large. Gold has risen about one per cent., but without exerting a very marked influence on prices generally. Breadstuffs have advanced, principally from the injury to crops at the West by the late storms. There are indications, however, of a reaction in the prices of these articles.

ASHES—Pots are in demand, but the supply is limited. Prices, $9 50 ₱ bbl. Pearls are nominal.

BRICKS—Common Hard, $10 50@$11 50. Croton and Philadelphia are $16@$17 for the former, and $40@$45 for the latter.

COAL—Foreign scarce and in demand. Liverpool Orrel, $18; Cannel, $20, delivered from yard; Lehigh, at Elizabethport, $7 50. Cumberland, at Georgetown, D. C., $5 50. Freight on Cumberland $2 25. Stove retails at $7 50@$8 50.

COFFEE—Demand for Rio. Laguayra, 18¼@19c., gold; 26c., currency. Costa Rica, 20c. Java, 25½c.

COPPER—Detroit, 31@31½c.; Portage Lake, 31½c.

COTTON—There has been a continued active speculative and spinning demand, and prices have further advanced 1c. ₱ ₱, and in some instances still higher prices have been paid. Ordinary, 30@31c.; Middling, 38½@40½c.; Good Middling, 41@44c.

FLOUR—Prices have materially advanced. Common brands rule from $10 50@$12 10; Ohio fancy brands $12 15@$12 20; Genesee extra, $12 60@$14 50.

GRAIN—Wheat advanced slightly. Milwaukee, $2 25@$2 37 Amber, $2@$2 88. Rye—$1 05@$1 08 for No. 1 Western; $1 25 for Canada. Barley, $1 35. Oats—50@55c. for Chicago; 55@58c. for Milwaukee; 57c. for Ohio. Corn—89c. for inferior Western mixed; 90@91c. for shipping, 96c. for choice White.

IRON—The market for Pig continues very firm, with moderate supplies and a steady fair demand for home use. The sales are 300 tons Gartsherrie Scotch at $47 50@$48 ex ship, and $50 from yard; 500 do. Glengarnock, from yard, $48, and to arrive $46 50; 600 do. No. 1 American, $48@$49; 100 do. No. 2 Allentown, $47 at Elizabethport. Trenton refined bar, $105@$107 50 ₱ ton cash. Swedes, in store, $170 ₱ ton.

LATHS—Are firm, with sales of Eastern at $4, three months.

LEAD—Pig is steady, with a fair demand; prices unchanged.

LEATHER—The market for Hemlock Sole is active, and prices are very firm. We quote Rio Grande and Buenos Ayres Light Weights, 33@34 cents; Middle do., 35@36; Heavy do., 36@37; California Light, 31@32; Middle do., 33½@34½; Heavy do., 34@35; Orinoco, etc., Light, 31@32; Middle do., 33@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—The market for Rockland is steady, with sales of 4,450 bbls., at $1 70 for Common, and $2 10 for Lump, cash. Rosendale Cement, $1 75, cash.

LUMBER—The market for Eastern Spruce and Pine is moderately active, with sales at $21@a$22 50, usual terms.

MOLASSES—Centrifugal and Clayed Cuba, part mixed, at 42@46c.; 204 hhds., 27 tcs., and 26 bbls. Cuba Muscovado, 48@51½c.; 474 hhds. 13 tcs., and 15 bbls. Barbadoes, at or about 58; 91 hhds. Trinidad, P. S., 45; 177 Nevis and Demerara, 50@72; and 65 hhds. and 50 bbls. Porto Rico, 62½@70, four months.

NAILS—Cut may be quoted 7@7¼c., the lower rates for lots of 500 kegs and over—8d., 10d., 3d., and 3d. Fine are very scarce—Clinch, 8½ (8d are very scarce); forged horse, 32; pressed do., 22@24; copper, 50; yellow metal, 32; zinc, 20; and wrought ship and boat spikes, 7@8, cash.

SUGAR—Prices unchanged from former quotations.

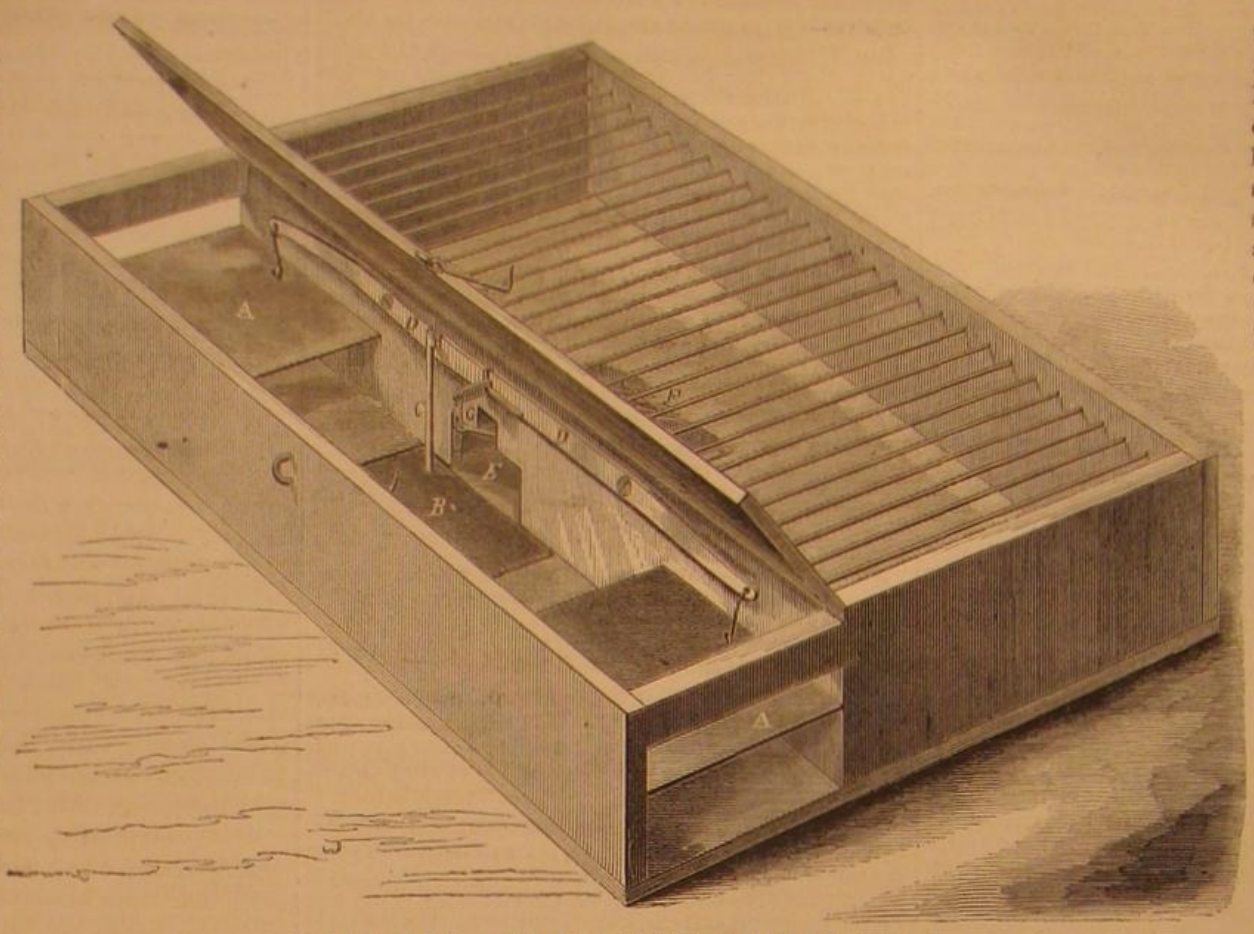
WOOL—The demand for low and medium fleece has been moderately active, but at the low prices previously current, and the market is rather weak for all kinds, except those suitable for combing, which are scarce and wanted at slightly improved quotations.

ZINC—9½c. less 4 per cent. for gold; 13½c., currency, for Lehigh.

Self-setting Animal Trap.

"Set a rogue to catch a rogue," is an old axiom, and in the engraving under consideration it is attempted to be put into practice. The "varmint," after being securely penned, is the unconscious instrument of the imprisonment of his fellows. The animal enters at either of the doors designated by the letter A, which turn on pivots sufficiently above their centers to allow them to fall when released. The bait is hung on a hook, and to reach it the rat must step on the platform, B, which has a slight movement on pivots sufficient to tilt the catch, C, which engages the connected arms, D. These arms are connected with the doors and retain them in an open position when the trap is set. When the trap is sprung and the doors are closed, the animal, seeing light through the opening at E, looks for escape in that direction, and passes through, lifting the wire wicket, F, which rests its lower edge in an inclined position on the floor. The lifting of the wicket sets the trap again by the wire loop, G, and the process may thus be continued indefinitely.

Patented through the Scientific American Patent Agency, July 31, 1866, by Ellis & Albertson, whom address for further information at, Salem, Ind.



ELLIS AND ALBERTSON'S ANIMAL TRAP.

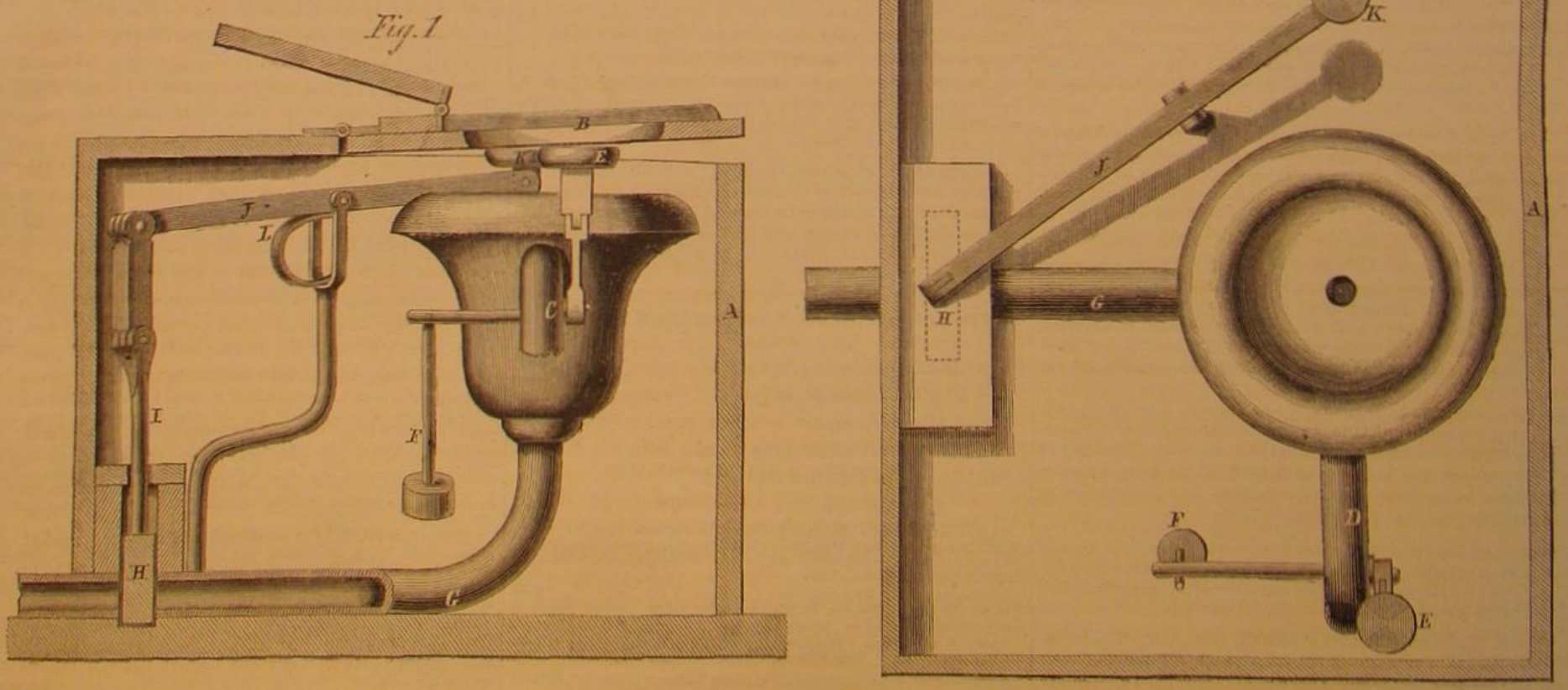
Improved Water Closet.

The convenience of a water closet in a dwelling, or any other inhabited building, is undeniable. Sometimes, however, from a defect in the principle of construction, or an unworkmanlike performance of the labor, it is more or less offensive, on account of the escape of unpleasant effluvia. The design of this arrangement is to make the rising of these gases impossible. It is claimed by scientific men that the offensive odors of water closets and cesspools are a prolific source of disease, especially when cholera and kindred complaints are prevalent. Any contrivance, therefore, which prevents them from impregnating the atmosphere is an improvement.

A is the box of the closet, and B the cover, the seat of which is hinged. B is held partially open by a spring in the usual manner. C is the valve of the water pipe, D, which is opened by the hand at E, and closed by the weight and lever, F. The pressure upon the seat opens the valve, C, permitting the flow of water into the pan or bowl. The discharge pipe, G, is cut across by a gland in which is a vertical sliding valve, H, attached to the rod, I, pivoted to the lever, J, which is operated by the head, K.

When the closet is in use the pressure upon the seat, B, depresses the head, K, and opens the discharge pipe so that the contents of the bowl have a free passage. When the pressure is removed the open spring, L, throws the valve, H, back into place. By this means the escape of gases is always prevented, both when the closet is in use and when not in use. The apparatus appears to be simple, effectual, and not liable to get out of order.

Patented through the Scientific American Patent Agency, May 15, 1866, by Oliver S. Pettit. For further particulars address Pierson & Pettit, No. 3 Park Row, New York.



PETTIT'S WATER CLOSET.

GOLD mining is carried on to quite an extent and with good results, in the State of Vermont.

The Broken Atlantic Cable.

The London *Spectator* tells the following singular and most interesting story :—

"Night and day, for a whole year, an electrician has always been on duty watching the tiny ray of light through which signals are given, and twice every day the whole length of wire—one thousand two hundred and forty miles—has been tested for conduction and insulation. * * * The object of observing the ray of light was of course not any expectation of a message, but simply to keep an accurate record of the condition of the wire. Sometimes indeed wild incoherent messages from the deep did come, but these were merely the results of magnetic storms and earth currents, which deflected the galvanometer rapidly, and spelt the most extraordinary words, and sometimes even sentences of nonsense, upon the graduated scale before the mirror. Suddenly, last Saturday morning, at a quarter to six o'clock, while the light was being watched by Mr. May, he observed a peculiar indication about it which showed at once to his experienced eye that a message was at hand. In a few minutes afterward the unsteady flickering was changed to coherency, if we may use such a term, and at once the cable began to speak, to transmit, that is, at regular intervals, the appointed signals which indicated human purpose and method at the other end, instead of the hurried signs, broken speech, and inarticulate cries of the still illiterate Atlantic. After the long interval in which it had brought us nothing but the moody and often delirious mutterings or the sea stammerings over its alphabet in vain, the words 'Canning to Glass must have seemed like the first rational word uttered by a high-fever patient when the ravings ceased."

THE mammoth Canada cheese is to be exhibited at the Paris Exhibition.

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NEW YORK, SATURDAY, OCT. 6, 1866.

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THE ATLANTIC TELEGRAPH---ITS PRESENT AND PROBABLE USES.

The last laid Atlantic cable has been in successful operation about two months. It has, as yet, shown no diminution of its conducting power, and the recovery and employment of the lost cable serves to give additional hope that the permanency of telegraph communication with the old continent can be assured. Now, the question arises, why cannot two cables be laid at the same time, instead of confining the work to the laying of one? Or why not lay a cable containing a number of conductors? In our issue of Aug. 4th, we gave engravings of a cable composed mainly of copper and an insulating material, which, the inventor claimed, was capable of transmitting six messages simultaneously. It may be that this plan in practice would be inefficient, but possibly some plan on a similar principle might be devised, by which the laying of one cable would insure the connection of the two continents by several independent conductors. If this is impracticable, is it not possible to lay two cables lighter than the present one, but possessing sufficient strength for service, so that the *Great Eastern* might take on board the double line and deposit both at the same time? We believe the project is feasible and within the resources of science.

The influence of the present telegraphic communication with Europe may not be, as yet, sufficiently marked to enable us to judge fairly of its future possibilities; but it is certain that it has already given a confidence to our business transactions and imparted a healthy tone to our commercial relations. Certainty has taken the place of conjecture, and diminished the opportunities for and discouraged the attempts at wild speculation, while, at the same time, it has aided the legitimate efforts of business men on both sides of the Atlantic. As the use of the telegraph becomes more general, by a reduction of the tariff rates, and by the facilities of communication afforded by a double line, we may expect increased life and energy will be infused into our trade.

In the diplomatic relations between this country and the nations of Europe the telegraph is destined, we think, to play an important part. By it mistakes can be rectified, misunderstandings corrected, and unpleasant complications avoided.

Occurrences trifling and unimportant in themselves, are often made by journalists the means of exciting the passions and arousing the prejudices of the people. The European mails bring us accounts of speeches, and of the action of Parliament, the opinions of influential men and the intentions of those in authority, which are sometimes misleading and erroneous, the error being strengthened by editorial remarks in prominent journals. Before the next mail arrival the subject has been debated and discussed in the journals all over the country, passions inflamed, antipathies renewed, and the public mind put into a ferment. The telegraph, in such a case, will prove a ready means of correcting false impressions before they have taken root in the popular mind.

But with this pleasing aspect of the matter comes another of grave import. Both *termini* of the cable are on English territory. In case of a hostile feeling between the United States and England, she could cut off the communication between this Government and its agents in Europe, while at the same time she would be in almost instantaneous communication with her vast naval and military depots and arsenals on our coast and frontier, as Halifax, Bermuda, and Quebec. Still, in case of war we might easily raise and cut the cable, so that England could derive no benefit from it which she denied to us. There may be, therefore, no reason for anticipating national danger from the cable, but much for believing that the cause of civilization and the advancement of the whole human family will result from its success.

PROGRESS OF THE PACIFIC RAILROAD.

On the first of September the Pacific Railroad was completed from Omaha City to beyond Fort Kearney, in Nebraska, a distance of over two hundred miles. The rate of progression is from forty-five to fifty miles a month, so that it is believed that another year will stretch the road to the Rocky Mountains. The route is from Omaha City, along the banks of the Platte river, the same course traveled by the pony express. The surface of the country is highly favorable to the work, being smooth, hard, dry, and almost level. A better road-bed could not be desired. The graders are at work along the third hundred miles, and will finish the fourth this fall.

At the other end the work is progressing rapidly—a work that will be considered one of the monuments of man's perseverance and industry. We have before alluded to the immense difficulties to be overcome in the construction of the road through and over the Sierras, and the success in surmounting them. To exaggerate the importance of this transcontinental highway is almost impossible. To a certain extent it will change the relative positions of this country, Europe, and Asia. The track of an army is a track of desolation. Its passage impoverishes and scorches the country through which it moves. Not so the track of commerce. That country which stands between the place of production and the mart of sale, which is the highway over which the wealth of nations must travel, enjoys a Danæan shower. This was the secret of the prosperity of Palmyra, the city over which the proud Zenobia reigned—it built Alexandria, sustained Carthage, and made Venice the strongest republic of the world.

With the completion of the Pacific Railroad, instead of receiving our goods from India, China, Japan, and the "Isles of the Sea," by way of London and Liverpool, we shall bring them direct by way of the Sandwich Islands and the railroad, and become the carriers, to a great extent, for Europe. But this is but a portion of the advantages of this work. Our western mountains are almost literally mountains of gold and silver. In them the Arabian fable of Aladdin is realized. To-day it costs almost a competence to reach them, and live among them for a year or two, until the labors of those weary months begin to make a visible return. Food, clothing, machinery, implements, and all other necessaries are costly in the mining regions of Colorado, Nevada, and Arizona. This cost is largely that of transportation. Let the road be completed, and the comforts as well as the necessaries furnished by Asia, the manufactures of Europe, and the productions of the States, can be brought by the iron horse almost to the miner's door, and in the production and possession of the precious metals, the blood of commerce, we shall be the richest nation on the globe.

But the substantial wealth created by the improvement of the soil and the development of the resources of the country is a still more important element in the results of this vast work. Ease of access, facility of intercommunication, and encouragement to travel, will invite thousands of the crowded inhabitants of Europe and our Eastern cities, and build up towns and cities, and make luxuriant farms where now nature exists in almost undisturbed wildness.

COAL, ITS ORIGIN AND NATURE.

There can be no reasonable doubt that all coals, bituminous and anthracite, are of vegetable origin. By a powerful microscope the vegetable texture of the mass can be distinguished, not only in the softer qualities, but even in the hardest anthracite. We have seen specimens of indubitable jet yield to the power of the microscope and reveal the original grain of the wood or vegetable fiber. Peat is the first combustible form of coal, and if our peat beds, now sought after with so much avidity, and judged to be such mines of wealth, were suffered to remain undisturbed, they would, at some future period, become beds of coal for warming and lighting the winters and nights of future generations.

Coal is not a material belonging exclusively to past geological periods, but is in process of formation now, as may be proved by an examination of the "brown coal," well known in Europe and frequently met with here. Thin slices, which allow the light to pass through them, show to the naked eye the original vegetable structure. It is universally acknowledged that this "brown coal," or lignite, is an undeveloped coal, not yet subjected to the changes of years which would transform it into pure bituminous or anthracite coal. To be sure, time is required to change the disintegrated porous mass of vegetable fibers, roots, and tendrils, leaves and *lignum* to hard, brilliant, laminated, or crystallized coal. But nature works slowly. We find it difficult to understand her processes or to comprehend her infinite patience, which watches through unnumbered years and countless ages for the slow and gradual progression of her agencies. But it is certain that her transforming processes have not suffered an abatement of their original power by the discoveries of man. They still go on, and will as long as this globe and the universe endure.

It is possible that the present *furore* about peat will lead to the discovery of accelerating the action of unaided natural forces, so that this material may be made to give out as much heat-power as the concentrated coal, but we much doubt it. The principal fault with our coal is, that it combines with it elements deleterious to iron, whether in a state of fusion or merely subjected temporarily to its heat. Stoves, for instance, which are constructed to burn wood only, will last a life time or longer; but burn anthracite coal and the parts warp, and crack, and oxidize, until the stove, or that portion exposed to the direct action of the heat, must be renewed yearly, if not oftener. With the bituminous coal it is worse still. The grate, with a hot fire, yields and falls in pellicles, melted from the mass, until, in a short time, the most important portions of the contrivance are useless. To withstand the concentrated heat they must be made of extraordinary thickness.

In reducing ores, also, and especially in fusing iron, these components of coal are the cause of much trouble. They are foreign bodies, which have become incorporated with the original vegetable mass, and hold, chemically or mechanically suspended, sulphur, silicon, and other elements, which are detrimental to the metal.

There is no reason to disbelieve that all varieties of coal have a common origin. They are vegetable masses, which, mixed with inorganic particles, have undergone different degrees of mineralization, the more recent still retaining much of the volatile elements, the bituminous less, and the anthracite still less, until this will burn with but little flame and no smoke.

DURING the last ten years the value of the industrial products of Massachusetts has increased seventy-two per cent; the population during the same time, only three per cent.

Patent Claims

ISSUED FROM THE U. S. PATENT OFFICE
FOR THE WEEK ENDING SEPT. 25, 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.

58,194.—MILK CAN.—Estes Abbott, Chagrin Falls, Ohio.

First, I claim forming the cylinder, A, bottom, D, and cover, fig. 5, each of whole or entire pieces, as herein set forth, when used in the manner and for the purposes specified.

Second, The bottom, D, constructed substantially as described, in combination with the body of the cylinder, A, and hoop, G, as and for the purpose specified.

Third, The cover, fig. 5, constructed as shown, and provided with the tube, J, as and for the purpose set forth.

Fourth, The hoop, fig. 6, constructed as described, to wit, straight on its inner edge, and curved on its outer edge, in combination with the body of the cylinder, A, as and for the purpose set forth.

58,195.—COMBINED BUTTON AND LOOP FOR TRACES.—Jacob Albert, Baltimore, Md.

I claim the herein described device, whereby the ordinary harness trace can be used with whiffletrees of different construction, as described, the same consisting of a beveled loop, curved shank, and button, formed in one piece, under the arrangement and for operation substantially as herein set forth.

58,196.—RAILWAY FROG.—E. G. Allen, Boston, Mass.

I claim the combination and arrangement of the plates, A and B, with their supports, E and F, whether made elastic or not, secured together substantially in the manner and for the purpose specified.

58,197.—DISTILLING OIL.—Samuel Andrews, Cleveland, Ohio.

First, I claim the fire chamber, C, and reverberatory chamber, F, in combination with the throat, C', and the openings, I, in the manner and for the purpose substantially as set forth.

Second, I claim the reverberatory chamber, F, in combination with the retort, A, as and for the purpose specified.

Third, I claim the flues, J, when separated from the walls of the retort by the wall, J', as and for the purpose set forth.

58,198.—CARRIAGE JACK.—Maurice Andriot, Mount Washington, Ohio.

I claim the key, F, formed with a straight back, f, and two oblique faces, F' F'', converging together at e, as and for the purposes specified.

58,199.—DARNING LAST.—George H. Babcock, Providence, R. I. Antedated Sept. 15, 1866.

I claim, as a new article of manufacture, a light, smooth last, or partial last, in the form of a box, substantially as described and for the purpose herein set forth.

58,200.—BRICK MACHINE.—Collins B. Baker, Troy, N. Y.

I claim the strike or scraper, K, operated from the rock shaft, J, as shown, and provided with the laterally adjustable wheels, L L, in com ination with the ways, g g, beveled at their inner ends, as shown at h h, and having oblique bars, l l, at their front ends, and all arranged to operate in the manner substantially as and for the purpose set forth.

I further claim the strip, M, in combination with the scraper, K, substantially as and for the purpose specified.

58,201.—TRAP FOR REMOVING WATER FROM STEAM HEATING AND EVAPORATING APPARATUS.—Robert J. Barr, Philadelphia, Pa.

First, I claim the hollow journals, E E', vessel, H, beam, I, and weight, G, as and for the purpose specified.

Second, I claim the valve, V, pipes, C and E, and vessel, H, as and for the purpose described.

Third, I claim the pipes, E E' F F', vessel, H, and pipe, N, arranged and operating as set forth.

Fourth, I claim the chambers, e e', stop, a, valve, V, and pipe, C, in combination, for the purpose set forth.

Fifth, I claim, broadly, the herein described steam trap, when constructed and operating substantially as and for the purpose specified.

Sixth, I claim operating the valve, V, that is opening and closing the same by the accumulation and discharge of water, as specified.

58,202.—STEAM RADIATOR.—T. B. Belfield, Philadelphia, Pa.

First, I claim a radiator composed of a number of sections of the zig-zag form described, for the purpose specified.

Second, The combination of the above with the inclined ribs, for the purpose specified.

58,203.—COMPOSITION FOR FILLING THE PORES OF WOOD.—Christopher S. Benjamin, Kalamazoo, Mich.

I claim the composition for filling the pores of wood preparatory to varnishing, substantially as herein described.

58,204.—PISTON-ROD PACKING.—Charles P. Benoit, Detroit, Mich.

First, I claim the corrugated or grooved packing rings, D D, in combination with the elastic coil of packing or stuffing, E, the cup-lipped flange, G, the annular space around the piston rod, C, or the lubricating chamber, H, with its connected oil cup, I, and the screw bolts, K K, with the springs, b b, under the nuts, c c, all constructed, arranged, and related to each other substantially in the manner and for the purposes herein described.

Second, I claim the lubricating chamber, H, combined with the piston rod, C, the flange, G, and the packing rings, D D, substantially as and for the purposes herein described.

Third, I claim the cup-lipped flange, G, combined with the elastic coil packing, E, and the corrugated rings, D D, constructed and operated substantially as and for the purposes herein described.

58,205.—SIRUP STAND AND SODA FOUNTAIN.—Edmund Bigelow, Springfield, Mass.

First, I claim the combination of sirup jars with faucets, substantially as and for the purposes herein specified.

I also claim the employment of plastic gum, as herein set forth, for connecting the faucet with a sirup jar and case by means of the metallic bushing, gum and screws, substantially as described.

I also claim the corner stops, a, for holding the divided cover in place, so that either section can be raised, without the other part being displaced, substantially as specified.

I also claim the setting of the sirup jars, substantially as herein specified, and fixing the same in place by means of the projection at c, and the gum packing.

58,206.—ROTARY STEAM ENGINE.—Aaron C. Baldwin, Boston, Mass.

First, I claim the central disk, a, diminished in thickness toward the periphery, with its pistons, a1 a2, arranged thereon relatively to each other and to the correspondingly tapered abutments, C, substantially in the manner and for the purposes herein set forth.

Second, I claim the depression or groove, x, in the part, B3, for supporting the end of the abutment, and preventing the escape of steam past that point, substantially as and for the purposes herein set forth.

Third, I claim the within described pistons, arranged as specified, the same being of a tapering or wedge form, with the base of the wedge presented inward, and sliding on the fixed inner surface, B3, substantially as and for the purpose herein set forth.

Fourth, I claim the within described combination and arrangement of the reciprocating valve, R, and the four ports, m n P and Q, whereby the exhaust port is kept open during the whole revolution of the engine, while the steam port is opened and closed as required for the intermittent admission of the steam at each revolution, and adapted to allow of reversing, or working in the opposite direction, substantially as herein set forth.

Fifth, I claim the metal ring, V, and yielding ring, v, in combination with the disk, a'', and the inner cylinder, B3, for the purpose of preventing the escape of steam inward toward the shaft of the engine, substantially as herein set forth.

Sixth, I claim the adjusting screws, W, or their equivalents, in combination with the rings, V v, disk, a, and inner cylinder, B3, and adapted to adjust the compression of the elastic packing, v, substantially as herein set forth.

Seventh, I claim the recesses in the rubbing surfaces between the ports, m and n, so as to reduce the friction of the piston through that part of its revolution, substantially as herein set forth

58,207.—SHOE FOR CAR BRAKE.—James Bing, Philadelphia, Pa.

First, I claim the shoe, B, and sole, A, united together without the help of any key or bolt, and so that the sole, by this off-center tendency, resulting from the peculiar shape of lug, C, can remain constantly in close contact with its shoe.

Second, The combination of packing, z z, with lug, C, and shoe, B, for the purpose before described.

Third, The combination of shoe, B, sole, A, close clevis, R metallic lining, I, and packing, z z, the whole combined, constructed, and arranged substantially as above specified.

58,208.—WATER WHEEL.—W. H. Blackmer and E. R. Carpenter, Clermont, Iowa.

We claim the combination of the radial buckets, C C, of the wheel, B, blocks, C' C' C', water passage, D, all constructed and arranged in the manner and for the purpose herein specified.

58,209.—APPARATUS FOR CARBURETING GAS.—John F. Boynton, Syracuse, N. Y.

First, I claim an apparatus for carbonizing gas and air, and which I prefer to call a gas-light multiplier, as herein described.

Second, A detachable reservoir, to operate substantially as described, for filling the carbonizer with liquid.

Third, The filling reservoir, D, in combination with the cocks, J and K.

Fourth, The combination of ligneous material with fibrous material.

Fifth, The compound capillary action of ligneous material with fibrous material.

Sixth, The perforated base board, or its equivalent.

Seventh, The use of pegs supported from a base board.

Eighth, The arranging of the fibrous material parallel with the ligneous material, in the manner described.

Ninth, The slot in the top of the pegs for securing the fibrous material.

Tenth, The securing of the fibrous material at the bottom of the peg by its being driven with the peg into a perforation of the base board.

Eleventh, The combination of ligneous and fibrous material, producing a compound capillary action, attached to a base board, forming a cage, and so arranged that it can be placed in and taken from the reservoir or carbonizing chamber.

Twelfth, A compound perforated partition, so arranged as to divide the carbonizing chamber into an internal and external apartment.

Thirteenth, The arrangement of the compound perforated partition, that it may be removed and replaced in the carbonizing chamber without disturbing the cage

Fourteenth, A double partition, so arranged that the compound capillary action of the ligneous and fibrous material may take place between its walls.

Fifteenth, The making of these partitions of any material capable of producing capillary action.

Sixteenth, The use of capillary action of any material of which these partitions may be constructed.

Seventeenth, The using of ligneous material for a partition.

58,210.—HEMMING GUIDE FOR SEWING MACHINE.—Thomas W. Browning and P. C. Hard, Wadsworth, Ohio.

We claim the combination and arrangement of the hemmer, B, with the under slotted plate, the middle plate with its tongue, T, and the upper pivoted plate, D', as and for the purpose set forth and described.

58,211.—FISHING-LINE SINKER.—Leonard A. Burnham, Gloucester, Mass.

I claim the improved swivel hawse made of the parts, C D G, constructed, arranged, and combined with the spindle, B, and the sinker, S', substantially as above set forth.

58,212.—REFLECTOR FOR LANTERN, ETC.—Wm. A. Butler, New York City.

I claim the combination of the conical side reflector, A, the concave back reflector, B, and the lens, D, all constructed, arranged, and operating as and for the purpose specified.

58,213.—LAMP BURNER.—George J. Capewell, West Cheshire, Ct.

I claim the toothed holder tube, G, for the wick of a kerosene lamp, in combination with the bent spring, K, or its equivalent, and pinion, I, when arranged together, and with regard to the ordinary wick tube of such lamps, substantially as herein described, and for the purposes specified.

I also claim forming the air-opening, C, to the air chamber of a kerosene or other lamp, as herein described, and shown in the drawings, for the purposes set forth.

58,214.—SEEDING MACHINE, ETC.—J. M. Carr, Omaha City, Nebraska.

I claim the swinging or adjustable frame, I, attached to the axle, d, as shown, and provided with the cylinder, k, having knives or cutters, l, attached, in combination with a seed-dropping mechanism, all arranged and applied to a mounted frame, substantially as and for the purpose specified.

I further claim, in combination with the above, the adjustable wheels, J J, attached to the lower end of the frame, I, substantially as and for the purpose set forth.

58,215.—WRINGER AND WASHING MACHINE.—Edwin Chesterman, Roxbury, Mass.

First, I claim the combination and arrangement of the slotted frame, A, dovetail rail, F, spring bar, G, springs, A, fingers, K K', sockets, J, capped wringers, B, toothed wheel, D, and worm, E, substantially as described for the purpose specified.

Second, I claim making the shafts of the rollers of a skeleton, or spider, the angles between whose radial arms are filled in with blocks of larger size than the spaces, substantially as above described.

Third, I also claim the cams, E', made substantially as described, for giving a reciprocating rotary motion to the elastic rollers so as to produce friction on the clothes placed between them, substantially as set forth.

58,216.—RUNNING GEAR OF RAILWAY CARS.—Samuel B. Childs, Syracuse, N. Y.

I claim the adjustable collar, C, and set screw, D, and the metallic wedges or box, F, in the wheel, when arranged and combined with the car axle, as herein described and for the purposes set forth.

58,217.—INSULATING WIRE OF HELICES.—James J. Clark, Eastchester, N. Y., and Henry Splitdorf, New York City.

We claim making helices for electro-magnetic and magneto-electric machines from wire insulated by passing it through any powdered material, such as powdered glass, stone sand or paper pulp, after the wire has been passed through any sticky fluid and before the sticky fluid becomes dry, as hereinbefore described.

58,218.—GATE.—Baxter Clough, Amherst, Ohio.

I claim the gate, B, arranged and hung as specified, in combination with the guys, C C', plates, B', posts, A', and counter braces, D D', as and for the purpose set forth.

58,219.—BROADCAST SEEDING MACHINE.—W. S. Coffman, Coldwater, Mich.

First, I claim the operating of the revolving scatterer by means of gearing, arranged in the manner substantially as shown and described.

Second, I claim the inclined bottom, a, in combination with the valve, D, adjusted through the medium of the lever and gage, substantially as and for the purpose specified.

Third, The plate, d, to retain or hold the valve, D, in place, substantially as and for the purpose set forth.

Fourth, The combination of the box, A, with the frame, B, provided with legs, a, substantially as and for the purpose specified.

58,220.—SORGHUM EVAPORATOR.—Thomas Cole, Cedar Hill, Ohio.

First, I claim the process herein described, whereby the raw juice after being exposed to a high temperature immediately upon entering the evaporator then conveyed away rapidly to a precipitating chamber not exposed to heat, and finally introduced at the cool end and discharged at the hot end of the chamber, where the final boiling and separation take place, substantially in the manner and with the effect described.

Second, In combination with an evaporating pan, the precipitating pan, D, substantially as and for the purpose described.

Third, The evaporating pan, A, divided by the partition, a, substantially as and for the purpose described.

Fourth, The evaporating pan, A, constructed with two apartments in combination with the precipitating pan, D, substantially as and for the purpose described.

58,221.—MANUFACTURE OF GAS.—Joseph H. Cannelly, Wheeling, W. Va.

First, I claim the forcing of the petroleum or its products, viz: residuum and crude benzole, in about equal quantities, in conjunction with lime water, into the retort with a jet of steam, when the retort is charged with coal, substantially as described.

Second, Introducing the petroleum or its products, in conjunction with lime water, into the retort when charged with coal, by means of the pipes, F G, provided with seals or traps, substantially as described.

Third, The iron spout, C, attached to the manhead and employed to conduct the liquids back to the center of the retort, substantially as herein set forth, and for the purpose specified.

Fourth, The combination of oil and lime water for desulphurizing and purifying in the manufacture of gas from coal, substantially as described.

Fifth, Also introducing the petroleum or its products in conjunction with lime water into the retort, when charged with coal, by means of the common receiving pipe, E, inserted into the retort at or near the back end either with the seals, traps or steam jet, substantially as described.

58,222.—BALING PRESS.—C. C. Converse, New York City.

I claim the rock shaft, E, actuated by the levers, F, or other equivalent means, and provided with the extension pendent bar, G, having a roller, I, at its lower end, in connection with the follower at platen, C, screws, J J, and press box, A, all arranged to operate substantially in the manner as and for the purpose set forth.

58,223.—PAPER COLLAR.—L. M. Crane, Ballston Spa, N. Y.

I claim as an improved article of manufacture a paper shirt collar having a thin sheet or layer of gutta percha interposed between the layers of paper of which the collar is constructed or made, substantially as described.

58,224.—BAIL FOR KETTLES AND OTHER VESSELS.—Anson D. Crocker, Boston, Mass.

First, I claim, in combination with a bail or handle, adjustable clamps constructed and arranged to fit upon the rim of and hold the receptacle to which they are attached, as described.

Second, In combination with the above the vertical bands, g g, and horizontal band, k k, as described and for the purpose specified.

Third, Making the bands g g and k k adjustable by the means herein above described and for the purpose specified.

58,225.—SLATE FRAME.—David Cumming, Jr., New York City. Antedated Sept. 17, 1866.

I claim a slate frame when constructed with a miter joint, having a tongue and groove or similar device, and held together by means of a continuous screw, substantially as set forth.

58,226.—STOP MOTION FOR SPINNING MACHINES.—Lewis Cutting, San Francisco, Cal.

I claim the bar, J, and slide, N, combined and operating substantially as and for the purposes described.

58,227.—UMBRELLA.—William Damerel, Brooklyn, N. Y.

First, I claim an umbrella held closed or shut by means of an elastic band placed around the stretchers of their frames, substantially as shown and described.

Second, I also claim rests, F, as arranged for holding the band or string, E, in its proper place, on or over the stretchers of an umbrella in all conditions, whether closed or extended, substantially as described.

58,228.—CHURN.—Francis Danzenbaker, Bridgeton, N. J.

I claim the combination of the tubular handle, A, adjustable stopper, B, or its equivalent, and valve, D, when constructed and arranged to operate substantially as set forth.

58,229.—MACHINE FOR ASSORTING POTATOES, COAL, ETC.—Mahlon D. Dickinson, Pitts' Grove, N. J.

I claim the crank shafts, A A, sieves, B B, and suspension rods, E E, when combined and arranged, as and for the purpose set forth.

58,230.—BOOT-JACK AND BLACKING CASE.—Bernard Douglas, New York City.

I claim a combined boot-jack and blacking case constructed by combining the two unequal parts of the case, A, with the hinges, a, blocks, f, and cover, d, substantially in the manner and for the purpose herein shown and described.

58,231.—RECLINING CHAIR.—J. B. Duane, Schenectady, N. Y.

I claim pivoting the seat bars to the front and back bars of the chair, by means of the transverse rods, A A, for the purpose described, in combination with the arms, g g, arranged directly over said bars, e e, and pivoted to the inner sides of the front and back bars, substantially as described.

58,232.—EXTRACTING CREAM FROM WHEY.—Kilian Egger, South Cortland, N. Y.

I claim the process above described for extracting the cream from the whey, substantially as above described.

58,233.—STOVE-PIPE DAMPER.—Norman J. Eldred, Chicago, Ill.

I claim the disk, A, with lugs, X X, cast upon it, and a square hole or opening cast in it, in which opening is placed a hoop, B, its axis being transverse to that of the disk, together with the damper plate, D, operating loosely between one side of the disk and the hook, the several parts being arranged and constructed as and for the purpose herein specified.

58,234.—BIT STOCKS.—Oliver Ellsworth, Boston, Mass.

I claim the arrangement of the jaws, C C, pivoted on the pins, D D, with spring, L, stationary screw, P, and traversing nut, G, the whole constructed as described for the purposes set forth.

58,235.—STUMP EXTRACTOR.—L. C. English, Corning, N. Y.

First I claim the derrick frame A A B, jointed at its upper end,

and provided with an adjustable brace, as and for the purpose described.

Second, In combination with the derrick frame, A A B, I claim the pivoted foot at the end of the leg, B, of the frame, as and for the purpose described.

Third, I claim the block, E, and catch, e, so arranged as to render the brace adjustable to the angle formed by the supports, A A and B, and avoid a breaking strain on the supports, as described.

58,236.—Evaporator.—Francis Farquhar and R. E. Doan, Wilmington, Ohio.

We claim a sugar evaporator having its fire box and flues arranged so as to be surrounded with the juice to be evaporated, substantially as and for the purpose herein specified.

We also claim the arrangement of the direct and return flues, C D D and E, in relation to the introduction and flow of the juice to be evaporated, so as to separate the impurities to be skimmed off, substantially as herein set forth.

We also claim the evaporating space, S''', between the flues, D D E, and the fire box, as described.

We also claim the flue connections, L L, between the fire box, B, and flues, D D, for the purpose set forth.

58,237.—Straw and Hay Knife.—Daniel Fasig, Rowsburg, Ohio.

I claim a cutting device for cutting hay or straw from the stack, A, having the tang, e, of the knife or cutter, c, fitted in it and operated by a lever, D, all constructed and arranged substantially as herein shown and described.

58,238.—Tweer.—Benjamin Fish, Mechanicsburg, Pa.

First, I claim the tongued grate, B, constructed and arranged as herein described, in combination with the air chamber, A, of the tweer, substantially as and for the purpose set forth.

Second, The cap, E, constructed as herein described, in combination with the grate, B, substantially as and for the purpose set forth.

58,239.—Method of Promoting Combustion in Furnaces.—Clark Fisher, Trenton, N. J.

I claim the employment of fans or other suitable air engines, having pipes leading from them into the chimneys, and directed upward for the purpose of promoting the combustion of fuel in furnaces by forcing cold air directly into the chimneys at points which are above the heating surfaces, but near the base of the chimneys, at a greater velocity than that which would result from natural draft, substantially as described.

58,240.—Vault Cover.—Frederick Fitzgerald, Cincinnati, Ohio.

I claim the vault cover or sidewalk plate, having the gutters, b, the diagonally scored and convex eminences, c, and corrugations, d, as and for the purpose set forth.

58,241.—Instrument for Measuring Distances.—Jones Frankle, Amesbury, Mass. Antedated September 3, 1866.

I claim the combination of the inclined plane, o, graduated with distances, and the telescopes, d and e, arranged substantially as herein set forth.

58,242.—Manufacture of Knives and Forks.—James D. Frary, New Britain, Conn.

First, I claim forming a bolster, a'', upon a blade, a, having perforations in the center thereof through which the metal is poured to form a solid bolster, substantially as described.

Second, Securing the handles, c, made in two parts, having holes therein to correspond with those formed in the blade, and countersunk so that the metal poured therein will firmly gripe the parts together, substantially as described.

58,243.—Combined Seeder and Cultivator.—W. J. Freeman, Spring Fork, Mo.

First, I claim the combination of the hopper, C, and beam, C' with the slide, C2, and the levers, E and E' and lugs, n, on the wheel, B, when constructed as and for the purpose set forth.

Second, I claim the frame, A, and the wheels, B B', combined and arranged with cultivator hereinbefore described, substantially in the manner set forth.

Third, I claim the frame, A, and the wheels, B B', combined and arranged with the seed planter hereinbefore described, substantially in the manner set forth.

Fourth, I claim the posts, D', and the rock shaft, D2, of the plows, D, in combination with the frame, A, substantially as described.

58,244.—Lantern.—Alonzo French, Philadelphia, Pa.

I claim the globe base, C, and the shell or case, B, combined and operating substantially as herein specified and described.

58,245.—Sewing Machine.—H. W. Fuller, Brooklyn, N. Y.

I claim the combination of the attachment described with the cloth plate, needle, rotating hook, bobbing slide, and other operative parts of a Wheeler and Wilson sewing machine, constructed and operating together, substantially as and for the purpose set forth.

58,246.—Roofing for Building.—William Gilbert, Detroit, Mich.

First, I claim the employment of a layer or net work of swamp grass, hemp, straw, or any other tough, fibrous material placed between the layers of the material employed for the roofing, substantially as described.

Second, For holding together the materials of which prepared roofing is made, I claim a cement composed of distilled coal tar and common slacked lime, as herein specified.

58,247.—Attaching Hub to Axles.—Chauncy H. Guard, New York City. Antedated Sept. 17, 1866.

I claim the attachment of a hub to an axle by means of a convexed journal, formed substantially as herein described, and combined with bearing plates secured to the inner end of the hub, and embracing said disk, substantially in the manner and for the purpose herein set forth.

58,248.—Fuel Dumper.—Joel Haines, West Middleburg, Ohio.

I claim the combination with the sloping sided truck and the derrick of the suspended fuel box having discharge boards closed by contact with the sides of the truck, and fastened and opened substantially as described.

58,249.—Medical Compound.—James M. F. Hall, Davenport, Iowa.

I claim the composition or compound as above prepared and described, and to be used as a medicine as herein set forth.

58,250.—Fan.—Nathan Harper, Newark, N. J.

I claim a fan constructed of wood as described and re-enforced by paper or cloth, substantially as and for the purpose specified.

58,251.—Stovepipe Damper.—B. J. Harris, Harrisburg, Pa.

I claim the swelled joint composed of the sections, A' A', when the lower section is provided with perforations or holes, and the upper section with an opening or door, substantially in the manner and for the purpose herein specified.

58,252.—Grate Bar.—Samuel Harrison, Philadelphia, Pa.

I claim a grate bar consisting of a deep and shallow rib or ribs, combined in one casting, substantially as and for the purpose set forth.

58,253.—Match Safe.—Thomas S. Hathaway, Decatur, Ill.

I claim the vertical slide, B, with its shoulder or recess, a, in combination with the receiving chamber, A, and friction spring, b, constructed and operating substantially as and for the purpose described.

58,254.—Grain Dryer.—Robert Heneage, Buffalo, N. Y.

First, I claim the heating cone, I, in combination with the induction chamber, H, and spout or hopper, G, said cone being supplied with hot air or its equivalent, substantially in the manner and for the purpose set forth.

Second, The pulverizing and distributing disk, L, constructed and operating substantially as described.

Third, The desiccating disks, F, provided with the inclined annular flanges, d d, and air passages and shields, i j, in combination with the curtains, c c, or their equivalent, substantially as shown and described.

Fourth, The combination and arrangement of the desiccating disks, F F, constructed as above described, with the diaphragms, C C, the whole operating substantially in the manner and for the purpose specified.

Fifth, The induction hot blast tube, K, and exhaust tube, O, in combination with the series of sections or divisions of the cylinder, each provided with a desiccating device, and said tubes having distinct connection with each division, substantially as set forth.

58,255.—Respirator.—Theodore A. Hoffmann, Beardstown, Ill.

I claim the gauze, B, inclosed cotton, C, covering, F, and elastic strand, E, combined and provided with the elastic strap, D, and operating substantially as described for the purpose specified.

58,256.—Machine for Stretching Silk, etc.—Goodrich Holland, Willimantic, Ct.

I claim the arrangement of two stretching drums, B C, the bobbins, E E, or their equivalents for delivering the unstretched silk to the first stretching drum, and the take-up apparatus, for taking up the stretched silk, substantially as herein set forth.

58,257.—Dentist's Tooth Plugger.—Chauncey M. Hooker, Hartford, Ct. Antedated May 1, 1866.

I claim the arrangement of the spiral spring, G, or its equivalent, to give the reciprocating movement as described, in combination with the tube, A, head, B, rubber stop, b, stem, D, collars, F and H, in the manner substantially as described.

58,258.—Radiator.—Henry Howard, Springfield, Mass.

I claim a steam radiator consisting of one or more steam chests or sections, each having the form of an extended endless pipe or flue, so arranged as that the steam shall enter and leave the same at one extremity thereof, through apertures pierced thereon opposite to each other, all substantially in the manner and for the purpose herein set forth.

I claim also breaking the exterior surface of said extended endlesss steam chest or flues into parallel ribs or flanges obliquely disposed at opposite inclinations, substantially in the manner and for the purpose herein set forth.

I claim also the use of diaphragms placed centrally between the induction and eduction apertures pierced at opposite points in a radiating steam chest or flue as hereinbefore described, substantially in the manner and for the purpose herein set forth.

58,259.—Hay Elevator.—J. L. Hubbell and E. Sherman, Fairfield, Ct.

First, We claim the combination of the pawl, I, the latch, G, and the catch, H, with the truck, B, constructed and arranged to operate substantially in the manner and for the purpose specified.

58,260.—Petroleum Cooking and Heating Apparatus.—John S. Hull, Cincinnati, Ohio.

I claim the open inverted conical tube, D, around the burner, C, in combination therewith and with the tubes, E E, arranged and operating substantially as and for the purpose herein specified.

I also claim the succession of open tubes, E E, formed, arranged, and operating substantially as and for the purpose herein set forth.

I also claim the combination of a burner provided with open tubes, D E F, as described, with a cooking or heating apparatus or utensil.

58,261.—Burner for Vapor Lamps.—John S. Hull, Cincinnati, Ohio.

I claim the forming of the cap, C, internally with an annular recess with channels and grooves, in the manner substantially as herein shown and described, in order to spread the burning material or cause a large volume of the same to be exposed to the flame for the purpose specified.

I further claim the fluted or corrugated plug, e, in combination with annular, serpentine, or circuitous passages in the cap, C, substantially as and for the purpose set forth.

58,262.—Measuring Scale for Coffins.—James W. Hyde, Lewistown, Ill.

I claim a scale or rule for the purposes specified, the same consisting of the form, A, having legs, B F, of different lengths tapered and graduated substantially as described, and the cross bar, E, with graduated arms, G G, as and for the purpose specified.

58,263.—Manger.—Jonathan Johnson, Kent, Ind.

First, I claim the combination with the manger, A, of the coarse screen, B, substantially as described and for the purpose set forth.

Second, The combination of the screen bottom drawer, E, with the drawer frame, D, and manager, A, substantially as described and for the purpose set forth.

Third, The combination of the screen drawer, E', constructed as described with the drawer frame, D, and manger, A, substantially as and for the purpose set forth.

58,264.—Steam Blower.—J. H. Johnson, Paducah, Ky. Antedated Sept. 10, 1866.

I claim the exhaust pipe, C, the receiving chamber, B, and the conical tubes, c, when combined and operated as herein described and set forth.

58,265.—Lamp-chimney Cleaner.—Levi Keiler, Catawissa, Pa.

I claim the adjustable cleaner of any material constructed and combined with a hollow stem or handle to be inflated and operated as herein described and for the purposes set forth.

58,266.—Bridge.—Zenas King, Cleveland, Ohio.

I claim the chord, B, with the rod, B', so that the point of connection, d', of said chord and rod, the chord shall enter the plate, D', at an angle in combination with the counter and main braces, thereby rendering the structure less liable to fracture, the whole being constructed as and for the purpose as herein described.

58,267.—Shearing Apparatus.—Isaac Lampbugh, Springfield, Ill.

The improved portable shearing machine constructed as herein described and shown, as a new article of manufacture.

58,268.—Gate Fastening.—Richmond A. Leeds, Stamford, Ct.

A latch for gate, etc., consisting of the two sector-shaped plates, D, hung eccentrically within a common casing or its equivalent, in combination with the fixed catch, H, substantially as herein described.

58,269.—Manufacture of Knife and Fork.—J. B. H. Leonard, Meriden, Ct.

The mode or process described, of forming around and upon the tang of a knife or fork a hollow soft metal handle, substantially as described.

58,270.—Card Holder.—A. A. Marks, New York City.

The combination of the holding disk, C, with the spring, F, to actuate the same, as and for the purpose set forth.

58,271.—Level.—Daniel Masten, Bingham, N. Y.

I claim the combination of the ring, A, with its internal flanges, A', piece, B, and wheel, C, or their equivalent, substantially in the manner and for the purpose set forth.

58,272.—Packing Vessel for Petroleum.—J. W. Masury, Brooklyn, N. Y.

First, I claim so constructing a casing that when the can is inclosed therein the handle of the can will serve for both.

Second, The top, I, with its openings, X X, to receive the lugs E E, of the can, constructed and arranged in the manner and for the purpose herein specified.

58,273.—Boring Attachment to Lathes.—C. E. McBeth, Hamilton, Ohio.

I claim an improved boring attachment to turning lathes formed by combining a thimble, E E, bush, G, and cap or ring, F, these parts being constructed and arranged as herein described with each other, with the hollow spindle B, and with the mandrel, H, substantially as described and for the purpose set forth.

58,274.—Grain Drill.—John McDonald, Hardin, Ill.

I claim the independently hinged cutters, A, levers, G, weights, H, and tubes, J, in combination with the slide, P, lever, M, and pins, N, when constructed and arranged substantially as and for the purpose set forth.

58,275.—Steam Generator.—John McMurtry, Lexington, Ky.

First, I claim the combination of the supply pipe, C, with the evaporating pans, D D, and E E, the latter having corrugated bottoms, the whole constructed and operating as herein set forth.

Second, The combination of the hinged cups, J J, the arms, n, the axle, K, the stuffing box, P, and the pulley, L, the whole constructed and operating substantially as herein specified.

58,276.—Beehive.—George W. Merchant, La Forte, Ind.

First, I claim the combination of the hive, A, and frame, B, with the honey box, C, in such a manner as to admit of the removal of spare honey in box, C, without disturbing the bees in the breeding hive, and also of the examination of the brood combs without disturbing the bees in the honey box, C, substantially as represented and described.

Second, The spare honey box, C, arranged over the bee entrance or passage, E, substantially as and for the purpose set forth.

58,277.—Corn Planter.—S. P. Metz and Martin Rohrer, McDonaldsville, Ohio.

We claim the upright, B, frame, C, and support, E, with roller, D, in combination with the plow beam, A, the whole being constructed and arranged as set forth.

58,278.—Padlock.—E. M. and J. E. Mix, Westfield, N. Y. Antedated Sept. 15, 1866.

First, We claim securing the seal plate, G, in position over the seal recess by means of the pin, i, on the tumbler, C, so that when locked it cannot be released without moving the tumbler, substantially as set forth.

Second, In combination with the hinged escutcheon, K, we claim the spring, l, pin, m, and beveled ear pieces, o o, whereby the spring is made to constitute a self-closing hinge for the escutcheon, arranged and operating substantially as shown and described.

Third, We also claim the arrangement of the seal plate, G, in relation to the face, A, of the lock, and the escutcheon, K, whereby the plate moves on a plane between the two, in the manner and for the purpose set forth.

Fourth, We further claim the combination and arrangement of the vertically rising escutcheon K, with the recess, f, and swinging seal plate, G, whereby the former is made to conceal and protect the latter, substantially as shown.

58,279.—Handle for Stoves.—J. H. Mueller, Detroit, Mich.

I claim as my improvement in stoves, a handle made of wood or other bad conductor of heat and secured to one end of a radiating coil, the other end being connected to the door of a stove, all substantially as herein shown and described.

58,280.—Hay Rack for Wagons.—Andrew Naramor, Utica, Mich.

I claim the adjustable stakes, B C, and ladder, e, in combination with the rack, a, box, A, and the pulley or windlass at each end, arranged and operating as and for the purpose substantially as set forth.

58,281.—Cap for Bottles.—M. V. Olry, Philadelphia, Pa.

I claim the within-described neck cap for bottles, the same consisting of the two tubes, A and b, connected together at the top and constructed for attachment to the neck of a bottle, substantially in the manner described.

58,282.—Machine for Raking and Loading Hay.—H. S. Palmer, Norwell, Mich.

I claim the endless, flexible apron or elevator provided with reciprocating teeth, as above described, in combination with a rake for gathering and depositing hay upon the load, for the purposes and substantially as set forth.

58,283.—Frame for Mosquito Canopies.—Isaac E. Palmer, Hackensack, N. J.

I claim the combination of the screw cap, B, skeleton center piece, A, and radial arms, C, substantially as herein described, whereby the said arms may be folded either in an upward or downward direction.

58,284.—Roller and Seed Planter Combined.—Ezra Perin, Connersville, Ind.

First, I claim the combination on one frame of a seed planter, rollers, B, and furrowing plows, C, when arranged substantially as set forth.

Second, I claim the combination of the wheel, I, rod, H, bill crank, G, and slide, F, with the seed box, E, the parts being constructed and arranged substantially as set forth.

58,285.—Device for Moving Cars on the Track.—I. W. Pettengill, Rockford, Ill.

I claim the lever, D, with arm or handle, E, attached, and a rod, F, with clamp, G, secured to it, in connection with a grapple, A, constructed and arranged as shown and described, or in any equivalent way, so that it will grasp the rail and slip or slide thereon in one direction under one movement of the arm or handle, E, and remain fixed or stationary on the rail under the opposite movement of the arm or handle, substantially as and for the purpose set forth.

58,286.—Animal Trap.—David N. Phelps, San Leandro, Cal.

I claim a trap constructed of wire or iron, A, with main spring, B, semicircle, C, parallel straight arm, D, with bent head, E E, said arm crossing the semicircle and forming the hold when sprung, when set held in place by the bent arm, H, and sprung by bait, H', substantially as described and for the purposes set forth.

58,287.—Watch-chain Hook.—Morris Pollak, New York City.

I claim the hook for watch chains and other articles, formed double with the points standing in opposite directions and attached to each other by a pin or rivet that allows said hooks to separate sidewise, in the manner and for the purposes set forth.

58,288.—Churn.—Isaac T. Price, Leesville, Ohio.

I claim the springs, G, in combination with a cream vessel, substantially as and for the purposes set forth.

Also the base board, F E', constructed and operating substantially as and for the purposes set forth.

58,289.—Potato Digger.—W. F. Quimby and George G. Lobdell, Wilmington, Del. Antedated Sept. 10, 1866.

First, We claim the use in rotary diggers of teeth bent to the curve described, for the purpose specified.

Second, The curved tooth, a, having the sectional form described, for the purpose set forth.

Third, The tooth, a, adapted to a groove in the cross bar, B, and secured thereto by a plate, D, as and for the purpose herein specified.

58,290.—Sheep Holder.—D. R. Reed, Orangeville, N. Y.

I claim the removable or detachable head rest, F in combina-

tion with the fixed bed piece, H, and the wheels, D D', provided with clamps, E, and fitted on the screw shafts, C C', all arranged substantially as and for the purpose set forth.

58,291.—Sadiron Handle.—Frederick Rehorn, New York City.

First, I claim the handle, B, consisting of the top cross bar, d, standard, b, and bottom cross bar, c, cast in one piece, and applied in the manner and for the purpose specified.

Second, The groove wooden handle, C, in combination with the top cross bar of the metal handle, B, and with pins or other suitable fastenings, substantially as and for the purpose set forth.

58,292.—Body Top for Carriages.—Uel Reynolds, New York City.

I claim the clip body loop, constructed as and for the purposes specified.

58,293.—Lady's Saddle Tree.—William Rhodes and Greenville Hazlewood, Bloomfield, Iowa.

We claim a lady's saddle tree which is so constructed that while its bellying portions, B B, accurately conform to the horse's back without being stuffed or padded, the upper surfaces of said portions are elevated above the side bars, A A, all along the length of said bars so as to form the requisite raised seat without being padded or stuffed on said surfaces—but this we only claim when the elevated bellying portion and the bars of each side of the tree are of one piece and the two side bars are united by straps, all substantially as set forth.

58,294.—Steam Safety Valve—George W. Richardson, Troy, N. Y.

I claim a safety valve with the circular or annular flange or lip, c c, constructed in the manner or substantially in the manner shown, so as to operate as and for the purpose herein described.

58,295.—Corn Planter.—Josiah S. Rickel, Geneseo, Ill.

I claim the lever frame, H, with seed slide, G, attached, in connection with the corn box or hopper, F, arranged and applied to the corn cover or jumper, substantially in the manner as and for the purpose herein set forth.

58,296.—Candle Stick.—Alfred Rix, San Francisco, Cal.

First, I claim the use of the jaws, B B, one or both movable, or their equivalents, arranged with a space, z, on each side of the candle by which the candle can be adjusted vertically by the thumb and finger.

Second, The trapezoid, a b c d, by which to operate the jaws, all constructed substantially in the manner and for the purposes set forth.

58,297.—Saw.—E. I. Robinson, Canton, Ohio.

I claim a saw constructed with elongated teeth, in the manner described for the purpose set forth.

58,298.—Car Wheel.—E. S. Robinson, New York City.

I claim the plate, a a, and cross piece, c, and hub, b, cast in one piece, forming the open space, as shown, in combination with the tire, B, secured by webs, D, substantially as described, for the purpose specified.

58,299.—Boring and Pumping Apparatus for Oil Wells.—John B. Root, New York City. Antedated Sept. 10, 1866.

I claim the combination of the horizontally-movable direct-action steam engine, the horizontal platform and guides on the derrick, and the boring bar or drill rod and pump, substantially as and for the purpose herein specified.

58,300.—Fence.—Sherman H. Rose, Wheeler, N. Y.

I claim the pins, a b, passing transversely through the posts, A, in combination with the slots, f, arranged in the ends of the removable panels, B, substantially as herein set forth for the purpose specified.

58,301.—Mechanical Medicator.—P. A. Royce, Buffalo, N. Y.

First, I claim the apparatus consisting of the pumping cylinder, B, chambers, F K, provided with induction and eduction valves and orifices with the supplementary or generating chamber, T, connected with chamber, F, by the passage, Y, the whole combined, arranged, and operating substantially in the manner and for the purpose herein set forth.

Second, I also claim, in combination with the above-described apparatus, the perforated air pipe, G, and sliding cap, W, operating in the manner and for the purpose specified.

Third, I also claim, in combination with the said apparatus, the ozone generator, Fig. 14, constructed and operating substantially as described.

58,302.—Manufacture of Soap.—John T. Ryan, Brooklyn, N. Y.

I claim the combination of solutions or mucilages obtained from Algaceæ (Linaceæ Acacia, or such other vegetables or vegetable substances as do not turn blue when tested with iodine, with soaps or saponaceous compounds, substantially in the manner and for the purpose herein set forth.

58,303.—Silicated Liquid for Manufacture of Soap and other Purposes.—John Taylor Ryan, Brooklyn, N. Y.

First, I claim the combination of any vegetable, gummy, or mucilaginous substances or solution, with any one or more of the silicates of potassa, soda (neutral or alkaline), ammonia, alumina, or magnesia, substantially in the manner and for the purpose herein set forth.

Second, I also claim the combination of animal gluten with vegetable mucilages or gums, and with the silicates of potassa, soda, ammonia, alumina, or magnesia, substantially in the manner and for the purpose herein set forth.

58,304.—Mechanical Movement.—Cyrus W. Saladee and Wm. Veach, Newark, Ohio.

First, We claim broadly supporting and operating the pitman, C K (Figs. 1 and 2, Plate I), across and upon a line with the center, E, of the corrugated driving wheel, A, substantially as and for the purpose set forth.

Second, We claim the arrangement of the corrugated wheel, A, in combination with the pitman, C K, and friction rollers, B B', or their equivalent, in the manner and for the purpose substantially as shown and described.

58,305.—Pea Sheller.—George T. Savery, Groveland, Mass.

I claim combining a roller of a machine, as described, by the employment of a ring of vulcanized rubber, or other elastic or suitable material under such an arrangement that while motion is communicated from one roll to the other by friction of contact there shall also be a sufficient space between the two rolls to effect the shelling of the peas, as herein described and set forth.

58,306.—Adjustable Wrench.—Alonzo Sedgwick, Poughkeepsie, N. Y.

I claim the slotted shank having a groove, T, in combination with the jaws, B B, constructed and arranged as described.

58,307.—Rotary Valve.—Daniel Sexton, San Gabriel, Cal.

I claim the arrangement of the ports, c c', port, d, valve, B, having partition, E', stem, C, lever, D, temper screw, G, ports, e e', ports, f f', and cylinder, A, constructed and operating substantially as and for the purpose represented and described.

58,308.—Fence.—J. W. Shankland, Summerfield, Ohio.

I claim the arrangement of the post, A, iron blocks, E E, and foundation stone, D, as described.

The mode of securing the arms and post in position by the combination of blocks, H, the keys, I, arms, G, and the blocks, F, on the post, A, substantially as described.

58,309.—Water Wheel.—Simeon Sherman, Weston, Mo.

First, I claim the upright ledge, n, n' the inner edge of the bottom of the scroll, D, in combination with a wheel, A, fitted within the scroll and exceeding the former in depth, substantially as and for the purpose set forth.

Second, The buckets, C C', placed alternately on the exterior of the wheel, and constructed and arranged in the manner substantially as shown and described.

Third, The attaching to or casting the buckets, C C', with a shell, D, fitted on the body of the wheel and arranged with set screws, E, by which the buckets may be adjusted higher or lower on the wheel, substantially as and for the purpose specified.

Fourth, The register, G, constructed and applied as shown and described, to regulate the flow of water through the draft tube, F, and prevent the upward reflux of water therein.

58,310.—Button.—Albert M. Smith, Brooklyn, N. Y. Antedated Sept. 17, 1866.

I claim a button having a compound shank composed of a central pin and a spiral fastening revolving around said pin, all substantially as described.

58,311.—Measuring Stopple for Canisters.—W. Morris Smith, Washington, D. C.

First, I claim so constructing an oscillating or rotating measuring device for canisters that their contents shall not be exposed to the external air during the act of measuring and discharging the measured quantity, substantially as herein set forth.

Second, An oscillating measuring chamber, C, or its equivalent, adapted to serve as a cut-off or stopple for a canister, and also as a means for measuring the contents of the same, substantially as described.

58,312.—Pepper Caster.—Louis Soehlmann, Jersey City, N. J.

I claim the finger bar, D, the fan, E, and the series of wipers, G, when in combination with a pepper caster, A, substantially as and for the purposes described.

58,313.—Attachment for the Legs of Billiard Tables.—William B. Soumeillian, Philadelphia, Pa.

I claim the combination of the vulcanized india-rubber or other equivalent substance for a step, with a metallic base, hollow screw pillar, plate nut, and friction disk, substantially as and for the purposes herein set forth.

I claim, in combination with the device above described, the double-armed nib wrench or hand lever, for operating the same, in the manner and for the purposes specified.

58,314.—Needle Threader.—Charles L. Spencer, Providence, R. I.

I claim a needle threader, the threading channel of which is divisible, all substantially as described.

58,315.—Machine for Cutting Leather.—Cabel S. Stearns, Marlboro, Mass.

I claim hanging the cutting-out die to a movable frame, so that it can be brought over any portion of the table, L, in combination with the presser block, M, or equivalent device for pressing it down, substantially as set forth.

I also claim the hollow shaft, H, with its swiveling collar, I, in combination with the die, K, and the rod, g, substantially as described.

58,316.—Siphon.—E. I. Stearns, Honesdale, Pa.

I claim a siphon, having its discharge end or nozzle enlarged, and provided with a sponge or other suitable filtering medium, substantially as described and for the purpose specified.

58,317.—Means for Raising Water by Steam.—John W. Stiles, New York City.

First, I claim the arrangement of the nozzle or ends of the steam and water pipes, substantially as and for the purpose specified.

Second, Arranging within the water or eduction pipe a valve, or its equivalent, H, for the purpose of enabling me to cause a back pressure in such pipe, A, and the space which surrounds the lower end or nozzle, B, thereof, by which any obstructions may be removed, substantially as described.

Third, The arm or brace, E, or its equivalent, substantially as and for the object specified.

58,318.—Plow.—R. B. Summers and S. Dement, San Jose, Ill.

First, We claim the manner of attaching the beam, B, to lever and crank, G, and raising or lowering the plow, D, by the lever and crank, G, and ratchet, F, as set forth.

Second, We claim the rod, g, and spring, h, as described, and for the purposes set forth.

58,319.—Rotary Cultivator.—Andrew Thompson, Ottumwa, Iowa.

First, I claim the pendent rods, J J, provided with bearings for the cylinder, G, said bearings being guided in slots in the frame, E, for the purposes and substantially as herein shown and described.

Second, I claim the revolving cylinder in combination with the pendent rods, J J, and crowned braces, H H, substantially as and for the purpose herein shown.

Third, I claim the frame, E, provided with the slots which guide the bearings of the pendent rods, J J, and braces, H H, substantially as herein shown.

58,320.—Corn Harvester.—Daniel J. Tittle, Albany, N. Y.

I claim, First, The revolving cutters herein described, arranged in respect to and operated independent of each other, as set forth, in combination with a machine for harvesting cane or corn stalks.

Second, The screw shafts, F, in combination with the cutting apparatus of a corn or cane harvester, for the purpose of adjusting the hight of the said cutting apparatus from the ground.

Third, In combination with the revolving cutters, G, the adjustable platform, P, substantially as and for the purpose set forth.

Fourth, The slotted bars, M, in combination with the reel, N, and cutters, G and H, arranged as described, of a cane or corn harvesting machine, for the purpose of adjusting the hight of said reel.

Fifth, In combination with the side bars, A A, the platform, B, provided with the vertical flange as shown, for the purpose of stiffening said platform and frame.

Sixth, Connecting the draft frames, a, of a corn and cane harvesting machine, as herein described, to the outer ends of the main axles, so that each of said axles shall be supported at a point outside of the bearing wheel, substantially as and for the purpose specified.

Seventh, In combination with the main frame and cutting apparatus of a harvester for cane and corn stalks, the curved brace plate, Y, to strengthen and support the lower end of the frame which contains the cutting apparatus.

Eighth, In combination with the main frame, A, of a harvester for cane or corn stalks, as herein described, the vertical frame, D, substantially as and for the purpose set forth.

58,321.—Apparatus for Supplying Gas on Steamboats and other Vessels.—N. Treadwell, New York City.

I claim the stop cocks or valves, a b c d, in combination with the gas supply pipe, D, pump, J, discharge pipe, G, pipe, C, and gas holder, A, all constructed and operating substantially as and for the purpose described.

58,322.—Sash Supporter.—William S. Van Hoesen, Saugerties, N. Y.

I claim the loose bolt or pin, C, arranged relatively with the inclined recess, B, in the manner described, and employed in combination with a ball or roller, A, for the purpose of locking and sustaining a window sash, as herein explained.

58,323.—Plow.—William Veber, Jr., Shingle Creek, N. Y.

I claim the rod, F, attached to a plow, when constructed and operated as herein shown, substantially and for the purpose as described.

58,324.—Sadiron Heater.—William P. Wage, Bane Center, N. Y.

I claim the stove, A, constructed as described, with an air chamber, provided with a metallic case, B, lamp, C, and pipe, E substantially as and for the purpose herein set forth.

58,325.—Flour Packer.—Gustavus A. Warner, Portland, Oregon.

I claim the arrangement of the stop, a2, spring sliding gate, S, spring frame, v, pulley, d, and weight, D, in combination with the carriage, C, constructed and operating in the manner and for the purpose herein described.

58,326.—Pruning Instrument.—G. F. Waters, Waterville, Me.

First, I claim the combination of the eccentric cutter, D, with the hook, B, when the parts are constructed and arranged to operate in the manner and for the purposes herein specified.

Second, The lever, E, in combination with the cutter, D, substantially as and for the purposes herein specified.

58,327.—Envelope Machine.—Thomas V. Waymoth, New York City.

First, Gumming the seal flaps of the blanks for envelopes, simultaneously or nearly so with the lower or end flaps, or during the time while the blank passes from the gumming to the folding mechanism, and by mechanism substantially such as herein described, or any other suitable mechanism which will produce the same effect.

Second, The arrangement of a curved guide, T, in combination with the table, A*, constructed and operating substantially as and for the purpose described.

Third, Causing the seal flap when folded to bear on one or more of the folding wings, or on parts or projections of said wings, substantially as and for the purpose described.

Fourth, The projecting lips, f', in combination with the joints of the folding wings, constructed and operating substantially as and for the purpose specified.

Fifth, The raised surface at or near the edge of the wing which folds the lower flap, substantially as and for the purpose described.

Sixth, The endless apron, Q, with radiating plates, or arms, j', in combination with a suitable gumming and folding mechanism, constructed and operating substantially as and for the purpose set forth.

Seventh, Passing the endless apron, Q, at its receiving end over a square or polygonal shaft, l', substantially as and for the purpose described.

Eighth, The curved rail, o', or its equivalent, in combination with the apron, Q, constructed and operating substantially as and for the purpose set forth.

Ninth, The receiving box, R, and follower, S, in combination with the discharging end of the endless apron, Q, constructed and operating substantially as and for the purpose described.

Tenth, The lever arm, O, in combination with the carrying platform, N, and with a suitable die inserted or secured to said lever arm or to the platform, or to both, substantially as and for the purpose set forth.

Eleventh, The arrangement of dies, s, on the creasing plunger and on the folding table, or on either, substantially as and for the purpose described.

Twelfth, The tapes, u, arranged in an arm, v, and operating in combination with folding table, P, and plunger, I, substantially as and for the purpose set forth.

58,328.—Hat.—William H. White, Kent Island, Md.

First, In combination with an open draw casing or other open casing, placed at the outer edge of the brim of the hat, as described, I claim the hoop or form of metal, or other suitable material, for forming and holding in shape said brim, constructed and arranged for operation, substantially as herein shown and set forth.

Second, As a new article of manufacture, I claim the hat or cap, constructed as herein described and set forth.

58,329.—Hat.—William H. White, Kent Island, Md.

First, As a frame for shaping hats and caps made of soft or limber material, I claim the combination of the crown and rim hoops, with a distending spring, which at the same shall admit of being compressed, so that the two hoops may be brought into juxtaposition, as and for the purposes set forth.

Second, I claim the combination of the distending spring, as above set forth, with the adjustable crown and rim hoops, so arranged that the frame may be adjusted to hats of different dimeasions, as herein shown and described.

Third, In combination with the hat or cap lining, provided at its upper end with draw casing and strings, as described, I claim the hoop or form for shaping the top of the lining, as herein shown and set forth.

58,330.—Shaft Coupling.—J. L. Winslow, Portland, Me.

I claim the combination of the flanges beveled and slotted, as described, the collars fitting thereupon, the bolt and metallic hoop, all constructed, secured, and operating to form a coupling for shafts, as herein set forth.

58,331.—Evaporator.—J. E. Youngman, Rockford, Ill.

I claim, First, The pans, S U Z, when arranged in relation to each other as described, in combination with the perforated strainers and skimmers connected with said pans, substantially as and for the purpose set forth.

Second, The skimmers, V, and strainers, W X, in combination with the pans, U, when arranged and operating substantially as and for the purpose set forth.

Third, The dampers, arranged as described, in combination with the fire-box, A, and grate bars, Fig. 5, as and for the purposes set forth.

Fourth, The chamber, I", in combination with the pans, S, double flues, arranged in the manner and for the purpose set forth.

Fifth, The flue, L, with double sides and bottom, in combination with the dampers, D' M, and pans, as and for the purpose set forth.

Sixth, The vents, d', and pans, S, in combination with the conductor, e, strainer, V, and pan, U, as and for the purpose set forth.

58,332.—Button.—Arthur W. Browne, Brooklyn, N. Y., assignor to himself, Joseph L. Moss, New York City, and Edward W. Moss, Brooklyn, N. Y.

I claim the combination of the button, A, having shouldered opening, a, flanged stud, b, having conical depression in its bottom, and slotted plate, c, substantially as described for the purpose specified.

Second, The stud or pin, d, for the purpose of detaching the button from the dress, and its combination with the wire spring fastening, B, constructed substantially as herein shown and described.

58,333.—Fan Attachment for Sewing Machines.—Samuel Burr (assignor to himself and David Coulan), New York City.

I claim the employment of the vibratory fan, L, when arranged with the supporting standards, I I, and driving arms, k h, and the treadles of the machine, all as hereinbefore specified.

58,334.—Potato Digger.—W. H. Burridge, Cleveland, Ohio, assignor to Henry Carter, Aylmer, Canada.

First, I claim the rake, I, wheel, B, provided with flanges and cutters, belt, K, fork, b, in combination with adjustable table, G, and guide, G', for the purposes and in the manner set forth.

Second, The share, F, saw-toothed cutters, scraper, M, section, N, and adjustable guide, G', when arranged to operate in the manner and for the purpose described.

Third, The wheel, B, spuds, c, scraper, M, share, F, adjustable table, G, and guide, G', when arranged in the manner and for the purposes set forth.

58,335.—Amalgamator.—S. Frederick Charles (assignor to himself and S. E. Russell), Dahlonega, Ga.

First, I claim the so combining a panning machine, a regrinding machine and an amalgator, that the gold shall be thoroughly extracted by the continuous and connected action of all of them, substantially as set forth.

Second, The adjustable partition, B, constructed and operate substantially as and for the purposes set forth.

Third, The deep radiating channels, j, in the lower surface of the grinder, K.

Fourth, The combination of an upper revolving grinder with an oscillating lower one, constructed and operating substantially as specified.

Fifth, The case or shell, M, of the grinders in combination with the rollers, i, and the reciprocating arm or lever, O.

Sixth, The amalgamator, R, constructed so as to form one large and one narrow compartment, by the insertion of the removable and adjustable partition, o, substantially as specified.

Seventh, The revolving frame provided with amalgamating pans suspended below the surface of the auriferous mass, constructed and operating substantially as and for the purposes specified.

Eighth, The location of the flue below the series of amalgamators, substantially as and for the purposes specified.

58,336.—Lady's Skirt.—Dwight M. Church (assignor to himself and George R. Bailey), Derby, Conn.

I claim an improved lady's skirt, formed by combining a detachable lower part, c, with the body or main part, A, of the skirt, by astenings concealed by a tuck, substantially as described and for he purpose set forth.

58,337.—Churn.—Horace Cliff, Mystic River, Conn., assignor to E. Burrows Brown, Groton, Conn.

I claim the construction of the dasher of radial arms, a a, having independent blades, c, arranged at right angles to them, substantially as described.

I also claim the combination of the button-head pin, h, and turn button, i, with the tenon collar, d, shaft, E, and key pin, e, in the manner and for the purpose described.

I also claim the arrangement of the rotary dasher, constructed as herein described, in combination with the air ducts, J J, and exit air pipe, N, arranged as described, all for the purpose set forth.

58,338.—Thrashing Machine.—A. B. Crawford (assignor to himself, John O'Ferrall and Thomas L. Daniels), Piqua, Ohio.

First, I claim the angular dividing board, L, applied and operating substantially as described and represented.

Second, The arresting pins, K, on the movable frame, M, as described.

Third, The link, Fig. 2, with its corresponding pintle and socket, the socket for the reception of the journal of the round and lug, limiting its rotation by the impingement of its projection, c, as described.

Fourth, The forked rod for shaking the shoe, as described and represented.

58,339.—Lubricating Apparatus.—John C. Eggleston (assignor to himself, E. M. Hitchcock and G. W. Beach), Waterbury, Conn.

First, I claim the brush, D, and toothed wheel, A, combined and operating substantially as described for the purpose specified.

Second, I also claim the pintle, a, in combination with the wheel, A, brush, D, and oil chamber, B, all substantially as and for the purposes set forth.

58,340.—Hoisting Apparatus.—Dennis Frisbie (assignor to himself and Samuel C. Goodsell), New Haven, Conn.

I claim the traversing frame, C, when supported by the truck wheels, D, running on the horizontal arm, B, of a crane, and moved by the pulley, E, through the spur wheels, G and H, and pinion, K, and rack, L, and bearing suspended the load, attached to the movable pulley, P, from pulleys, M and M', over which the chain, Q, passes, said several parts being arranged substantially as set forth.

58,341.—Cotton and Hay Press.—Samuel C. Goodsell and Dennis Frisbie (assignors to themselves and D. P. Calhoun), New Haven, Conn.

First, In cotton, hay and other like presses we claim the combination with a movable platen operated by levers as described, of a differential drum or shaft for imparting motion to the levers at a speed increased proportionate to the resistance, as herein shown and set forth.

Second, In a cotton, hay, or other like press, we claim the combination of the following elements: 1st, a movable platen; 2d, levers to operate the platen; 3d, a differential drum to operate the levers.

Third, In combination with the pawls for actuating the ratchet wheel we claim the oscillating or rocking trips for disengaging the pawl from the wheel under the arrangement shown and described, so as to be operated by the eccentrics upon which the said pawls are mounted.

Fourth, In combination with a stationary or inwardly yielding end plate, as described, we claim a door or doors mounted eccentrically upon hinges in such manner that they may be moved laterally to become engaged with or disengaged from the said end plate, substantially as herein shown and described.

58,342.—Lifting and Pressing Screws.—Richard H. Gray (assignor to himself and S. B. Abrams), Greenville, Alabama.

I claim the combination and arrangement of the cast-iron screw, B b, and cast hollow nut, D, provided with cup, G, with the two-part cast collar, H, provided with flanges, f and i, the whole being constructed and operating with friction balls, I, in the manner and for the purpose set forth.

58,343.—Recumbent Chair.—Daniel B. Hall (assignor to himself and M. G. Wiley and C. J. Cobb), Bucksport, Maine.

I claim the above described improved recumbent chair, consisting of the supporting frame, A, the movable back frame, B, the sacking, C, the leg rest, and the levers, arms and rollers, as explained, or their mechanical equivalents, constructed, arranged and applied substantially in manner and so as to operate together as herein before specified.

58,344.—India-rubber Necktie.—William H. Halsey (assignor to David N. Ropes), Hoboken, N. J.

I claim the arrangement of the band of metal, or its equivalent, in a necktie formed of hard india-rubber or similar material, under the external strip or band, passing around the bow and necktie, for confining together and holding the several parts of the necktie, and preserving the external band from fracture, substantially as above described.

58,345.—Shaft Coupling.—Moses Hawkins (assignor to R. M. Bassett, T. S. Bassett, and Moses Hawkins), Derby, Conn.

I claim the use, in combination with the surrounding sleeve and the slotted shaft ends, of a key, E, so shaped and the whole so arranged as to lock the shafts' ends longitudinally together, and key them both in the sleeve, substantially as set forth.

I also claim forming the journals of the shafting of the coupling sleeves, C, substantially as hereinbefore described.

58,346.—Forge Furnace.—Bennet Hotchkiss, New Haven, Conn., and Henry Shattuck, Hamden, Conn, assignors to Bennet Hotchkiss.

We claim, First, Combining a forge, A, with a reverberatory furnace, C, in the manner substantially as described for the purpose specified.

Second, Applying a current of air, whether set in motion by an artificial blast or by the chimney draught, to cool the furnace doors and to furnish a draught to the fire, in the manner substantially as described.

Third, The use of an air blast to prevent the flames and gases from belching from the furnace when the door is opened, arranged and applied substantially as described.

Fourth, The combination of a cistern, K', arranged as described, with the furnace, A, for the purpose of converting into vapor a body of water by the waste heat of the furnace, and applying such vapor to stimulate combustion, substantially as set forth.

Fifth, Combining with the escape flue, J', a space, L, for the circulation of air, and connecting the same with the furnace for aiding the draft of the fire, substantially as described.

58,347.—Ciphering Machine.—Samuel J. Kelso, Detroit, Mich., assignor to himself and James Edgar, New York City.

I claim, First, The face plate, A, with segmental slots, a a1 a2, and orifices, e e1 e2, in combination with the wheels, b b1 b2, and pointer, c, all constructed and operating in the manner herein shown and described.

Second, The jointed rods, h i, with noses, g, and teeth, k, in combination with the toothed wheels, b b1 b2, and pins, f, constructed and operating substantially as and for the purpose set forth.

Third, The disengaging slide, q, in combination with the carrying mechanism, constructed and operating substantially as and for the purpose described.

Fourth, The multiplying slide, D, with strips, u u, in combination with the adding mechanism, constructed and operating substantially as and for the purpose set forth.

58,348.—Corn Harvester.—George Manlove and J. P. Green (assignors to George Manlove), Chicago, Ill.

First, We claim the forked frame, K, in combination with the roller, R, yielding rollers, P Q, and cutters, S, substantially as described.

Second, And in combination with the above, we claim the endless belt, N, substantially as described.

Third, We claim the husking cylinder armed with teeth, as described, and bent rods, i i h h, in combination with the frame, K, cutter, S, and endless apron, f, all constructed and operating substantially in the manner and for the purpose set forth.

Fourth, And in combination with the above, we claim the partitioned box, V, substantially as described.

Fifth, We claim the frame, A, lever, L, standards, M N, forked frame, K, with its rollers, P Q R, cutters, S, and endless belt, f, in combination with the husking cylinder, p, rods, h h i i, and partitioned box, V, the whole being constructed and operated substantially in the manner and for the purpose set forth.

58,349.—Corn Harvester.—George Manlove and J. P. Green (assignors to George Manlove), Chicago, Ill.

We claim, First, The guard, H, in combination with the rods, M, pins, o o, for receiving the stalks, curved rods, I, and cutters, a, substantially as described.

Second, And in combination with the above we claim the endless apron, cutters, and reel, situated on the adjustable frame, L, the whole being constructed and operated substantially in the manner and for the purpose set forth.

Third, We claim the table, A', connected to the frame of the machine by a universal joint, and having rods, e e, attached to the said table, and rods, e' e', attached to the hinged piece, g, and cords or bands, f f, the whole being constructed and operated substantially in the manner and for the purpose set forth.

Fourth, We claim the guard, H, cutters, a, rods, M and I, and pins, o o, in combination with the endless conveyer, N, and table, A', constructed as described, the whole being operated substantially in the manner and for the purpose set forth.

58,350.—Snap Hook.—Alonzo McManus (assignor to North and Judd Manufacturing Company), New Britain, Conn.

I claim constructing the recess, a, and combining therewith the solid bridge, c, arranged transversely over the spring, B, in connection with the slot, b, substantially in the manner and for the purpose as herein described.

58,351.—Artificial Limb.—Joshua Monroe (assignor to himself and Jetna Gardiner), New York City.

First, The elastic side straps, a a, in combination with straps, d b, and with the limb, A, constructed and operating substantially as and for the purpose set forth.

Second, The arrangement of a tendon, C, made of rigid material, in combination with a knee joint of an artificial leg, constructed and operating as and for the purpose described.

Third, The button, o, and mortise, p, in combination with the ankle tendon, D, constructed and operating substantially as and for the purpose described.

Fourth, The toe plate, q, applied in combination with the toe joint, substantially as and for the purpose set forth.

58,352.—Pad Hoop.—George Ross and Michael White (assignors to themselves and Charles W. Daniels), Buffalo, N. Y.

We claim forming a pad hook for harness in two parts or jointed sections, a b, the one rigidly attached to the tree, and the other movable on its pivot axis, in combination with a spring, d, and bearing, e, or its equivalent, constructed and arranged substantially as herein set forth.

58,353.—Shifting Cutter Thill.—H. L. Taylor (assignor to himself and Charles W. Daniels), Fredonia, N. Y.

I claim the combination of the rod, E, double-acting spring, I, or its equivalent, and eye-bolts, a b c and d e f, arranged and operating substantially in the manner and for the purpose herein set forth.

58,354.—Lubricating Cup for Steam-engine.—Maurice Vergnes (assignor to himself and Alphonse Perrine), New York City.

I claim, First, The arrangement of the movable oil vessel or reservoir, E, in combination with the cup, B, and oil passages, a and b, and their connections with such reservoir, E, the whole arranged and operating substantially as and for the purposes set forth.

Second, The arrangement of the openings, g g, in the fixed plate, c, in combination with the openings, 3 3, in the oil vessel, E, substantially as and for the purposes set forth.

58,355.—Horse Shoe.—Cassius M. Werner (assignor to himself and Edwin A. Bigelow), Rockford, Ill.

I claim, First, The combination of the band, F, with the shoe, A, constructed, arranged, and operating substantially in the manner described for the purpose set forth.

Second, The combination of the ribs, J, with the band, F, arranged and operating substantially in the manner and for the purpose set forth.

58,356.—Faucet.—Eugene Candler, London, Eng.

I claim the tap, as above described, having the body, p, plug, f, air inlet, e, valve, i, and valve seat, g, all arranged substantially as and for the purpose set forth.

58,357.—Card Case.—F. A. Lamontagne, Montreal, Canada.

I claim, First, The spring slide, o, provided with beveled teeth, so hung in the race, m, and combined with the spring, e, as to press and hold the card on its forward motion, and slide back over the cards without contact, substantially as described for the purpose specified.

Second, The spring, e, and pin, f, in the forward part of the box, A, guiding the card in its discharge, and preventing more than one card from being forced out at the same time, substantially as described, for the purpose specified.

Third, The elliptic springs, a a, slotted plate, b, having lugs, c, spring, e, and pin, f, slotted plate, i, and toothed spring slide, o, arranged in combination with the slotted lid, B, and case, A, provided with guide and holding laps, s, and grooves, d, operating substantially as described for the purpose specified.

58,358.—Method of Scouring Wool.—Gustave Michelet, Brussels, Belgium.

I claim the combined process for extracting from the wool itself all the elements necessary for cleaning, scouring or removing the soil from the same, and of obtaining by the same operation liquids free from foreign matters which would decrease the value of the products derived from them, and sufficiently concentrated for forming these sub-products with advantage, substantially as above described.

58,359.—Lifting Cylinder of Wool-washing Machines.—John Petrie, Rochdale, England, and James Teal, Towerby, England.

We claim the grooved disk, g, right angular arms, i, and levers, k, in combination with the crank, f, shaft, c, prongs, m, and cylinder, a, constructed and operating substantially as and for the purpose described.

58,360.—Pump.—Louis Drescher (assignor to Gustavus Meyer), Matanzas, Cuba.

We claim the cup-shaped pistons, B, with packing disks, f, in combination with spring disks, g, applied and operating substantially as and for the purpose set forth.

58,361.—Lamp.—Gustav Stobwasser, Berlin, Prussia, assignor to E. Douglas, Son & Company, New York City.

We claim the pin, i, attached to the lower cylindrical part, e, of the fountain, and having a cylinder, f, fitted loosely on e, and provided with a vertical rib, a*, having a notch, b*, made in it, and a horizontal slot, c*, in combination with the vertical groove or recess, b, and the horizontal groove, c, in the cylinder, G, which is secured in the socket, F, the cylindrical part, e, of the fountain, and the cylinder, f, having holes, g h, made in them, and all arranged to operate substantially in the manner as and for the purpose set forth.

REISSUES.

2,363.—Machine for Kneading Dough.—George R. Baker, St. Louis, Mo. Patented Oct. 10, 1865.

First, I claim the combination of the dough-kneading chamber, B B', and the eccentrically rotating wheel, C, whether said wheel rotates on a fixed and rigid or a flexible and yielding axis of rotation, as and for the purposes described.

Second, I also claim the combination of the shaft, a, with its pivoted arm, a', the slot, e, and spring, f, arranged and operating substantially as and for the purpose described.

2,364.—Washing Compound.—Richard W. Chappell, Chicago, Ill. Patented Sept. 19, 1865.

I claim a washing compound composed of unslacked lime, sal soda, borax, salt of tartar, and ammonia, in the proportions, substantially as herein specified and described.

2,365.—Manufacture of Paper.—R. L. Delisser, New York City, assignee of Aloyse Chevalier Auer de Welsbach, Vienna, Austria. Patented April 21, 1863. Antedated Nov. 23, 1861.

I claim my discovery or invention, and as a means of obtaining from the husks, leaves, and stalks of Indian corn fibers in a suitable condition to be spun into thread is the treatment of such material in a heated alkaline solution, substantially as described, to dissolve and separate the proximates of the plant from the fibrous, in combination with the after process of hatcheling, or the equivalent thereof, to get the fibrous in a suitable condition for spinning, substantially as described.

2,366.—Machine for Gumming and Printing Envelopes.—Henry C. Berlin and George H. Jones (assignees of Thomas V. Maymouth), New York City. Patented June 12, 1866.

First, We claim the operation of the hinged table, B, in combination with the gummer, D, substantially in the manner and for the purpose described.

Second, We claim the operation of the movable separator, G in combination with the gummer, D, substanially in the manner and for the purpose described.

Third, We claim imparting an intermittent motion to a suitable mechanism combined with the endless apron, H, and the reciprocating carrier, F, and gummer, D, operating in the manner and for the purpose described.

Fourth, We claim the operation of the finger, I', and rollers, K', in combination with the apron, H, and carrier, F, substantially in the manner and for the purpose described.

Fifth, We claim putting on the gum on the seal flap of an envelope blank by the picker or gummer so that the envelope is raised or held stationary while the balance of the pile is removed, substantially in the manner and for the purpose described.

DESIGNS.

2,428 and 2,429.—Picture Frame.—John H. Bellamy (assignor to David A. Titcomb), Charlestown, Mass. Two patents.

2,430.—Center Piece.—Henry Berger, New York City.

2,431.—Clock-case Front.—L. F. Carter and W. W. Carter, Bristol, Ct.

2,432.—Pulley Hall Lamp.—Francis T. Fracker (assignor to The Tucker Manufacturing Company), Boston, Mass.

2,433.—Blacking-brush Handle.—William A. Greene, Troy, N. Y.

2,434.—Canceling Stamp.—B. B. Hill, Springfield, Mass.

2,435 and 2,436.—Stove Plate.—George Himrod and Charles G. Moulton (assignor to George Himrod), Chicago, Ill. Two patents.

2,437.—Cook Stove.—James R. Hyde (assignor to A. Sheldon and Chauncey O. Greene), Troy, N. Y.

2,438 and 2,439.—Center Piece.—Samuel Kellett, San Francisco, Cal. Two patents.

2,440.—Drinking Tumbler.—John Matthews, Jr. New York City.

2,441 to 2,444.—Floor Oil-cloth Pattern.—C. S. Meyer, Bergen, N. J., assignor to Edward C. Sampson, New York City. Four patents.

2,445.—Burial Case.—Levi Moses, Janesville, Wis.

2,446 to 2,455.—Carpet Pattern.—Elmer J. Ney (assignor to Lowell Manufacturing Company), Lowell, Mass. Ten patents.

2,456.—Trade Mark.—Edward F. Pugert, Chicago, Ill.

2,457.—Child's Long Comb.—Leonce Picot, Hoboken, N. J., assignor to Rubber Clothing Company, N. Y.

2,458.—Snap Hook.—John Protz, Easton, Pa.

2,459 to 2,466.—Candy Figure.—Leonhard Schulze (assignor to Thomas Mills and Bro). Philadelphia, Pa. Eight patents.

2,467.—Stove Ornament.—Samuel S. Utter, New York City.

2,468.—Plates of a Hall Stove.—Jasper Van Wormer, Albany, N. Y.

2,469.—Floor Oil-cloth Pattern.—John Y. Webster, New York City, assignor to Edward Harvey, Brooklyn, N. Y.

2,470.—Fork or Spoon Handle.—William B Durgin, Concord, N. H.

2,471.—Label.—A. Miles, Winona, Minn.

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MOST VALUABLE MACHINE for all kinds of irregular and straight work in wood, called the Variety Molding and Planing Machine, indispensable to competition in all branches of woodworking. Our improved guards make it safe to operate. Combination collars for cutters, saving 100 per cent, and feed table and connection, for waved moldings and planing, place it above all others. Evidence of the superiority of these machines is the large numbers we sell, in the different states, and parties laying aside others and purchasing ours, for cutting and shaping irregular forms, sash work, etc.
We hear there are manufacturers infringing on some one or more of our nine patents in this machine. We caution the public from purchasing such.
All communications must be addressed "Combination Molding and Planing Machine Company, cor. 1st ave. and 24th-st., New York, where all our machines are manufactured, tested before delivery, and warranted.
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Articles for Competition and Premium must be deposited before Thursday night, Sept 27th.
For particulars, address the undersigned, or Joseph Gibson, Actuary.
JNO. F. MEREDITH,
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Patent Rolled Plate Glass for Skylights for sale very low by
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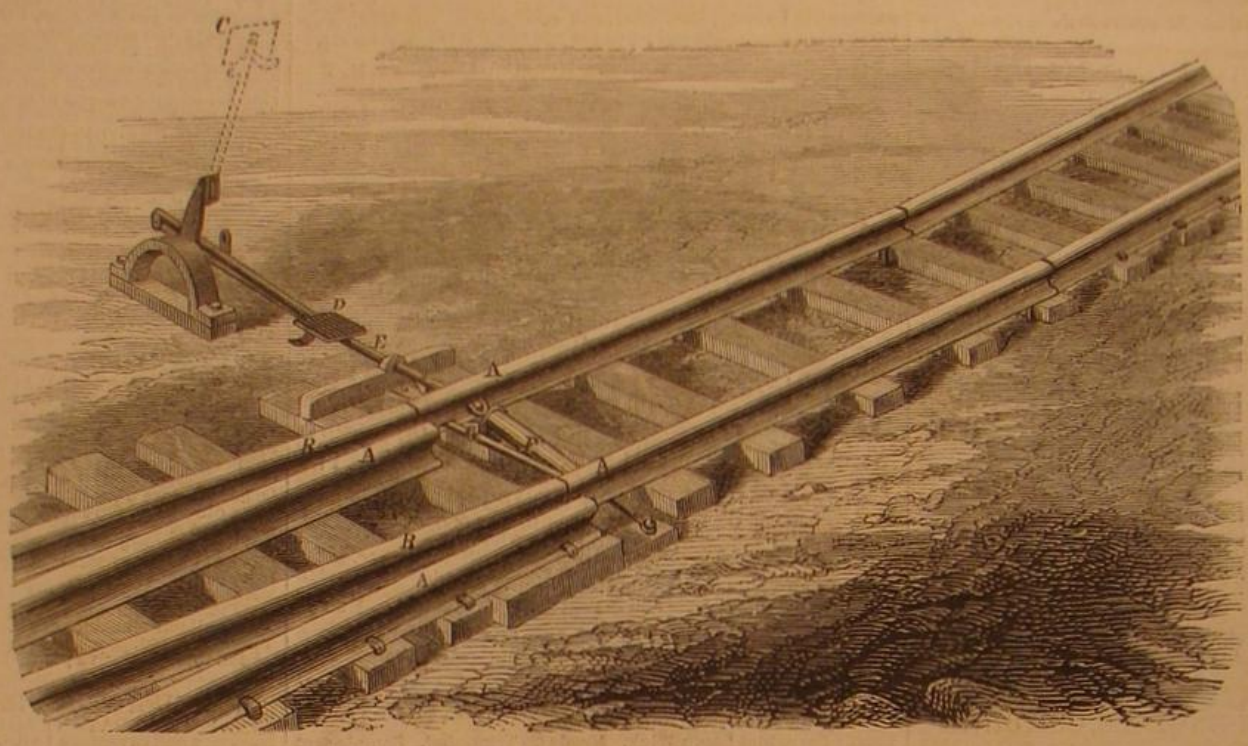
GOVERNORS.

THE GILLESPIE GOVERNOR COMPANY, of Boston, are now manufacturing
GILLESPIE'S PATENT HYDRAULIC GOVERNOR,
for Water Wheels of every description.
After a test of five years' service, this Governor has proved itself far superior to any other hitherto in use, practically accomplishing for Water Power the same as a Cut-off for Steam Power.
Every machine guaranteed to give entire satisfaction to the purchaser, or no sale. Office 13 Kilby street, Boston, Mass.
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For sale in New York by J. E. STEVENSON, 40 Dey street, and GEO. TALCOTT, 69 Liberty street.

☞ A few of the many testimonials which the Company has received, in regard to the operation of their Governors, were published May 19, 1866, in No. 21 of this paper, to which reference is made. 26 13

Self-adjusting Railroad Switch.

The carelessness or inattention of switchmen has been one among the causes of some of the most deplorable accidents on our railroads. Wherever a siding occurs it is not in so constant use as the main line, and is generally designed for occasional and temporary purposes. Consequently, if a switch keeps the main line intact, except at the time while being operated, it subserves the usual purposes of a railroad switch. The improvement illustrated in the engraving is intended to firmly lock the line, and to bring the rails back to their normal position as soon as the force which removed them is withdrawn.



ZINN'S SELF-ADJUSTING RAILROAD SWITCH.

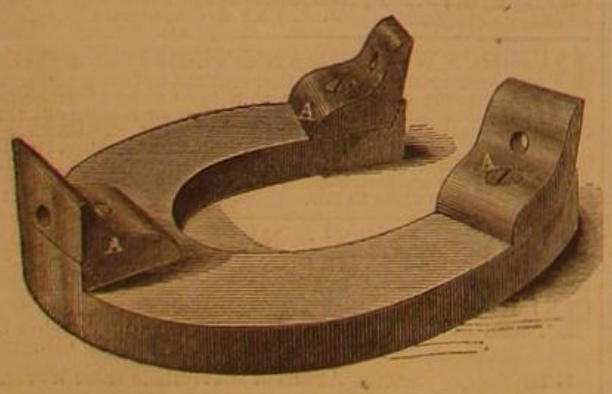
Let A represent the rails of the main line, and B the turnout. The switchman, to connect the switch with the siding, depresses the lever from its position at C, and brings it to a horizontal position, retaining it there by his weight upon the seat, D.

To assist him in holding it, a lug on D can be made to catch on the bar, E. When the lever is released, a strong spiral spring in the cylinder, F, brings the rails back to position, where they are held securely by the catch-spring, the end of which is seen at G. This spring has a projection which rises above the base of the rail and secures it firmly, so that no accident can displace the track. The first movement of the lever from its upright position depresses this catch-spring and permits the shifting of the track. The device appears to be a very efficient and desirable improvement.

It was patented March 13, 1866, by John W. Zinn, Caldwell, N. J., to whom apply for further particulars.

LITZENBERG'S ADJUSTABLE SHOE CALKS.

The engraving represents a new method of applying winter calks to horseshoes. Its object and mode of application can be readily understood by the engraving. The shoe itself is forged, very like the ordinary summer shoe, except that at the toe and heel are left slight projections, against which the adjustable calks abut. The improvement is intended



to admit of the sharpening and adjustment of the calks without the aid of the smith. They are secured by a screw, A, passing through the shank of the calk and tapped into the shoe.

It was patented Aug. 21, 1866, through the Scientific American Patent Agency, by William Litzenberg, to whom applications for rights and for further particulars should be addressed, at Macomb, Ill.

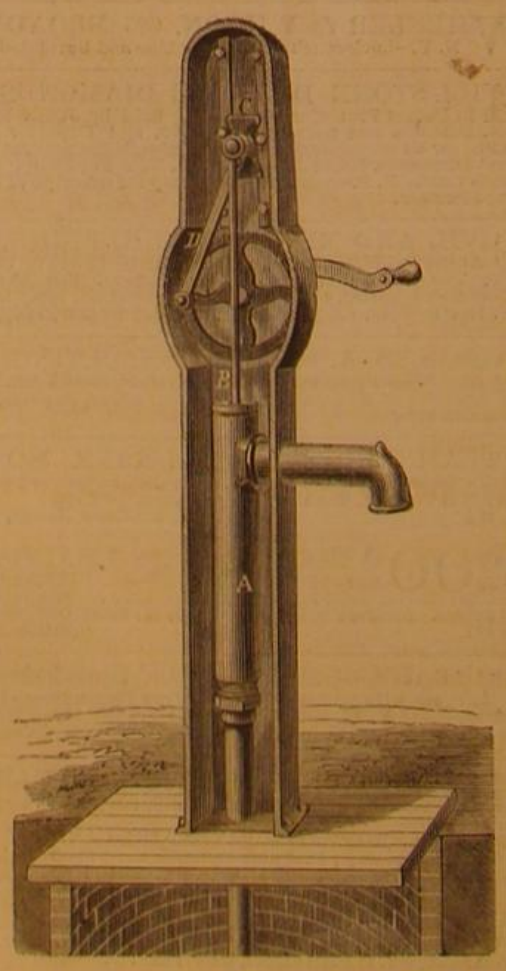
Railroad in the Alps.

Dr. Prime, over the signiture of "Irenius," is writing to the New York *Observer* very interesting letters from the continent. In his last he gives the following account of a railroad up the Alps to convey ice down to the European continental cities:—

"Penetrating secluded regions where frost has been king since the world began, the rail has made even the everlasting glaciers, these frozen cataracts, articles of merchandise. As the quarries in the mountains are worked by the art and spirit of man, so the icebergs that here grow from age to age, and scarcely seem to melt at all, are cut into blocks and transported by rail to Paris. The glacier of Griadelwald is drank in brandy punches at the Grand Hotel and the Louvre. To get the ice, these mighty frozen seas are excavated in galleries and chambers and magnificent saloons. The depths of snow on the surface exclude the sunbeams, but calcium lights shed a brilliant luster reflected as from a thousand mirrors of glass, and in small apartments fitted up for the purpose, the furniture of a well appointed parlor, sofas, chairs, and cushions, invite to cold but not inhospitable repose. When the Mer de Glace is taken by rail down into Italy and thence by ship to the East Indies, ice will be reasonably cheap in Calcutta. And this will be more readily done than to tow an iceberg from the North Pole."

ANDREWS'S LIFTING AND FORCE PUMP.

Solomon said "to the making of books there is no end." The statement is equally applicable to that



household implement, so extensively used, the pump. Still, although there may sometimes be failure of improvement where alterations are made, yet the pump has been improved; it could not well be simplified. The engraving of the pump herewith presented possesses qualities which, it is claimed, are not shared, combined together, by any other in the market. As will be seen, a rotary motion is easily transformed into a direct-acting reciprocating movement, and the pump can be used as a common lifting or as a force pump.

The pump itself is inclosed in a cast-iron case, one side left off in the figure, the case inclosing the working barrel, wheel, arm, and slide. A pipe leads down the well, and a nozzle or discharge pipe projects from the case. The common valves are contained in the barrel, A, and are operated by the rod, B, which is connected to the cross head, C, and receives motion from the arm, D.

It will be seen that all the motions affecting the working parts of the pump are direct, and that any part can be easily repaired when worn. It will also be noticed that there can be but little wear to these parts, and that, therefore, the pump may be kept in order for an indefinite time. It seems to be a very simple and effectual device for raising water.

Patented on May 8, 1866, by R. H. Andrews, whom address, Box 358, Washington, D. C.

POLISHING SLATE, brought from Bohemia, has been computed to contain in every cubic inch forty-one thousand millions of animalcules. Since a cubic inch of this slate weighs 220 grains, in every single grain there are 187 millions of skeletons, and one of them would therefore weigh about $\frac{1}{187000000}$ of a grain.

MECHANICS

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FROM THE STEAM PRESS OF JOHN A. GRAY & GREEN.

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Sanitary House Warming.

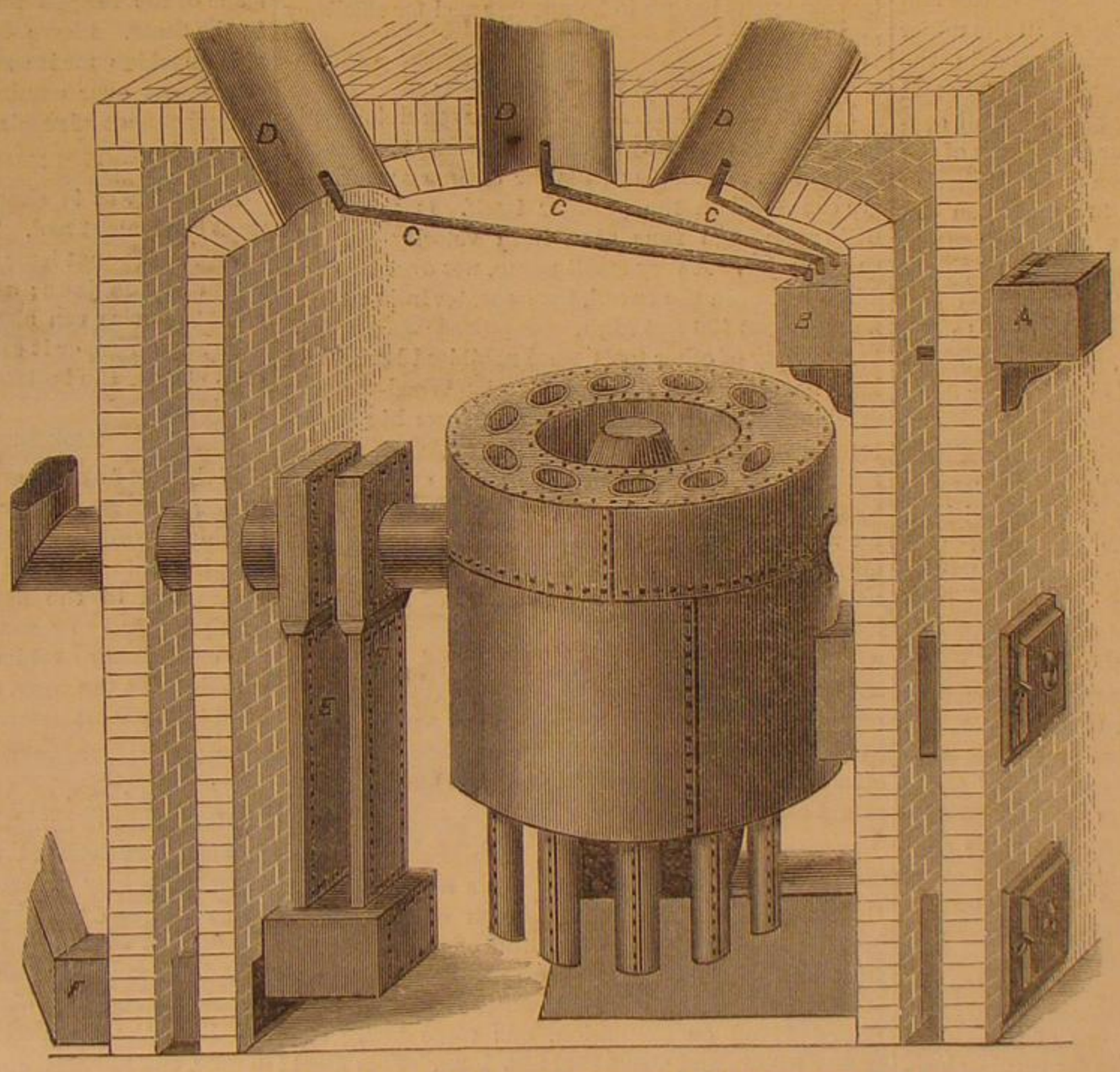
The quality of the air we breathe, and its influence upon health, are the first in importance of all the sanitary considerations to which the attention of mankind can be given. This will not be disputed when it is remembered that no man can live more than three minutes if wholly deprived of air, and that to maintain the blood in perfect purity, every person requires an average of eighteen pints every minute, which is equal to about sixty hogsheads full every twenty-four hours. If the air inhaled contains any impurity, or is in any degree deprived of its natural properties, an immediate evil effect is produced, and to no single circumstance is the great number of diseases by which mankind is afflicted, or the brevity of human life, especially of infants, more directly attributable, than to impurity of air.

One of the most active sources of foul air in modern dwellings is the method employed to obtain a proper temperature in cold weather. Very many of what are called modern improvements in the art of warming dwellings are believed to be prolific sources of sickness. The ordinary hot-air furnace is regarded by the best sanitarians as among the most frequent and potential sources of ill health, because of the impairment of the chemical qualities, and the deprivation of the natural moisture from the air as it passes through the furnace.

The engraving presented herewith represents the Whittingham Moist Warm air Furnace, which is constructed so as to obviate the objections incident to the use of the ordinary hot-air furnace. The heating surfaces in this furnace consist of heavy wrought-iron tubes, placed perpendicularly in a circle extending around and below the fire-pot, in such a manner that the heat from the surface of the burning coal reaches their exterior, and the air passing through the tubes receives caloric only from contact with their interior. This circle of tubes is inclosed in a cylinder, in the top of which is placed an inverted cone, all of which are made of heavy wrought iron.

A radiator, E, is also constructed for realizing the heat that would otherwise be lost in the chimney flue, so that about twenty thousand square inches of heating surface are obtained. Being constructed of wrought instead of cast iron, it is capable of being made perfectly tight without the use of packing or cement, and the risk of leakage from fracture, by expansion and contraction, or the mingling of the gases, from combustion, with the air in the chamber, is entirely avoided. Another desirable feature claimed by the inventor of this furnace, is the position of the water evaporator, B, placed in the upper part of the air chamber, and the vapor from it being conveyed by means of tubes, C, directly into the distributing air pipes, D. This evaporator is supplied with water from a reservoir, A, upon the outside.

This furnace, with its extensive heating surface, is able to warm a large volume of air to a temperate degree, instead of being compelled to heat a small volume to a high degree; and the water evaporation is taken, by means of the tubes, directly where it is required to supply the atmosphere with the moisture lost in passing through the furnace, thus rendering the air mild and pleasant.



THE "WHITTINGHAM" MOIST WARM-AIR FURNACE.

Patented through the Scientific American Patent Agency, by Harry Whittingham, and manufactured by Wm. H. Church & Co., 108 and 110 East 29th street, New York city, of whom further particulars may be obtained. They are also ready to dispose of rights for counties or States, and will furnish iron patterns complete.

THE USE OF TIME AND USELESSNESS OF HURRY.

Time was given man to use and not waste. It is for rational use and not foolish abuse. And at times it appears to the reflecting mind that we are mistaken in our endeavors to crowd into half an hour what should fill half a day. We do not refer to our habits of hurried eating, so frequently the subject of critics and lectures, but to the general hurry and haste that characterize every movement of our people. In traveling we give preference to the fastest lines, this being the grand recommendation of one competing line over another. The annihilation of space and time is a modern boast, as though the feat was really meritorious.

It is to be questioned whether this idea is a correct one. Human life is more valuable than a few hours or days, yet we risk life and limb in patronizing those conveyances which run the longest possible distances in the shortest possible time. The employés of railroad and steamboat companies have received the title of "baggage smashers," for no reason except that the rules of the companies and the exacting demands of the public will not allow them to handle baggage, as Tom Hood advised the management of the body of the despairing suicide:—

"Take her up tenderly
Handle with care."

It is a public demand that every thing shall be done in the shortest possible time, but it is a wasteful and often suicidal demand. We do not "live out half our days." If we exist the allotted space of man's life we do not live. We are driven by this spirit of hurry as relentlesslyas the poor souls in Dante's Inferno by the tormenting devils of Hades.

But laying aside all considerations affecting the general welfare of the race, the element of hurry—not judicious employment of time—in the building of engineering works and machinery, is really injurious. Men and concerns are intrusted with the building and completion of a work of magnitude, which is to remain for the use of future generations and as a monument of our skill and workmanship—and, instead of priding themselves on a job well done, they boast, rather, of one quickly performed. We have bridges that break down, ships that founder, engines that fail, boilers that explode—not to speak of theories that will not stand the test of practical use—simply because we conceive time to be of more value than any thing else. It is all wrong. The engineer had better take twelve months to test and perfect his plans, and then plenty of time to build his structure, than to make it an experiment, the offspring of crude ideas. The mechanic would do better to study the parts of his machine, and at last embody them in a perfect and practical whole, than to be satisfied with a hurried completion of a work that may ruin his reputation.

If "large bodies move slowly," works of use and for endurance should be carefully and slowly constructed. A crude idea may be worthless, and it may contain the germ of a valuable improvement, but neither of these facts can often be ascertained without patient investigations and repeated experiments. Hurry is the curse of our mechanics. It prevents them often from successfully competing with the studious German, the patient Swiss, the persistent Frenchman, and the obstinate Englishman. We jump at conclusions, and insist that even if "Rome was not built in a day," we can erect a greater than Rome in an hour.

We need to use care, patience, *time*, if we ever intend to succeed as mechanicians. Time employed in the elucidation of an idea, the demonstration of a theory, the test of an improvement, or the reliability of an invention is never wasted. The fruit may be long ripening, but, when ready to pluck, it will not prove defective.

[Special Correspondence of the Scientific American.]

THE WORCESTER MECHANICS' FAIR.

WORCESTER, Oct. 1, 1866.

When I was a boy the "schoolmarm" used to impress upon my memory the necessity of fixing permanently the natural boundaries of the States. The lakes, rivers, and States that were thus forced upon my attention have remained ever since objects of affection.

If I were asked to define the position of Worcester I should say that it was bounded on the north by engine lathes, on the east by planers, on the south by boilers, bolt cutters, and steam engines, and on the west by all sorts of machinery for various purposes. Certainly a finer show of tools than those in the Mechanics' Fair just closed here would be hard to find. I knew very well that a good many machinists' tools were constructed in Worcester, but the variety, as well as general excellence, surpassed my expectations.

The men who make the tools have associated themselves together and built one of the finest edifices in the State. It is a large and massive brick building containing two splendid halls for public amusement, beside various smaller offices and rooms occupied by other associations. In the upper hall they have one of the largest organs in the country, equal to that in Boston in point of power and tone, and, beside this, the reading room is well supplied with periodicals, so that after the labors of the day are over in the shops relaxation and information are both to be had. From these few facts you can see that Worcester mechanics are not content to plod on in the dull and well-trodden path of commonplace, but strive to elevate themselves and their profession. The result is easily seen in the quality of the work done by them. Without further preaching, I shall tell you what I saw in a few days' sojourn.

The arrangement of the material was excellent, and without that "higgledy-piggledy" appearance which characterizes too many industrial expositions. The heavy machinery was in the basement. Carriages occupied the hall of the main entrance, while above there were looms, steam engines of a small class, leather-cutting machines, and materials generally used in the arts. In the extreme upper room of the building were the finer wares, such as sewing machines, textile fabrics, clothing, etc., etc. As a consequence you knew where you were, so to speak. If you wished to examine one class of goods you could do so without running up and down a dozen pairs of stairs. Every thing could be seen systematically and thoroughly; this, to persons who go to such exhibitions to be posted on the latest inventions and improvements, is a thing of no small importance.

IN THE BASEMENT.

The first thing that strikes the eye of the visitor on the lower floor is the large lathe for turning locomotive driving wheels. This machine is unusually fine in point of finish, while its proportions are massive. It weighs about ten tuns, and in point of convenience for shifting the carriage, general accessibility, for changing the speeds of the cone, is well constructed. The backhead and spindle are unusually strong, and taken all together it is a fine machine. It was built for a railroad company in New Jersey, and is to be sent away at the close of the Fair. Beside this, Mr. Pond turns out a number of other tools of all classes. His engine lathes are in great demand; and I was told he generally made about six every month.

THE NEW YORK STEAM-ENGINE WORKS.

Directly back of Mr. Pond is a fine boring mill designed by Mr. A. B. Couch, who knows a good tool when he sees it, and, what is more, knows how to make one. This boring mill is also at work, and has a very long bed raised by screws under each end. The frame that carries the bush which the end of the boring bar works in is unusually strong, and is not fastened to the table the work is on, but entirely independent of it, being capable of moving close to the job so as to make the bar as short and stiff as possible.

A small shaping machine was also shown by this Company which is universally admired by machinists This little machine stands on a column, the body of which holds the tools. It is not only neat looking but as solid as a rock, and has the feed so connected that the tool is advanced when about to return. It occupies but very little room and can take a good stout cut. There are also lathes and planers on exhibition by the Works which evince not only taste, but a knowledge of mechanical principles in regard to the proper distribution of the materials.

BELLOWS & WHITCOMB'S TOOLS.

In one corner Messrs. Bellows & Whitcomb have a twenty-five horse engine at work furnishing power for the machinery. There is nothing peculiar in this engine as regards the design, but it is well made and strong. The same firm also show engine lathes and portable engines which are useful and convenient machines.

KNOWLES'S STEAM PUMP.

Mr. L. A. Knowles, whose factory is at Warren, Mass., makes a fine show with his pumps. These are in all respects first-class machines, and the way they force the water is a caution. These pumps have all ground joints on the face, with steel rods and the best materials generally, and are certified by competent judges to be unsurpassed for efficiency and economy.

HENDERSON'S STEAM PUMP.

Horace McMurtree & Co., of Boston, exhibit a little pump which is plainly got up, but works to a charm. The valves are rubber balls for ordinary work, and are contained in the plunger itself. It takes but little room, and runs at a high velocity without shock or jar. A very small pump, not over two and a-half inches in the barrel, threw water from an inch nozzle about 100 feet high.

A variety of other tools were exhibited here, but I have not space to enumerate all. Wood-working machines were in operation which were highly esteemed by the visitors. J. A. Fay & Co., of Cincinnati, were on hand with their scroll saw and did some fine work with it. A carving machine or tool for working out moldings on irregular forms was also shown. This was a simple machine having nothing but two cutters on the end of a spindle; by a simple arrangement the cutters were reversed so that right and left hand work could be done to accommodate the grain of the wood. A slate-pencil machine was in operation which made a great many at once. The slate was run under a row of cutters on a mandrel revolving at high speed, and came out at the other side completely finished.

WASHBURNE HALL.

In Washburne Hall there were a great many things well worthy the attention of mechanics. Not the least were some beautiful edge tools made from black-diamond steel of Park Brothers, Pittsburgh, Pa. The firm had quantities of this celebrated brand on exhibition, one piece being six inches square and about four feet long. This steel bears a very high reputation and is warranted to be uniform in quality. Just complaint on this score has been made against American steel, and we hope the reproach cannot be uttered again.

WASHBURNE'S STEAM ENGINE.

The whole of the machinery in the hall is driven by Washburne's steam engine. This is another novelty in steam motors, and is without question a most ingenious and compact machine. When I say that it is no larger than a common ice cream freezer, that it has two cylinders, 3 7-10ths inches bore by 1 85-100ths inches stroke, that it runs about 370 revolutions per minute, and drove all the machinery in the hall without once flagging or halting, your readers can form some estimate of its power. The machinery is as follows: one loom, one carding machine, one twenty-shuttle tape loom, one cloth loom, one spinner, twenty spindles, envelope machine, six fine wire blocks, three hoop-skirt covering machines, one eight-foot planer, one 16-inch engine lathe, one 15-inch engine lathe, one card and two small printing presses. These machines were all new and consequently took much more power to run than old ones, but with all that the little steam engine marched off with it easily and seemed to want more.

The simplicity of this engine commends itself to all. It is capable of being run at a very high velocity having no complicated arrangement of valves and pistons. I cannot describe its peculiarity clearly, and shall not attempt it. It is probable that your readers will have an opportunity of seeing an illustration before long.

SHAW & JUSTICE'S HAMMER.

A loud rapping attracted our attention from this engine, and on investigating the cause we found a crowd assembled round a small forge hammer. This was a new invention lately got up in Philadelphia, and manufactured by Shaw & Justice. I can describe it well enough, for there is not much to do in that way. It is simply a square block of steel suspended from a steel bow by a leather belt, much the same as if an arrow was hung from a boy's bow. This steel block moving in guides is driven at a high speed and by compressing the spring at each stroke gives a very powerful blow. The hammer was shown by Mr. Egbert P. Watson, of your city, who explained and illustrated its action. It was highly approved by all the leading manufacturers, who thought its simplicity and efficiency were very marked. I was told that many of them were now in use and that they are shortly to be introduced in some of the largest manufacturing establishments in the State. I have been thus prolix concerning this machine for it seemed to me to be a great improvement over cumbrous trip hammers that are constantly out of repair.

HOARE'S VISE.

A novel vise is shown by Mr. Hoare, which is a most convenient tool. The jaws are offset one side the screw, so that long work can be held the whole width of the jaws; a handy thing for gunsmiths, etc. The vise can also be swung round, so as to take any angle, or it can be removed wholly and put on a planer, the bottom being faced off square with the jaws.

SHOE-PEGGING MACHINE.

If there is any one among your readers who likes to peg boots for fun, I can tell him that there was a machine exhibited at this fair which knocks hand pegging into a cocked hat. By means of a small device held in the hand and turned by a crank a man can peg a row round the sole of a boot while you are looking at him. I watched this exhibitor grinding out the pegs, and I can assert that he did a good job in short order.

MUSICAL INSTRUMENT.

Mr. Isaac Fiske, of Worcester, Mass., exhibits a beautiful case of cornets, which embody many improvements calculated to enhance the tone of the instrument. By a new and peculiar process Mr. Fiske attaches the "bell" to the other parts of the instrument so that the vibration is unchecked, and that dull, muffled sound, frequently met with in others, is entirely obviated. Mr. Fiske has also simplified the manufacture of the cornet in a great degree, and has got up many tools which not only expedite the processes but enhance the strength for a given weight of material. His musical instruments are widely known and esteemed.

RULE FOR FINDING THE SIZES OF GEARS.

Mr. Charles B. Long, of Worcester, Mass., exhibits a case of boxwood rules handsomely got up for the purpose of finding the size of any gear with any desired number of teeth to the inch. He thus brings the somewhat complicated process of finding size within the comprehension of persons of limited education. The rule is marked off in vertical columns with the diametral pitch from 10 to the inch to 16. These columns also contain any number of teeth from 10 to 321, so that by referring to them any one can find the exact size of the gear in inches, the dimensions being laid down the same as a common rule; a two foot rule contains over 2,000 gears. Mechanics will find this a capital instrument.

STOVES.

The Earl Stove Company exhibited some fine wares of their make, among which was a new and efficient heater for rooms. It was designed on well-known principles so long in use in steam boilers, namely, admitting air in fine streams directly over the fire, thus consuming the products of combustion which ordinarily escape. In the hall were some fine soap-stone stoves, highly polished, which made a fine show.

I cannot begin to enumerate all the novelties shown, and may as well stop here as anywhere. The fair is one of the finest held here in a long time, and far surpasses those curious exhibitions given by that old fossilized institution in your city, the venerable American Institute. I believe the judges of this fair have no interest in the machines, and have no idea of awarding themselves premiums.

HAMMER AND PEN.

THE TARGET EXPERIMENTS AT FORTRESS MONROE.

The following account of the target firing with fifteen-inch smooth-bore and twelve-inch rifled Rodmans on the 21st ult., is from one whose position and official capacity enabled him to ascertain all the facts in relation to the trial. It will be seen that his report differs essentially in several important particulars from that published in the papers generally:—

FORTRESS MONROE, VA., Sept. 24.

On Friday, 21st inst., the firing at the great target of iron plates and massive granite backing, took place here. Frames covered with two sets of wires were arranged in front of each gun in line of fire and fifty feet apart. The wires communicated with two sets of galvanic batteries, one for each set of wires; these, in turn, being attached to two recording machines, known as the "Benton Ballistic" and "Schultz Chronoscope," and which measure the velocity of whatever projectile may be used. On firing, the shot breaks the first set of wires, and each machine records the fact. When the second set are broken the record is again made, and the interval of time taken to pass from frame to frame—fifty feet—and the rate per second, are easily obtained.

Again, when the charge is prepared, a strongly-constructed cylinder of iron, solid to all appearance, is tied to the bottom of the cartridge. It is known as the "Rodman Pressure Plug." It consists of a cylinder, nicely fitted with a piston, terminating with a cutting edge, like a tapering wedge, and rests on a thick copper disk. On the shock caused by the explosion of the charge, the copper is cut crosswise and the depth and length is proportional to the strength of powder. The precise and relative pressure of the gunpowder and velocity of projectile are of great importance in gunnery.

The target represented the section of a casemate, the like of which for strength is not to be found in the United States.

Two 4-inch iron plates were secured edge to edge and bolted to the granite, while the lower plate had six inches of sand backing between the plate and granite wall. The structure was about 26 feet high, 7 feet 9 inches thick behind the plates, with a weight on the top of 200,000 lbs. of old guns etc., to increase the inertia. The whole represented a wall 30 feet high. Many of the stone were from 1,000 to 2,000 lbs. in weight. The mass of masonry was well secured with cement, iron "dowels" and "toggles." The plates weighed each about eighteen thousand pounds.

At 11 o'clock A. M., the 15-inch gun was prepared for action. Every officer was at his post. A cartridge of 55 lbs. of mammoth powder was placed in the gun and rammed home; then followed a ponderous round shot, weighing 432 lbs. The gun was then sighted, when the warning cry was heard "flag up," "prime," "fire." In less than a second the target was struck, a flash of fire, a thin cloud of black smoke, and the air was filled with fragments of shot flying in all directions as if a shell had just burst at the target. Then came an exciting race. Fleet horses, vehicles, well loaded with living freight, and a hand car propelled by three stout negroes freighted with officers, etc., soon arrived at the point of interest. It was found that the shot had broken into many pieces; the plate and part of the shot were intensely hot; the fine dust of the fragments had probably taken fire. Its effect was an indentation in the upper plate of about 15 inches in diameter and three inches deep. At the rear of the target two granite blocks were broken and driven outward about 10 inches, and other seams were opened in their immediate vicinity. The pressure was found to be 17,000 lbs., and the initial velocity 1,155 feet per second.

A second shot was fired from the same gun, aimed at the lower plate, which was punched through, but the wall suffered less than in the first shot. It was found therefore, that the wall was saved at the expense of the plate.

The third shot was of a very different character. It was a 12-inch elongated projectile, 24 inches long, weight 620 lbs., solid, and known as the "Dyer Projectile," constructed on the expanding principle, and quite recently brought to a state of perfection by Mr. Thomas Taylor, of Washington Arsenal. The charge used, as before, was 55 lbs. The gun was that known as the "Union Gun," a 12-inch Rodman rifle. Eight of these shots were fired at the target, and four solid 15-inch shot. The scene that succeeded reminded one of the ruins of Fort Sumter. The 600-pounder 12-inch, moved with a velocity of about 1,100 feet per second; the flight was smooth and regular, and the shots were distinctly seen in flight. Their effect was tremendous. The granite was ground into dust, which filled the atmosphere; pieces of stone were seen flying toward the gun, a distance of 300 feet. Solid blocks of over 1,000 lbs. weight were sent reeling backward ten and fifteen feet—one piece of 200 lbs. weight being found thirty feet to the rear.

So ended the experiments.

ONE OF THE SMITH FAMILY.

The Atlantic Cable of 1865.

The grappling and raising of the cable of last year in 1,900 fathoms, or a little less than 2½ miles of water (instead of three miles, as has been so widely understood), affords, perhaps, an even more striking proof of the resources of telegraph engineering than the successful laying of this year's cable. There was, of course, no difficulty in finding the precise spot in mid ocean where the end of the broken cable lay. But it was a question whether the grapnel would drag steadily along the bottom at such a depth, or whether it would catch and jump successively from one point to another. It was not certain even that, with such a weight of grapnel wire out, it could be told when the cable was hooked, and it was a matter of the greatest doubt whether, even if once hooked, the cable could be hauled to the surface, supposing furthermore, that it was hooked within two or three miles of the broken end, so as to oppose but little friction in "coming home" along the bottom, as a cable laid with but little slack must have done to be lifted at all through two miles of water.

It is well understood that the course of the cable was first marked by buoys, and that the ship engaged in grappling—and there were four ships engaged in the task—first went according to the wind, three or four miles to the north or south, and then drifted broadside on across the course of the cable, with her grapnel dragging. To pay out 2,300 fathoms of grapnel wire took from one hour and twenty minutes to three hours, and the strain on the dynamometer in 1,900 fathoms of water was 7½ tuns, increasing to 8½ or 9 tuns, according to the motion of the ship. The cable itself weighed 14 cwt per nautical mile in water and a breaking strength of 7¾ tuns. When the steady strain on the grapnel line at the depth named exceeded 8 or 9 tuns, it was concluded that the cable was hooked, and this was generally found to be the case. Hauling in occupied five or six hours, the resistance occasionally reaching 10½ tuns. As the wire came in with the cable, the resistance due to the weight of the former lessened, and that of the cable itself increased. When at the surface, the strain on the dynamometer was from 7½ to 8 tuns, and the calculated strain on the cable was nearly up to its breaking weight. It was grappled ten times in all, and, besides being raised to considerable hights from the bottom, and then breaking or slipping off the grapnel, it was twice raised to the surface. The bottom of the ocean where the cable was raised is proved to be of ooze containing microscopic shells, and no accident can happen to the cable there unless it is purposely dragged for and broken, as it unquestionably may now be, by an evil-minded skipper having grappling gear of sufficient strength, or unless a wreck fell across it. It is now being confidently predicted by certain writers that both cables will soon be destroyed by icebergs. It is, of course, possible that they may, but the more the probabilities are examined the less they appear. Even if thus destroyed, however, in the iceberg track, which is only two hundred miles wide, the cable, being in shallow water there can easily raised and repaired.—*Engineering.*

Jungles on Fire.

The jungles of India are set on fire by the larger bamboos, as they are swayed by the wind, emitting fire from their hard glossy stems through the violence of their friction, and thus spreading destruction through adjacent mountain forests. These are so extensive that the fire continues to burn for many days together, and is as suddenly extinguished by mighty deluges of rain so common in mountainous countries where water pours from clouds resembling small catracts.

MISCELLANEOUS SUMMARY.

SOLDERING SOLUTION.—Mr. F. Oakley sends us the following recipe for a soldering fluid, which, he says he has used for many years, always with success:—

"Two ounces muriatic acid, in which as much zinc is dissolved as it will hold, to which add half an ounce sal ammoniac. Clean the metal well and the solder will run and adhere to any part of the metal to which the solution is applied. It will also solder brass and steel together."

DR. N. DYES, chief medical officer at Verdowa, has been experimenting with feeding of pigs on anthracite coal. The animals seemed to thrive so well under the treatment, that he has adopted this as an internal remedy to be used in all that class of diseases usually treated with coal tar externally.

AN official report shows that the French crops will this year fall short fully one-fourth of an average crop. In consequence, the commission and produce houses are making immense purchases of all kinds of corn and grain, and are anxiously looking for large arrivals from this country.

GOLD IN ALABAMA.—The Columbus, Ga., *Enquirer*, furnishes a communication from an "old miner," who says he has examined a mountain in Tallapoosa county, Ala., the rock of which he has tested, and which he considers the richest auriferous ore in the world.

THE telegraph in Switzerland is the property of the State. The charge is uniformly one franc for twenty-five words, or a little over one cent per word, irrespective of distance. Even at this low price a large revenue accrues to the Government.

IF a continuous solid iron rail were laid from New York City to Albany, no amount of force applied at one end could move the other in less than one minute and a quarter, the time required for mechanical force to travel in iron that distance.

AN immense aquarium is being constructed for the French Exhibition, having a front of one hundred feet. Sharks, porpoises, and every variety of fish are to be therein collected for the amusement of the public.

THE metric system is in force in France, Belgium, Holland, Switzerland, Spain, Italy, Portugal, and the States of the German Confederation, and legalized in the United States, and Great Britian.

THE value of the eyelets annually used in this country, though costing but eighteen cents per thousand, amounts to the sum of four millions of dollars.

AN expert printer will set about 25,000 letters daily, his hand traveling more than nine miles, and in the working days of a year about 3,000.

COMPRESSED peat, by a late patent, is destined to prove a rival of hard india-rubber in the manufacture of picture frames and other small articles.

IRON of a superior quality is found in abundance throughout northern Arkansas, and coal and zinc in the western part of the State.

A SEA wall for the protection of a portion of the harbor of San Francisco, is to be constructed at a cost of $2,500,000.

TWO YOUNG Americans stand first and third, out of a class of one hundred and thirteen, in the competitive examination of civil engineers, in Paris.

MORE than a million of new-laid eggs are daily imported into England from France.

EVERY thirty-five cubic feet of salt water displaced by a floating vessel are equal to one tun burthen.

Improved Bark Mill.

Tanners understand the difficulty of getting a good leach from the bark as usually ground in ordinary mills. Some of it is a fine powder, making the liquor muddy, and a part of is in such large pieces that all the tannic acid cannot be extracted, involving a serious loss. Sometimes the bark is not cut, but rubbed and bruised. The object of the inventor of this mill, which is herewith illustrated in parts, was to procure a good quality of ground bark for his own business. It has proved excellently adapted to produce that result.

The frame work of the mill is built in the usual manner. Secured to its top by the lugs, A, is the hopper, its upper side shown in Fig. 1, and its under side in Fig. 3. The top of the arms has teeth, B, which act in conjunction with teeth on the radii

Fig. 3.

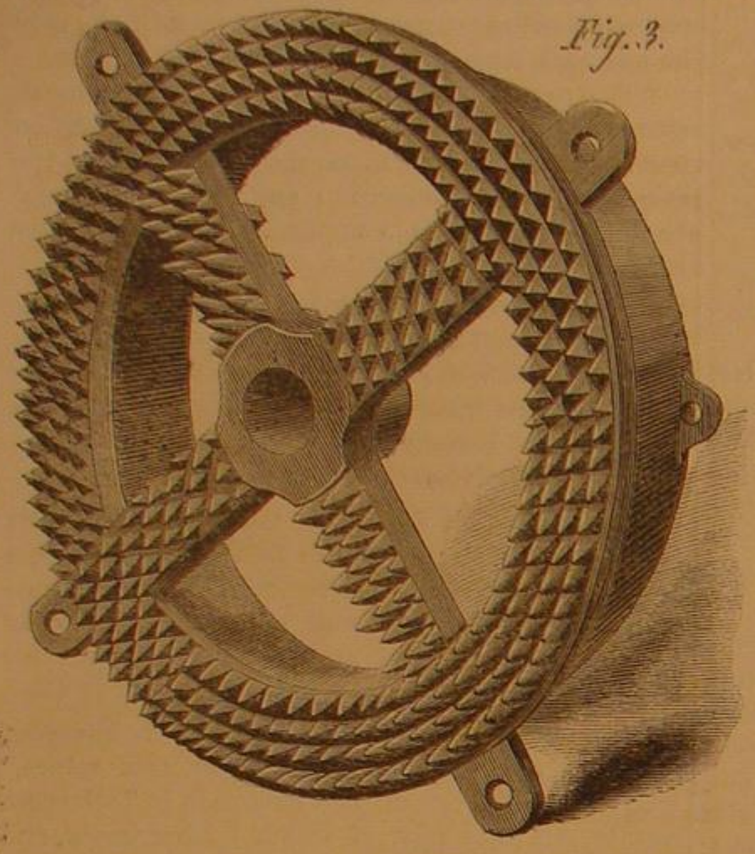


Fig. 2

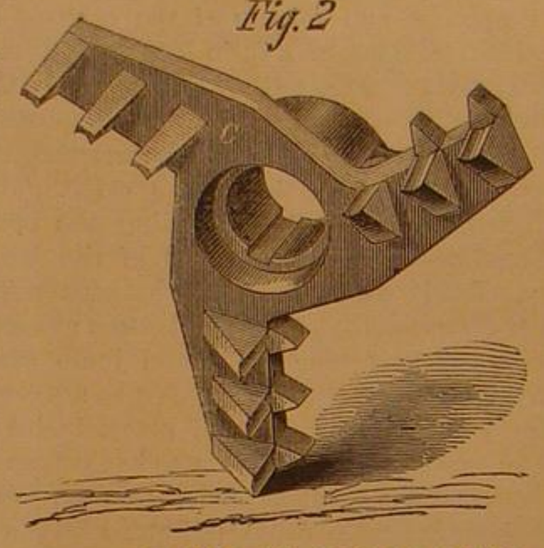
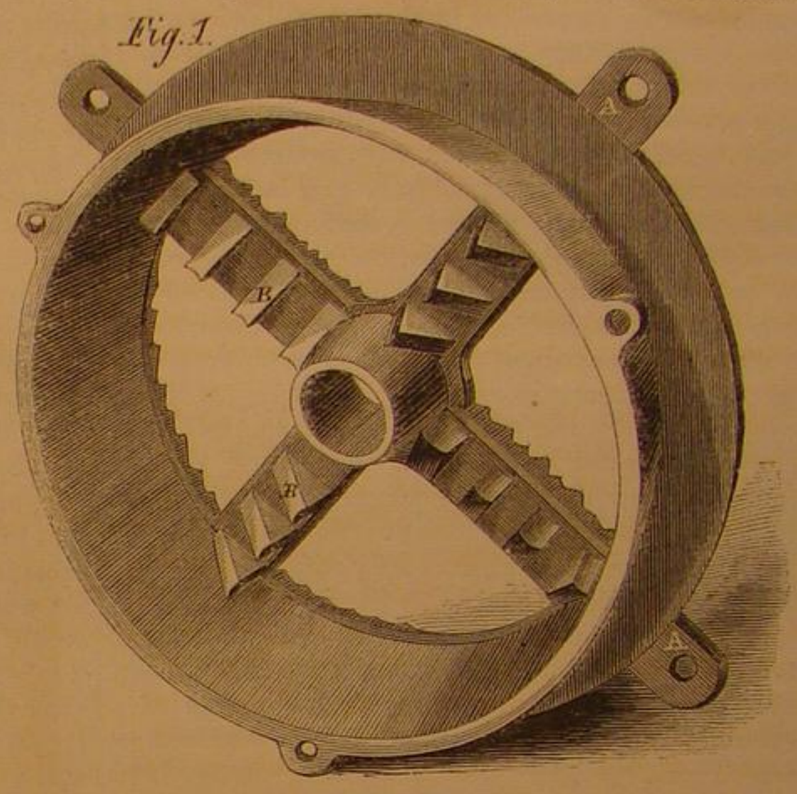


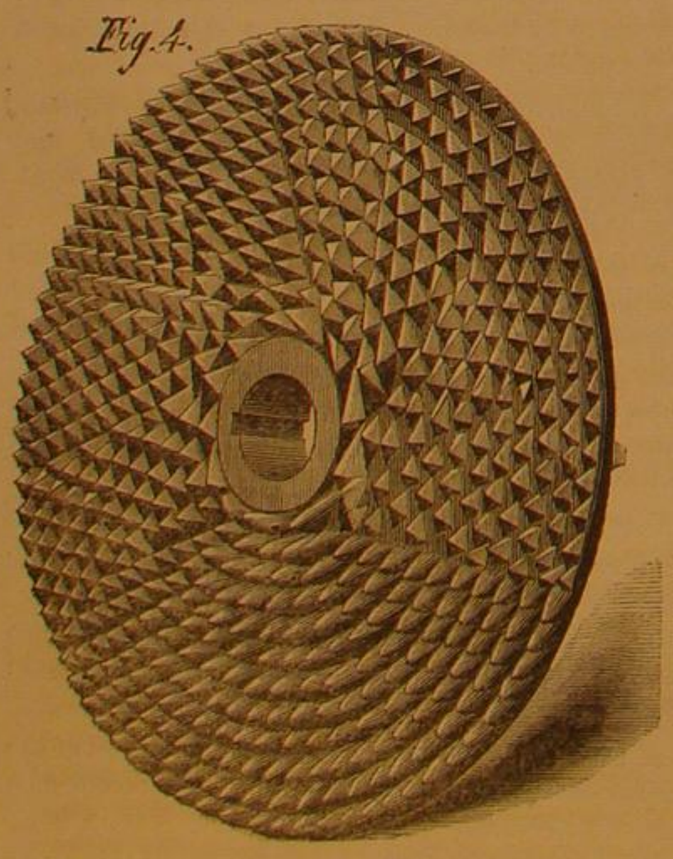
Fig. 1.



THOMAS'S BARK MILL.

of the breaker, C, Fig. 2. The lower side of the hopper, as seen in Fig. 3, is armed, both spokes and rim, with teeth, which act with those on the disk, Fig. 4. This disk is secured to an upright shaft and revolves with it, as also does the breaker, C. The teeth of the breaker pass between the spaces of the teeth on the upper side of the hopper arms and prepare the bark, by cutting it in pieces, for the grinding surfaces of the hopper and the revolving disk. The fineness of the product can be regulated by screws, which raise or lower the vertical shaft with its appurtenances. The bark can be ground as fine

Fig. 4.



as ordinary corn meal, or left to any size required, the advantages of its operation being that the bark is ground uniform, and that nothing is wasted either by dust, or unground pieces incapable of being properly leached. This mill, it is claimed, requires no attention except that of being fed with bark. It is also adapted for grinding other material, es pecially bones and plaster for fertilizing, and corn in the ear for stock feed.

Patent issued through the Scientific American Patent Agency, Aug. 8, 1865, to N. Spencer Thomas, Painted Post, Steuben Co., N. Y., to whom all letleters should be addressed.

Steamship Commerce on the Atlantic.

In the year 1858, Congress, through the recommendation of the Postmaster-General of Mr. Buchanan's administration, refused to renew any contracts for transporting the mails to Europe, and adopted the policy of sending the mails by every steamer, whether foreign or American. The London *Times*, at that epoch, advised British capitalists to "grasp this traffic and the lucrative trade that accompanies it, on the North Atlantic." Let us see how well this advice has been followed. The Inman line of steamers was, in 1858, just struggling into existence. It has now become a flourishing and profitable company, dispatching steamers twice a week each way between New York and Liverpool. The following lines have also come into existence within the last few years, and most of them have become well established:—The North German Lloyds, between New York and Bremen, twice a month; North American Lloyds, between New York and Bremen, dates of departure irregular; the Hamburg American Packet Company, between New York and Hamburg, also weekly; the National Steam Navigation Company, between New York and Liverpool, weekly; the General Transatlantic Company, between New York and Havre, twice a month; New York Havre line, comprising the *Fulton* and *Arago*, monthly; the London and New York Company, between New York and London, twice a month; the Anchor line, between New York and Glasgow, twice a month; and the Continental Steamship Company, between New York and Antwerp. Including in this statement the Cunard service from Boston and New York to Liverpool, weekly, and the Montreal Company, from Montreal or Portland to Liverpool, weekly, we find that upward of four hundred and twenty round trips per annum (about three arrivals and departures for every two working days of the year, on either side of the ocean) are made in the Atlantic trade by steamships, mainly under foreign flags, and that the gross receipts of the foreign vessels engaged in this trade to our own shores amount on a fair estimate to upward of twenty millions of dollars annually. These lines, except three of the least important, are foreign, and are understood to be doing well.

In addition to the foregoing, the American and Holmstead Emigration Steamship Company, between ports in Sweden and Russia and New York, has just been organized, one steamer having arrived here a few days ago; and the Italian Government, it is understood, has just granted a subsidy of $160,000 per annum, for a term of thirty years, to a steamship company, to run bi-monthly between Italian ports on the Mediterranean and New York, touching both ways at Madeira, Cadiz, Marseilles and the Azores or Western Islands. In addition to this, it is stated that the authorities of the port of Genoa have also granted important aid, and that no doubt is entertained of the ultimate success of the enterprise.

With judicious assistance on the part of our Government, there is now some prospect that this important branch of commerce, which has been lost to us through bad management, will ere long be recovered, in part at least. During the last session of Congress, Senator Anthony introduced a bill to establish ocean mail lines between the United States and Europe: 1st, Between Boston and Liverpool, thirteen trips annually, at not exceeding two dollars per mile on 5,900 miles per voyage, or $153,400 per annum; 2d, New York to Havre, via Southampton, 6,540 miles per voyage, monthly service, at $170,040 per annum; and 3d, New York and Antwerp, 6,710 miles, at $459,440 yearly, on a semi-monthly service. As the New York and Boston Chambers of Commerce have both strongly expressed themselves in favor of special legislation for the encouragement of American steam navigation upon the Atlantic, it is confidently expected that the bill will pass both branches of Congress at the ensuing session. If it does, the Postmaster-General will be empowered to call for tenders for a term of not less than seven, nor more than ten years, the average speed of the steamers not to be under ten miles per hour, and no offer to exceed the fixed maximum amounts specified, reckoned at two dollars per mile, which, in the aggregate, gives the estimated receipts for postage received by the Government on the transatlantic routes. As the late English administration gave notice some months ago that the system of paying subsidies for the conveyance of the mails to North America would cease in 1867, on the termination of the Cunard contract, there are additional grounds for hope that the monopoly of this traffic will not long be permitted to remain undisturbed in the hands of other nationalities. The facts and arguments in favor of the granting of judicious subsidies to steamship lines between Atlantic ports and Europe are so cogent that it would seem to be necessary only to place them clearly before Congress to secure the desired legislation.—*Shipping and Commercial List.*

The Suez Canal.

In a little more than a year, the great work projected, but never begun, by Napoleon the Great, will be completed. The Cape of Good Hope, at the southern extremity of Africa, will become to European commerce what the Isthmus railway has made Cape Horn to our Atlantic and Pacific trade. Africa will no longer block the highway between Europe and the East. While we are endeavoring to reach the Indies by a road across this continent, Louis Napoleon is connecting the Mediterranean with the Red Sea and the Arabian Gulf. It will undoubtedly be a success, and become one more link to bind the nations together in the bonds of commerce, the precursor and *avant courrier* of a higher civilization.

In time of peace Europe keeps in arms nearly four millions of men, at an annual cost of over six hundred millions of dollars.

THE MAD STONE.

There is a superstition, or a popular belief, "as old as the hills," that certain stones, or mineral substances, possess the power of extracting the virus of poisonous bites from the human system. We frequently hear of wonderful cures performed on those bitten by venomous reptiles, or insects, by its means. In No. 11, Vol. XV., current series, we published a statement of such a case from an Indiana correspondent, in which it was said that the stone was procured from the "rennet of a deer."



Such a stone has been shown us, from which the accompanying engravings are made. The illustrations repesent the curiosity in full size, one a longitudinal and the other an end view, showing the shadings on its surface. It will be seen that the stone is almost a perfect ellipsoid, slightly flattened in the line of its shorter axis, as may be noticed in the transverse view. From its weight and appearance it seems to be composed of phosphate of lime.

This stone was brought to us by Mr. Er Lawshé, of Atlanta, Ga., who gives the following account. It was taken from the stomach of a deer shot in Houston county, Ga., by David Halliburton. Similar concretions are not unusual in the deer's stomach; those which are young having small ones, sometimes not larger than a pea, while in older animals they are much larger. This is one of the largest Mr. Lawshé has seen. His experience of its reputed medicinal virtues is limited. His brother, in swarming a hive of bees, was stung on the back of the neck, and this stone, having been heated in warm water, was applied to the swelling one minute, when the pain and swelling together disappeared. Mr. Lawshé states, on the authority of hunters in his section of the country, that the deer feeds with impunity on the wild, or poisonous ivy, his escape from death being attributed to this stone. In one case a hunter killed a deer while browsing on the ivy, and although the flesh was eaten by himself and others without bad effects, his dogs, who eat the entrails, died.

All this seems to be somewhat doubtful, yet there are many cases related of the virtues of this stone. The specimen under consideration appears to be a water-worn pebble, and totally unlike the concretions found in the bladder of the human body which are indicative of disease. In the opinion of some of our chemists and geologists, to whom it has been submitted, it cannot be a product of animal disease, but is unmistakably a mineral production, accidentally or purposely swallowed by the animal. They do not subscribe to the popular belief in its virtues, and attribute its professed effects to imagination. As a curiosity, however, without regard to the fact or falsity of the assumptions made for it, we considered it of sufficient interest to engage the attention of our readers. Knowing nothing practically of the value of these curious natural productions, we presume to offer no opinion on the subject of their medical properties. It has been suggested that the material for these stones is found in the calcareous and silicious soil about the salt licks, which deer frequent, and that, being of an indigestible nature, it remained in the stomach, gathering gradual accretions, and by muscular action being slowly "rounded into form."

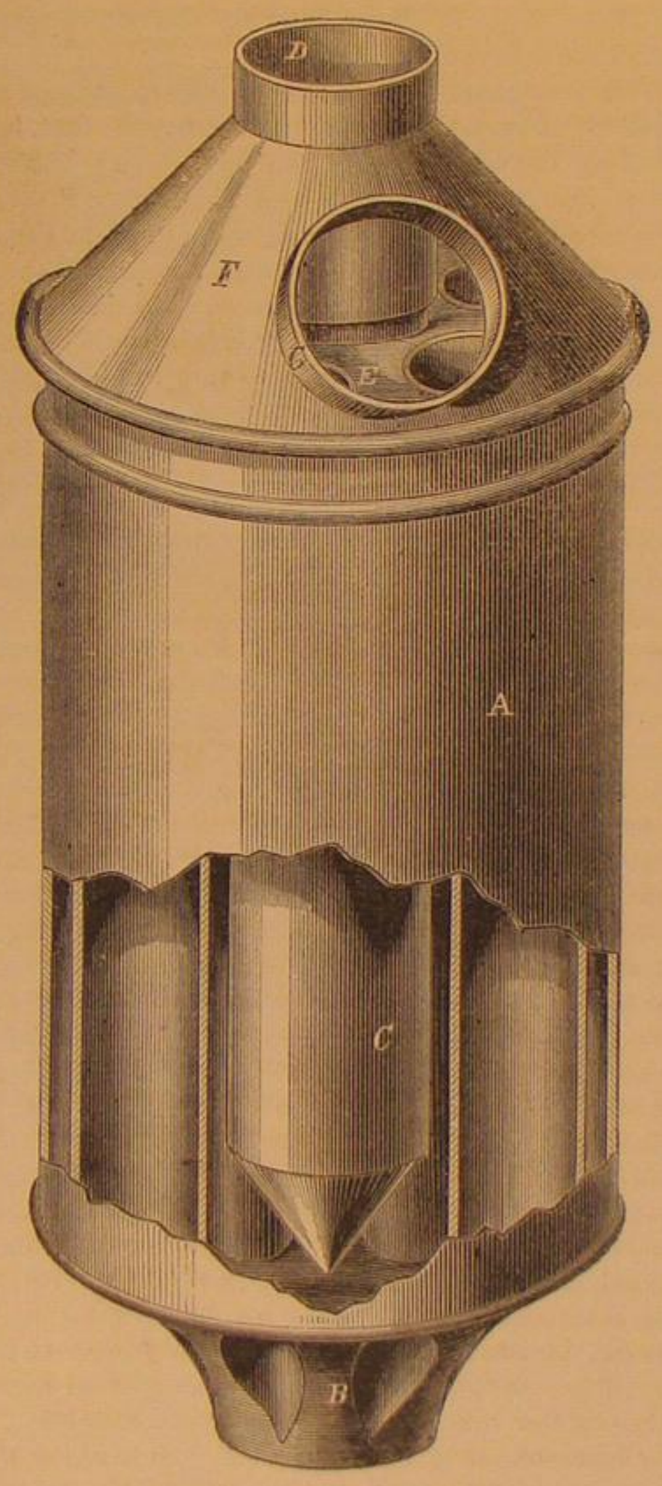
This opinion receives some force from the fact that similar stones called "bezoars" have been known and used in the East from time immemorial, and are usually found to be concretions surrounding some foreign substance in the stomach of ruminants. The pearl is said to be formed in a similar manner, and the Chinese introduce beads and small images into the pearl oyster, which in time become coated with the substance.

THE total earnings of railways in the United Kingdom amount to over $200,000,000 annually.

MORSE'S STOVEPIPE FURNACE.

The desideratum of utilizing all the heat from combustion has been sought by attempts to burn the smoke and gases of a fire, but has not yet been effectually attained. Appliances have been devised to arrest a portion of the heated air in its progress from the fire to the external atmosphere. The invention here illustrated is of this character, and the inventor declares it to be entirely successful.

It is a cylinder, A, of tin or other sheet metal, having a cast-iron bottom, B, which receives one end of the stove funnel. In the center of the drum, A, is a cylinder, C, closed at the bottom by a cone-shaped cover, and opening at the top, D, to receive the prolongation of the stove funnel. Surrounding this central tube are others, placed at equal distances, and open at the bottom at B, and at the top at E. These are merely conductors for the atmospheric air, while the smoke and gases of the fire rise through the funnel at B, and pass up between the central and surrounding tubes heating the air in the



latter. The cone-like bottom of the central cylinder diverts the smoke on all sides to the walls of the other cylinder, thus surrounding the air tubes.

When the heat is required in the room where the stove is situated the cone cover, F, is not used. It is intended to retain the heat and divert it through the aperture, G, whence it is led by a pipe to any room desired. It is claimed that by this waste heat from an ordinary cooking stove, rooms may be dried and warmed, or fruit or clothes dried in a closet or attic, which could not be heated by any other means.

Patented through the Scientific American Patent Agency, March 6, 1866, by E. P. Morse, Batavia, N. Y., who will furnish any further information.

AN official report shows that in British India, there are 4,971 miles of railways in course of construction, of which 3,213 miles were in working order last spring.

THE Chicago and Northwestern Railway has 1,020 miles of main track open, and within a year it will be completed to the Missouri river and connect with the Pacific Railroad.

Correspondence

Grain Elevators---Grain Trade.

MESSRS. EDITORS:—In the number of Sept. 15th, under the head of "How Grain is Stored in New York," you state the amount received in New York, and you also give a description of the fire-proof "United States Elevator and Stores" in Brooklyn.

The grain trade is a marvel in its volume, and over twenty years ago began to necessitate grain elevators in its movement. Mr. Barton, in a historical lecture a few years since, in Buffalo, stated that the "Dart Elevator" was the first one in that city, built in 1844, and I think the first one in the country for storing and transferring grain.

With the design of obtaining the correct history of this great institution in our country—grain elevators—I have at different times urged the Commissioners of the Agricultural Department to issue a circular to the Board of Trade of the various cities, from New York to Chicago, by which to obtain the capacity of each elevator in the respective cities, with full description and cost, but have been unsuccessful in my efforts. It would be quite an appendage to the Paris Exhibition if one of our mammoth elevators were there in full operation.

Europe is far behind us in this matter, though they have never had such vast quantities to handle in transportation. In the grain ports of the Danube the grain is carried in sacks on men's shoulders from the storehouse to the vessel. Dantzig, a Baltic port and a grain mart for centuries, had, at the period of Mr. Jacob's "Parliamentary Report of the State of the Corn Trade in the North of Europe, 1826," but indifferent facilities for handling grain; and the poor methods of transportation descending the river Vistula only forty years ago, which he describes, would be surprising to men on the line of the vast grain tide that flows from Chicago to New York.

During two years of our late war it is an astonishing fact that, exporting each year over 50,000,000 of bushels of cereals to Great Britain, we furnished the 29,000,000 of the population of the United Kingdom bread food for one meal in three of their daily bread for that period, beside liberal supplies to her dependencies in other parts of the world, and also to other foreign countries. Such a grain export from any one country is unparalleled in the history of commerce.

It may be further remarked that, from a scale of prices published in the Parliamentary returns, of grain imported from the different countries, by a calculation which I have made, the wheat from the United States was 16 per cent better in price and therefore better quality than that of the combined average imported from other countries. Yet was our export of wheat of an inferior quality to the average of that sold in our own markets, so that the people of England, in the mass, subsist on a poorer quality of bread than do the people of the United States, we should say 20 per cent poorer in quality, even modified by taking into the account their own English-grown wheat.

You speak of canal boats unloading at the Brooklyn elevator. A short time since, being on the *Dean Richmond*, I noticed the large number of "tows" we met and passed in the course of the two hours' daylight before reaching New York at 7 A. M. At this rate quite a fraction of the area of the river from New York to Troy must be occupied continually by the "tows" during navigation. I was reminded of the words of that powerful pleader, Elisha Williams, of Hudson, who, in a speech in the legislature advocating the passage of the Canal Bill, in 1817, earnestly appealing to the New York delegation, who opposed the canal (!), to win them over to the measure. Said he, "If the canal is to be a shower of gold it will fall upon New York; if it is to be a river of gold it will fall into your lap."

Kindred to these words of Mr. Williams was the prophecy of the late Jesse Hawley, the originator of the "Erie Canal," in his Canal Essays, published in the *Ontario Messenger*, at Canandaigua, in 1807, the year of Fulton's first trip to Albany by steam, and

republished in Dr. Hosack's Life of Clinton, 1829. Enumerating the benefits that would flow from the construction of the canal, Mr. Hawley writes, "In a century the island of Manhattan will be covered with the buildings of its population." He did not then see what a brood of cities and towns would spring up surrounding Manhattan island. Nor did he see as an off-shoot of the Canal the Croton Water Works costing $15,000,000—twice and a-half the original cost of the Canal; nor the Central Park, another off-shoot, costing $16,000,000 more.

A. PENFIELD.

Washington, D. C., Sept. 25, 1866.

Insulation of Lightning Rods.

MESSRS. EDITORS:—A correspondent in your number for Sept. 8th says, "It is a common *error* to suppose that lightning rods should be insulated." Had he said common *belief*, he would have been nearer right; but whether error or belief, it is an argument against him, under the old maxim that what "everybody believes must be true." In fact, the belief, or error, if you choose, is almost universal. Almost all men who have made electricity a study believe and teach it, and the rest of the world believe it because so taught. All our electric telegraph men believe and practice it. But, says your correspondent, "the lightning rod ought rather to be so contrived as to facilitate free passage from the building to the rod and thence to the atmosphere, and *vice-versa*." If so, let us have our lightning rods laid with our courses of brick or clapboards, and sticking through our roofs with one end in the building and the other out; for, in that position, they could certainly much better facilitate the free passage from the building to the atmosphere, and *vice-versa*.

It is true that "currents of electricity are continually circulating through masses of matter in a rarefied state," and by so doing perform a very useful office, and we need no lightning rods to rid us of the friend, but when it comes in bolts, on the outside of our dwellings, then we prefer to interpose some "obstruction" to its passage into the dwelling.

I cannot conceive of any appositeness in comparing a lightning rod to a safety valve. We certainly do not generate electricity in our dwellings in dangerous quantities, as a boiler does steam, and if we did I should want the safety valve on conductors leading it out as above suggested, and not stapled on the outside merely. It would seem that a lightning rod should be rather a shield than a valve, and to not insulate it is to leave it so that the bolts may penetrate it and do damage beyond it. It is true, as he tells us, that the rod should be brought in "metallic contact" with all important metallic substances on the outside of the building. But why? Simply because the rod will be relieved thereby of so much electricity as will be required to charge such metal, just as lateral points relieve the rod by discharging any overload from it; but if his theory is correct, why not connect the rod with any metals within the house as well as outside?

Prof. Horace Mann, late of Antioch College, than whom there is no higher authority on this subject, says, "The old method of fastening the rod to the house by an iron staple, is a direct invitation, or rather a direct command, to the lightning to come in; and when it does come in, we all know what liberties it takes. Electricity, indeed, is valuable, is indispensable in all our dwellings, but not in the form of bolts."

But, Mr. Editor, while I thus argue for insulation, I would not mislead, and, therefore, say I do not mean glass rings. I do not consider any rod as insulated which runs through glass, for, when the electricity destroys the glass, as it is sure to do if in the form of bolts, then the rod immediately falls in contact with the staple which held the glass, and becomes, in fact, a stapled rod, and the records are full of disasters caused by such rods: indeed, people seeing their failures, and believing them to be, as they are generally called, lightning rods, have come to be skeptical of the value of all rods. But, I believe that a lightning rod properly put upon a building, with insulation, so that the rod does not come in contact with the glass—or the building—except it be with a metal roof or leaders, is as perfect a protector against electricity, as the roof is against rain.

W.

The Piston Question.

MESSRS. EDITORS:—In your notice of my answer to the question in your issue of Aug. 18, about the position of the piston of a horizontal engine, there is a mistake which I desire to correct. The question was this: "Where is the piston of a horizontal engine when the connecting rod is at right angles with the crank?" You mistake in understanding me to assert the crank to be vertical. In that case, my rule will not apply; but it does apply to the question as stated by me above. But when the crank is vertical, the connecting rod becomes the hypothenuse of the triangle, and I think that, in this case, the rule should read thus: Subtract the base of the triangle so formed (the crank being the perpendicular), from the sum of the lengths of the crank and connecting rod, and the remainder is the distance the piston has receded from the end of the cylinder, opposite the crank shaft; and the length of crank, or half the length of stroke, deducted from the above distance, shows how far the piston has passed the center of the cylinder.

With your permission, I should like to propose a question. I suppose it has been observed that, in the long days in summer, the sun, when it rises, shines into a north window, and also, before it sets in the west, will shine into the same window, thus demonstrating the fact that it both rises and sets north of a due east and west line, in our latitude: say of Utica, N. Y., which is, I believe, about 43 deg. north. Now, as the sun is said to vary but 23½ deg. from the equator, in the longest days, and Utica being 43 deg. north, how can the two be reconciled?

Sauquoit, N. Y. A. S.

Measuring and Regulating Temperatures.

MESSRS. EDITORS:—On page 200, current volume SCIENTIFIC AMERICAN, my attention was called to the subject of thermostats by a notice of one of your subscribers. I wish only to remark that the thermostat made on the principle mentioned by Mr. Grout works well; that of Ure, described on page 115, same volume, is unsatisfactory, for the simple reason that as it takes very little power to bend a flexible compound metallic bar, all thermostats founded on the principle of moving any contrivance by increased or diminished flexion of such a bar, operate with so little power that they usually refuse to do what is desired.

The modification suggested by Mr. Grout makes the thermostat to act, not on the principle of flexion, but of longitude and extension of the bars. I described the very same arrangement, with a wood cut, in 1843, in the *Konst* and *Letterbode* published in Haarlem, Holland, and applied it also as a compensation pendulum. I found, however, later, that this principle applied in the way as it is in the common compensation pendulum, namely, a steel bar between two brass bars, or a steel rod placed in a zinc tube, was preferable. This arrangement also acting by the difference of longitudinal expansion, may be easily made of sufficient length to cause a motion of a considerable fraction of an inch, which motion will take place with great force. I would advise Mr. Brown (see page 115,) to take a long beam of dry wood, which possesses scarcely any longitudinal expansion, and in a groove on its upper surface place a bar of zinc of the same length; fix this bar of zinc with one end to the end of the wood, and have the whole bar sliding freely; the other end will then project beyond the wood by any rise of temperature, and the wood may serve as the fulcrum for any mechanical arrangement. As the linear expansion of zinc for the desired 2 deg. is 0·00003 of an inch, we will find that a zinc bar must be about 300 feet long, to give a direct expansion of ⅛ inch every two degs. This length, however, being impracticable, it will be best to take a beam and zinc bar of 30 feet long, and attach a lever of inflexible material, of which the arms have the proportion of 1-10, or to take a bar 10 feet long and lever of proportion 1-30. Such an arrangement, when well made, will move a weight with almost irresistible force for the extent of ⅛ inch for every 2 degs. of change of temperature.

P. H. VANDER WEYDE, M. D.

Philadelphia, 1866.

On Lightning Conductors.

MESSRS. EDITORS:—I have noticed several articles in your paper lately on the subject of lightning rods. I have made the subject a study for many years, and have come to the conclusion, which is supported by practical experience, that it makes no difference what metal the rod is made of—copper wire, or iron—or whether it is insulated or not, so that it is put up right. The secret is this: from the point going down, it should go down all the way, and not ascend in any place.

You quote from Lyon in his ninth requisite, "the rod should run along the whole length of the ridge," which, if the ridge is level, will have many places between the insulators where the lightning will have to run up hill. No serious effect would come from this, providing the rod was large enough to carry the charge, but if not, it will jump off and seek some other road to the ground. Numerous instances of this kind have come under my observation. The most frequent are those on the telegraph line. In all offices between the main offices of the line, the wire is brought in at the top of the ceiling, and, running along near the instrument, descends several feet where the cut-off is—which is used to detach the instrument during a thunder storm—and then returns. Usually the wire in the office is copper and smaller than the iron wire outside.

Now the effect of a heavy stroke on the line is usually this: If it strikes a pole first, the top above and below the insulator is broken, part of the charge goes down the pole, the rest goes on the wire, and if it does not melt the wire between the poles and jump off, it will break the next pole below the insulator, showing that the wire could not carry all the charge when there was anything to jump to. Sometimes half a dozen poles will show the effect of this single stroke, and still the wire will have all it can carry. The first office this goes into it will jump from the copper wire to the ground wire, sometimes a couple of feet. Operators have learned this secret and usually have the ground wire close to the cut-off.

Your correspondent from Ohio, in No. 11, is right in speaking about insulation, as I believe it does no good but rather injury; but I differ with him in connecting the rod to the gutters, spouts, etc. Lightning don't seem to care how far it goes in getting to the earth providing it has a good road to travel. Last summer our school house was struck. The rod was in contact with the gutter, part of it went on the conductor to the cistern and burst it.

To secure a house against descending and ascending strokes, I would run strips of copper up each corner of the building, under the siding, over the roof boards and under the shingles, and terminate them with a point at the ends of the ridge. These, in good connection with the ground, will secure the house against all ascending strokes; still, I would have a good rod, the best and cheapest of which is a small iron cable, half or three-quarters of an inch in diameter, with a steel point, all painted black and spiked to the building with staples, and descending all the way from the point to the ground.

It would be a good plan to have the tin conductor connected with the ground with a copper strip to save the cistern.

W. E. P.

Lacon, Ill., Sept. 10, 1866.

Shot Guns.

MESSRS. EDITORS:—Many articles on rifles and rifle-shooting have appeared in your paper. Now, as the shot gun is the sporting gun of our country, will not some of your sporting readers give their views of shot guns? What makes a gun shoot close or causes it to scatter? Is it possible to construct a gun that will throw a charge of shot 35 yards within a circle of 16 inches? What would be the features of such a gun? I know that many of your readers are interested, and hope some one will give the information.

JOHN RICHARDS.

Columbus, Ohio.

A PRUSSIAN inventor will have at the Paris Exhibition a guillotine constructed on a new model, and capable of cutting off six or eight heads simultaneously.

NEW INVENTIONS.

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

APPLYING TIRES TO LOCOMOTIVE WHEELS.—EDWARD MELLON, Scranton, Pa.—This invention has for its object the securing of tires on the wheels of locomotives without the aid of bolts and so that the tire, in case of becoming loose, cannot casually slip off from the wheel.

CARVING TABLE.—ROYAL E. DEANE, New York City.—This invention relates to an improvement in carving tables such as are used in restaurants, hotels, etc., for holding meats while being carved and keeping them in a warm state.

WASHING MACHINE.—J. L. WEAVER, Davis, Ill.—This invention is designed to furnish an improved washing machine by the use of which the time, labor, and expense expended in washing clothes may all be diminished.

LANTERN.—A. M. DUBURN, Chicago, Ill.—This invention consists in a novel manner of constructing the lantern, whereby all its parts are rendered accessible for repairs and cleansing purposes, the wick rendered capable of being adjusted higher or lower without detaching the lamp from the lantern, and the lamp supplied with a burner which does not require a draft chimney.

IRON RAILROAD CARS.—S. MERRICK, New Brighton, Pa.—This invention relates to the manner of connecting together and securing the panels to the car, whereby the constructing of iron cars is greatly facilitated and the panels rendered capable of being readily removed for repairs when necessary, and peculiar advantages afforded for the finishing of the interior of the car.

ROOFING CEMENT.—GEORGE STEAD, Brooklyn, N. Y.—This invention has for its object to furnish a roofing cement, or paint for pointing and painting metallic roofs, and other out-door surfaces, that will not crack or peel off; that will yield to the expansion and contraction of the surfaces to which it may be applied; and which will be more durable, tougher, and more elastic than ordinary paints or cements.

LOCK FOR TRUNKS, ETC.—JOHN GEO. KAST, New York City.—This invention relates to a lock for trunks, boxes, valises, and other similar articles, and it consists in a sliding bolt provided with two or more hooks which, by the action of a spring, are caused to catch in corresponding sockets or staples secured to the lid or cover of the trunk, etc. The end of the sliding bolt is provided with a screw fastening so that a key can be readily connected therewith, and by pulling on the key the hooks of the bolt can be disengaged from their sockets. A spring stop which rises automatically when the lid or cover is opened retains the bolt in such a position that the cover or lid can be closed with ease and convenience.

SEED-PLANTING ATTACHMENT FOR HOES.—NELSON SAFFORD, Pleasant Valley, Vt.—This invention relates to a seed-planting attachment for hoes, whereby seed may be dropped and covered with the hoe at one operation.

DITCHING MACHINE.—EDWARD HEATH, Fowlerville, N. Y.—This invention consists in so constructing a machine that the ground may be ditched rapidly and to any desired depth for laying tile for the purpose of draining land; and more particularly for the peculiar and novel manner by which is produced a longitudinal motion to the excavator or digger and a lateral motion to the scraper through the same cross head. It also consists in the novel manner by which the machine is propelled forward by means of the same cross head.

CULTIVATOR.—JACOB K. REINER, Line Lexington, Pa.—This invention consists in the novel means employed for adjusting the beams in adjustable cultivators whereby said adjustment may be made with facility and the beams firmly retained in position as adjusted.

PRESSING HATS.—ISAAC T. GREEN, Milford, Conn.—This invention consists in the application of steam to the hat while the same is in place between the presser and the die in such a manner that by the action of the steam the material from which the hat is made is kept soft and pliable and said hat assumes the correct shape.

FURNACE AND BOILER.—HENRY MCCLURE AND JAMES ELLIS, Terre Haute, Ind.—This invention is designed to furnish an improved furnace and boilers so constructed and arranged that the heat shall strike the boilers, except the first one, above any deposit of sediment that may be in them; that the draft may be adjusted to all changes of weather; and that it may be a complete smoke consumer.

ROTARY SPADING MACHINE.—E. J. FRAZER, Erie, Pa.—The distinguishing principles of construction and operation of this machine consist in the arrangement for shifting the traction from the driving wheels to the rotary spade or digger, by which all the weight of the machine and driver, and any accessory loading which may be required, rests upon it and pushes the spades deep into the ground, the only operative force being that derived from the team; and, vice versa, shifting the traction from the rotary spades to the wheels, by which the machine travels with the spades elevated clear of the surface of the ground.

MACHINE FOR PRESSING BONNETS.—GEORGE M. RICHARDSON, Barre, Mass.—The object of this invention is to facilitate the operation of pressing bonnets and hoods, and consists in two hollow iron dies or molds, which are heated by steam, and by means of a screw are clamped around a block form, on which the bonnet to be pressed is placed.

PRIVY.—D. T. FORNEY, Wytheville, Va.—The object of this invention is to remedy the many defects of the system now pursued and adopted for the construction of privies, water closets, and other similar places.

FASTENING FOR NECKTIE, ETC.—HARRY M. HEINEMAN, Williamsburgh, N. Y.—This invention consists of a fastening or clasp of such a nature as to be susceptible of being readily fastened on or detached from the collar, to which clasp the necktie, etc., is attached by sewing or otherwise.

HOLLOW AUGER.—JAMES LEFEBER, Cambridge City, Ind.—In the hollow auger embraced in this invention simplicity, strength, durability, and cheapness are secured.

FASTENING FOR WINDOW BLINDS, ETC.—HEZEKIAH MONROE, Fall River, Mass.—This invention consists of two plates or pieces so constructed or arranged together as to be self-operating, when brought into connection with the fixed staples with which they are to interlock.

SPICE BOX.—WALLACE A. MILES, Meriden, Conn.—The object of this improvement in spice boxes is to prevent the loss of the aroma of their contents. This is accomplished by making them tight and close when not in actual use, their tops being so arranged as to be easily and readily opened to allow the spice to be shaken out after the manner of sprinkling or dredging powdered substances out of a box.

SETTING STONES IN JEWELRY.—FRANCIS STEFANI, New York City.—This invention relates to the setting of stones in jewelry, whereby the stone is held in a reliable manner, but can be easily removed at any time for changing the stone if desired.

CORD AND LINE REEL.—H. W. CHAMBERLIN, Jersey City, N. J.—The reel embraced in this invention consists of a flat piece of wood, molded with deep and capacious notches in its ends, for receiving the coil as it is wound upon it, and having handles so attached that the reel can be operated with great facility and rapidity.

GLOBE VALVE.—C. STIERLE and JOHN C. BAER, Cincinnati, Ohio.—This invention consists in certain improvements in globe valves, whereby the grinding of the valve seat can be evenly and accurately accomplished.

CULTIVATOR.—EDWIN CHILDREN, Lancaster, Wis.—This invention consists in a novel arrangement of the plow beams and the draft pole, whereby the plows may be moved or adjusted laterally with the greatest facility. The invention also consists in a novel manner of attaching the plow standards to the beams, whereby the plows may be adjusted more or less obliquely to throw the earth either toward or from the plants, as may be desired, or adjusted in a plane at right angles with the machine to cast the earth at both sides of the furrow when required.

STAMP MOISTENER—H. A. HOYT, Mott Haven, N. Y.—This invention has for its object to furnish an improved apparatus for moistening stamps preparatory to attaching them to their places

COALING ENGINE.—EDWIN R. KERR, Kewanee, Ill.—This invention relates to a new and improved means for supplying locomotive engines with coal, and it consists in having one or more chutes in a shed or building, which are provided with doors arranged in such a manner that the outer doors, when lowered or opened, will form a continuation of the chutes, and the inner doors so arranged as to admit of being readily opened to allow the coal to be discharged, the outer doors being counterpoised so as to work, open and close, easily without any slamming, and consequently without the liability of being broken or torn from their hinges.

PRESSING AND FINISHING HATS.—WM. WALSH, WM. WALSH, JR., and M. J. WALSH, Brooklyn, N. Y.—This invention consists in improved devices and machinery for finishing and pressing hats, whereby the operation is much facilitated.

FOLDING TABLE.—G. W. NELLIS, Richmondville, N. Y.—The object of this invention is to construct a table in such a manner that it may, when not desired for use, be folded into a small compass, so as to be capable of being stowed away in any convenient place without monopolizing much room.

BOOKBINDER'S PAPER CUTTER.—MICHAEL RIEHL, Philadelphia, Pa.—The nature of this invention is to provide a cutter for bookbinders, by which the paper may be pressed and cut simultaneously, and is so constructed that the instant the knife ceases to cut or has passed through, the press is slacked and the book is released at once from the press.

PAINT COMPOSITION.—G. W. MOORE, New York City.—This invention relates to certain improvements in that class of paints in which antimony or a compound of antimony forms one of the chief ingredients.

ROOFING.—JOHN ROUSE, Port Gibson, N. Y.—This invention relates to a tile produced of lime and sand mortar, in suitable molds, which are lined with cloth or paper to prevent the mortar from adhering to the mold, so that the tiles when dried can be readily removed from the mold. Said tiles are made with beveled edges, whereby their removal from the molds is facilitated, and a joint is obtained which can readily be filled with mortar. The tiles thus prepared are saturated with coal tar, asphaltum, or any other substance which fills the pores of the mortar and prevents it from absorbing any water when placed in a horizontal position, and consequently renders the tiles proof against frost.

SAFETY LAMP.—CARL RIEDEL, Guttenberg, N. J.—This invention consists of a lamp, the oil reservoir of which is hermetically sealed and filled with some absorbent material, such as raw cotton, sponge, or other substance, with a layer of pounded coal or other bad conductor of heat between the top of the oil reservoir and the absorbent material, in combination with a cylinder of wire gauze which surrounds the wick in the interior of the lamp, and with two hollow curved handles, in such a manner that with the proper treatment light hydrocarbon liquids such as naphtha, or benzine from petroleum, can be burned with perfect safety.

STEAM BOILER.—AUG. H. TAIT and JOS. W. AVIS, New York City.—This invention consists in the arrangement of angle and T-rings, welded and turned in the lathe to the proper angle for caulking, in combination with a series of cylinders made of boiler plate and riveted to the angle and T-rings, so that by said rings the boiler is strengthened and adapted for high pressures; also, in the arrangement of longitudinal bolts or stays, in combination with the angle and T-rings in such a manner that the principal strain exerted by the steam on the boiler is thrown on the rings and stays, and a cheap, durable, economical and strong boiler is obtained.

LOOM.—BENJAMIN OLDFIELD, Newark, N. J.—This invention relates to improvements in the batten, the shuttles and the sleys or reeds, and it consists, first, in the arrangement of two or more shuttles placed in an upright position, one behind the other and in the same place, in such a manner that more than the ordinary number of shuttles can be passed through one opening in the ways, and different colors can be introduced in the work without imparting to the batter or any part thereof, a rising and falling motion. Second, in cutting away the body part of the shuttle and substituting therefor a metal bow, in such a manner that the hight of the shuttle and the cost of its manufacture is reduced, and the quill in the shuttle can be readily reached and supplied with thread.

SURGICAL SPLINT.—RICHARD J. P. GOODWIN, Manchester, N. H.—This splint, which is applicable for fractures of arms or legs, and also for curing deformities. The invention consists in the arrangement of an adjustable band, applicable above and below the joint, in combination with suitable guides and fastenings, in such a manner that the limb can be stretched during the operation of applying the splint, and after the splint has been secured, the movable band can be readily adjusted over the fracture.

DRESS ELEVATOR.—CHRISTIAN GRUN, New York City.—This invention relates to an improvement in that class of dress elevators which are composed of a V-shaped bed plate with two spring jaws, which are so arranged that a portion of the dress can be clamped between each jaw and the bed plate, and this improvement consists in the manner of securing the spring jaws and the spring to the V-shaped bed plate.

GRUBBING MACHINE.—CORTLAND BALL and J. W. HOUGHTELIN, Detroit, Mich.—Patented August 15, 1866.—This invention relates to a new and improved device for eradicating or drawing out stumps, roots, etc., etc., and it consists in having two ratchets and a drum placed on an axle provided with two wheels and having upon it a frame to which pawls are pivoted to engage with the ratchets, the above parts being used in connection with a chain or clamp, whereby a very convenient device is obtained for eradicating or drawing out medium-sized roots, stumps, etc., and one which may be drawn from place to place and manipulated with the greatest facility.

Inventions Patented in England by Americans.

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

PROVISIONAL PROTECTION FOR SIX MONTHS.

1996.—CONSTRUCTION OF ORDNANCE.—John Ericsson, New York City. August 2, 1866.

1998.—CARDING ENGINE.—Edward A. Cutler, Providence, R. I., and Charles Bliven, Putnam, Conn. August 3, 1866.

2000.—CHURN.—Leander Langdon, Northampton, Mass. August 3, 1866.

2024.—MACHINERY FOR STAMPING, CRUSHING, AND PULVERIZING ORES AND OTHER HARD SUBSTANCES, PARTS OF WHICH IMPROVEMENTS ARE APPLICABLE TO POWER HAMMERS.—William Wright, New York City. August 3, 1866.

2025.—MANUFACTURE OF CARBONATES AND BI-CARBONATES OF SODA AND POTASH, THE SOLUBLE AND INSOLUBLE SILICIATES OF SODA AND POTASH, AND MURIATIC ACID, FROM CHLORIDES OF SODIUM AND POTASH.—Haydn M. Baker, Joseph H. Poole, and William R. Stace, Rochester, N. Y. August 5, 1866

2028.—CONSTRUCTION OF PORTABLE LANTERNS.—George Barnes Windle, 56 Maiden Lane, New York City, but now residing at 53 Gracechurch street, in the City of London. August 5, 1866.

2034.—PRESERVING WOOD.—Louis Robbins, New York City. August 6, 1866.

2,036.—CHUCKS FOR TURNING LATHES AND OTHER TOOLS.—Isaac Smith and William Harvey Haigut, both of New York City. August 7, 1866.

2,052.—IMPROVED TELEGRAPHIC CABLE.—Alexander De Morat, Philadelphia, Pa. August 7, 1866.

2,056.—MACHINERY FOR MANUFACTURING ENVELOPES, PARTLY ALSO APPLICABLE TO OTHER PURPOSES.—Edwin Allen and John Turner, Norwich, Conn. August 9, 1866.

2,058.—EXPLOSIVE SHELL.—Lewis Williams, Peekskill, N. Y., at present residing at Halifax, county of York, England. August 10, 1866.

2,063.—STAMPS FOR PRODUCING IMPRESSIONS, WHICH ARE ALSO APPLICABLE TO CYLINDER PRINTING.—Jabez Elverson, Newark, N. J. August 11, 1866.

2,067.—APPARATUS FOR MANUFACTURING ILLUMINATING GAS AND PRODUCING BONE BLACK AND OTHER VALUABLE RESIDUUM.—John Ensley, New York City. August 11, 1866.

2,073.—BREECH-LOADING FIRE-ARM.—Alexander Bergen, Brooklyn, N. Y. August 13, 1866.

2,082.—MODE OF FASTENING BOILER TUBES.—James Bowden, Horace Theall, and William H. Cobanks, New York City. Aug. 14, 1866.

2,084.—WATERPROOFING TEXTILE FABRICS, AND PRESERVING LEATHER, CORK, WOOD, AND VULCANIZED INDIA-RUBBER, ALSO TERRA COTTA, STUCCO, BRICK, AND LIKE SUBSTANCES.—Charles Baxter, Boston, Mass., now residing at Nelson square, Blackfriars Road, in the county of Surrey, England. August 14, 1866.

2,092.—APPARATUS FOR CUTTING, GRINDING, AND FINISHING MARBLE AND OTHER SIMILAR MATERIALS.—James W. Maloy, Boston, Mass. August 16, 1866.

2,104.—RUDDER FOR SHIPS AND OTHER WATER CRAFT.—William L. Wetmore and Nicholas D. Le Pelley, both of Cleveland, Ohio. August 16, 1866.

2,117.—CONSTRUCTION OF BALE FASTENING.—Hazard Knowles, New York City, and Henry Anwyl Jones, Brooklyn, N. Y. Aug. 17, 1866.

2,118.—STUFFING FOR MATTRESSES, CHAIR SEATS, AND OTHER LIKE PURPOSES.—Almanzor Alden, Matteawan, N. Y. August 17, 1866.

2,119.—PUDDLING FURNACES.—Christopher de G. Baker, Jacob Harlan, and Joseph Bell, all of Wheeling, W. Va. August 17, 1866

2,144.—MACHINERY FOR MAKING NAILS.—Excelsoir Nail Company (Incorporated), Providence, R. I. August 21, 1866.

2,154.—CONSTRUCTION OF SELF-RAKING REAPER.—James Marsh, Lewisburg, Pa. August 22, 1866.

2,159.—BREECH-LOADING AND OTHER FIRE-ARM AND BAYONET FOR THE SAME.—Charles Howard, New York City. August 23, 1866.

2,171.—SUBMARINE RAKE FOR GATHERING OYSTERS OR OTHER ARTICLES.—Job Johnson, Brooklyn, N. Y. August 23, 1866.

2,250.—MACHINE FOR MAKING EYELETS.—Thomas Garrick, Providence, R. I. September 4, 1866.

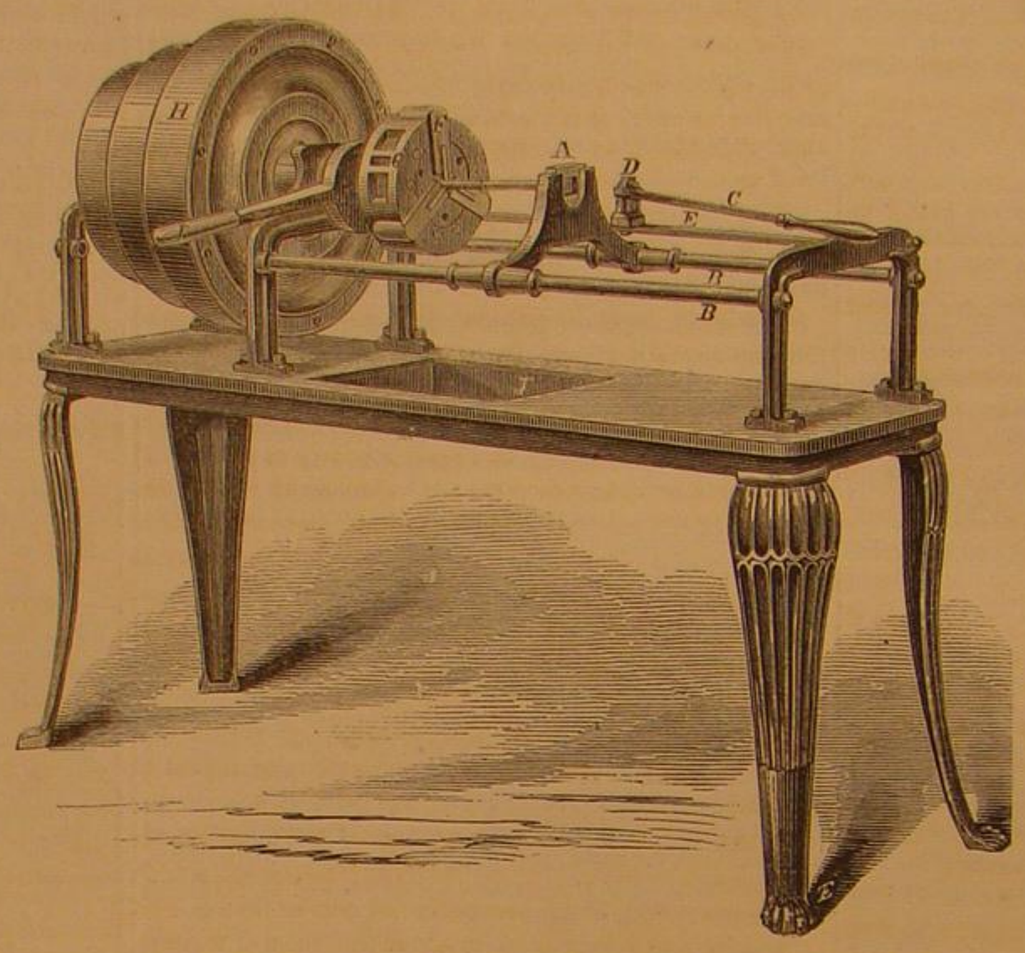
PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as a fee for copying. We can also furnish a sketch of any patented 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.

Improved Bolt Cutter.

No tool used in a machine shop is more necessary or oftener required than a bolt cutter. Some are complicated, and yet poorly perform the work, "raising" and weakening the thread, and not being easy of adjustment. The simpler the parts and the more absolute and direct their action, the more efficient and valuable any machine; and the bolt cutter, above all others, should possess these essential requisites. The inventor of the machine here represented, claims to have perfected a tool that is simpler, more readily adjusted, and capable of doing work quicker and better than most implements designed for the purpose. With it, he says, bolts can be cut close to the head and of any length desired, limited only by the size of the shop. But little explanation is necessary to understand its operation.

The cross head, A, sliding on the guide rods, B, is fitted to receive chucks for holding a bolt head, or can be furnished with a vise, the jaws moved by right and left hand screws. The lever, C, is attached to a sliding fulcrum, D, which moves on the rod, E, and can be used, if necessary, to start the cross head at the commencement of a cut. The dies are inserted in the jaws, F, of the revolving head, G, which is secured to a hollow spindle, sustaining the cone, H. By means of inclined slides passing through the head, and attached to the clutch and lever, I, the jaws can be opened from the center, or closed to the size of the screw required. When closed they are held securely in place. The dies can be adjusted to different sizes of bolts by a screw (not shown), which acts against the back end of the die. The recess, J, in the bed is for the reception of the oil and chips.



RODGERS'S BOLT CUTTER.

It is claimed that this bolt cutter is the cheapest in the market, that its work is equal to that of the lathe, and that the dies can be changed without moving a screw.

Patented by J. F. Rodgers, South Bend, Ind., whom address for rights and additional particulars.

Sliding Parallel Vise.

The object of this invention is to dispense with the laborious operation of turning the screw out and in to suit different articles of work, and changing the pin at the bottom of the vise jaw, which all mechanics will admit is a great loss of time as well as an annoyance, whereas in the illustration here shown, the movable jaw is adjusted instantaneously from one size to another, and the face of the jaw stands parallel with the bench, therefore it will gripe an article with greater firmness than is possible in the common vise.

The improvement consists of a ratchet, A, secured to the nut, B, and partially embracing the front of the nut. C is a catch, secured to the rear of the bench leg to engage the teeth of the ratchet. D is the movable jaw of the vise, E the screw, and and F a brace, to keep D in a vertical position and insure its parallel movement. Where the screw passes through the bench the aperture is elongated to allow of the raising of the ratchet out of the catch so that the jaw can be drawn out or pushed in at pleasure. A tenon on the upper side of the nut, B, works in a channel in the box, G, to guide the nut. Its operation can be readily seen. The improvement can be attached to any ordinary bench screw at a small cost.

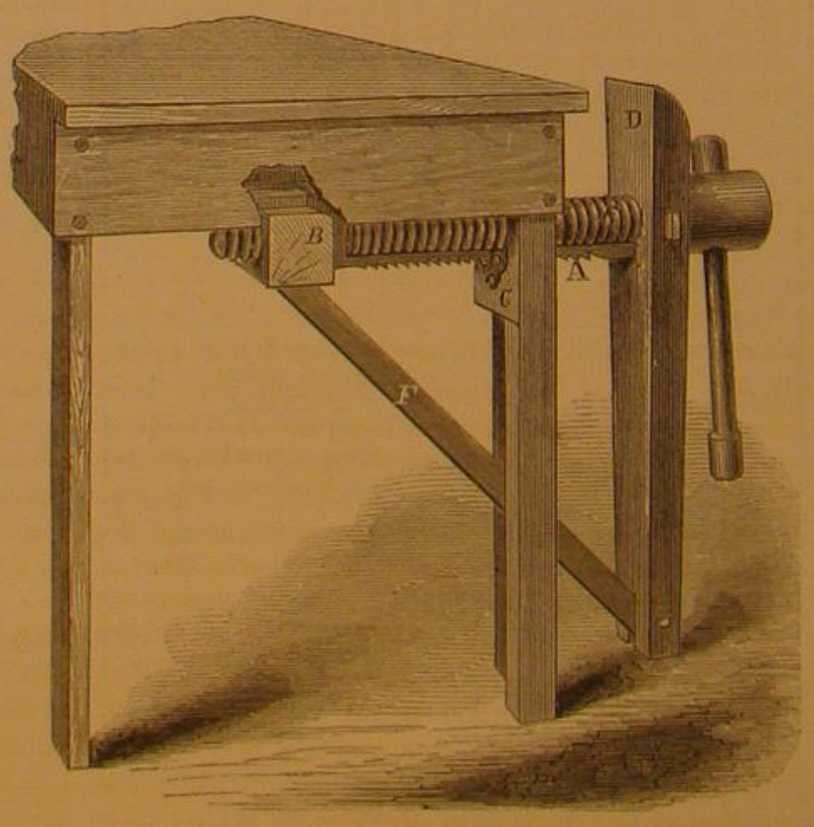
Patented Aug. 14, 1866, by O. V. Flora. All communications should be addressed to Flora, Moore, and Rogers, Box 55, Madison, Ind.

London contains 19,000 miles of gas pipes.

THE MANUFACTURE OF CARTRIDGES.

The cartridge for fire-arms for the use of soldiers is a subject which has employed the inventive faculty largely within a few years. The common fowling piece has been loaded for a great many years by means of open powder and shot, the powder being poured into the hand, measured either by a tubular gage on the flask, or estimated by the eye; the amount of shot being calculated in the same manner.

Then the paper cartridge was introduced, for military purposes, the powder alone being placed in the paper cylinder, and, when used, the twisted end being bitten off by the soldier and its contents emptied into the gun. (Vide Scott's Tactics.) Afterward the paper cartridge, with ball secured at the top, was used, paper and all being introduced into the gun. Then skins, or the prepared intestines of animals, were employed as a receptacle for the powder, the projectile being placed at the open end and the skin secured about its base by a string. These were very neat cartridges. A brief description of their manufacture may not be uninteresting.



FLORA'S PARALLEL VISE.

The skins, or animal intestines, were brought from Europe in a dried and salted state. They were macerated in water until they became perfectly pliable and very elastic. The operatives were girls, each one of whom sat at a table, having at her side a tub of the intestines, looking like linen or cotton strings. Before her was a board bearing a number of upright pegs, in form like an elongated truncated cone, or, in other words, resembling a human finger. Over these, sections of the skin, cut off by a pair of scissors, were stretched, and when all the pegs were covered the board was placed in the sun to dry. When dry these pockets were filled with powder, the quantity graduated by weight, and the bullet was tied at the top. The skin is so thin and yet so tough, that, although the grains of powder are easily distinguishable through it, it will bear a large amount of rough handling. These were far superior to any paper cartridges.

But the metallic cartridges appear to be gradually displacing these other forms. They are made of sheet copper. The copper is cut by a punch into a circular disk, and at the same time, by means of a punch and die, is formed into a cup shape, the punch forcing the center of the copper disk down through a die. This operation is repeated, by means of constantly diminishing punches and dies, until the requisite diameter and length are obtained; annealing and washing being occasionally resorted to for softening the metal and removing the oxi dized scales.

When brought to the proper size and shape, the shells are placed upon a revolving spindle and cut to the required length, the upper edges being, of course, irregular in outline when the shell comes from the last die. The shell must then receive a head, or rather the head or bottom, which is now of no larger diameter than the body, must be "upset" to make a receptacle for the fulminating compound, which is distributed around its circumference. To secure this result, the shell is slipped on a spindle, having a shoulder at the proper distance, and a "header" strikes a blow against the bottom which bulges out equally all around, forming a narrow rim at the base of the shell, of larger diameter than the body of the shell, itself, and hollow.

The fulminate, precisely like the explosive preparation used in percussion caps, is spread over copper plates, perforated with holes about three-sixteenths of an inch diameter. The material lodges in the perforations, which, by a suitable device, are brought over the shells so that the fulminate may be dropped into them. As this substance is to be confined to the rim of the head, it must be distributed. For this purpose each shell is held under a vertical spindle which is made to revolve very rapidly. The end of this spindle is cut into radial teeth, similar to the congeries of radii on the face of a millstone, by which the fulminate is forced centrifugally into the rim of the shell head. This is the only process in the manufacture of these cartridges attended with danger, as the compound is of a highly explosive character. The shell is then filled with powder, the base of the projectile inserted, and the copper crimped around its base.

These cartridges stand the test of rough handling, dampness, climate, and time, better than any others yet invented. They are fast superseding all other cartridges.

New Northern European Steamship Line.—The American-Scandinavian-Russian Emigrant Company has completed three new steamships which are to connect New York with Southampton, England; Christiania, Norway; Guthenberg, Sweden, and Copenhagen, Denmark. They will connect with other vessels running between Copenhagen and Stettin, Dantzic and Königsberg in Prussia, and Riga and St. Petersburg in Russia.

Tuning Pianos.—A correspondent suggests that an improvement might be made for tuning pianos up to a given standard pitch, by means of some device which shall indicate automatically when the required tension has been given to each string. Here is a chance for the ingenious.

Over five hundred cubic feet of air pass through the human lungs in two hours.

THE

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NEW YORK, SATURDAY, OCT. 13, 1866.

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THE COMMISSIONER OF PATENTS.

The SCIENTIFIC AMERICAN has nothing to do with mere party questions, and what we are about to say, therefore, in reference to the Commissionership of Patents must not be construed into any indorsement or condemnation of any particular policy that now disturbs the great political parties of the country. It is unfortunate for the best interests of the people that, in the ebbing and flowing of political tides—as one party rises and another falls—the policy of proscription enters into every department of the Government. Jefferson's rule, "Is he honest? is he faithful?" has given way to the more dangerous rule, "Is he a good party man, has he political influence?" To contend against this principle, is to contend against the old declaration that "to the victor belong the spoils;" and herein consists the chief danger to the future safety of the Republic. The strife of party and the temptation that power places before officials, produce the evil spirit of political persecution, and tend to corrupt the virtue of those who deem themselves fortunate to get a position under Government, which is always held by a slender tenure.

The present unfortunate controversy which has sprung up between the President and Congress, has engendered an angry partisan warfare; and, in order to strengthen his position, the President judges it best to remove from office all those who do not heartily support his policy.

The people do not much care whether this man or that man holds a particular office. Their chief concern is to have the responsible offices held by honest and capable men. We have always contended that, in the application of strict party rules, the Patent Office ought to be exempt from a mere political partisanship—that appointments should be made with strict reference to individual qualification to perform the required duties, and that fitness alone should be the test.

It is a most dangerous and pernicious practice to remove an experienced officer from the Patent Office to make room for some political aspirant, whose only recommendation consists in fidelity to a certain line of party policy and discipline.

The Patent Office was not created to subserve the ends and interests of any party. Its administration requires integrity, and judicial and scientific knowledge, which experience alone can render eminently useful. It is no light matter to determine the intricate questions that are daily to be decided by the officials at the Patent Office, and inventors might reasonably be alarmed for their interests when changes are made for mere opinion's sake.

An impression has somehow gained currency that Commissioner Theaker is to be removed, and speculation is rife as to who is to be his successor. Representing the largest body of inventors in the country, we express the hope that President Johnson will not make any such change. Mr. Theaker is an honorable man, and has discharged his duties in a very acceptable manner. He is entirely conversant with the routine of the Office, is master of its rules and practice, and, withal, has a warm sympathy with the great body of inventors. No complaints have been made of his official conduct; on the contrary, we believe the great body of Patent Solicitors and applicants for patents, are entirely satisfied with Mr. Theaker, and would regret to hear of his removal.

IS STEAM A GAS?

If a solid body is kept at the same temperature it may remain at rest for any number of ages, but if it be subjected to heat, it begins to move. Its several particles retire to a greater distance from each other—widening the spaces between them. If the temperature be elevated sufficiently, the cohesion of the particles is destroyed, and they flow freely over each other; in other words, the solid is changed to a liquid. If the elevation of temperature be continued, the expansion goes on, till, finally, the liquid is converted into a transparent gas, like those that make up the atmosphere. If now the temperature be reduced the changes are reversed—the gas is transformed to a liquid, and the liquid to a solid.

Formerly a distinction was made between vapors which are condensable to liquids, and gases which were supposed to be incapable of condensation, and the distinction is still maintained by many writers, though there seems to be no philosophical foundation for it.

In the first place, each substance is evaporated at different temperatures, varying with the pressure of the atmosphere or other medium by which it may be surrounded. In the case of water this has been investigated with the utmost care, and we have repeatedly published tables of the results. Under the ordinary pressure of the atmosphere—about 15 pounds to the square inch—water boils at 100 deg. Cent., or 212 deg. Fah., and as the pressure increases the boiling point rises.

Then, among the several substances known on this earth there is the widest conceivable temperature of evaporation at the pressure of the atmosphere or other given pressure. This is forcibly illustrated in the following table of the boiling points of a few well known substances. We give the figures in the Fah. scale:—

Ammonia	boils	at	—28·6
Ether	"	"	+93·6
Acetic acid	"	"	240·8
Oil of vitriol	"	"	617
Mercury	"	"	662
Sulphur	"	"	824
Zinc	"	"	1904

The list might be extended in both directions till, in one, we reach substances which have never been evaporated by any degree of heat, and in the other, substances which have never been liquefied by any degree of cold. Indeed, it was owing to the supposed existence of substances that would retain the gaseous form under all conditions that the distinction was drawn between permanent gases and vapors. But it was found that by combined cold and pressure some of these gases could be liquefied, and as progressive improvements were made in the art of producing cold and increasing pressure, one after another of the supposed permanent gases was condensed, and now only six remain which have so far baffled the skill of our physicists; these are oxygen, nitrogen, hydrogen, nitric oxide, carbonic oxide, and marsh gas. Analogy leads to the very confident opinion that if reduction of temperature and increase of pressure could be carried far enough, these six also could be reduced to liquids.

In the other direction, substances which could not be boiled by the fire of any furnace in use, have vanished in vapor when subjected to the flame of the compound blow-pipe, or the still more intense heat of the galvanic battery. It is a common class experiment of Professor Doremus to lay a gold quarter eagle between the poles of his immense battery, and to hold a clean silver cup inverted over it, when the coin is volatilized, and the interior of the cup is beautifully gilded by the golden fumes.

It is true that carbonate of lime, tallow, and many other compound substances, cannot be evaporated without undergoing decomposition—that is to say, they are decomposed at temperatures below their boiling points. It is, however, a significant fact, that if carbonate of lime is sealed in a tight gun-barrel, it is melted without decomposition. All known truths seem to point to the general conclusion that every substance in nature may, under proper conditions of temperature and pressure, be made to assume all three states of matter—the solid, liquid and gaseous. Even waiving this general conclusion, there appears to be no rational distinction between gases and vapors. The fact that as vapors recede from their point of condensation they approach more nearly the permanent gases in their ratio of expansion, strengthens this conclusion. As ice is water in the solid state, so steam is water in the gaseous state.

Gmelin, in his great work on chemistry, a translation of which has been published in 16 volumes by the Cavendish Society, makes the statement, that if all pressure was removed, all bodies would take the gaseous from at all temperatures. If a body were isolated in space, the instant any portion of it was evaporated, the vapor or gas would surround the body as an atmosphere, and would exert a pressure from the gravity of the body. We suppose, of course, that Gmelin means that this pressure should be removed as well as all others. The statement is made positively and directly as if the fact were a manifest result of the known properties of matter.

The Circular Saw Question.

We have given much room to the contributions of correspondents on the running and management of saws, both circular and sash. But, as one of the latest remarks, "there are as many differing opinions as saws," and as all we have received profess to be the result of years of experience, we hardly deem it worth while to copy these conflicting opinions. We have now on hand, among others, three well written communications, two from Wisconsin and one from New York, neither of which we publish, for the reason that they contain no new facts and no practical ideas, which have not heretofore been stated in our columns. The size of teeth, the mode of setting, swedging, and filing, the speed of the saw, end play of the mandrel, and other details of sawing, are subjects of disagreement among sawyers; yet every correspondent claims to make good work. Probably the successful running of saws is to be attributed as much to the good judgment of those having them in charge as to any peculiarity in their build and management.

Safety Valves.

A correspondent writes in relation to safety valves, replying to a communication in a previous issue of this paper, stating that steel springs for the levers of locomotive safety valves are entirely reliable. He says that often there is an undue amount of area given the valve, that portion constituting the seat being too great for that exposed to the action of the steam pressure. For a valve of three inches diameter, he says, the seat should not be over one-fourth of an inch. He gives the following rule, which has before been substantially given in our columns:—"For calculating the required weight for a safety valve, add to the area of the valve opening, the area of the total diameter of the valve seat. Divide the sum by two and one-tenth, and use the product in place of the simple inside diameter, as commonly done. This rule is founded on experience and is reliable."

LIGHTNING FIGURES.—Professor Tomlinson, of King's College, points out, in a letter to the *Times*, that the apparent impressions of trees in miniature, so often observed upon the bodies of persons killed by lightning while standing under trees, are in reality produced by all electrical discharges whether of lightning or from a Leyden jar, and that they have no connection with trees.

Patent Claims

ISSUED FROM THE U. S. PATENT OFFICE
FOR THE WEEK ENDING OCT. 2, 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.

58,362.—CONDENSER FOR STEAM ENGINES.—John Absterdam, New York City.

First, I claim a condenser for condensing the exhaust steam of steam engines and other steam vessels wherein the vacuum is produced and maintained by the direct action of one or more jets of steam from a steam boiler or generator, thereby condensing the exhaust steam in vacuo, and creating and maintaining a vacuum in said condenser by the direct action of steam instead of the ordinary air pump, substantially as above described.

Second, I also claim a condenser for condensing the exhaust steam of steam engines and other steam vessels, wherein the vacuum is produced and maintained by the direct action of steam aided by the columns of water of injection and discharge, dispensing with the use of the air pump, substantially as herein specified and set forth.

58,363.—SPRING PEN RACK.—James Adair, Pittsburgh, Pa.

I claim the spring pen rack having its springs arranged close together, made self connecting or in continuity, and formed of wire properly curved and having its bed and fastening rod as made, used, and applied, all substantially as and for the purpose set forth.

58,364.—SLIDE LACING AND SHOE FASTENER.—Robert Adams, Cincinnati, Ohio.

First, I claim the jointed slide fastener, C, as constructed and operating for the purpose set forth.

Second, I claim so arranging the lacing, D, that it acts as a guide for tongue, B, and fastener, C.

Third, I claim slide fastener, C, tongue, B, as arranged in combination with lacing, D, as constructed and operating for purposes set forth.

58,365.—PAPER FASTENER.—Chas. L. Alexander, Washington, D. C.

I claim a clasp, constructed substantially as described, whether of two plates or of one plate, so that the attachment is made by the passage of the plate or plates through an incision and the turning down of the plate or plates upon the surface of the paper or other material.

58,366.—SEWING MACHINE.—Jacob F. Andrews, New Providence, Pa.

First, I claim the arrangement of the verge, F, moving on its pivot, 6, in combination with the connecting rod, 4, and cam, E, in the manner and for the purpose specified.

Second, I claim the feed bar, C, when operated by the heel, 5, of the needle bar, B, in combination with the verge, F, and its connecting rod, 4, constructed and arranged in the manner set forth and shown.

Third, I claim the shuttle bar, D, with its pivot, d, and elliptical terminus, U', forming an elliptical opening which surrounds the vertical shaft, G, said shaft having an arm, 9, with or without a friction pulley, 3, at its end, in contact with the inner edge of said ellipsis, U', the whole operating in the manner and for the purpose specified.

Fourth, I claim the treadle, H, with its ears, h, and two connecting rods, M, M, united around the crank pin, i, upon the horizontal driving wheel, all connected in such a manner as to play freely with the motions of the wheel or arm, I, in the manner shown and specified.

Fifth, I also claim in a sewing machine the horizontal fly wheel, or its equivalent, when in connection with a vertical shaft provided with a cam, E, and arm, 9, arranged and operating in the manner set forth.

58,367.—SKATE.—F. W. Arvine, New Haven, Ct.

First, I claim adapting the runner of a skate to serve as a lever in conjunction with clamps, or other fastenings, for securing a skate to the foot, substantially as described.

Second, Pivoting the runner, A, to the foot stand at one end, and providing a latch fastening for said runner at its other end, substantially as described.

Third, Applying the instep and toe straps to a sliding plate, G G', operating substantially as described.

Fourth, The heel spurs, a, in combination with a sliding plate, G G', having toe and instep straps applied to it, substantially as described.

Fifth, The construction of the bottom slide of two portions, G G', which are adapted for adjusting the toe and instep straps of a skate.

58,368.—WATER ELEVATOR.—Emmet R. Austin, Norwalk, Ct.

First, I claim the wheel having the concave rim composed of two parts with an open space between them and the arms, C, constructed as set forth.

Second, In combination with the wheel, constructed as described, I claim the buckets, B, as shown and described.

58,369.—FENCE GATE.—J. S. Benedict, Bedford, Ohio.

I claim the rest, A, in combination with the gate roller, C, and hinge, B, when arranged and operating conjointly as and for the purpose specified.

58,370.—COMPOSITION FOR REMOVING INK FROM TYPE.—A. M. Bouton, Newark, N. J.

I claim the use of these substances in any combination for cleansing purposes, substantially as set forth in the foregoing.

58,371.—MEDICAL COMPOUND FOR HOG CHOLERA.—M. Boyes, Pocahontas, Ill.

I claim the within-described medical compound made of the ingredients and in the proportions substantially as herein described.

58,372.—COTTON-SEED PLANTER.—Frederick H. Brown, Auburn, N. Y.

First, I claim the adjustable nature or character of the machine as to regulate the space between rows, in combination with the cotton-seed planter, as above specified.

Second, In cotton-seed planters, regulating the depth that the seed are deposited.

Third, The mode described of constructing the endless chain, and its combination with the cotton-seed planter, as above set forth.

Fourth, The peculiar movement given to the shaft, X, above described, when used for the purpose above set forth.

58,373.—HOT-AIR FURNACE.—John S. Budd, New York City.

First, I claim the dome, d, pipe, e, and damper, in combination with the two ranges of return pipes, f, at the sides of the furnace connected to the pipe, e, by the lateral connections, g, as and for the purposes set forth.

Second, I claim the air jacket, h, surrounding the fire pot, in combination with the shield, k, for allowing a regulated quantity of heated atmosphere to pass into the gases above the fire for their consumption, as set forth.

58,374.—METHOD OF PRESERVING FLOUR, GRAIN, ETC.—Joseph Carlin, Cincinnati, Ohio.

I claim the mode of preserving flour and grain from souring by suspending masses of unglazed pottery (or its equivalents), within the barrel, bin, or other receptacle, substantially as set forth.

58,375.—SODA FOUNTAIN.—James W. Cahill, Madison, Ind.

First, I claim the cup, U V, made of two portions screwing together and with perforated bottom, W, constructed and operating as and for the purpose described.

Second, The perforated shield, K, extending nearly to the top of the water chamber to keep the ice away from the pump, pump rod and crank.

Third, The branching head, O Y X, provided at the respective ends with the plain nozzle, T, and the soda cup nozzle, T', substantially as described.

58,376.—RUFFLING ATTACHMENT FOR SEWING MACHINES.—Dewitt C. Carey, Baltimore, Md.

First, I claim the curved or segmental guide, A, in the described combination with the bar, B, carrying a ruffling plate, L.

Second, I claim the spring R, when employed in connection with the ruffling plate, L, and bar, B, substantially as and for the purposes set forth.

Third, I claim the connecting strap, T, connected to the head of the needle bar or other suitable needle-operating mechanism, to actuate the ruffling device, substantially as described.

Fourth, In combination with the aforesaid ruffling mechanism, A B L, I further claim the slotted bar, S, and clamp screw, C, for varying the fineness of the ruffling.

Fifth, I claim the spring detent, g, constructed and employed as described to hold the work from being drawn back by the return motion to the ruffler.

58,377.—MANUFACTURE OF WATER-PROOF HOSE.—Edwin M. Chaffee, Providence, R. I.

First, I claim the method substantially as herein described of lining hose of woven or other fabric with india-rubber, gutta-percha, or other flexible and vulcanizable gum on the inside by means substantially such as set forth, or by any other equivalent means.

Second, The use of the tin tube or its equivalent for the purpose herein described.

Third, Strengthening the lining by the longitudinal threads or their equivalent, substantially as described.

58,378.—CORD AND LINE REEL.—H. W. Chamberlain, Jersey City, N. J.

First, I claim the reel, A, and two handles, n m, arranged and operating substantially in the manner and for the purpose set forth.

Second, I claim the adjusting or securing slides, I and P, in combination with the reel, A, for securing the handles in the reel as and for the purpose set forth.

Third, The combination of the cord clamp or holder, J j, with a reel adapted to operate substantially as specified.

58,379.—METHOD OF BURNING OIL FOR FUEL.—Robert A. Chesebrough, New York City.

I claim the use of bone black as an absorbent bed for oil when the same is used as fuel.

Second, The combination of bone black and hydrocarbon or other oils for use as fuel.

58,380.—CULTIVATOR.—Edwin Children, Liberty, Wis.

I claim the pivoted draft pole, D, in combination with the pivoted bars, H H, lever, G, and the plow beams, L L, connected to the bar, I, which is pivoted to the bars, H H, all arranged substantially as and for the purpose set forth.

58,381.—MACHINE FOR PLANTING COTTON SEED.—John G. Clark, Middletown, Ohio.

I claim, First, The toothed cylinder, B, in combination with the toothed reciprocating slide or slides, constructed arranged and operating in the manner substantially as described.

Second, The combination of the agitator with the cylinder, B, and ribs, e e, operating substantially as specified.

Third, The hopper teeth arranged tangentically in relation to the cylinder in combination with the positively operating devices for separating and discharging the seed, substantially as and for the purpose described.

58,382.—LIGHTNING ROD.—Henry B. Comer and John Denton, Pittsburgh, Pa.

We claim a new article of manufacture, to wit: a lightning rod consisting of a central core from which extend two tain wings, said core and wings being made in one piece and twisted, the whole being made by means and constructed in the form substantially as herein described and for the purpose set forth.

58,383.—CULTIVATOR.—James Cook, Collinsville, Ohio.

I claim, First, The intermediate frames, A and a a', constructed in the manner described in combination with the standards, d and d', beam, B, and drag bars, f, arranged, connected and operating in the manner and for the purpose specified.

Second, The upper frame, a a', and spring connection b, in combination with the plow handles and notches or gains, to limit the oscillating motion of the plows, in the manner and for the purpose substantially as described.

58,384.—GANG PLOW.—Thomas J. Cornell, Decatur, Ill.

I claim, First, The plow standard, I, journaled on a horizontal axis, K, to vibrate rearward, under the circumstances described.

Second, The catch, Q, in combination with the standard, I, operating as described.

Third, The spring, R, in combination with the standard, I, operating as described.

Fourth, The eccentric segment, W, in combination with the beam or beams of the plow, and operating substantially as described.

58,385.—POTATO DRILL.—John Croco, Holmesville, Ohio.

I claim the hopper, E, the spout, M, the bar, N, the spring, d, and knobs, g, the whole constructed and arranged as and for the purpose herein specified.

58,386.—GANG PLOW.—H. N. Dalton, Pacheco, California.

I claim, First, The plow frame, F, parallel arms, E, beam, H, links, J C, vertical bar, I, and pins, d e, combined and operating substantially as described for the purpose specified.

Second, The lever, J, arms, E E, beam, H, and frame, F, combined and operating substantially as described for the purpose specified.

58,387.—CARVING TABLE.—Royal E. Deane, New York City.

I claim a carving table having a top, A, constructed in the form of a shallow vessel divided by a longitudinal central partition plate, b, one or more, with a space, c, allowed at one end to form a communication between the two compartments, d d', and the latter made to communicate by means of pipes, e e', with the water back or heater of a range or furnace, substantially as herein shown and described.

58,388.—APPARATUS FOR REMOVING THE WIRE FROM SODA WATER BOTTLES.—C. M. Dedrick, Temperanceville, Pa.

I claim the apparatus consisting of the base or lever, A, inclosure, C, and catching point, B, when said apparatus is used for the purpose of removing wire off the corks of soda or mineral water bottles, the whole being constructed, arranged and operating substantially as herein described and set forth.

58,389.—CULTIVATOR.—G. W. Doolittle, Lincoln, Ill.

First, I claim the form of the plow mold as herein described, for the purpose specified.

Second, I claim the arrangement and combination of the guiding mechanism herein described.

Third, I claim the iron axle, s, and the supporting brace, n, constructed and operating as herein described.

Fourth, I claim the combination of all the parts operating substantially in the manner herein described.

58,390.—FORK FOR DIGGING POTATOES.—Harrison Doolittle, East Cleveland, Ohio.

First, I claim constructing the cross head, A, adapted to receive the tines in the manner described.

Second, I claim the tine, B, constructed as herein described, in combination with the cross-head.

Third, I claim the adjustable support or fulcrum, D, in either of the forms represented, in combination with the handle and shank, C.

Fourth, I claim the employment of the guard rod, E, for the purpose herein specified.

Fifth, I claim connecting the fork into a rake in the manner herein described, and the combination of the fork and rake, for the purposes herein set forth.

58,391.—MAKING HATS.—William E. Doubleday, Brooklyn, N. Y.

First, I claim the ring brim block, b, to which the edge of the felt or other material is to be connected by pins or otherwise, in combination with the crown block applied to stretch the fabric to shape, as set forth.

Second, In combination with the brim ring and crown block, I claim the brim block or its equivalent to connect the brim ring and crown block, so that they may be removed and retain the hat or similar article while cooling or drying, as set forth.

Third, I claim the method herein specified of forming or shaping hats and bonnets by heating and softening the felt or other material by steam and then stretching and shaping said fabric at one operation by blocks, before it cooks or dries, substantially by the means set forth.

58,392.—LANTERN.—A. M. Duburn, Chicago, Ill.

First, I claim the arrangement of the globe, G, as shown, so that it may rest on spring supports and be capable of being drawn through the band, C, when desired.

Second, The wick adjusting mechanism composed of the two rods, k m, fitted respectively in the lamp burner and band, C and provided with the square, l, and three sided socket, n, all constructed, combined and arranged as shown, to admit of the wick being raised and lowered without removing the lamp from the lantern and at the same admitting of the removal of the lamp whenever desired.

58,393.—SCREEN FOR DRY GAS PURIFIERS.—Edward Duffee, Haverhill, Mass.

I claim, in a screen for dry coal gas purifiers, made up of crossed or interlaced thin strips of wood, supported by a frame-work, grooving the outer edges of each frame, so that the strips shall be imbedded in or sunk below the surface of each outer edge, to prevent abrasion, and to allow the frames to abut closely together, substantially as set forth.

58,394.—BED BOTTOM.—F. B. Duffy, Sparta, Wis.

I claim a spring bed bottom, consisting of the slats, c, resting at their ends on the elastic strap, E, secured to the bar, a, by the staples, e, and the whole secured to the bedstead by means of the hooks, m, and staples, o, as set forth.

58,395.—PLOW.—J. B. Edgell, J. W. and E. A. Alexander, Independence, Iowa.

First, We claim the construction of a plow carriage for supporting plows, of the axletree, A, wheels, B, beam, c, seat, c', beam, D, pivoted pole, G, hand lever, H, and connecting rod, g, substantially as described.

Second, The pendant, E, applied to the beam, D, of an adjustable plow carriage, which is constructed substantially as described.

Third, Pivoting a plow to an adjustable beam of a carriage, so as to operate substantially as set forth.

58,396.—COFFEE POT.—William Edson, Boston, Mass.

I claim, as an improved article of manufacture, a coffee pot provided with a fixed diaphragm, E, pipe, P, strainer, F, and otherwise made as shown and described, and for the purpose set forth.

58,397.—AIR ENGINE OR MOTOR.—Peter A. Ensign, Adrian, Mich.

First, I claim the combination and arrangement of the cylinder, A, suitably elevated, wind wheel, D, vertical shaft, E, shaft, K, perforated stationary tube, J, governor, H, valve, F, and heater, B, substantially as described, for the purpose specified.

Second, I also claim the heater, B, and stove, C, arranged alongside of and connected to the cylinder, as above described, in combination with the said cylinder, and the wind wheel, substantially as shown.

58,398.—OVEN FOR GAS COOK STOVE.—Luther Irving, Brooklyn, N. Y. Antedated September 23, 1866.

First, I claim the inverted conical deflector, E, when used in connection with an oven, F, and a gas burner, substantially as and for the purpose set forth.

Second, Constructing the oven with double walls to form flues or draft passages, when said oven is provided with a deflector, E, arranged relatively with the draft passages, so as to guide or deflect the products of combustion into the flues, and at the same time admit of the heat from the flame rising directly into the oven, as set forth.

Third, The shelves, G, in the oven, F, arranged in such a manner that they have open spaces on every side to allow the heat to pass, in the manner and for the purpose described.

58,399.—SEWING-MACHINE SHUTTLE.—Frederick Etzold, Union Hill, N. J.

I claim the toothed eccentric cam, D, applied in combination with the spring, C, and in relation with the bobbin, B, and shell, A, of the shuttle, substantially as herein set forth for the purpose specified.

58,400.—PRIVY.—D. S. Forney, Wytheville, Va.

First, I claim the portable receptacle, F, for excrementitious deposits, in combination with the box, W, connected by a pipe or tube to the receptacle, F, and provided with the cover, L, and lids, d d, the whole being constructed, arranged, and operated as described.

Second, A swinging cover, M, or its equivalent, so arranged upon the excrement receptacle that it can be either swung away from or over its mouth, by means substantially as and for the purpose specified.

Third, The box cover or lid, M, having its bottom perforated or made of wire netting, for the purpose specified.

Fourth, The swinging cover or lid, S, for the seat opening of the privy, operated as described, whether arranged to swing in conjunction with the cover of the excrement receptacle or not.

58,401.—HAY AND GRAIN PROTECTOR.—Andrew J. Frisbie, St. Mary's, Ohio.

I claim the longitudinal hay and grain cap, as herein described.

58,402.—OAR SWIVEL.—Martin Fryer, Greenbush, N. Y.

I claim the combination of the swivel, A, with the ring, B, and its slot, b, and the ring, C, with its pin, c, operating together in the manner and for the purpose described.

58,403.—SURGICAL SPLINT.—Richard J. P. Goodwin, Manchester, N. H. Antedated September 24, 1866.

First, I claim the adjustable band, D, one or more, between the stationary bands, B, or B', in combination with the guide rod, a or a', constructed and operating substantially as and for the purpose described.

Second, The segmental slots, c, and set screws, d, in combination with the hinge joints, C, which connect the two parts of the splint, A, substantially as and for the purpose set forth.

Third, The arrangement of hinge joints, h, in the middle of the bands, B B' D, or nearly so, substantially as and for the purpose described.

Fourth, The application to the bands of waterproof pads, substantially as and for the purposes set forth.

58,404.—Fish Hook.—W. C. Goodwin, Hamden, Conn.

I claim the combination of the fish hook with the spiral or helical spring, when they are constructed, put together, and made fit for use, substantially as herein described.

58,405.—Door and Gate Spring.—John C. Gould, Boonton, N. J.

I claim the plate, D, spring, F, or its equivalent, lever, G, arm, H, with the guides, I and M, and the notch, J, substantially as set forth and for the purposes named.

58,406.—Elevator for Ladies' Skirts.—Christian Grun, New York City.

I claim the mortises, a a' b, in the V-shaped bed plate, A, in combination with the eyes, c, on the spring jaws, and with the spring, e, constructed and operating substantially as and for the purpose set forth.

58,407.—Belgian Pavement. — Charles Guidet, New York City.

I claim the employment of rhomboidal blocks, in which the angles are unequal, and the planes of thin sides are not at right angles, arranged substantially as and for the purpose set forth.

58,408.—Melting and Molding Tinners' Solder. —D. Hagerty, Baltimore, Md.

I claim the combination of recess, E, with its interior furnace, e, and gate, G, mold plates, B B, toothed wheel, C, and tube, A, constructed and arranged in the manner substantially as shown and described, and for the purpose set forth.

58,409.—Lubricating Apparatus.—William Hamilton, Chicopee, Mass.

I claim an oil cup divided into separate compartments, as described, when said cup is combined with a chain or ring, B, by means of which the oil is carried up to lubricate the axle or shaft, in the manner and for the purpose herein described.

58,410.—Mode of Ornamenting and Lettering Glass.—Thomas R. Hartell, Philadelphia, Pa.

I claim ornamenting and lettering glass objects by making depressions in the same while the glass is in a plastic state, and filling or lining these depressions with white plaster while in a plastic state, as and for the purpose set forth.

58,411.—Snow and Ice Guard for Roofs of Buildings.—S. R. Hathorn, Castleton, Vt.

First, I claim a snow and ice fender, composed of the supporting pieces, D, and fender rods, e, and combined together substantially as and for the purposes set forth.

Second, I claim the snow and ice fender, constructed and arranged substantially as herein described, so that it may be secured to the roof of a building before the shingles or slates are put on, as set forth.

58,412.—Horse Hay Rake. — Jerrah Hayward, Greene, N. Y.

I claim the combination of the lever, F, to the lever, E, main braces, C C, pitman, D, and rake B, when made and operated substantially as and for the purposes set forth.

58,413.—Ditching Machine. — Edward Heath, Fowlerville, N. Y.

First, I claim the ditching machine, so constructed as that the cross head will impart a longitudinal motion to the excavator and a lateral motion to the scraper at the same time, substantially as and for the purposes herein described.

Second, I claim the cross head, J, pitman, I, and crank, H, in combination with the bar, E2, lever, H2, and ratchet wheel, C2, all for the purposes and substantially as herein set forth.

Third, The excavator, S, pitmen, L L, in combination with the spring catch, T, and rock shaft, P, substantially as and for the purposes described.

Fourth, The scraper, R, in combination with the excavator, S, for the purposes and substantially as described.

58,414.—Fastening for Neckties.—H. M. Heineman, Williamsburgh, N. Y.

I claim the fastening, A, consisting of the two jaws, B and C, and clasp or slide, E, arranged and connected together, and constructed so as to operate substantially in the manner and for the purpose specified.

58,415.—Churn. — Joshua Henry, Stenbenville, Ohio.

I claim the arrangement of the metal tube, d, passing through the journal, c', and into and beyond the bottom of the funnel, a, when used in combination with the revolving churn box, A, substantially as and for the purposes specified.

58,416.—Apparatus for Discharging Bilge-water from Vessel Holds.—Augustus Hermann, New Haven, Conn.

I claim the apparatus, substantially as described, consisting of a vertical axle, I K, to which is attached a hollow cylinder, R R, with projecting chambers, T T T, containing valves, U U U, which open on the said axle and hollow cylinder being rotated, said apparatus being operated in the manner substantially as described for the purpose of freeing vessels from water.

58,417.—Cap for Mucilage Bottle.—Thomas N. Hickcox, Brooklyn, N. Y.

I claim the sheet metal cap for mucilage bottles, etc., formed with a spring flanged hole for the brush handle, as and for the purposes set forth.

58,418.—Car Coupling.—Chas Holtz, Chicago, Ill.

First, I claim so arranging the coupling pin, in combination with the adjustable or movable bumpers, D, or their equivalent, that pressure upon said bumpers will raise up the coupling pin, and allow the coupling link to enter the draw head when the cars are run together.

Second, I claim so arranging the springs, S, or their equivalent, in combination with the coupling pin, that said pin is caused or permitted to drop through the coupling link to couple the cars when pressure upon the aforesaid bumpers is renewed.

Third, I claim the combination of the bumpers, D, the movable bar, E, the pin, d, sliding bar, c, bent lever, b, and coupling pin, a, arranged and operating substantially as specified and shown.

Fourth, I claim the combination and arrangement of the bumpers, D, cross bar, E, springs, S, pin, d, slide, c, lever, b, and pin, a, operating substantially as specified and set forth.

Fifth, I claim, in combination with the pin, a, bent lever, b, and slide, c, the employment of a projection, e, and hook, g, for uncoupling the cars, substantially as specified.

Sixth, I claim, in combination with said slide, e, the employment of a spring, h, as and for the purposes described and shown.

Seventh, I claim the employment of the levers or arms, H, and cord, I, in combination with the shaft, f, and hook, g, arranged and operating as and for the purpose set forth.

58,419.—Clothes-line Clamp.—Charles W. Howard, Philadelphia, Pa.

I claim a device for supporting a clothes line, consisting of the pieces, A and B, or their equivalents, constructed and combined to operate together so as to pinch and hold the line by the tensional strain of the latter, substantially as described and set forth.

58,420.—Stamp Moistener.—H. A. Hoyt, Mott Haven, N. Y.

I claim an improved stamp moistener, formed by combining the spring, B, and screw, C, constructed and arranged with the sponge, D, and sponge cup, A, substantially as described and for the purpose set forth.

58,421.—Composition for Paint.—William C. Hurd, New York City.

I claim a composition for painting compounded by the addition of powdered quartz to oil, lead, zinc, and other materials ordinarily employed in the manufacture of paints, substantially as set forth.

58,422.—Automatic Feed for Carbureters.—Elias S. Hutchinson, Baltimore, Md.

I claim a valve to regulate the supply of liquid from the reservoir to the chamber which is operated from the revolving shaft or a projection thereon, which strikes against an object brought within reach by the sinking of the fluid in the chamber.

58,423.—Composition for Destroying Insects.—George M. Jacques, Boston, Mass.

I claim the combination of extracts, solutions, and distillations of tobacco, including the nicotine oils, and ammonia, and soaps, in the manner and for the purpose above described.

58,424.—Sadiron Heater.—Eugene N. Jenkins, Chicago, Ill.

I claim the wire with the feet, f, bend, g, and end, h, constructed substantially as and susceptible of being operated in the manner and for the purposes herein recited.

58,425.—Process of Seasoning Wood.—Barton H. Jenks, Bridesburgh, Pa.

I claim the process, substantially as herein described, of seasoning or drying wood.

58,426.—Oyster Rake.—Job Johnson, Brooklyn, N. Y.

First, I claim the lever in combination with a pair of rakes, hinged together substantially as specified, for keeping the rakes apart as they are lowered, and allowing the rakes to close after they touch at the bottom of the water, as set forth.

Second, I claim a line or cord passing from the end of one handle to the rake on the other handle, for opening the rake when it becomes necessary to disconnect the same from any article in the water, as specified.

Third, I claim the mode of constructing the metallic rake head with the angle iron receiving the teeth clamped to the same, substantially as set forth.

Fourth, I claim the metallic fenders formed of the bars, a, and rods, u, the parts being united to the rake head, c, in the manner specified.

58,427.—Watch.—Thomas Johnson, Elmira, N. Y.

First, I claim the combination and arrangement of the cock, with the plate and its pillar and pin, when said pin is inserted in a direction running lengthwise with the cock, substantially as herein shown and described

Second, The combination and arrangement of the hair spring stud with the segment screw, e, when constructed and operating substantially as herein shown and described.

Third, The combination of the arms or levers, f g, with the hair spring, d, constructed and operating substantially as herein shown and described.

Fourth, The combination and arrangement of the clicks and springs with their ratchet, constructed and operating substantially as herein shown and described.

Fifth, The arrangement of the clicks and click springs combined, and ratchet, with the bridge or cap inclosing them, substantially as herein shown and described.

Sixth, The combination of the face ratchet, u, with the stop work, constructed and operating substantially as herein shown and described.

Seventh, The male stop, p, when constructed with a lip, s, stud, q, and beveled slots, o' o', as herein shown and described.

Eighth, The hook and auxiliary stop work, x, constructed and operating substantially as herein shown and described.

Ninth, The arrangement of the teeth upon the center of the periphery of the barrel containing the main spring, substantially as herein shown and described.

Tenth, The combination of a suspended cap jewel, by means of an elastic bearing, with a pivot, substantially as herein shown and described.

Eleventh, The construction and arrangement of the jewel in the spring, a", substantially as herein shown and described.

Twelfth, The method of forming in a watch movement suspended elastic end bearings to the pivot, substantially as herein shown and described.

58,428.—Card Rack.—James M. Keep, New York City. Antedated September 18, 1866.

First, I claim the springs for holding cards, when constructed and arranged relatively to each other, and to the tablet or other surface to which they are secured, as herein described, so that each spring shall bear upon the swell or crown of the succeeding spring, immediately above, as and for the purposes set forth.

Second, I claim the combination in a card rack of the springs, constructed and arranged as above described, with the frame, A, bars, B, and alphabetical reference or tablet, substantially as hereinbefore shown and set forth.

Third, I claim constructing a card rack of separable and detachable parts, as described, and so that said rack may be easily taken apart and readily readjusted, substantially as and for the purposes herein set forth.

58,429.—Billiard Register.—O. W. Kellogg and H. R. Hill, Ripon, Wis.

First, We claim the dial plates, A A, with disks, D D, bar, M, ratchet, E, and pendulum, F, arranged in the manner substantially as and for the purposes herein specified.

Second, The pendulum, F, attached to the count wire when used as and for the purposes set forth.

58,430.—Belt Buckle.—George R. Kelsey, West Haven, Conn.

I claim the combination of the bow, Fig. 3, lever, Fig. 4, and hook, Fig. 5, when they are constructed, put together, and fitted for use, substantially as herein described and set forth.

58,431.—Plow.—Isaac Kennedy, Ithaca, N. Y.

First, I claim making the wheel at the rear end of the mold board adjustable by means of a frame or other devices at the top and bottom of the said wheel, one or both, by means of which I am able to evert, set on edge, throw completely over, or otherwise regulate the furrows by the use of the said wheel and frame as described.

Second, I claim the combination of the wheel or equivalent device and frames, with the mold board, and the V-shaped handles meeting in one eye on the land-rest, the same making a whole as described.

Third, I claim the so combining together the wheel and the immovable part of the mold board, and shaping each to the other that they shall maintain a constant relation to each other in whatever position the wheel may be placed, as described.

58,432.—Fence.—George Kicherer, Brooklyn, N. Y.

I claim as a new article of manufacture the panels, fitted with staples or eyes for the reception of the rods or braces, substantially in the manner described and for the purpose specified.

58,433.—Let-off and Take-up for Looms.—John F. Kirkwood, Thistle, Md.

First, I claim the combination of the lever, V, and spring, U, with the whip roll, T, arm, S, and rod, Q, for the purpose of increasing the speed of the let-off devices conformably with the decrease of thread upon the yarn beam, substantially as described.

Second, I claim the arrangement of the lever, F, cam, E', and arm, P, for imparting motion to both the let-off and take-up mechanism, as described.

58,434.—Machine for Twisting, Stretching, Cleaning and Reeling Silk and other Threads.—Tobias Kohn, Hartford, Conn.

First, I claim the combination of the mechanism for twisting with the means for stretching and the mechanism for cleaning, substantially as described.

Second, I also claim the combination of the mechanism for twisting with the means for stretching and the mechanism for reeling, substantially as described.

Third, And finally, I claim the combination of the mechanism for twisting with the apparatus for macerating, the means for stretching, the mechanism for cleaning, and the mechanism for reeling, substantially as described.

58,435.—Drilling and Quarrying Stone, etc.—Ebenezer G. Lamson, Shelburne Falls, Mass.

I claim connecting the chisels, drills, or other cutting instruments for working in or on stone, to the crank wheel, or its equivalent raising and lowering mechanism, through the intervention of a bow string and strap, substantially as and for the purpose described.

I also claim, n connection with a stone-cutting, channeling, tunneling or quarrying machine that is moved along upon a track or ways while operating upon the rock or stone, a reversible pawl, the worm gear, and clutch, so that it may be moved along in either direction upon the track, or stopped thereon at will while the cutter or tools continue to operate, substantially as described.

58,436.—Hollow Auger.—James Lefeber, Cambridge City, Ind. Antedated August 23, 1866.

I claim a hollow auger, substantially as above described, with radial wings on the exterior of its body, and with bits or cutters fastened adjustably to such wings, as above shown.

58,437.—Bedstead Fastening.—John Lemman, Cincinnati, O.

I claim inserting in a bedstead post a segment of circle, B, in a mortise with beveled sides and lower end, for the purpose of securing it to the post, A, without any other fastening, substantially as described.

58,438.—Pick and Ax Combined.—H. L. Lowman, New York City.

I claim as a new article of manufacture a compound tool, consisting of an ax and pick united, the eye being of elliptical form, and of even size throughout its length, as described and represented.

58,439.—Induction Coils for Electro-magnets. —J. B. Lyon and Arnold Doll, Cleveland, O.

First, We claim making the coil for the main or direct circuit of two wires of dissimilar metals, as copper and iron laid side by side in alternation, as specified.

Second, We claim laying the coil for the induction current in two sections, of about equal length of wire, one section being upon the core of the coil, and the other upon the outside of the main coil, the two sections being of one continuous wire, as herein set forth, in combination with a primary coil composed of dissimilar metals, as specified.

58,440.—Skate. — Andrew Mabon, Philadelphia, Pa.

I claim a skate having a projection, d, hinged plate, f, and recess y, adapted for the reception of a pin on the boot to which the skate is to be attached, the whole being constructed substantially as described.

58,441.—Fastening for Window Blinds.—Francis A. Makepeace, Worcester, Mass.

First, I claim the construction and arrangement of the double spring jaws, when constructed and operating substantially as set forth.

Second, The locking plate in connection with the double jaws, when constructed and operating in the manner and for the purposes substantially as set forth and described.

58,442.—Lifter for Stove Covers, etc.—Sidney Maltby and J. R. Brown, Dayton, O.

First, We claim a stove lifter composed of the parts B B', and jaws, D D and E E, constructed and arranged as and for the purpose shown.

Second, Providing one jaw in each set with ribs.

Third, The hooks on ends of reins in combination with the reins and jaws, all substantially as and for the purposes set forth.

58,443.—Safety Gun Lock.—James E. McBeth, New Orleans, La.

First, I claim the cocking trigger, B, formed with the curve, b, in combination with the hammer, A, formed with the curve, a, substantially in the manner and for the purposes herein described.

Second, I claim the notch, h, and spring, k (on B), with the projecting point, o (on D), and the projecting point, p (on C), substantially in the manner and for the purposes herein described.

Third, I claim the combination of the notch, h, spring, k, projecting points, o and p, sear, c, sear spring, F, trigger, D, and trigger, B, substantially in the manner and for the purposes herein described.

Fourth, I claim the combination of B and C, substantially in the manner and for the purposes herein described.

Fifth, I claim the combination of the several parts, A, B, C, and D, substantially in the manner and for the purposes herein described.

58,444.—Breech-loading Fire-arm.—Reuben McChesney, Ilion, N. Y.

First, I claim lifting a swinging breech piece from an open to a close position entirely by the immediate action of the hammer or of some projection thereof, without any intermediate device, substantially as herein specified.

Second, I also claim the relative arrangement and combination of the breech piece and hammer, in such a manner that the breech piece may descend by its own weight and open the breech before the hammer reaches half cock, and be raised again to close the breech while the hammer is passing from half cock to full cock, substantially as and for the purpose herein set forth.

Third, I also claim the combined arrangement of the breech piece, locking bolt, or its equivalent, and the hammer, in such manner that the breech piece shall be held locked independently of the hammer during the entire descent of the latter, then unlocked by the action of the hammer before the same reaches half cock in ascending, and again locked by the action thereof at or before reaching full cock.

Fourth, I also claim the sliding firing pin, q y, arranged to slide in the side of the breech piece, substantially as above described.

Fifth, I also claim the dog, g, of the hammer piece of the bolt, F, substantially as and for the purpose above described.

Sixth, I also claim the dog, 6, in combination with the pendent plate, f, of the sliding bolt, F, substantially as and for the purpose above described.

Seventh, I also claim the hook, p, of the hammer, in combination with the firing pin, constructed and operating substantially as and for the purpose above described.

Eighth, I also claim the mode above described of securing the end of the main spring, to wit: by fitting its end in a groove on the screw pin, n, in combination with the projection, 8, and recess, 7, substantially as above described.

58,445.—Tie for Cotton Bales.—John McMurtry, Lexington, Ky.

I claim the hoop-iron cotton bale tie, A, constructed and operating in the manner and for the purposes herein set forth.

58,446.—Device for Griping Screw Blanks.—Dustin F. Mellen, New York City.

First, I claim a hollow spindle in which forceps or some other analogous device is placed, made in two parts by a longitudinal division, substantially as and for the purposes set forth.

I also claim the adjustable fulcrum, 8, for the adjustment of the forceps regulated by the screw nut around the spindle, by which it is shifted and held, substantially as and for the purposes set forth.

I also claim inserting folding springs, 6, within the spindle, to open the jaws of the forceps, constructed, arranged and combined with the forceps and spindle, as and for the purposes set forth.

I also claim the hardened steel bearing, 10, combined with the spindle and box, 12, substantially as herein specified.

I also claim the hardened bearing and box, 15 and 16, in connection with a forward bearing that will not allow end chase, constructed and arranged substantially as and for the purposes specified.

I also claim the sliding ring, 18, and hardened ring, 19, for closing the forceps, substantially as herein set forth.

58,447.—Mode of Attaching Tires to Wheels of Locomotive.—Edward Mellon, Scranton, Pa.

I claim the wheel with the curved flange upon the inner edge, in combination with a tire with a rounded corner to fit said curved flange, as set forth.

58,448.—Construction of Iron Railroad Cars. —S. Merrick, New Brighton, Pa.

I claim an iron railroad car, having its panels, F, secured in position by metal stanchions, C D, provided respectively with a groove, a, and rib, b, and connected together, and to wooden stanchions, B, by bolts, E, substantially as herein shown and described.

57,449. — Cask, Barrel, etc. — Joshua Merrill, Boston, Mass.

I claim as of my invention and improvement in casks, barrels, and kegs, in combination with the joints of a cask suitable for holding and transporting liquids, having the common straight or

plain joints, a coating or stuffing of glue or similar gelatinous cement applied to the joints before putting the cask together, substantially as described.

58,450.—Cask, Barrel, etc.—Joshua Merrill, Boston, Mass.

I claim the improved cask, substan tially as described, having lapped joints formed by a lip and rebate, substantially in the way and for the purposes described.

In combination with the lapped joints of lapped-jointed casks, substantially as described, a coating or stuffing of glue, or similar gelatinous cement, applied to the lapped joints, substantially as described, whereby said joints are firmly glued or cemented together.

In combination with the lapped joints of lapped-jointed casks, substantially as described, a coating or stuffing of shellac, rosin, or other similar resinous cement, applied to the lapped joints, substantially as described, whereby the lapped joints are more securely protected against leakage.

58,451.—Cask, Barrel, and Keg.—Joshua Merrill, Boston, Mass.

I claim as my invention and improvent in casks, barrels, and kegs used for holding and transporting liquids, the improved cask, substantially as described, having its joints made with two or more tongues, and two or more corresponding grooves at each joint, substantially in the way and for the purposes hereinbefore described.

In combination with the joints, a cask having its joints made with two or more tongues, and two or more corresponding grooves to each joint, and a coating or stuffing of glue, or similar gelatinous cement, applied to the said joints, substantially as and for the purposes described.

In combination with the joints of a cask having its joints made with two or more tongues, and two or more corresponding grooves to each joint, a coating or stuffing of shellac, rosin, or similar resinous cement, applied to the said joints, substantially as and for the purposes described.

58,452.—Barrel and Keg.—Joshua Merrill, Boston, Mass.

I claim, in combination wit the joints of a cask, suitable to hold and transport liquids, having plain or straight joints, a coating or stuffing of shellac, rosin, or other similar resinous cement, applied to the joints, and substantially in the way and for the purposes described.

58,453.—Combined Foot Warmer and Reflecting Lamp.—Charles S. Merwin and Charles A. Metcalf, Dubuque, Iowa.

First, We claim the employment, in a combined foot stove and lantern, of a reflector, C, substantially as and for the purpose specified.

Second, We claim the combination of the glass plate, d, the lamp, c, and reflector, c, substantially as specified.

58,454. — Prepared Paste. — Samuel Merwin, Springfield, Mass.

I claim, as a new article of manufacture, the substance herein described.

58,455.—Spice Box.—Wallace A. Miles, Meriden, Conn.

I claim the covers, A, having perforations in a radial line, registering with the slotted cover, B, of a box, operating substantially as described for the purpose specified.

58,456.—Dust and Shaving Conveyer for Planing and Sawing Machine.—David R. Miller, Harrisburg, Pa.

I claim the conveyer, A, made of metal or wood, provided with the hooks, F F, flanges, C and D, with opening, B, when constructed substantially as described, and used for the purposes herein specified.

58,457.—Sand Pump.—Bernard Morahan, Brooklyn, N. Y.

I claim the split-linked piston rod, E, in combination with the piston, C, operating with the bail, B, firmly secured to the cylinder, B, as and for the purpose specified.

58,458.—Paint for Ship's Bottom.—G. W. Morse, New York City.

I claim a paint composition made of the ingredients above specified.

58,459.—Lamp.—Charles Mulchahey, Springfield, Mass.

I claim the application to an oil lamp, of an absorbent or retaining material, around outside of the tube, c, substantially in the manner and for the purpose described.

58,460.—Spider.—Jonas Mull and Asa D. Reed, Troy, N. Y.

We claim the employment of a spider, for culinary purposes, constructed with an outward projecting flange, I, with aperture, D, upon the upper edge thereof, and with the projections, G', so as to suspend the said spider back of the center thereof, in combination with the outer rim, A, and surrounding or annular chamber, A', each being arranged in the manner substantially as herein described and set forth.

58,461.—Fastening for Window Blind.—Hezekiah Munroe, Fall River, Mass.

I claim the combination of the two plates, H and I, when constructed and connected together so as to operate substantially in the manner described and for the purpose specified.

58,462.—Folding Table.—G. W. Nellis, Richmondville, N. Y.

I claim the table having a folding top, A, slides, K, sockets, L, hinged legs, H, brace rod, g, and button, I, arranged and operating substantially as described for the purpose specified.

58,463.—Alphabet Frame.—E. B. Nourse, Eaton, Ohio.

I claim the frame, constructed as described, having spring pads connected by link, or equivalent, to shutters, covering letters, and operating substantially as described and represented.

58,464.—Loom for Weaving Narrow Wares.—Benj. Oldfield, Newark, N. J.

I claim, First, Making the racks, f, adjustable by means of movable strips, or any other equivalent means which will produce the same effect, for the purpose of throwing them out of gear with the pinions, c, as set forth.

Second, Supporting the sleys or reeds, C, by springs, which will allow of depressing said reeds, for the purpose of removing them, as desired, substantially as described.

58,465.—Carriage Shackle.—John H. J. O'Neill, New Haven, Conn.

I claim the combination of the base, A, and the lever, C, hinged thereto, with a cam, F, pivoted to the base, A, constructed and arranged to operate substantially in the manner and for the purpose specified.

58,466.—Apparatus for Holding Paper Ribbon.—William Orr, Jr., and George F. Wright, Clinton, Mass.

We claim the use of the shears, f, or any device which will sever paper in connection with the paper ribbon, a, and paste rolls, d, above mentioned, as and for the purpose specified and shown.

58,467.—Fastening for Trunks, Boxes, etc.—W. S. Paddock, Albany, N. Y.

I claim the combination of the plates, A B C, with the lock, D, all constructed and arranged substantially as herein described, and constituting a fastening for trunks, bags, valises, and boxes.

58,468.—Packing for Deep Well Tube.—J. J. Parker, Marietta, Ohio.

I claim, First, The sleeve, F, pin, g, and slot, m, in combination with the safety band, H, in the manner described.

Second, The outer and inner tubes, A B, the bands C, and the inner metallic sheet, D, in combination with the tube, E, in the manner and for the purpose described.

58,469.—Well Packing.—J. J. Parker, Marietta, Ohio.

I claim the tube, A, in combination with the expansible metal case, B, and lining, C, all substantially in the manner and for the purpose described.

58,470.—Machine for Making Dies for Braid and Embroidering.—J. J. Parker and E. D. Parker, Marietta, Ohio.

We claim, First, The sliding cutter, D, and stationary cutter, E, in combination with moving arms, B, or bar, or their equivalents, by which the pins or wire are set and cut, as set forth.

Second, The turn table, L, set in the frame of the stamping machine, and used to regulate the width of the blocks, and the length of the wires constituting the stamps, in the manner described.

58,471.—Apparatus for Carbureting Air, etc.—Andrew Patterson, Birmingham, Pa.

I claim the combination and arrangement of the divisions, c c c, within the adjustable inclined pan, a, with their alternate submerged passages, d d d, the whole being arranged and applied substantially in the manner and for the purposes set forth.

58,472.—Cleansing Sorgo Sirup.—P. Perdew and H. A. Perdew, Seal, Ohio.

I claim, First, The use of two or more filter boxes for the purpose of cleansing sorgo sirup.

Second, The downward and upward flow of the sirup in passing through, as set forth.

Third, The combination of the filter boxes, below the apron, with the other filter boxes, for the purpose set forth.

58,473.—Apparatus for Cutting and Stamping Soap.—Harvey Alvah Phelps, Albany, N. Y.

We claim, First, The mode herein described for cutting and stamping soap, substantially as set forth.

Second, We claim the arrangement of the feed guide, E, cutting frame, F, sliding transversely to said feed guide, in combination with the stamping bar, H, and edging knives, f f, the whole constructed and arranged in order to operate as set forth.

Third, We claim the employment of a cutting wire, a, tensioned in a transverse sliding frame, F, when used in combination with an intermitting feed, as shown and described and for the purpose specified.

58,474.—Grate Bar.—Charles W. Pierce, Albany, N. Y.

I claim a compound grate made by the combination of an upper grate, D, formed as shown, resting by its outer bars upon the entire upper surface of the outer bars of a lower grate, A, formed as shown, the grates being held to each other by dovetailed joints formed along the outer edges of their outer bars, at f, in the manner and for the purposes set forth in this specification.

58,475.—Storing Petroleum, etc. — Emmett Quinn, Washington, D. C.

I claim a dock or crib with its appurtenances, in which to store petroleum or other oils in barrels or casks, constructed and used in a manner substantially as described.

58,476.—Cultivator. — Jacob K. Reiner, Line Lexington, Pa.

I claim the bars, G G', having the handles, H H, attached and connected by the screw, J, provided with the nut, K, in combination with the bars, F F, attached to the inner sides of the beams, and passing through eyes, a, at the end of a bar, L, secured to the under side of the front bar, G, with the clamp bar, M, attached to the under side of the rear bar, G', all arranged substantially as and for the purpose set forth.

58,477.—Heating Stove.—William Resor, Cincinnati, Ohio.

I claim the arrangement of oval fire chamber, A B C, interior descending flue, E, bottom flue, F, neck, G, external descending flue, H, collar, J, and registered draft inlet, K L, substantially as and for the purpose set forth.

58,478.—Steam Engine.—George H. Reynolds, New York City.

First, I claim the rods, D, arranged as represented relatively to the cylinder, E, cross head, F, bed piece, C, and binders, C', so as to receive the crushing and rending strain between the cylinder and the binders in the line of their axes, as herein set forth.

Second, I claim arranging the link, H, to hold the link block rigidly in the desired position thereon, substantially in the manner and for the purposes herein set forth.

Third, I claim the pinion, O, carried on the link block, in combination with the rack, h, on the link, and with means for confining the link firmly to the block in any desired position, so as to prevent loose play between the parts while the engine is working, substantially as and for the purpose herein set forth.

Fourth, I claim the compound link block, M L K, adapted to allow of adjustment by shimming, substantially as herein set forth.

58,479.—Driving Pump. — Samuel H. Rhoades, Clyde, Ohio.

I claim the point, I, with an enlargement or projection, e', corresponding in size to the sides of the tubular sections and collars, in combination with the said sections and collar valves, E D, and rod, G, arranged and operating in the manner and for the purpose set forth.

58,480.—Whip Rack.—Edward Richmond, Brooklyn, N. Y.

First, I claim in a rack or frame for holding whips, composed of plates of wood or other suitable material, with an interposed sheet of rubber or other elastic substance, as specified, the V-shaped openings or slots formed in the edge of said rack for holding the whip by its tip, the same being constructed and arranged substantially as herein described.

Second, As a new article of manufacture, I claim a rack or frame composed of the materials herein described, in which the circular holes, a and c, are combined with the V-shaped openings, formed in the edge of said rack, the whole being constructed and arranged for operation substantially as shown and set forth.

58,481.—Lamp.—Karl Riedel, Guttenberg, N. J.

I claim the reservoir, A, having hollow handles, H, with suitable absorbent material, D, and non-absorbent material, E, in combination with the gauze cylinder, F, constructed, arranged, and operating substantially as described for the purpose specified.

58,482.—Bookbinder's Paper Cutter.—Michael Riehl, Philadelphia, Pa.

I claim, First, The wheel, L, provided with pintles, in combination with the pendent lever, N, and elbow lever, O, and counterbalance, k, substantially as and for the purposes described.

Second, I claim the cams, a2 and a3, in combination with the wheels, o2 and o3, and table, C, for the purposes and substantially as described.

Third, I also claim a paper-cutting machine by which the paper is pressed by the action of the table raising against the cutter, and so constructed that when the cutter has passed through the paper that the table and cutter instantly recede from each other, for the purposes and substantially as herein described.

58,483.—Machine for Making Spikes.—A. J. Rogers and W. D. Rinehart, Pittsburgh, Pa.

First, We claim forming the head of the spike by rolling it from point to head between a flange roll and reciprocating die, constructed and operating substantially as hereinbefore described, for the purpose of enlarging the head without bending or upsetting.

Second, The use, in combination with the die, f, forming the bottom and one side of the cavity for forming the spikes, of the poppets or side dies, m, constructed and operating substantially as hereinbefore described.

Third, The use, in combination with the poppets or side dies, m, of the drum, F, and table, H, for elevating, and the roller, q, for depressing the poppets, constructed and operating substantially as hereinbefore described.

Fourth, The use of the wedges, k, in combination with the frame, H, and die, f, for the purpose of adjusting the die, f, to the flanged roll, B, substantially as hereinbefore described.

Fifth, The use of the rollers, l l, in the housing frame pressing against one side of the die table, E, and the rollers, s s, in the adjustable frame, I, pressing against the poppets or side dies on the other side of the table, E, in combination with the die table, E, die, f, and poppets, m, for the purpose of keeping the table in proper position, and preventing the spreading of the poppets, substantially as described.

58,484.—Roofing Material.—John Rouse, Port Gibson, N. Y.

First, I claim the within described process of producing a tile by molding it from sand and lime mortar in molds lined with paper or cloth, and afterward saturating it with coal tar, asphaltum, or petroleum, substantially as and for the purpose described.

Second, A tile made of sand and lime mortar, with beveled edges, and saturated with coal tar, asphaltum, or petroleum, as a new article of manufacture.

58,485.—Machine for Forging Horse-shoe Nails.—Joseph Roy, Boston, Mass.

I claim the combination as well as the stationary arrangement of the stationary anvil, C, the movable anvil, D, the two hammers, F G, and the mechanism for supporting and revolving the nail rod and moving it lengthwise, as set forth, such movable anvil and hammers being provided with mechanism for operating them, substantially in the manner as specified.

I also claim the combination as well as the arrangement of the cutter, E, with the anvil, C, the movable anvil, D, the two hammers, F G, and the mechanism for supporting and revolving the nail rod and moving it lengthwise, as set forth, such movable anvil, hammers, and cutter being provided with mechanism for operating them, substantially as hereinbefore specified.

I also claim the mechanism or combination for supporting and revolving the nail rod and moving it lengthwise, as set forth, the same consisting mainly of the shaft, S, the box, T, the rail, U, the lantern wheel, V, the cam, X, the projection, y, the spring, z, the head, a2, the slotted post, w', the rack bar, H, with its toothed racks, the pawls, b' c', the slider, u, the spring, y, the cam, o, the shaft, h, the crank, u', the rod, t', arm, s', shaft, r', arm, q', pawls, o' p', connecting rod, v', lever, t, and link, m', the whole being substantially as specified.

I also claim the combination of the cams, p', the levers, q q', and springs, r r, or their mechanical equivalents, with the hammers, F G, as arranged and combined with the stationary and movable anvils, C D, and mechanism for supporting and operating the nail rod, substantially as described.

58,486.—Hand Planter.—Nelson Safford, Pleasant Valley, Vt.

First, I claim the elastic bands, b, one or more, fitted in the tube or hole, E, of a seed dropping slide for the purpose of varying the capacity of the same, substantially as and for the purpose set forth.

Second, The scatterers, constructed as shown or in any equivalent way, when applied to a hoe seed planter, substantially as and for the purpose specified.

58,487.—Process of Separating Crude Emery from Foreign Substances.—Nathaniel C. Sawyer, Boston, Mass.

First, I claim the process of cleaning emery and separating it from extraneous softer minerals and other substances by motion and friction in revolving hollow cylinders or receptacles, in connection with the introduction of currents of water or air into such cylinder or receptacles, to facilitate the separation and escape of such extraneous materials, substantially as set forth.

Second, The process of polishing and rounding emery, by subjecting it when ground or crushed to friction in hollow revolving cylinders or receptacles, without currents of air or water, substantially as set forth.

58,488.—Wood-bending Machine.—J.P. Schmucker, Ashland, Ohio.

First, I claim the table, G, clamps, K, plate, M, and former, P, when constructed and operating as and for the purpose specified.

Second, In combination with the table, G, plate, M, and former, P, I claim the guide blocks, s, constructed as specified.

58,489.—Turn Table for Baker's Oven.—Reuben Shaler, Madison, Conn.

I claim the herein described turn table as a new article of manufacture.

58,490.—Money Drawer.—A. G. and P. M. Shults, Avasca, N. Y.

First, We claim the combination of the loaded lever, E, and locking mechanism, or their equivalents, with the drawer, C, operating substantially as and for the purpose specified.

Second, The spring, D, in combination with the drawer, C, and locking mechanism, or their equivalents, substantially as and for the purposes set forth.

Third, The combination of the lever, E E, rod, G, spring catch, I, bracket, J, cord, L, and spring, D, with the drawer, C, substantially as and for the purpose set forth.

68,491.—Governor for Steam Engines.—Thomas Silver, New York City.

First, I claim the oscillating sleeve fitted to the governor spindle, and so geared therewith that the driving power is transmitted through it to the momentum wheel and its attached vanes, and so connected with the spring and with the regulating valve that the controlling influences of the wheel vanes and spring are transmitted through said sleeve to the valve, substantially as herein described.

Second, Connecting the spring with the oscillating sleeve by means of an eccentric segment or sector, so arranged as to make the action of the spring always uniform or equivalent to that of a weight, substantially as herein specified.

Third, The connection of the speed-limiting vanes with a sleeve or piece which is adjustable longitudinally in relation to the governor spindle, substantially as and for the purpose herein set forth.

58,492.—Signal for Railroad Drawbridges.—Alba F. Smith, Norwich, Conn.

First, I claim in drawbridges mechanically connecting the locking devices, D1 D2, with the danger signal or signals, so that the draw can not be liberated without the danger signal being properly set in advance of the commencement of the movement of the draw from the safe position, and the safety signal cannot be shown until the bridge is locked in the safe position, all substantially as and for the purpose herein set forth.

Second, I claim, in combination with the above, so connecting the night and day signals that both shall be operated at the same time.

Third, I also claim, in combination with the above, the locking of the signals by means, F2 R r1 r2, or their equivalents, so as to necessarily continue to indicate danger during the whole period that the draw is out of the safe position, substantially as and for the purpose herein specified.

58,493.—Cooking Stove.—Samuel Smith, Philadelphia, Pa.

First, I claim the movable plate, B, with its boiler holes and cross pieces, the whole being applied to the top of a cooking stove or range, substantially as and for the purpose herein set forth.

Second, The annular cavity, n, in the plate, D, the said cavity containing any desired number of rollers, in combination with the plate, B, and its annular rib, m.

Third, The perforations, t, in the plate, D, beneath the rollers, q, for the purpose described.

58,494.—Grate Bar.—Sterry Smith, Salem, Mass.

I claim a grate bar composed of a series of parallel, longitudinal bars, connected together by lugs placed alternately on opposite sides of the next adjoining bar, in combination with the curved bars, H H', alternating with the bars, G G', as shown and described.

58,495.—Horse Shoe.—Edward Sneider, Baltimore, Md.

First, I claim a supplemental shoe, B, provided with the inclined toe pieces, B' B', sliding clamp, E, and screw bolt, F, whereby said supplemental shoe is to be clamped to the fast shoe, substantially as described.

Second, I claim the spring washer, G, applied to the bolt, F, to prevent the same from working loose, substantially as described.

Third, I claim the studs, a a, formed on the rear extremities of the supplemental shoe, B, and employed to prevent the lateral displacement of the same, substantially as described.

Fourth, I claim the combination with the supplemental shoe, B, of the clamp, E, guides, C C, and protecting plate, B', all constructed and arranged substantially as and for the purpose herein specified.

58,496.—Safety Valve in Water Back for Ranges.—T. S. Speakman, Philadelphia, Pa.

I claim the combination, substantially as described, of the valve, B, with the water back, A, for the purpose specified.

58,497.—Manufacture of Floor Covering.—James H. Spencer, Philadelphia, Pa.

I claim burlap, treated and printed, or otherwise colored, substantially in the manner and for the purposes herein described.

58,498.—Angular Saw Gage.—Elbridge G. Stanley and James Goodrich, Fitchburg, Mass.

We claim the links, F F, when used for and applied to the purpose specified, to wit: to connect the plates, B and C, constructed substantially as described and set forth, or in any similar manner.

58,499.—Roofing Cement.—George Stead, Brooklyn, N. Y.

I claim a roofing cement, compounded and prepared substantially as herein described, and for the purposes set forth.

58,500.—Plow.—Clinton Steen, Athens, O.

I claim the novel construction of the plow knee and the mode of attaching the handles, as set forth in the above specification.

58,501.—Mode of Setting Stones in Jewelry.—Francis Stefane, New York City.

I claim the mortised jewel frame, A, adjustable clamping fingers, c c, and retaining screws, d d, constructed and arranged substantially as and for the purpose herein described.

58,502.—Top for Fruit Cans.—A. Stewart, Cincinnati, Ohio.

I claim a rim, or trough, A, for a metal fruit can, constructed and applied in the manner herein shown and described.

58,503.—Steam Engine Globe Valve.—C. Stierle and John C. Baer, Cincinnati, Ohio.

I claim the independent valve seat, E, for the valve, H, substantially as described.

I also claim the combination of the valve stem, I, independent screw nut, J, and hub or plug, L, connected together, substantially as and for the purpose specified.

58,504.—Tool Rest for Grindstone.—W. H. Strahan, Philadelphia, Pa.

First, I claim the combination of the adjustable foundation plate, A, plate, B, the adjustable plate, D, and bar, E.

Second, The combination of the bar, E, its adjustable guard, I, arm, G, movable block, H, and adjustable collar, H', the whole being arranged substantially as set forth for the purpose specified.

Third, The guard, I, constructed for adjustability and retention on and removal from the bar, E, substantially as described.

Fourth, The clamping pieces, K, constructed and adapted to the plate, B, with serrated edge, and to the foundation plate, A, substantially as and for the purpose herein set forth.

58,505.—Skirt Supporter.—John Taggart, Philadelphia, Pa.

I claim yoke, y, double stays, c1 c1, c2 c2', c3 c3', single stay, c'' c''', belt with buttons, M, endless strings, S P, when combined and constructed together for the purpose and in the manner above described.

58,506.—Steam Generator.—A. H. Tait and Jos. W. Avis, New York City.

First, We claim the T rings, C, in combination with the cylinders, A B, made in sections and connected to said rings, substantially as and for the purpose described.

Second, The longitudinal stay bolts, D, in combination with the rings, C, and cylinder, A B, constructed and operating substantially as and for the purpose set forth.

58,507.—Machine for Cutting Wood.—John A. Taplin, Carthage Landing, N. Y.

In a rotary wood-cutting machine, the circular head, constructed as herein described, for fastening the cutters and the crank shaft, each constructed and arranged substantially as and for the purposes herein described.

58,508.—Lap Skiver.—John S. P. Taylor, Oxford, Ohio.

First, The combination with the knife, C, or its equivalent, of an eccentric swinging or vibrating gage, constructed substantially as and for the purpose set forth.

Second, The combination with the knife, C, and gage, D, of the springs, B, and screws, F, or equivalent device, for adjusting the said gage in relation to the said knife, substantially as described.

Third, The combination with the gage, D, and knife, C, of the spring plate, K, constructed and arranged substantially as herein set forth.

58,509.—Tweer.—John Theat, Detroit, Mich.

I claim the combination of the convex or conical cover, A, provided with a flange projection, A', overlapping the walls of the mouth of the tweer with the stationary disk, B, and chamber, L, when constructed and arranged substantially as and for the purpose set forth.

58,510.—Baby Jumper.—J. Patton Thompson, Philadelphia, Pa.

Firit, I claim the hangers, a a, rod, A, traversing pulley, C, strap, D and E, and the elastic cord, G, when combined and arranged substantially as herein specified and described.

Second, The hook, l, and ring, b, straps, D and E, elastic cord, G, and the chair, H, when combined as specified and described.

58,511.—Method of Preserving and Curing Meat.—John Tilton, New York City.

I claim curing meats by first cutting them from the bone when expelling the water by pressure, then mixing the curing composition and smoking loose on shelves, or in the canvas bags, substantially as set forth.

58,512.—Double Still for Petroleum.—Peter H. Vander Weyde, Philadelphia, Pa. Antedated Sept. 21, 1866.

I claim a double still, in which all the defects and objection against other double stills are corrected, in the manner described

58,513.—Hat-finishing Press.—Wm. Walsh, Wm. Walsh, Jr., and M. J. Walsh, Brooklyn, N. Y.

First, We claim the press table, F, with dies, H, and leaves, K, hung on adjustable hinges so that the hinges can be raised and lowered to suit dies of different hights, substantially as described.

Second, We also claim the combination of the table, F, having sectional dies, H, with a platen, E, the dies and platen being operated from the same shaft, substantially as described.

Taird, We also claim the hinged dies, H, constructed in two unequal sections for finishing and pressing hats, substantially as and for the purpose specified.

Fourth, The overlapped hinges, I, in combination with the leaves, K, and tables, F, which contain the dies, H, substantially as described for the purpose specified.

Fifth, We also claim the sectional dies, H, in combination with the platen, E, substantially as described.

Sixth, We also claim the sectional hat blocks, P, divided obliquely from near the center of the tip to opposite side, substantially as described for the purpose specified.

58,514.—Cider Mill and Fruit Press.—L. A. Warner, Freeport, Ill.

First, I claim the press, K, piston, L, strainer, c, slides, p and e', cone driver, M, rods, l and f', curved lever, f and o, and jointed lever, L', arranged in the manner substantially as shown and described and for the purpose set forth.

Second, The arrangement of the attachment of the jointed lever, L', to the rear end of the press by the spring, n, and adjustable stays, n', and connecting rod, s, for the purpose and in the manner set forth.

Third, The wheel, H, friction roller, J, as arranged in combination with the levers, f o and S, for the purpose and operating in the manner described.

58,515.—Washing Machine.—J. L. Weaver, Davis, Ill.

First, I claim the combination of the frame, G H I, with the side and end boards of the washing machine and with the roller frame, J K L, substantially as described and for the purpose set forth.

Second, The combination of the roller frame, J K L, with the side boards, B and C, and with the pressure rollers, M and N, substantially as described and for the purpose set forth.

Third, The levers, U, constructed as described, in combination with the links or bars, T, the cross piece, K, of the roller frame, and the elastic ropes or bands, V, substantially as described and for the purposes set forth.

Fourth, The arrangement of the endless apron, B' C', rollers, M N H, and box of the machine, operating in the manner and for the purpose herein specified.

Fifth, The arrangement of the rods, F', levers, G' H', with the top frame G H I, substantially as described and for the purpose set forth.

58,516.—Engraving Copper, etc.—Victoria Quarre Wedikind, Philadelphia, Pa.

I claim the production by chemical process of engraved plates forming designs in relief by the following process:

Covering the copper plates with German white, tracing of designs therein, covering the white layer with engraver's varnish and treating it with nitric acid, substantially as above described.

58,517.—Machine for Gathering Clover Seed.—Daniel K. Wertman and William H. Rirnbold, Centralia, Pa.

First, We claim the peculiar setting of teeth, a a a, on axle, m, in the manner and for the purpose above set forth.

Second, The combination of levers, P, with uppers, u, reel, R', axle, m, when constructed and operated in the manner and for the purpose above set forth and described.

Third, The independent connection of teeth and upper and lever from body or box of machine, allowing the teeth to be worked irrespective of the box, as aforesaid set forth and described and for the purpose mentioned.

58,518.—Coffee Pots.—William Westlake, Chicago, Ill.

First, I claim, in combination with the cylindrical portion of a coffee pot, the scraper and strainer, constructed and operated as herein set forth:

Second, I claim the combination of the bar, d, having the recesses, e, with the wires, f, and projection, g, for guiding and locking the scraper and strainer, as set forth.

58,519.—Bench Hook.—Charles H. Weston, Lowell, Mass.

I claim a bench hook, when its several parts are constructed and arranged to operate substantially as described.

58,520.—Machinery for Making Horse-shoe Nails.—Amos Whittemore, Cambridgeport, Mass.

First, I claim the oscillating dies, operating in conjunction with hammers which move back and forth in a right line, which are arranged in inclined positions, and operate substantially as described.

Second, The combination of two hammers, B B', with the oscillating die head or beam A3, and connecting rods, b3 b3, arranged to operate substantially as described.

Third, The combination of the die beam, A3, inclined hammers, B B', eccentric, a, and yoked pitman rods, a', the latter being guided by the driving shaft, A2, substantially as described.

Fourth, The application of spring or yielding guides, b2, to the reciprocating hammers, substantially as described.

Fifth, The rocking feed nippers, D, constructed and operated so as to gripe the nail rod and then deliver this rod between the nippers, E, in a position to be acted upon by the hammers and dies, substantially as described.

Sixth, The application of a support and guide, f2, to the nippers, D, for guiding the end of the nail rod up to the gage, E, substantially as described.

Seventh, The adjustable gage, F, in combination with the rocking feed nippers, D, substantially as described.

Eighth, The pair of shears, d5 d6, constructed and operated substantially as described, and arranged in front of the point where the nails are forged, and in such position as to allow of the feeding of the nail rod to a proper position by the nippers, D, substantially as described.

Ninth, Communicating motion to the shears, and also to the feeding nippers, from the driving shaft, A2, through a cam shaft, C', by means substantially as described.

Tenth, The employment of the reciprocatingretractingu ippers, E, so arranged and operated as to take the nail rod from the feeding nippers, hold it until the nail is finished, and then retract the nail from the hammers and dies, substantially as described.

Eleventh, The combination of the hooked rod or lever, l, with the nippers, E, substantially as and for the purpose stated.

Twelfth, Effecting the opening and closing of the nipper jaws, g g', and hook, k, substantially as described.

Thirteenth, Connecting the nippers, E, to a rectilinear reciprocating rod, g3, which passes transversely through the frame plate A A1, and is opened by means of a cam on the cam shaft, C', and a spring, substantially as described.

Fourteenth, The adjusting screws, g4, or its equivalent, applied to the rod, g3, for regulating the length of its strokes, substantially as described.

Fifteenth, The combination of the hook or stop, d7, on the lower shear blade, d5, with the retracting nippers, E, substantially as and for the purposes described.

Sixteenth, The combination of rocking feed nippers, D, the retracting nippers, E, and the shears, with the devices for forging horse-shoe nails, said parts being arranged substantially as described.

58,521.—Machinery for Making Split Spikes.—Amos Whittemore (assignor to the Cambridge Horse Nail Company), Cambridgeport, Mass.

First, I claim so constructing the splitting devices, that in the act of splitting the metal both split portions shall be supported laterally, and be separated in the plane of the cut, substantially as described.

Second, The combination of a device for severing the spike blanks from the rods, with a device which will split the spikes in a direction with their length, constructed and arranged substantially as described.

Third, The combination of the movable blocks, E E', with the splitting and cutting-off mechanism, and with the furnishing mechanism, substantially in the manner and for the purpose described.

Fourth, The beveling cutters, G' H, or their equivalents, which will bevel the ends of a split spike blank, before its split ends are closed, substantially as described.

Fifth, The combination of splitting and beveling cutters, in a machine for producing split spikes, constructed and arranged substantially as described.

Sixth, The combination of the heading tool, J, with machinery constructed and arranged substantially as herein described for splitting and forming the spike ready for its action, as set forth.

Seventh, The employment of the compressing head, L', to close the forked ends of the split rods or spikes, substantially as described.

Eighth, Making split spikes of the construction herein described, by means substantially as described, and which operate on the principle set forth.

58,522.—Oven.—Abel Whitlock, Danbury, Ct.

I claim the jacket or reverberator, E, in combination with the baking chamber of an oven, substantially in the manner and for the purpose set forth.

58,523.—Caster for Furniture.—John A. Wiedersheim, Philadelphia, Pa.

I claim the combination and arrangement of the armed revolving socket, A, and flanged cap, D, provided respectively with depressions, d, and projections, c, and operating substantially as described and for the purpose specified.

58,524.—Lamp Burner.—Samuel W. Wilcox, Mendon, Mass.

I claim the arrangement and application of the two separate gates or extinguishers, with respect to the flat wick tube and a lever or its equivalent applied to such tube, and the body of the burner.

I also claim the arrangement as well as the combination of the two gates or extinguishers with the wick tube and its auxiliary deflector, the whole being substantially as described.

58,525.—Breech-loading Fire-arm.—David Williamson, New York City.

First, I claim the detached spring stop, a, used with the lever, G, and the underside of the barrel, B, being so constructed and arranged as to act as a stop for the barrel and a direct retractor, substantially as specified.

Second, The pin, x, upon trigger, E, when used with stop, a, for the purpose of locking the barrel and preventing it from being thrown up to or away from the breech except at half cock, substantially as set forth.

58,526.—Bailing Press.—John S. Williams, Meridian, Miss.

I claim the combination of the capstand, M, the horizontal draft lever, I, the roller, f, on the track, L L, the driving or compressing lever, H, the follower, G, and the tumbling box, F, constructed, arranged and operated substantially as and for the purpose herein described.

58,527.—Clasp for Hoop Skirt.—Samuel R. Wilmot, Bridgeport, Conn.

I claim, First, A hoop-skirt clasp, the longitudinal edges of which are straight near the ends and for the rest of their length so formed into tongues and recesses that when folded upon the hoop, the tongue of one edge shall fit into the recess of the other, and vice versa, substantially as described.

Second, The punctured spurs or projections, e, in said clasp, substantially as and for the purposes set forth.

58,528.—Machine for Preparing Peat for Fuel.—Herman Winter, Williamsburgh, N. Y., and Frederick W. Newton, South Orange, N. J.

We claim the combination in a peat machine of the preparing chamber and press in such manner that the material of the former constitutes a part of the frame of the press, substantially as set forth.

We also claim the combination in a peat machine of the following instrumentalities, viz.; the preparing chamber, grinding instruments, and press, all operating in combination, substantially as set forth.

We also claim the combination in a peat machine of the following instrumentalities, viz.; the preparing chamber, internal heater, and press, all operating in combination, substantially as set forth.

We also claim the combination in a peat machine of the following instrumentalities, viz.; the preparing chamber, grinding or kneading instruments, internal heater, and passage thereto, all operating in combination substantially as set forth.

We also claim the combination in a peat machine of the following instrumentalities, viz.; the preparing chamber, press, grinding instruments, and pipe for admitting steam into the preparing chamber, all operating in combination, substantially as set forth.

We also claim the combination in a peat machine of the following instrumentalities, viz.; the preparing chamber, press, internal heater, and pipe for admitting steam into the preparing chamber, all operating in combination, substantially as set forth.

We also claim the combination in a peat machine of the following instrumentalities, viz.; the preparing chamber, press, grinding instruments, internal heater, and pipe for the admission of steam into the preparing chamber, all operating in the combination substantially as set forth.

58,529.—Sheep Rack.—John D. Woodbury, Wilson, N. Y.

I claim the slots, p p, in combination with the pins, o o, and bolts, r r, for the purpose of adjusting the side boards, C, so as to form a roof, arranged and operating as described.

I also claim the dovetailed notches, s s, in combination with the side boards, C C, when provided with slots, p p, for retaining the said boards in place, substantially in the manner set forth.

58,530.—Filter and Cooler Combined.—H. T. Woodman, Dubuque, Iowa.

I claim the arrangement of the water chamber, B, filter, C, with top and bottom, perforated plates, c d, pipe, n, receiving and supplementary chamber, D, and pipe, E, with walls, A, constructed and operating in the manner and for the purpose specified.

58,531.—Cherry Stoner.—Charles E. Wright, Auburn, N. Y.

I claim the combination of the corrugated cylinder, B, with the curved perforated bed plate, D, and springs, F, when used as and for the purpose specified.

58,532.—Composition of Matter.—William K. Wyckoff, Ripon, Wis.

First, I claim the use of residuum as above described and for the purposes specified.

Second, I claim also the treating and refining process, substantially as herein described.

Third, I claim the within described composition made of the ingredients set forth, and mixed together, substantially in the manner and for the purposes specified.

58,533.—Mode of Attaching Cultivator Teeth to the Frames.—George W. Zeigler, Tiffin, Ohio.

I claim, First, Securing a shovel or cultivator tooth to its frame by means of a universal joint, in such manner that the shovel can be inclined either laterally or longitudinally with respect to its frame, substantially as described.

Second, The concavo-convex shank, a, formed on or secured to a shovel or tooth, substantially as and for the purpose described.

Third, The combination of the shank, a, concave plate, D, convex bolt head, g, nut c, and a shovel, C, or its equivalent, substantially as described.

58,534.—Plow.—Christian Zimmerman, Collinsville, Ohio.

I claim, First, The manner of attaching the tongue to the plow by means of the perforated plates, a a, and pins, b b, arranged and operating in the manner and for the purpose described.

Second, The combination of the protecting plate, c, inclosing the land side of the plow, with the mold board and land side made of one piece of metal, substantially as described for the purpose specified.

Third, The hinged draw bars, d d, with their adjusting nuts and screws, in combination with the adjusting frame composed of screw rods, e e, and cross bar, g, with their nuts, and adjustable handles arranged and operating in the manner and for the purpose set forth.

58,535.—Clothes Pole.—W. W. Armington, New Haven county, Conn., assignor to E. A. Kelsey, Meriden, Conn.

I claim making a clothes line supporter, a, in two or more parts, with the clasps, b, catch, c, substantially as and for the purpose described.

58,536.—Match Safe.—James E. Auld (assignor to himself and John M. Layton), Buffalo, N. Y. Antedated September 15, 1866.

I claim the igniter, D, so combined with a pocket match safe that it shall act against the prepared end of the match as it is thrust from the safe and ignite it, and afterward hold it, until extinguished, substantially as set forth.

58,537.—Cigar Lighter.—William Belcher (assignor to himself and F. G. Hickerson), New Haven, Conn.

I claim the cigar lighter herein described, constructed and attached to the cigar, substantially as and for the purpose specified.

58,538.—Cigar Press.—Jeremiah Campbell (assignor to himself and John Campbell), Lancaster, Pa.

I claim the construction and application of the flat links, E, with their hole, e, and slot, f, when employed in the manner and for the purpose specified.

I also claim the followers, I' I'', and headed slats, D, when combined, linked, and operated, substantially in the manner and for the purpose specified.

I also claim the open filling in frame, G g, with its notches, h, constructed and operating in the manner and for the purpose set forth.

I also claim the key blocks, W, in combination with a double side pressure and vertical pressure, given in the manner and for the purpose specified.

58,539.—QUARTZ CRUSHER.—I. S. Croll, North San Juan, Cal., assignor to himself and Quartus Rice, Nevada, Cal.

I claim giving the mullers a positive motion on their own axis by means of the gears, D and G G, or their equivalents, while said mullers are driven around in the pan by the rotation of the frame which carries the shafts of the mullers.

58,540.—CLASP FOR SKIRT HOOP.—Thomas B. De Forrest, Birmingham, Conn., assignor to the American Press and Clasp Co., Bridgeport, Conn.

The two clasps, d d, in combination with the indentation, C, so as to secure the two ends of the hoop, substantially in the manner herein set forth.

58,541.—HAY ELEVATOR.—Phineas C. Ellsworth (assignor to himself and M. Salizbiery), Venice, N. Y.

I claim the arrangement of the reel, the lever, J, the cord, E, and the trip handle, K, constructed substantially as specified, for the purpose set forth.

58,542.—SHIFTING RAILS FOR CARRIAGE SEAT.—John Fellows (assignor to himself and Albert Card), Chicago, Ill.

I claim, First, The braces or supports, D, when provided at their upper ends with heads having slots or mortises on the plane of the seat, and gtted to the seat, so as not to project beyond, substantially as and for the purposes specified.

Second, The arrangement and combination of the braces, D, with the spurs or projections, e e and d d, with the rail, c, and carriage seat, substantially as and for the purposes specified.

58,543.—ROTARY SPADING MACHINE.—E. J. Fraser (assignor to himself and Orange Noble), Erie, Pa.

I claim, First, The smooth-faced cylinder, C, set with rows of teeth or spades, m, and hung on the tree shaft, a a, in combination with the shifting clutch, d, and the vertical rack, c, and pinion, b, for raising and lowering the cylinder, constructed and operated substantially as and for the purpose herein described.

Second, I claim the rotating pulverizing arms, p, in combination with the spading cylinder, C, and connected therewith by the gear wheels, h k l, operated, by the epicycloidal wheel, F, on the chine of the cylinder, constructed and operated substantially as and for the purposes herein specified.

Third, I claim the spring scrapers, r, and the friction roller or bearer, E, in combination with the spading cylinder, C, constructed and operated substantially as and for the purposes herein described.

58,544.—HAT-PRESSING MACHINE.—Isaac T. Green, Milford, Conn., assignor to himself and C. H. Berry, Fort Greene Place, Brooklyn, N. Y.

I claim, First, The application of steam to the hat while the same is in place between the presser and the die, as and for the purpose described.

Second, The employment of a wet sheet, in combination with the die and presser, while the operation of pressing a hat progresses, substantially as and for the purpose set forth.

Third, The perforated shield, C, in combination with the presser and die, substantially as and for the purpose described.

Fourth, The perforated shield, C, and wet sheet, D, in combination with the presser and die, as set forth.

Fifth, Making the perforated shield tapering, or thicker at the bottom, as and for the purpose described.

58,545.—BED BOTTOM.—Robert L. Hall, Lowell, Mass., one-half, undivided, assigned to Jos. G. Russell, Boston, Mass.

I claim the combination of the rubber springs, i, metallic washers, g, and circular holes, e, as herein described, and for the purpose set forth.

58,546.—BOILER GAGE COCK.—William T. Howard, Baltimore, Md., assignor to himself and Isaac McKim Chase.

I claim, First, The adjustable siphon or tubes, E E', employed in combination with the chamber, A, and try cock or valve, G, to indicate the water level in the boiler, substantially in the manner specified.

Second, I further claim the combination of the scale, J, with the adjustable gage tubes, substantially as set forth.

58,547.—HORSE-POWER BRAKE.—John Hull and Wm. P. Anderson (assignors to themselves and Henry J. Hull), Hackettstown, N. J.

We claim, First, The hooked lever shaft, d, and flanged roller, G, thereon, operating relatively to the belting, D, for the release of the brake, E, in its connection with the lever, by the rod, g, substantially in the manner and for the purpose set forth.

Second, The brake, E, and weight, H, combined, operating automatically by the dropping of the flanged roller, when the belting slips off from the wheels, substantially in the manner and for the purpose as herein set forth.

Third, The construction of the box, a, block, c, hooked lever shaft, d, and flanged roller, G, as arranged and applied to the standard, F, of the side of the platform, substantially in the manner and for the purpose specified.

58,548.—LOCK FOR TRUNKS.—J. G. Kast (assignor to L. L. Arnold), New York City.

I claim, First, The sliding spring bolt, B, provided with two or more hooks, c d, and with a suitable fastening for the key, C, at its end, in combination with the staples, e f, and with said key, constructed and operating substantially as and for the purpose set forth.

Second, The spring, h, and notched collar, i, in combination with the sliding bolt, B, key, C, and bit, j, constructed and operating substantially as and for the purpose described.

Third, The spring stop, k, in combination with the staple, e, and spring bolt, B, constructed and operating substantially as and for the purpose set forth.

58,549.—COAL-DUMPING APPARATUS.—Edwin R. Kerr (assignor to himself and J. L. Platt), Kewannee, Ill.

I claim the chutes, B, placed in a shed or building and provided with two doors, C E, the outer ones, E, being so arranged as to serve, when lowered or opened, as a continuation of the chutes, substantially as shown and described.

I also claim counterpoising the outer doors, E, by means of weights, substantially in the manner as and for the purpose specified.

I further claim the hanging of the inner doors, C, at their upper ends in combination with the spring bolts, D, at their lower ends, when said doors are applied to chutes, B, for the purpose herein set forth.

58,550.—"CAST OFF" OF WAXED-THREAD SEWING MACHINES.—Charles E. Langmaid, Woburn, Mass., assignor to himself and Geo. A. Langmaid, Stoneham, Mass.

I claim a hinged cast-off foot for sewing machines which adjusts itself to the side of the hook and wears evenly to prevent cutting the thread, constructed substantially as herein described.

58,551.—GRAIN SCREEN.—Josiah Lang (assignor to Jacob G. Wolf), Morristown, Ind.

I claim the cam wheel, T, in combination with the friction rollers, S, and box, D, the whole constructed and operating substantially as herein described.

58,552.—FURNACE AND BOILER.—Henry McClure (assignor to himself and James Ellis), Terre Haute, Ind.

I claim an improved furnace and boilers formed by combining the sides, O, rock shaft, P, rock arms, R, links or bars, S, and boilers, F G I J K L, with each other and with the furnace flue curved beneath the boilers, when said parts are constructed and arranged substantially as herein described and for the purposes set forth.

58,553.—MANUFACTURE OF ILLUMINATING GAS.—Adolph Millochan (assignor to the American Retort Company), New York City.

First, I claim a separate casing for containing the coal, or other material, to be distilled, in combination with the main retort within which said casing is introduced, as and for the purposes specified.

Second, I claim the method herein specified of subjecting the products of distillation to a heating operation within the retort in which they are generated, as and for the purpose set forth.

58,554.—METHOD OF OPENING TIN CANS.—J. Osterhoudt (assignor to himself and Wm. B. Dubois), New York City.

First, I claim a device for closing a can, or other vessel, consisting of a cover or cap, a, to be separated from the said vessel, by rolling it upon any suitable instrument by the aid of a tag or lip, c, formed in one piece with the cover or cap and left loose in soldering the latter to the can, as herein explained.

Second, In combination with a cover constructed as aforesaid, I claim a recess in the top plate, B, of the can, for the reception of the tag, c, as explained.

58,555.—MACHINE FOR PRESSING BONNETS.—George M. Richardson, Barre, Mass., assignor to himself and N. L. Johnson, Dana, Mass.

I claim, First, Employing the screw, C, in combination with the dies, A A, and the bonnet block, E, constructing and operated substantially as and for the purposes herein described.

Second, I claim also the metal strip, f, within the dies, A A, for covering the division between them, as herein described.

Third, I claim also the spring, e, in combination with the block, E, as herein described.

58,556.—WOOL-OILING MACHINERY FOR CARDING ENGINES, ETC.—Wm. H. Salisbury, Providence, R. I., assignor to himself and Jesse A. Locke, Boston, Mass.

I clam the steam pipe, k, in combination with the oil reservoir, K, substantially in the manner and for the purpose set forth.

I also claim, in combination with the oil reservoir, K, the tube, f, with its regulating cocks, g h, and strainer, i, for the purpose specified.

58,557.—CORN PLANTER.—T. T. Shawcross (assignor to himself and L. D. Wyatt and E. D. McManama), Allisonville, Ind.

I claim, First, The box, 1, the wheel, 19, with its cavity, 21, and the agitator, 20.

Second, The spring, 12, levers, 13 14 15 16 18 and 17, all arranged and operating substantially as described for that purpose.

58,558.—COMBINED ERASER AND PENCIL SHARPENER.—Charles D. Smith, Washington, D. C., assignor to himself and John A. Wiederscheim, Philadelphia, Pa.

I claim the combination with an eraser of a pencil sharpener, having substantially the characteristics herein specified.

58,559.—APPARATUS FOR CARBURETING AIR.—Levi Stevens, Fitchburg, Mass., assignor to himself and Norman C. Munson, Shirley, Mass.

I claim, First, The cups or disseminators, B B, constructed and operating substantially as described.

Second, The combination of one or more cups or disseminators, B B, with the cylinder, A, for the purposes described.

Third, The arrangement of two or more cups or disseminators with each other, substantially as described.

58,560.—POTATO DIGGER.—Andrew Walker, Claremont, N. H., asssignor to J. P. Upton, same place, and C. Eastman, Conway, Carroll county.

I claim the combination of the cutter, c, plows, f, and cylinder of prongs, g, with the grate or screen, k, and mechanism for actuating said cylinder, substantially as specified.

58,561.—NECKTIE, COLLAR AND BOSOM COMBINED.—G. V. Woods (assignor to Austin White), Belchertown, Mass.

First, I claim making or forming a collar, bosom and necktie from a single piece of paper, cloth or other suitable material, substantially as set forth.

Second, Making the part or necktie, C, substantially as set forth.

Third, Making the part or bosom, A, and part or necktie, C, together or from a single piece of material, substantially as set forth.

Fourth, Making the collar or part, B, and necktie, C, together or from a single piece of material, substantially as set forth.

Fifth, The combination with the end, c, of the collar, B, substantially as shown in the drawings.

Sixth, I claim the piece, D, in combination with the bosom and collar or either, for the purposes set forth.

58,562.—SIGNAL CODE FOR ELECTRIC TELEGRAPH.—F. J. Bolton, London, England.

I claim the herein described code of signals for communicating intelligence or transmitting messages by the electric or magnetic telegraph, and the method of arranging and compiling the same, substantially as set forth.

58,563.—STOP CUTTERS FOR CUTTING CONTINUOUS SHEETS OF PAPER INTO SHORTER ONES.—Geo. Keeble, Suffolk, England.

I claim the combination of the lever, h, connecting strap, i, rod, E, key, o, collar, G, tube, B, stand, A, cap, c, and the spring, D, or its equivalent, the whole arranged substantially as and for the purpose set forth.

58,564.—STEAM GENERATOR.—Robert W. Thomson, Edinburgh, Great Britain.

I claim the constructing of vertical boilers, with fire gas in tubes arranged in a circle or circles, and combined with a vessel which projects down into the furnace from within such circle of tubes, and which is enlarged below its attachment to the tube plate, substantially as hereinbefore described.

58,565.—CONSTRUCTION OF RAILWAYS.—Swain Winkley, New York City, assignor to himself and Asa Bigelow, Jr.

I claim the construction of the corrugated base plates, a, combined with the cap pieces, b, and tie rods, c, when applied to railways, substantially in the manner herein described.

REISSUES.

2,367.—PICKER-STAFF MOTION FOR LOOMS.—Edmund H. Graham, Manchester, N. H. Patented Oct. 16, 1860.

I claim steadying the rocker of the picker staff on its bed by journals at a right angle to the picker shaft, which journals form its center of motion, substantially as described.

I also claim the journal boxes with open ears in combination with the journals that steady the rocker on the bed.

2,368.—STRAW CUTTER.—Franklin Benjamin Hunt Richmond, Ind. Patented Jan. 5, 1864.

First, I claim, as my improvement in straw cutters, so attaching the balance wheel to its shaft by a yielding or frictional device that when the knife meets with an obstruction the wheel may continue to revolve for a limited period independent of the knife until stopped by the frictional device, for the purpose of preventing injury to the knife, substantially as herein described.

Second, I claim the bar, c', connected to the shaft, n, and carrying the pinions, b' and d', in combination with the pinions, a' and e', and link, f', connected to the shaft, p, in substantially the manner specified, whereby the rollers, H and G, on the shafts, n and p, are allowed to move apart and the wheels remain in gear, as set forth.

Third, I claim the guide board or plate, n, connected to and moving with the frame, t, of the upper feed roller, H, and extending down the back of the said roller to near a level with its axis, substaintially as and for the purpose set forth.

Fourth, I claim the bearing bar, x, formed in one piece with the lower halves, b, of the journal boxes of the cutter shaft, C, and extending across from one to the other, in combination with the standing cutter, E, attached to said bar, x, substantially as and for the purposes specified.

Fifth, I claim mounting the upper feed roller, H, in a frame formed with slings extending below the lower roller and acted upon by a spring, or its equivalent, in combination with a slotted frame to guide the roller as it moves up or down, substantially as set forth.

Sixth, I claim the hooked slings, q, in combination with the yielding feed roller, H, and spring, I, or its equivalent, substantially as set forth, whereby the said feed roller, H, is limited in its lateral movement, as set forth.

Seventh, I claim the curved slot, v, in the frame, w, in combination with the feed roller, H, slings, q, and a hub, n', surrounding the axis, p, of the roller, H, and relieving the same from friction against the frame, w, as set forth.

Eighth, In combination with the bar, x, and standing cutter, E, made as set forth, I claim the single revolving and diagonal knife, D, with its axis placed above the standing cutter, E, to act with a slanting and shearing cut, substantially as set forth.

2,369.—BLOWER.—P. H. Roots, Connersville, Ind. Patented Sept. 25, 1860.

I claim the coacting rotary abutments, A B, each consisting of two or more pistons, D D, and two or more recesses, E E, which are arcs of true circles and formed with equal radii, substantially as set forth.

2,370.—WASHING MACHINE.—Benjamin Wright, Hudson, Mich. Patented March 28, 1865.

First, I claim the rocker, N, and arms, G, constructed and used with the box, A, substantially as and for the purpose herein specified.

Second, The arrangement of the box, A, with the rubber, C raised above its bottom when used with the rocker, N, and arms, G, as and for the purpose specified.

2,371.—PREVENTION OF INCRUSTATION IN STEAM BOILERS.—N. B. Webster, Portsmouth, Va., and Robert W. Young, Richmond, Va. Patented Oct. 23, 1860.

We claim the connecting with the interior of a steam boiler, a metal electro-negative to the boiler, for the purpose of preventing incrustation in the steam boiler.

DESIGNS.

2,472.—BRACKET.—John H. Bellamy (assignor to himself and D. A. Titcomb), Charlestown, Mass.

2,473.—SEWING MACHINE.—Joseph Bond, Jr., Newark, N. J., assignor to the Lathrop Sewing Machine Company of the State of New York.

2,474.—FRAME OF A SEWING MACHINE.—Joseph Bond, Jr., Newark, N. J., assignor to the Lathrop Sewing Machine Company of the State of New York.

2,475.—SPOON HANDLE.—Augustus Conradt, Philadelphia, Pa.

2,476.—DENTISTS' GRINDING LATHE.—Henry Coy, Philadelphia, Pa.

2,477.—CIGAR AND TOBACCO SAFE.—John H. Knight and Joseph P. Farrand, Detroit, Mich.

2,478.—REEL.—Catholina Lambert, New York City.

2,479.—LAMP FLUE.—Thos. Moore and J. S. Haldeman, Bloomington, Ill.

2,480.—PLATE OF A COOK'S RANGE.—Rees Moss, Philadelphia, Pa.

2,481.—COFFIN HANDLE.—C. L. Neiberg (assignor to Sargent & Co.), New Haven, Conn.

2,482 and 2,483.—CHILD'S LONG COMB.—Leonce Picot, Hoboken, N. J., assignor to the Rubber Clothing Company of New York. Two Patents.

2,484.—WHEEL.—Amos Rank, Salem, Ohio.

2,485.—COOK'S STOVE.—Jacob Steffe (assignor to Thomas Foster), Philadelphia, Pa.

2,486.—BURIAL CASE.—J. A. Wilson, Springfield, Mass.

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Office of William Sellers & Co.,
Philadelphia, Aug. 15, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—We have your favor of the 9th inst., and may say in reply, that we have now had the "Harrison Boiler" in constant use in our Works for nearly two years. It has given us great satisfaction. We consider it quite as economical in the use of fuel as any boiler we have used, or with which we are acquainted, and are satisfied that it is much safer than any boiler made.
Jours truly,
WM. SELLERS & CO.

Philadelphia Rolling Mill,
Kensington, Philadelphia, Aug. 13, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—I will say in reply to yours of the 9th inst., that I have had one of your Boilers almost in constant use over one of my Puddling Furnaces for over eighteen months, and in all that time it required no repairs, with the exception of changing a few light bolts for heavier ones, and it is now running without any signs of leaking or want of repair, apparently as good as when first put up. I think I have just grounds, from the experience I have had, to recommend them as a good and safe boiler, and one that generates steam very fast. I feel confident that I get nearly double the quantity of steam from this boiler that I do from any other Puddling Furnace in my Mill that has two Cylinder Boilers over them. I believe the day is not far distant when they will be in general use in Iron Manufacturing establishments.
Yours respectfully,
STEPHEN ROBBINS.

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Mr. Joseph Harrison, Jr.:
Dear Sir:—We take great pleasure in testifying to the merits of your Boiler, as a generator of steam, the confidence we have in its safety, its economy of fuel, and also of space for its erection. It has now been in successful operation more than a year, without the necessity of any repairs, and our confidence increases with its use. We shall always consider it a privilege to exhibit and explain its merits to any who may wish to examine it.
Respectfully, etc.,
GEO. W. SIMONS, BRO. & CO.

Philadelphia, Aug. 9, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—In reply to your communication respecting our opinion of the "Harrison Boiler," we would state as follows: We have had one of your Boilers in constant use for twenty-two (22) months, during which time it has supplied steam to a 6-horse Engine, driving about seven lathes and several other power tools. It is perfectly tight and free from leakage; takes up less room than an ordinary Boiler; and as to its economy in fuel, you can best judge for yourself, from the following statement: During the past year it has burned from 50 to 60 tons Pea Coal, each week averaging 6½ to 7 days. We can truly recommend said Boiler, from our own experience, as safe, reliable, and economical.
Truly yours,
TAWS & HARTMAN, 1237 North Front street.

Office of the Salem Coal Company,
Philadelphia, August 16th, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—After having your cast-iron Boiler in use at the Colliery of this Company for more than a year, it gives me pleasure to state that its operation has been very satisfactory. In the important point of economy of fuel it is reported to be superior to any other Boiler we have in use, and as regards its safety from destructive explosion, it certainly has no equal among all the various forms of boilers that have come under my notice.
Very truly,
JNO. C. CRESSON, Pres't.

Germantown, Aug. 16, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—About four months ago, we put in one of your "Harrison Boilers," and it gives us much pleasure to be able to state that, as a safe steam generator, in its general economy in fuel, time, etc., we consider it the best Boiler now in use. Our Boiler is 50 horse-power; our Engine has a 10-inch cylinder, with a 36-inch stroke: the cost of running this, and almost always at its utmost capacity, is about two dollars per day. In fact, we consider your Boiler so excellent in its services, aside from its safeness from explosion and its real economy, that we could not and would not do without it. It will afford us much pleasure to show the "Harrison Boiler" to any one who may call at our Works, where they can daily see it in practical operation.
Very truly yours, etc.,
SELSOR, CROOK & CO.,
Manufacturer of Edge Tools, Hammers, etc., Armat-st.,
Germantown, Philadelphia.

New York, August 15th, 1866.

Mr. Joseph Harrison, Jr., Philadelphia, Pa.:
Dear Sir:—We take pleasure in informing you that the Boiler purchased from you, which we have had in use about five months, has given the best satisfaction, and has borne out everything you claimed for it. As a steam generator we have never seen anything equal to it. We consider the saving of fuel as being very great compared to ordinary boilers. If we had need of more steam capacity, we should most certainly use your Boiler in preference to any other. You are at liberty to use this, if it will be of any service to you. Yours truly,
UNITED STATES WATCH CO., F. A. GILES, Pres't.

Pennsylvania Hospital for the Insane,
Philadelphia, August 11, 1866.

My Dear Sir:—In my annual Report of this Institution, for 1865, I stated my high estimate of your Boiler, for safety, economy, and general efficiency. Additional experience has tended to confirm all that I then said, and if we required additional Boilers, for any purpose, I should certainly recommend yours.
Very truly yours,
THOMAS S. KIRKBRIDE.
Jos. Harrison, Jr., Esq., Philadelphia.

Philadelphia, Aug. 10, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—The "Harrison Boiler" we bought of you, some four months ago, has given us perfect satisfaction. The Boiler is placed over one of our heating furnaces, and, in consequence of the steam-pipe connections with our main steam pipe, we have no means of testing its economy in fuel. We believe it to be safer and more economical than the Cylinder Boiler, and have no hesitation in recommending it as admirably adapted for Rolling Mills. Its length, the same as the length of a heating furnace, enabled us to place it immediately over the furnace, requiring no additional space, thus avoiding the necessity of locating the furnaces at an inconvenient distance from the machinery, which the ordinary Cylinder Boiler requires.
Very truly yours,
VERRAE & MITCHELL.

Philadelphia, Aug. 15th, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—Before ordering one of your Boilers, we sought information respecting them from several of our friends who were using them. Their testimony was of such a character that we felt no hesitation in adopting it, and it has more than answered our expectations. We recommend them as safe, very economical, and easily managed; they possess fully all the advantages you claim for them.
Very respectfully yours,
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Atlantic Mills, Ellwood, Atlantic county, N. J.,
August 13th, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—We have had one of your Six-slab Boilers in use in our Paper Mill for five months. We consider it unequaled by any other make of boiler now in use. With less than one-half the fuel t produces more and drier steam than any boiler we ever used. It is simple, easily managed, and perfectly safe. Our Boiler bleaches the stock for, and dries one tun of paper daily, with one cord of pine wood per day.
Very truly,
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Mercantile Printing Rooms, Franklin Building,
Philadelphia, 15th Aug., 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—I am very much pleased with the Boiler you put in for me some nine or ten months ago. It has been in constant use—no trouble—no repairs—no stopping to clean out, and steam can be "got up" in about twenty minutes. It requires less coal than the Cylinder Boiler formerly used here, although it is doing a great deal more work. I cheerfully recommend it as being and doing all that you claim for it.
Yours very respectfully,
JAMES B. RODGERS.

Daily Evening Bulletin,
Philadelphia, Sept. 1, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—We have one of your 31 Horse-power Globular, Five-Slabbed Boilers, known as the "Harrison Boiler," in use now nearfive months, and as a safe, reliable steam boiler, and for economy of fuel, we think it cannot be equaled.
We have a ten horse-power engine, running eight hours per day, with an average saving of 50 per cent in the use of fuel over the old-style boiler. Our Engineer, Mr. George Lodge, has had over thirty years' experience in the management of boilers, and he has no hesitation in pronouncing the Harrison Boiler the "Best" he ever worked.
Very respectfully yours,
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Earle Stove Company,
Worcester, Mass., Sept. 3, 1866.

Joseph Harrison, Jr.:
Dear Sir:—Before purchasing your boiler, we examined with much care the various kinds now in use, determined to get "The Best." After eight months' trial, our experience conclusively confirms the correctness of our judgment in making choice of yours. Our President (T. K. Earle), and Treasurer (Edward Earle), who have in their Card Factory, one of the best of tubular boilers, are now putting in one of yours. We refer you to our Engineer, Mr. Frederick Edwards.
Truly yours,
EARLE STOVE CO., SIDNEY SMITH, Supt.

Worcester, Mass., Sept. 3d, 1866.

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EREDERICK EDWARDS, Engineer,
Earle Stove Co., Worcester, Mass.

Worcester, Mass., 9th mo., 6th, 1866.

Joseph Harrison:
Dear Sir:—We received your letter, and in answer will say, we are highly gratified with Boilers. The one we are using at the Earle Stove Co. has been in operation, since the first of the year, in perfect order. We have just got in operation the last sent, at our Card Factory, and are running it beside a Tubular of about the same capacity: so far we find a saving of about one-half by actual measurement.
Truly yours
T. K. EARLE & CO.

Alpine Mills, Howards, Center county, Pa.,
September 8, 1866

Joseph Harrison, Jr., Esq.:
Dear Sir:—It gives me great pleasure to be able to inform you that your Boiler comes up to the most sanguine expectations; in fact, all that you can possibly claim for it: being economical, safe, and a speedy generator of steam. Since they were first put up in the spring (which, by the way, was done without having a mechanic on the ground, except the mason), according to your plans, sent gratis, the first leak, trouble, or delay has yet to make its appearance. Steam is kept up from 75 to 90 lbs. for Wm. H. King's (1015 Sansom street), 25 horse-power Oscillating Engine, with saw dust, there being but a 25-feet iron stack of 2 feet diameter. . . .
I am, dear Sir, yours very respectfully,
PERCY H. WHITE, Agent.

Lincoln Mills,
S. W. cor. 25th and Spruce streets, Philadelphia, Sept. 10, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—In reply to your letter of the 9th ult., I would say that I have been using the "Harrison Boiler" for more than two years, and it gives me great pleasure to state that I find it entirely satisfactory. I have had both Cylinder and Tubular Boilers in use, and have consequently been able to compare each of them with yours. I have two of your boilers of 75 horse-power each in use, and my engine is 70 horse-power. I do not require more than 50 lbs. of steam, but would not hesitate to run up to 250 lbs., if necessity required me to do so. I had each of the slabs tested in my presence to 600 lbs. to the square inch. I know that it requires less fuel than the best of either the Cylinder or Tubular Boilers. My neighbor, with about the same machinery, using the steam for power generally, and heating his Mill with exhaust steam, informs me that he burns four tuns of coal per day under his Cylinder Boiler, while I used less than two tons per day, during the coldest days of last winter, and heated my Mill with live steam, in addition to the amount required for power. The question of durability is one of time. I think that in consequence of the ease with which it can be cleaned or repaired, that it will last far longer than any other kind now in use. It is perfectly safe. There is no danger whatever of explosion. I do not hesitate to recommend it. If I ever need another boiler, I will get one of yours in preference to any other that I now have any knowledge of.
Yours truly,
SAMUEL W. CATTELL.

Superintendent's Office, Camden and Atlantic Railroad,
Camden, N. J., Aug. 21, 1866.

Joseph Harrison, Jr.:
Dear Sir:—You ask our opinion of the safety, economy in fuel, and general merit of the Harrison Boiler we have in use. I deem it a safe Boiler; from its construction I do not think it possible that a disastrous explosion can occur. It is a rapid generator of steam, and requires less fuel than any boiler that has come under my notice. . . . . .
Very respectfully yours,
G. W. N. CUSTIS, Supt.

Philadelphia, Aug. 10, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—Having charge (as administrators) of the Worsted Mills of the late Mr. Samuel Yewdall, at which the recent terrible explosion of a wrought-iron boiler occurred, we have decided to avoid a recurrence of such a calamity in the future, and, believing your Boiler to be the only one absolutely free from danger from explosion, and at the same time equal, if not superior, as a generator of steam, and in economy of fuel, to any boiler now in use. You will please accept our order, to furnish us for said Mills, two fifty horse-power Boilers, to be used separately or in conjunction. By complying quickly with the above order, you will very much oblige,
Yours truly,
JAMES HUNTER, } Administrators.
N. R. SUPLEE, }

Rock Island Manufacturing Company,
Charlotte, N. C., August 23, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—Our experience with your Boiler warrants us in bearing testimony to its superiority over any other with which we are acquainted. Ours is a 100 horse-power boiler, and drives six sets of woolen machinery, and furnishes steam for our dyeing operations, and for heating the mill. Our fuel is wood, and we use three cords per day to do all our work, whereas, we formerly used that quantity under Cylinder Boilers, merely to furnish steam for our dye house, and heating the mill. Our experience is, that in fifteen minutes after applying the fire in the morning, we have on a full head of steam, and our machinery at work. We have had it in use only a few months, it is true, but we presume long enough to test its adaptation to our fuel and our work, and have found it in every respect to come up to your representations. Our Boiler was set up and put to work by a man who never had seen it done, without the the slightest difficulty. Your Boiler commends itself for economy in fuel, and its merits need only to be known to render it universally popular.
Very respectfully yours,
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☞ A few of the many testimonials which the Company has received, in regard to the operation of their Governors, were published May 19, 1866, in No. 21 of this paper, to which reference is made. 26 13

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Gate Supporter and Latch.

The "sagging" of heavy swinging gates, and the insecurity of the ordinary fastening, when the gate and post have begun to part company, have led to many devices for gates. The lifting gate, self-opening and self-closing gate, the balanced gate and many others, have their friends and supporters. But the old fashioned swinging gate is still a favorite with farmers, the only drawback to entire satisfaction being the liability to "sag." The engravings represent a convenient device to remedy this defect. As a farm gate is usually kept closed, and only opened occasionally, so that for by far the larger portion of the time it remains latched, the prevention of its "sagging" should be applied when in that position. This is done by the contrivance herewith illustrated.

Fig. 1 shows a common occurrence, where a "sagging" gate swung from its fastening gives freedom to a flock of sheep. The gate shown at A, however, performs its office, because equally supported by the hinges and the latch improvement The part, B, Fig. 2, is screwed to the post in a horizontal position, and C, carrying the roller, is secured to the gate at such a hight that, in swinging the gate, the roller engages B at D, which receives the weight of the gate, and sustains it as it is moved to a point where the latch, E, can drop into the recess at F.

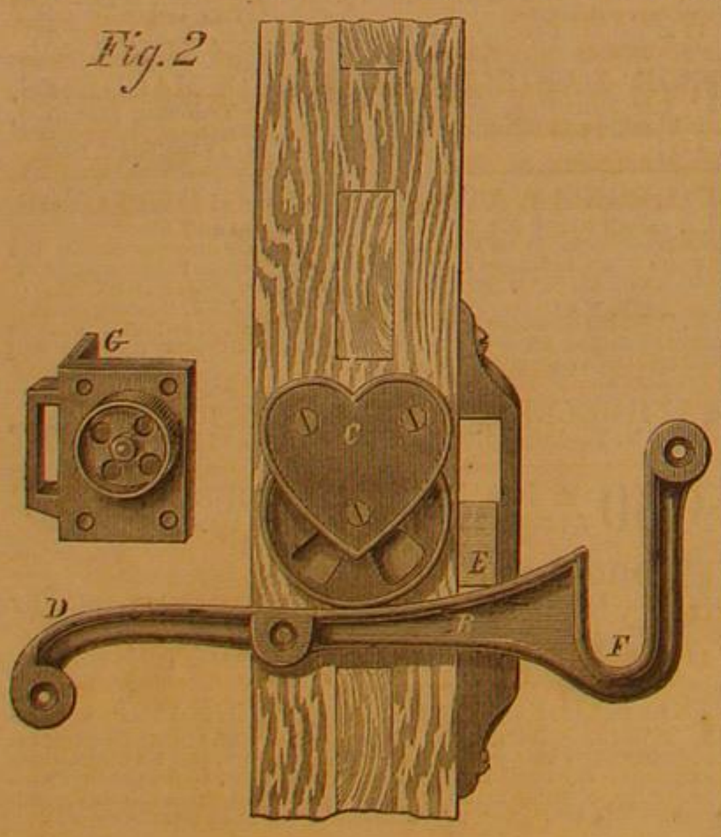
Fig. 1



KETCHUM'S GATE SUPPORTER AND LATCH.

The latch end of the gate is thus always supported, so that there is no danger of leaving the hinge post and displacing the gate. The casting,

Fig. 2



G, with latch guide and roller combined, is for a small gate.

Patented through the Scientific American Patent Agency by Frank Ketchum, to whom, at Monongahela City, Pa., apply for further information.

A QUEER BOILER "EXPLOSION."

The Cleveland *Plaindealer* says that a boiler exploded, Sept. 15th, in the mill of Schumacher & Co., at Akron, under remarkable circumstances.

"The boiler, which is the return flue style, was built at Pittsburgh, and has a shell of about 72 inches diameter. The plates immediately over the furnace, either from excessive pressure of steam alone, or aided by the deposit of scale on their interior surface, which prevented the water from coming in contact with the iron, became considerably bulged outward, and it was while the workmen were engaged in cutting out these defective plates that the accident occurred. They had chipped an opening of several inches at the forward end of one of the sheets, when suddenly the after end tore apart with a tremendous noise; in fact, so loud was the report that the men engaged in the mill rushed to the door exclaiming, 'there goes another powder mill' (one having exploded only a few days before in that vicinity), and it was several minutes before it was discovered that the rupture of the boiler had caused it. One of the men, who was in the act of chipping, and had his hand hold of the chisel which was wedged in the boiler, was so completely paralyzed on one side as to be unable to move, and he was conveyed home, very ill. The rupture took place in one of the transverse seams of the boiler, tearing the solid iron between the rivets about one-sixteenth of an inch apart, and over one foot in length."

From these details it will be seen that the term "boiler explosion" is incorrectly used. One of the crown sheets merely tore from its fastenings, at a time when there was no water, steam, or heat in the boiler. We think that if the cause of this mysterious accident cannot be fully demonstrated, it can be approximately conjectured, at least. First, there is generally in the newspaper accounts of these wonderful occurrences, some gap, which requires a fact to fill, but is often filled by imagination. Second, the bent or "bulged" plates were simply a "strung bow," wanting only an occasion to exert their latent force. They were strained to almost their highest point of tension, and when the violence of the hammering, in cutting one end of a plate, disturbed the conditions of quiet, and released a portion of the latent strain, the sheet gave way at its weakest part, which, in this case, seemed to be the riveted edge. If the "bulging" had not been resisted by the riveted seams, and the mass of the boiler itself, it would have exhibited its effects before, in a pulling away at the seams, and a leaking of the boiler. Third, the paralysis of the workman will be well understood by every machinist who has made a a foul blow while "chipping," the jar of the chisel disabling his hand for a time. Fourth, the only mystery about the affair is the reputed noise of the explosion, which may be mainly imaginary, the workmen who heard it having been alarmed but a few days before by the explosion of a powder mill. We are not informed that any but those employed in the mill heard this boiler explosion.

SALUTES fired in New London harbor by the French frigate *Themis*, were heard distinctly in Norwich, a distance of fourteen miles.

Progress of American Invention.

The best evidence of the progress which this country is making in science and the mechanic arts, is seen in the rapid increase in the number of inventions. Last week five hundred applications for patents were received at the Patent Office in Washington, together with sixty-eight caveats; and it is stated that two hundred and twenty-two patents will be issued this week. When we consider the comparative perfection of mechanics at the present time, it seems as though the whole field of invention has been covered, and that there is but little more to be done. The statistics show, however, that the march of invention is now going on more rapidly than ever before, and the imagination is lost in the attempt to conceive what it may bring forth. The remarkable impetus which has been given to invention within the last few years is doubtless attributable, in a great measure, to the removal of those difficulties which used to beset inventors in the procurement of patents. Messrs. Munn & Co., of this city, through whose agency the patent business is chiefly conducted, have so systematized the business that the inventor now encounters no trouble whatever. Their aim has been to encourage and promote American inventions, and by scrupulous regard for the interest of inventors they have unquestionably done much to produce the results which are now seen. Our country is now far in advance of any other nation in respect to useful inventions, and there is every reason to believe that we shall soon entirely eclipse the old world in the products of our ingenuity.—*New York Sun.*

MECHANICS

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Scientific American.

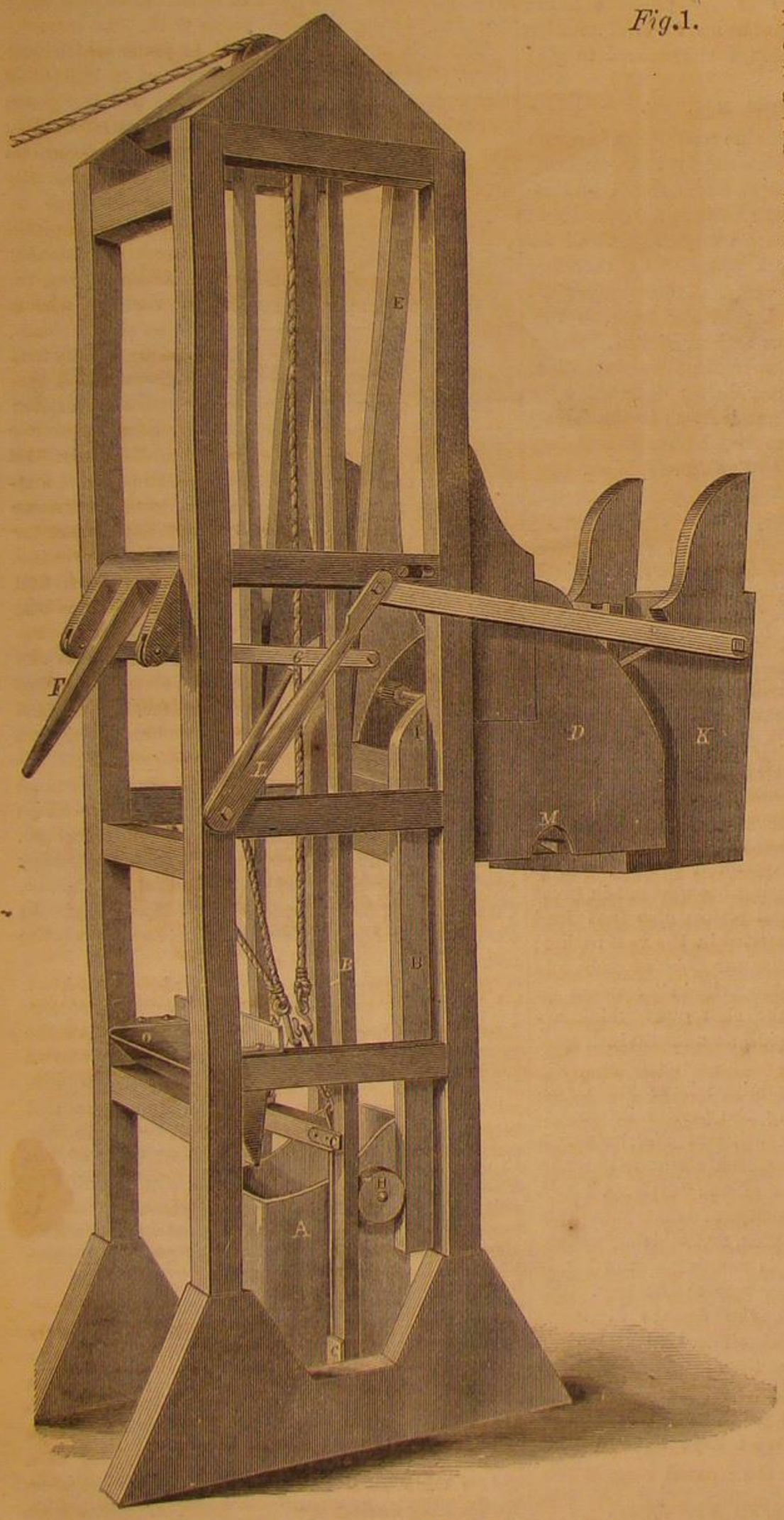
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Vol. XV.---No. 17. [NEW SERIES.] NEW YORK, OCTOBER 20, 1866. $3 per Annum, IN ADVANCE.

Improved Elevator for Mines.

The business of mining in this country has grown wonderfully within twenty-five years. Our coal production, which was the main mining interest, was the result chiefly of foreign talent and labor, our own people evincing no predilection for the business. The discovery of the vast deposits of copper in the Lake Superior region, and the gradual failure of the pan diggings of California, aroused the attention of our capitalists and mechanics to the necessity of a scientific and systematic prosecution of the art of mining. So successful have been the efforts in this direction, that mining has become one of the chief resources of our wealth. Our mines of the precious metals are of such extent and richness, that they may be relied upon for the production of gold and silver enough for the extinguishment of our national debt, without aid from any other element of productive wealth.

Fig.1.

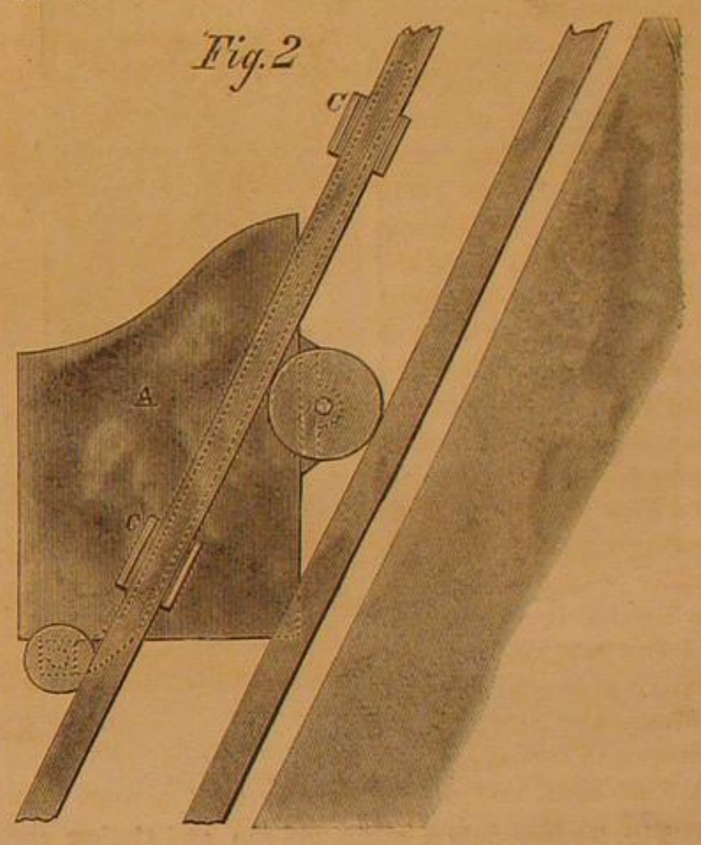


WILLIAMS'S ELEVATOR FOR MINES.

The improvement illustrated in the series of engravings accompanying this article, is designed to facilitate the process of mining, by simplifying the work of extracting and conveying the mineral out of the mine from the different lodes and galleries. Fig. 1 is a perspective view of an ordinary form of the elevator. The power for raising the elevator proper, or the receptacle for the mining products, can be that of man, animals, steam, or water, and be located near, or at a distance from the frame. The elevator, A, of wood, or boiler iron, is slung by a yoke passing under the bottom, to which it is attached by pivots, to allow the vessel to be tilted or inverted. It is guided in its ascent by the rails, B, and the lips, C. A portion of the front rail is pivoted above the chute, D, as seen at E, and where it connects with the lower portion, is curved to fit a corresponding curve on B. By means of the lever, F, and arm, G, this upper portion can be detached from the lower part, closing the vertical ascent and compelling the elevator, A, to turn, by means of the roller, H, into the passage to the chute, as seen in Fig. 1, when, by means of the yoke, the elevator is reversed or tilted sufficiently to discharge its contents through the chute. It can be readily seen that by the suspension of the elevator by the yoke attached to its bottom, instead of requiring additional power at the point of tilting, the weight of the elevator is shared by the lifting rope and the incline at I. Soon as the elevator begins to turn over, a portion of its weight is received by the roller, H, and the incline track, I, and the strain on the rope is lessened.

When coal, quartz or other minerals are to be discharged, that portion of the chute shown at K is closed by the lever, L; K being pivoted to the main chute, D. When, however, mud or water is raised, which is not to be discharged into cars or wagons, the chute is placed in the position shown in the engraving, which closes the front opening of the chute and allows the water or mud to pass out at M. To retain and secure the elevator at any point, as the level of a gallery, a simple hook, N, is slung by two lines, which keep it always in position for use. This engages the yoke and secures the elevator in the position, by which it can be readily filled from the hopper, O.

Fig.2



It can be easily seen that the devices for dumping from any gallery and for loading at any point, may be repeated indefinitely, so that the apparatus is adapted for mines having numerous galleries. The hook, N, upon the raising of the elevator, unhooks automatically, so that while it prevents the descent of the elevator, it permits it to rise to another gallery.

Fig. 3

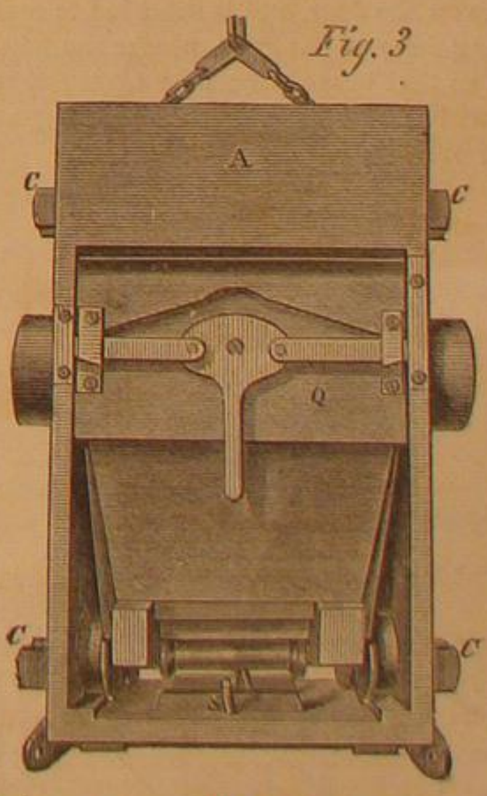


Fig. 2 shows a modification of the elevator, by which it can be made to traverse a shaft at any angle, always retaining an upright position. This is done by a yoke, shown in the dotted lines, which suspends the elevator by the rear of the bottom, and is furnished with a roller that engages with a rear rail.

Figs. 3 and 4 represent an elevator which receives a car loaded with coal, or ore. Fig. 3 is a front view, and Fig. 4 a rear view of the elevator and car. By simple devices the car is secured in the elevator, so that both can be tilted together. The door, Q, Fig.

S, secured by double latches, and the lever catch, R, Fig. 4, holds the car in position. A crank lever, the end shown at S, which engages in the space between the two axles, assists in holding the car in place. Cleats running along the sides of the elevator hold the top of the car, so that the elevator can be reversed without allowing the car to escape. By opening the door, Q, and lifting the lever, R, the car can be driven straight through the elevator, so that its suspension at the floor of the gallery will not prevent the passage of the car across the shaft. By the use of the yoke, shown in Fig. 4, the elevator can be completely inverted to discharge soft, cohesive mud or clay.

Fig. 4

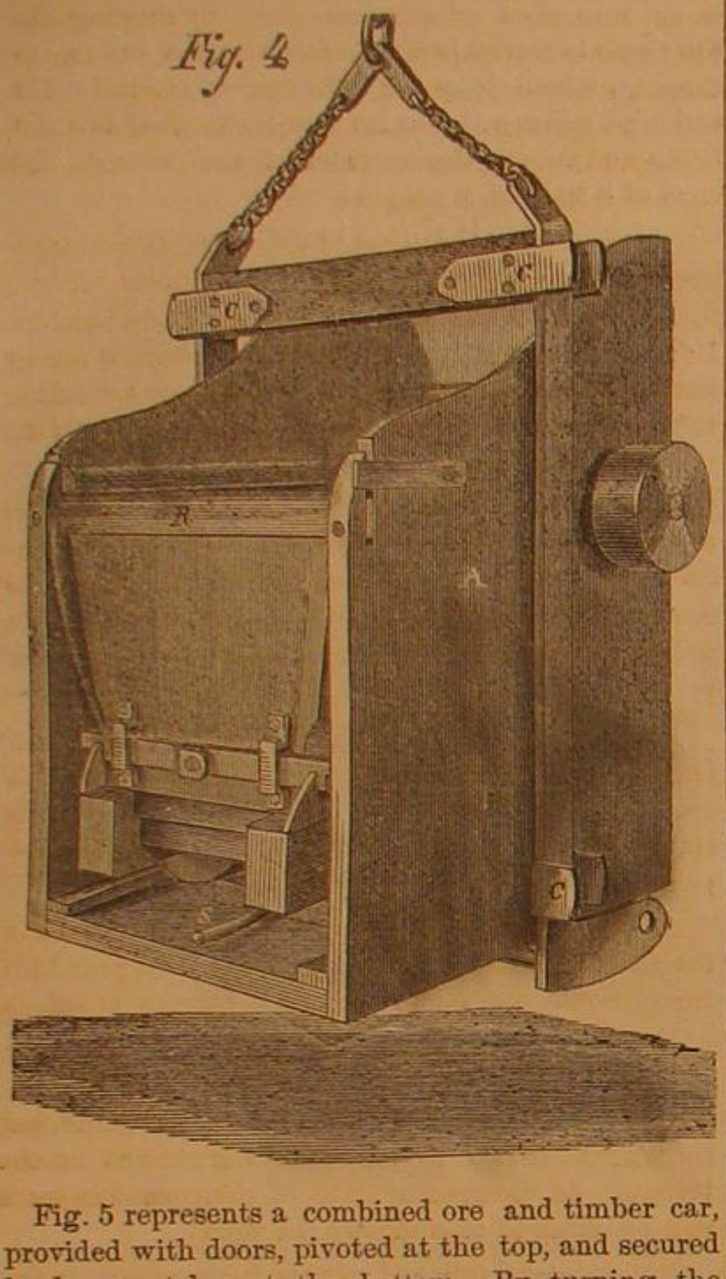
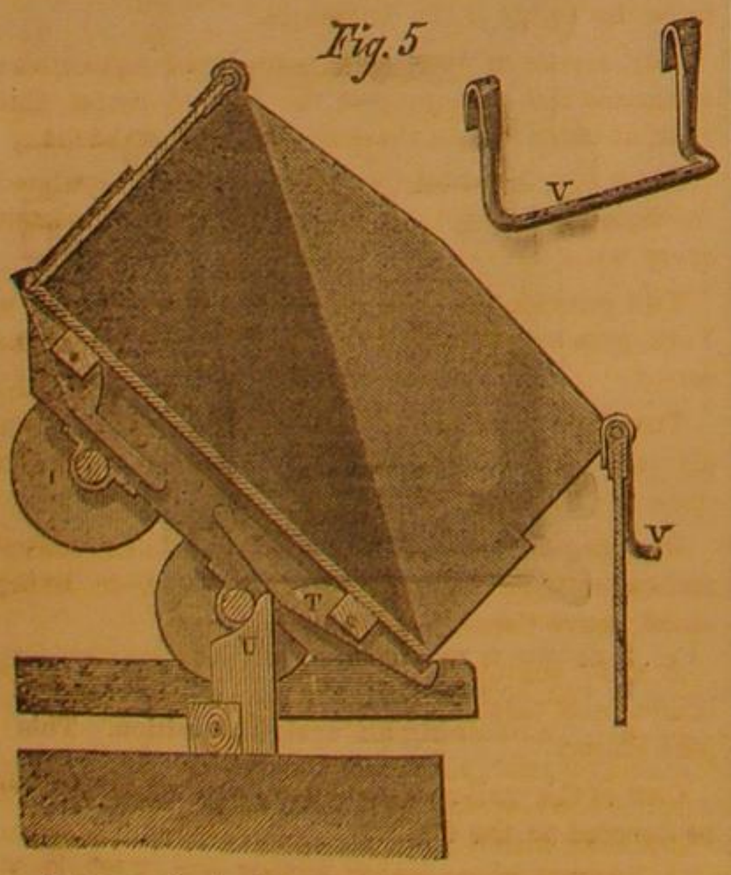


Fig. 5 represents a combined ore and timber car, provided with doors, pivoted at the top, and secured by lever catches at the bottom. By turning the doors up over the top the ends are left open for the conveyance of timber. Closed, the car is adapted for ore, coal or any other material. The engraving represents the car in the act of discharging a load. The long end of the lever, T, engages the abutment, U, which stops the car and opens the door. The hook, V, hangs on the door, and is intended to receive the propelling force of the hand nearer the wheels than the top, so that in meeting any obstruction on the rails it will not tend from the center of gravity, but will ride over the obstacle.

Fig. 5



The practical miner will readily see and understand the varied advantages of this combined apparatus. From its rapidity of operation it is admirably adapted to raising water from mines; it can be employed in coal yards in delivering coal, and can be used in loading or unloading ships or boats with coal, requiring the services of only one man where three are now employed.

It is the subject of two patents, through the Scientific American Patent Agency, dated July 17, 1866, by George Williams, of Sterling, Colorado, Ter.

Patents have been secured in foreign countries also through the Scientific American Patent Agency.

Mr. Williams is temporarily sojourning in New York, and for a few weeks letters will reach him addressed to the care of this office.

[Special Correspondence of the Scientific American.]

THE WORCESTER MECHANICS' FAIR.

WORCESTER, Oct. 8, 1866.

In my last letter I gave you a brief summary of the attraction at the Mechanics' Fair in this city. It has just closed after nearly three weeks' session, and was a most successful exhibition. In addition to the articles mentioned in my previous letter, there are many deserving of at least a brief mention which, with your permission, I will proceed to give them.

LAMB'S KNITTING MACHINE.

This now celebrated machine was shown in operation. The quality of work done by it is certainly beautiful, not only beautiful but durable and reliable in all respects. It will knit *any thing*, and that tells the whole story. I saw a very modest and attractive young lady at work upon it, and therefore examined it with much care and circumspection. She knit me a scarf, and I paid her for it, so this notice is entirely gratuitous and unsolicited, being a simple act of justice to a meritorious invention. The machine runs very easy, being operated by a crank, and is sold for $65, and if I was in the family line, as much as I used to be, I should certainly have one. The factory is in Springfield, Mass.

CHASE'S MICROSCOPE.

This is a simple and useful little instrument for magnifying natural objects, such as insects, etc. It is also valuable for detecting counterfeit money, as the lines in the engraving are easily distinguished from genuine; exhibited by O. N. Chase, Boston, Mass.

ETHAN ALLEN'S GUNS.

A splendid case of fire-arms was shown by Ethan Allen, of Worcester, Mass. They comprise breech-loading rifles, shot guns and pistols of surpassingly beautiful workmanship. They have just commenced the manufacture of Damascus barrels, and have been exceedingly successful. A shot gun shown had that beautiful mottled exterior, peculiar to this style of workmanship, the finish being brought out in great strength. They make small pistols also that load at the breech, and can be carried in the vest pocket; handy things for one of Sylvanus Cobb's heroines to pull out when the invariable "villain" appears on the scene. They also make shot guns which are sure fire, and as certain to kill as a fifteen-inch gun, at point blank range.

The awards of the Committee have made considerable excitement among the parties interested, medals being distributed without discrimination and "diplomas" being scattered about with a perfect looseness. The value of the "diploma" to a firm which transacts thousands of dollars' worth of business in the course of a year, and which has spent large sums to keep its tools running at the fair, is certainly not very great nor very satisfactory. But who shall decide when the doctors disagree? Bronze medals also were distributed to various individuals who did not value them, and to some who had no earthly right to them, but if the Committee's conscience is sound on this point, mine is. The fair was a complete success, and I hope there will be another next year.

The First American Fire-arms.

As early as 1748 muskets were manufactured in Massachusetts. They were made by Hugh Orr, on the order of the Province of Massachusetts Bay, at his shop in Bridgewater, Mass. He built five hundred for the colony, which were deposited in Castle William, and when the British evacuated Boston they carried off most of them. Hugh Orr came from Renfrewshire, Scotland, at the age of twenty-one, his only possessions being a knowledge of the gunsmith and locksmith trades and a bundle tied in a handkerchief. He died in 1798, at the age of eighty-two. During the war of the Revolution he cast iron and brass cannon for the Continental army, with calibers of from three to forty-two pounds. They were first cast hollow and bored, but Mr. Orr introduced the method of casting them solid and then boring, which insured a more perfect and a stronger piece

[For the Scientific American.]

WEST ALBANY LOCOMOTIVE WORKS.

We were favored a few days since with a visit to the Locomotive Works of the New York Central Railroad, at West Albany, and although we had heard much of them, yet we were agreeably disappointed in finding them of greater magnitude and completeness than we had anticipated.

The location of the Works is admirably chosen, being about three miles from the city, on high ground, where fresh air and an abundance of room are always enjoyed

The buildings are new and of immense proportions. They are built of brick and roofed with slate. They are admirably arranged with reference to each other, the various shops being situated in the most convenient manner possible. There is ample room between the buildings for roadways drives, etc.

The grounds round about present a most pleasing and attractive appearance. They are tastefully laid out, with drives and walks; and on the south of the Works, at the foot of a hill covered with a beautiful pine grove, flows a quiet, winding stream, which gives to the whole scene an air of beauty and repose.

Instead of encountering great piles of broken cars, scattered parts of used-up locomotives, scraps of old iron and masses of unaccountable *débris*, all is so neat and orderly without, that one would almost fancy he was approaching the grounds of some Shaker settlement. There is absolutely a place for everything and everything in its place. There is a place for superannuated cars, and there you will find them. There is a place for scrap iron, and you will find it all there. There is a place for shop sweepings, and you will find them all there. I was told, on being shown a large mass of these scraps, that what a speculator had offered fifty dollars for, was melted up at the Works, and yielded fifteen hundred dollars worth of metal.

Inside of the buildings and workshops, the same order and good taste prevail as outside. The shops are spacious, well ventilated and well lighted. There is nothing here wearing a gloomy, dingy aspect. Every room is light, cheerful, and clean. Cleanliness, in fact, pervades every department. In the foundery, oil room, and locomotive shop it is the same.

The machinery is of the most perfect of its kind. I have visited many engine rooms on board steamboats, steamships, and at various works about the country, but have never seen equaled the one at these Works. It is a room about thirty feet square, with yellow-pine floor, as smooth and clean and bright as a Shaker dancing hall. The engine is a beam engine, and a perfect model of its kind. It would seem almost impossible that a machine in daily use could be kept so perfectly clean and bright in every part. The room is rendered doubly cheerful by having its spacious windows filled with some of the choicest plants.

The present master mechanic of the road, Mr. C. Manning, has been in charge of the Works only about a year, but has introduced some features which we heartily commend to the consideration of all master mechanics. In most shops of the kind, some of the workmen may be seen with huge pipes in their mouths, enjoying the luxury of a smoke while at work. This is not allowed here. No smoking during working hours. A whole train of evils is thus broken up. The tool room was, to us, the object of greatest interest and commendation. Instead of the tools being scattered about the shop, or kept in a hundred different tool chests and drawers, there is a small, convenient room fitted up at one end of the machine shop, and all the tools are kept there. There are inclined shelves arranged about the room and the tools are placed on these in

the most perfect order. There are shelves for drills' and a place for every drill; and the drill is numbered to correspond to its place. Any particular tool is as readily found as a book in a well-arranged public library. The drills and taps are all made after the United States standard. The size of each drill or tap is marked on the head.

Every tool is polished and perfect. There are two or three men employed in this room whose business it is to furnish the workmen the tools they call for, and charge the same to them. When the tools are returned their condition is noted—"broken," "dirty," etc. When the tools need sharpening they are sent to the blacksmith shop in boxes, and when sharpened are returned to the tool room. By this means the tools are always in good condition, and much time is saved.

A steel locomotive is in process of construction by Mr. Manning, the first of the kind ever made. The steel is from the Troy Bessemer Steel Works.

A new method of tempering steel for springs has been invented by Mr. Manning, on which he has recently secured patents. It is a matter of great importance to railroads. By his method, a better spring is made from less than half the steel usually employed. These springs are now being introduced on the New York Central Railroad.

There are many features about these Works we should be glad to mention, did space permit. All parties interested in mechanical enterprises can spend half a day agreeably and profitably at the West Albany Locomotive Works.

J. Wesley Carhart.

Troy, Oct. 1, 1866.

Jamaica--A Field for Inventors.

A correspondent, writing from the island, furnishes a number of interesting facts in relation to this country, concerning which, as the writer justly observes, little is known beyond the fact of its gradual decline.

The productions of the island are easily mentioned. Logwood always finds a ready market. Cotton has been tried and failed, growing into bush in the wet parts, and perishing for want of rain in the country around Kingston. Tobacco pays well when properly cultivated, but enough is not now produced on the island, to supply even its own inhabitants. The cocoanut grows abundantly near the coast; one estate mentioned, has one hundred acres of them well fenced in, the grass underneath the trees serving for pasture.

Corn and peas grow several crops per year, but cannot be kept for any length of time, so that prices range from fifty cents to two dollars per bushel.

The great evils of Jamaica are, no market for home consumption on a large scale, and the limited number of the articles of export, and the unreliability of profit, governed by the prices in England.

A new branch of industry, which promises well for Jamaica, is the increasing demand for bamboos, for the manufacture of paper in the United States. Any one who would introduce cheap machinery for converting these into pulp on the spot would make a fortune.

It is the difficulty arising from the carriage of the raw material to the wharf on the inferior roads, that prevents more people from engaging in the trade. None but the most valuable articles can stand the expense of going over hilly roads without swallowing all the profits. On the mountains the most beautiful hard-wood timber is found, but the demand is so slight that it would not be profitable to transport it to market, for the paths are so rough that the use of the block and tackle is often required.

The want of small portable saw mills to saw boards, fuel for steam boilers, or staves for hogsheads, is referred to by our correspondent, the usage now being to allow a stick to project a couple of feet from the fire, to save labor. Rotary engines for water and still-house purposes are also needed. Let inventors advertise in the island papers and appoint agents. Jamaica has also a vast quantity of fibrous plants, penguins, manilla, and the barks of many trees, which are now applied to no practical use on a large scale. If now any one would introduce machinery to clean the penguins, six feet in length, of the fleshy matter, quickly and thoroughly, it would be a source of great profit.

In reply to our correspondent's inquiries, we would state that tubular boilers are fast taking the place of the flue boilers, and are being universally adopted. The plan of Mr. Wye Williams, of introducing air behind the fire bridge, has been advantageously and extensively employed, and is highly recommended.

MISCELLANEOUS SUMMARY.

It is said that an artificial ivory is now made in France from a paste of *papier-maché* and gelatin. Billiard balls formed of this material, though barely a third of the price of those made from real ivory, are yet so durable and elastic that they can be thrown from the top of the house on to the pavement, or violently struck with a hammer, without injury. With this same paste, to which the name of Parisian marble is given, among many other things, the finest and most complicated moldings for ceilings can be made, or capitals of columns can be constructed in any color so as to resemble the most valuable marbles.

[In the United States various substitutes for ivory have been proposed, such as preparations of india-rubber or compounds of bone shavings with clay and suitable acids, but neither of these compounds has been fully equal to ivory, and the field is still open for our inventors. We understand that Michael Phelan, the celebrated manufacturer of billiard tables, has endeavored for some years past, to obtain a substitute for ivory from which to make billiard balls. Messrs. Phelan & Collender of this city, offered through these columns, not long ago, $10,000 for the patent of some artificial substance which could be used for billiard balls, and which would cost less and be equal to ivory.—Eds. Sci. Am.

An experiment was recently tried in England to ascertain the cost of transporting goods by steam engines on common roads. The work performed was the hauling of three wagons loaded with fifteen tuns of lime, sand, and coal, twenty-six miles, the entire weight of the train being twenty-one tuns. The train occupied twelve hours and a-half in the journey, including thirty-three minutes' stoppage. This was a speed of two and one-sixth miles per hour. The coal consumed was 2,576 pounds, and the expense of the journey was, for tolls, $10 54; coal $5 67; oil and waste, 84 cents; labor, $3 13; wear and tear and interest, 94 cents—total $23 01. This is equal to a cost of but six cents for moving one tun one mile, nearly one-half of it being tolls collected by the road companies.

The first iron works in this country were established near Jamestown, Va., in 1619. In 1622, however, the works were destroyed, and the workmen, with their families, massacred by the Indians. The next attempt was at Lynn, Mass., on the banks of the Saugus, in 1648. The ore used was the bog ore, still plentiful in that locality. At these works Joseph Jenks, a native of Hammersmith, England, in 1652, by order of the Province of Massachusetts Bay, coined silver shillings, sixpences, and threepences, known as the "pine tree coinage" from the device of a pine tree on one face.

The Paris Exhibition.—We would call attention to an advertisement in another column of Dr. Evans, of Paris, who proposes to collect and exhibit, at the great Exhibition, sanitary and surgical articles which were adopted and used in the late war. Mr. Evans is an American, and is dentist to the Emperor, and possesses unequaled facilities for successfully carrying out his purpose.

The gold and silver products of the United States for the year 1860 have been estimated at from eighty-two to one hundred and six millions. California producing twenty-five millions; Montana, eighteen millions; Nevada, sixteen millions; Idaho, seventeen millions; Oregon, eight millions; Colorado, seventeen millions; other sources, five millions.

A market report dated Boston, January, 1719, shows that deer skins dressed for clothing were regularly quoted. Those dressed by Indians sold for five shillings a pound, while those dressed "in oyle" by the whites, brought eight shillings, sixpence.

Sweet oil rubbed on the skin is said to be a sure antidote for ivy poison.

Near Basingstoke, in England, the ancient Roman and British capital of southern England, some excavations have recently been made which have laid bare a Roman street, with another smaller one running from it. Two large Roman houses, with tesselated pavements, the site of an amphitheater, and a portion of the walls surrounding the ancient capital, have also been dug out. Several coins, of periods anterior to the Christian era, have been found, and a brick, with parts of an inscription upon it.

Test papers are made by dipping unsized papers into a solution of a vegetable matter which changes color when exposed to the action of an acid or alkaline solution. The paper after being gently dried, is cut into slips of suitable size. By dipping the appropriate test papers into any solution, we can ascertain whether it is acid, alkaline, or neutral. Litmus and turmeric are most commonly used as a coloring matter—litmus for the detection of acids, and turmeric for that of alkalies.

The new anemometer at Greenwich Observatory consists of a circular plate, having an area of two square feet, supported vertically on eight springs. It has a directing vane which always keeps it facing the wind, and the deflection of the springs according to the force of the wind, is registered on a revolving table in the room below.

The public debt of the United States, on the 1st of October, was $2,573,326,941, which shows a decrease of over twenty-two millions in the month of September. The Government holds $86,000,000 in gold and $41,000,000 in currency now in the treasury.

The English river steamers are not provided with engineers' signal bells, but the captain conveys his orders to the engineer by means of a boy, who is stationed at the entrance of the engine room to repeat the word.

English Patents.—It appears from the report of the Commissioners of Patents, that in the year 1865 there were 3,386 applications for patents, of which 2,186 passed the seal. The receipts of the Patent Office amounted to £115,340, during the year 1865.

The tunnel under the Alps has reached 7,615 feet in length on the French side and 11,285 on the Italian. At the present rate of progress five years will be required to complete the work.

One thousand miles of telegraph are now in operation in New Zealand, while a sub-marine line, a branch of the great Anglo-Indian line, is to be completed next year.

The capacity of iron ships built on the six principal rivers of England, during 1866, amounted to 408,206 tuns of new vessels.

The wires of the Russian-American Telegraph have been extended a distance of 715 miles above New Westminster, in British Columbia.

The latest antiquarian sensation is the discovery of an ancient city in southeastern Africa, believed to be the Ophir of the Scriptures.

The report of the Commissioner of Agriculture estimates the corn crop of the United States, this year, at more than a thousand millions of bushels.

Over four hundred thousand dollars of mutilated fractional currency are destroyed by Government every week.

The principal manufacturer of soda water, in New York, gets out 3,000 gallons per day throughout the season.

The London Water Works Company offer to supply large consumers at three cents per tun, or twelve cents per thousand gallons.

By using delicate gold electroscopes, indications of statical electricity have been obtained from living blood, nerve tissues, and muscular fiber.

A raft containing 2,000,000 feet of choice pine lumber and valued at $50,000, was recently lost on lake Huron.

One of the galleries in the Paris Exposition will be devoted to the display of human skulls.

A French sugar maker applies the principle of endosmose to separate the sugar from beet molasses.

Bath brick are now being manufactured in Stratford, C. W. They are said to be of excellent quality.

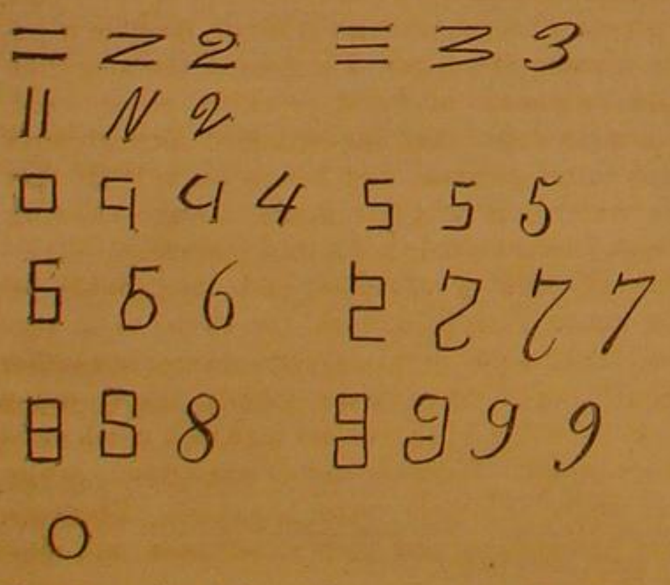
THE ARABIC NUMERALS REPRESENTATIVE, AND NOT ARBITRARY CHARACTERS.

It can hardly be successfully disputed that the first methods of expressing ideas to the eye were by means of figures which were, in some measure, representations of those ideas. Such was the picture-writing of the Aztecs, by which their rulers were informed of the appearance, character, numbers and supposed designs of the Spanish strangers. The same mode of pictorial representation was subsequently adopted by the Christian teachers of Europe, who endeavored and succeeded by it in imparting to the Mexicans the primal truths of the Christian faith.

Sir William Jones traces an analogy between the present written language of the Chinese and the true hieroglyphic, which represented ideas by pictures. The Egyptian characters are of this nature. Our North American Indians employed the same means for the expression of ideas. It is easy to see that so far as the written language attempted to deal only with visible objects, and even the qualification of them by comparison, this picture writing would serve a purpose. Possibly the relation of one symbol to another, or of the qualities of one written object to another could be expressed in the same way; but either a phonetic or alphabetical script became necessary to give coherency of expression and facility of interpretation, when the information intended to be conveyed was of a more abstruse and abstract character than that concerning visible objects. But this form of written communication was of necessity confined to those who understood the particular language to which it was adapted, while the representative method was of universal application.

In the representation of numbers, especially, the most expressive characters would undoubtedly be adopted. Numbers depend upon no distinctions of character either in the climate, soil, or scenery of a country, or the pursuits, inclinations, or habits of a people. They are immutable, unchangeable. Therefore, we find to-day every enlightened people using the same characters in their written expression. The Arabic numerals may have been first adopted by Europeans because of their immense superiority over the cumbrous Roman system; but its originators probably intended each character to express the number it was used for. Let us look at this subject for a moment critically.

Of course it can be seen that one straight line, as in our figure 1, represented that number. The starting appendage was undoubtedly added by carelessness in writing it, the pen being brought close to the surface before the downward stroke was given, and in preparing for that stroke making the preparatory upward hair line. Now let us, by means of the following diagram, see if the succeeding characters can be as successfully found to represent the numbers they are designed to express.



Let us analyze these characters by the light of common sense and the natural movements of the hand in writing. In tracing the formation of the 2 we have supposed that two horizontal lines, instead of two vertical lines were used; but if this assumption may appear to be too much of an assumption, it may be shown, as in the lower group, that the two upright lines might be corrupted into the present form of 2. The second character of this group is a 2 in a leaning position. But it serves our purpose to assume that originally the 2 was two horizontal lines. Beginning at the left of the top line, in bringing the pen, or other writing instrument, from its right to the left of the lower line, it was perfectly easy, and, indeed, almost unavoidable, when in haste, to leave a connecting diagonal line between. In time this became the accepted form. But as it is easier and more natural to write in curves than in arbitrary straight lines and angles, the form became ultimately that which we now use, ornamented and perfected.

The progress of the 3 can be readily seen. The 4 was a square, made by beginning at the right of the top line and forming, by a left, downward, and a right-hand movement, the three sides, the square being finished by a downward stroke on the right. This was easier than forming the whole square without lifting the pen from the writing surface. The progress of this character can be readily traced.

Looking at the 5 it may be asked why depart from the standard furnished by the 4? Why not add to the 4 by another line? Because the 4 being made in the way just described, and any addition to it being naturally merely a prolongation of one of the lines already existing, it might be difficult, in many cases, to distinguish one from the other. This character was begun, originally, at the upper right hand, but afterward, as in the second example, the upper horizontal line was the finishing stroke. The curl upward of the body shown in the third example was a scratching caused by carelessness in lifting the pen when going upward to give the last stroke. As in former instances, however, it furnished an excuse for the adoption of the present form.

The figure 6 can be traced from its original form to its present appearance without special explanation of the examples given in the diagram.

But the 7 may be somewhat puzzling. Let us consider, however, that to get a simple and convenient form which should represent the number and be sufficiently distinct from the 6 and the 5—one of which the 7 would resemble if another line was added to the 6—a new combination of lines was required. So the upright across the upper horizontal was made to count two intsead of one, as it was bisected by the horizontal. Note the progress of the figure from the exact perpendiculars and horizontals to the present form, the lower portion being gradually simplified into a mere thickening of the stem.

Of the 8 it is scarcely necessary to speak. It is apparent that it is but a double 4, and its change to the present form is easily accounted for when we remember, what is stated above, that it is more natural and easy to write in curves than in right lines and angles.

The 9 is two figures 4 united by a line. The remarks in regard to the lower portion of the 7 will be found applicable to this figure. It certainly is opposed to the idea of representative characters to believe that the 9 is but a 6 reversed.

The last character is styled "naught," or "cipher," both meaning when applied to this figure "nothing." And see how perfectly its form carries the idea when viewed in connection with the others. Each of them derives its power and value from straight lines without curves. This, however, when alone, having no value whatever, is a continual curve without an angle or a right line.

Possibly some may consider these examples and explanations far-fetched, but the writer believes that the more they are examined the more it will appear that the present form of the common numerals is a corruption of what were once merely representative characters.

DOMINUS.

MANUFACTURES IN HARTFORD.

Hartford, Conn., is known the world over for its vast insurance business, but it is not so well known for its manufactures; although the Colt pistol and the Sharps rifle have made it somewhat famous. Still, many who have heard of these weapons never knew the place of their manufacture. The Spencer rifle, also, was first tested in Hartford, and the manufacture was commenced by Hartford men, who owned the patent, in Boston, Mass. This celebrated arm was invented by an employé of the Cheney Brothers, silk manufacturers, whose works are located in Hartford.

The manufactures of this city are varied, and in each department are important from their extent, the amount of capital invested, and the large returns realized. The Colt's Patent Fire-arms Company should, perhaps, head the list. The extent of this concern can be judged from the facts that the flooring of the buildings contains an area of six and a-half acres; that the capital invested is one and a-quarter millions of dollars, and the number of hands employed about fifteen hundred. Sharps's Rifle Factory is another important Hartford concern. The arms manufactured here have proved exceedingly efficient weapons, and have, during our late war, sometimes decided the turn of a battle. They are wonders of simplicity and durability, and are great favorites with those who have used them.

The Woodruff & Beach Iron Works are one of the most complete establishments for the manufacture of stationary and marine engines in the country. Work of the heaviest character can be done here. They have a planer capable of finishing a condenser weighing thirty tuns, steam derricks with a lifting power each of seventy-five tuns. The engines of the celebrated *Kearsarge* were built here. Their engines are remarkable for finish and easy working; those of the *Nipsic* gunboat sustaining a trial of ninety hours at the dock and three months at sea without heating a journal, driving a propeller screw of bronze eleven feet diameter, and weighing 3,500 pounds. The engines of the *Pequot* were built here, on a new plan. The cylinders are curved tubes, segments of a circle, thirty inches diameter. The piston rod is a complete circle, corresponding to the radius of the tube and works on centers. The connecting rod leads to the piston rod without the intervention of a cross head. These engines are reputed to work well.

The belting manufactory of P. Jewell & Sons is probably the largest in the country. It converts six hundred hides into belts every week, using leather tanned at an establishment in Michigan owned by the company. Messrs. Jewell & Sons also manufacture immense amounts of lace leather from Patna hides, from the East Indies, which they cure in salt, alum, and hot tallow, and not by the ordinary process of tanning.

The Cheney Brothers are probably the largest manufacturers of silk goods in this country. They import from China and Japan their raw silk by the cargo, and manufacture it into ribbons, neckties, and dress silks. They have an auxiliary concern at Manchester, about twelve miles from Hartford, the two establishments being connected by a telegraphic wire.

Tobias Kohn is another silk manufacturer, who devotes his attention mainly to the making of sewing silk, embroidery braids, and cords and tassels. He has lately patented a new machine for "twisting, stretching, cleaning, and reeling silk and other threads" (see SCIENTIFIC AMERICAN, No. 16, Vol. XV., current series, page 255), which produces a more even and better-finished quality of silk than is usually found in the market. His braids are considered superior to those of the same style imported.

J. L. Howard & Co. have a large manufactory for car trimmings, which sends its products all over the country, and they are to be seen in the cars of nearly all the principal roads.

Among the new manufactories of Hartford may be mentioned one for the production of toys, and the new concern of Pratt, Whitney & Co., referred to in another column. This company is composed of three young men, all practical mechanics, and more earnestly desirous of permanent celebrity founded on excellence of workmanship, than of present advantage at the expense of workmanlike reputation. Their establishment is a thorough school for the mechanic. Every article that goes from the shop is thoroughly tested and elaborately finished. No sham work is permitted. Their machinists' tools are models of beauty and convenience. They have recently added to their engine lathes Slate's device for turning tapers, the simplest and most efficient contrivance for the purpose we have ever seen.

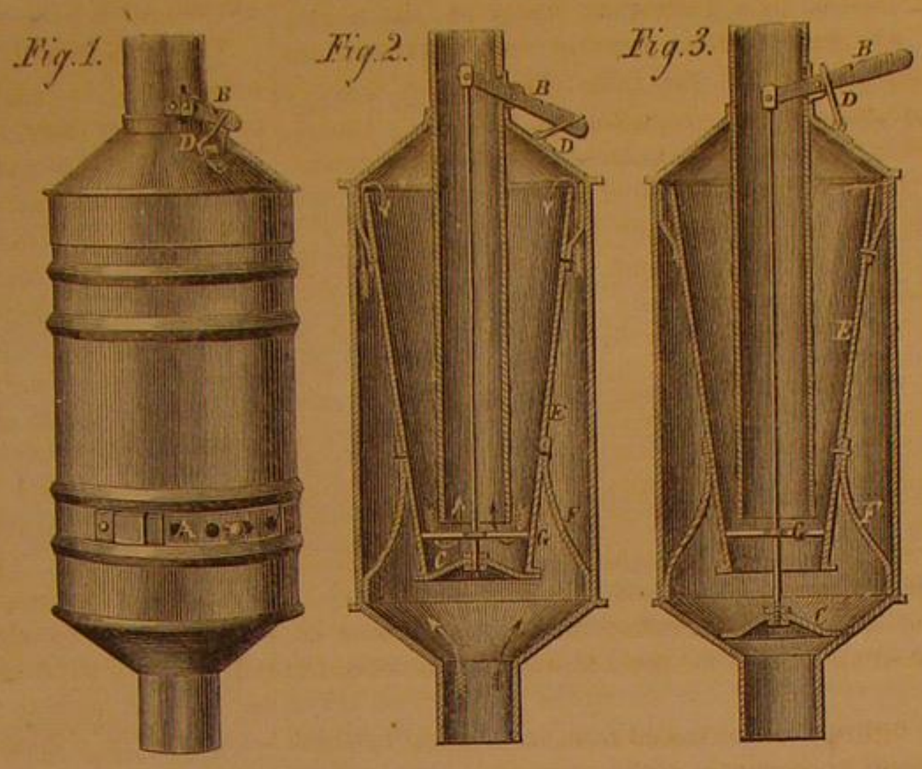
These are but a portion of the manufactures of this thriving city. There are many others, some of them of great importance, to which we have no time nor space to allude.

A CALIFORNIA paper asserts that a grain of wheat, lately unearthed, put forth a sprout and commenced to grow, having been imbedded for thirteen years.

Improved Funnel Drum or Radiator.

The engraving presents three views of a drum to be attached to a stove funnel, for the purpose of collecting a portion of the heat from the gases of combustion, and of regulating the draft of the pipe. Fig. 1 is a perspective view, and Nos. 2 and 3 vertical sectional views of the same.

The drum is made of sheet iron with a section of pipe at each end of the cylinder, rising from the conical top and bottom, to connect with the stove funnel. At A, Fig. 1, is a sliding damper for the admission of external air. At the top is a lever handle, B, which connects by a rod with a damper, C, inside the drum. The lever may be held in any position by the loop hook, D. When the damper, C, is closed on the bottom of the inner cylinder, E, which is sustained in place by four braces, F, the heated gases and smoke from the fire follow the direction of the arrows in Fig. 2, circulating around the interior of the drum and parting with a large portion of their heat before going off through the chimney. G is a guide to keep the rod and damper in position. Fig. 3 shows the damper depressed to prevent the heat from circulating through the drum, when a direct draft is required. The apparatus and its operation can be easily understood by reference to the engraving.



TRUTH & DE LONG'S FUNNEL DRUM OR RADIATOR.

Patented Aug. 28, 1866, through the Scientific American Patent Agency. For rights to vend and manufacture address A. W. Beecher or J. De Long, Upper Sandusky, Ohio.

Inlaying.

The process of inlaying iron work with mother-of-pearl by which the higher-priced sewing machines are ornamented, is an illustration of the improved methods of doing work which was formerly the result of close application and patient labor. Inlaying is one of the oldest styles of ornamenting metals, and is now extensively practiced in precisely the same way it was by the Saracens in the time of the crusades and by the armorers of Europe. Fire-arms, daggers and sword blades are often beautifully inlaid with gold and silver. In this work the metal to be ornamented is chiseled to the pattern required, and the gold or silver forced into the recess and secured by riveting or dovetailing. But the sewing machine and the articles of *papier-maché*, which are so beautifully decorated with flowers and fruits composed of the iridescent shell of the pearl oyster and gilding, are ornamented in quite a different manner. Thin scales of the shell are selected for their color, or shade, and cemented to the surface of the material. The rest of the surface is covered with successive coats of Japan varnish, generally black, being subjected to a baking process after each application. When the varnish is as thick as the shell it is polished, the gilding and painting added, and a flowing coat of varnish put over the whole. The surface, if well done, is almost as hard as the metal.

A Singular Land Slide.

The Cleveland, Ohio, *Herald* of Sept. 28th, relates a remarkable occurrence which took place in that city the day before. It seems that there was an oil refinery situated in a ravine on the north side of Hill street, which is filled up to grade across the gorge. About twelve o'clock the man in charge of the works saw about fifty feet of this embankment moving rapidly toward the buildings, which it reached and crushed, filling the ravine with earth to the depth of four or five feet, deposited quite level.

The singular feature of this affair is that it was not the falling of a steep bank, but a vast mass of earth was forced out horizontally by some unknown agency, carried some of it seventy-five yards on nearly a level. There was some water with the slide, but the greater part of the earth which moved was not even wet.

There are various theories among those who first saw the slide. The most common is that it was an earthquake, and the most probable is that it was caused by a large accumulation of water and quick sands under the road, which finally burst their bonds.

New Gas Project.

Dr. Hachenberg, of Coxsackie, N. Y., has recently visited the coal mines, where, with a corps of engineers he has been making observations as to the feasibility of furnishing New York City with gas for light and also for heating buildings, generating steam, and for culinary purposes. He informs us that the plan is regarded as perfectly feasible and likely to prove one of the great enterprises of the day.

Time was when such a proposition as this would have been treated as a visionary scheme, but since the success of the Atlantic Telegraph and other wonderful enterprises of modern science, who dare say that this suggestion is not practicable? The idea, however, is not new. We have been familiar with it for some years, but so far as we know Dr. Hachenberg is the first to examine into the feasibility of the project.

Inventors' Commission Agency.

A correspondent from Worcester, Mass., complains that poor inventors stand but little chance with capitalists who own patents, as the latter can employ "runners," who sell a number of articles at the same time. He says: "It costs each of these individuals (poor inventors), just as much to travel for the sale of a single article as it does a runner to sell a hundred different articles, and the runner has one hundred chances of sale to his one."

Our correspondent suggests, as a remedy, "a commission house at some central place like New York, where inventors can place their goods for sale, and where purchasers from all parts of the United States will gather at least twice a year."

Experience has fairly shown that he who attempts to travel for the sale of a number of articles, unless all in the same line and adapted to one business, does not succeed as well as he who devotes his entire energies to one thing. The theory of a combination of inventors for the exhibition and sale of their improvements is good, but it is to be doubted whether it would be practicable. The professional and individual jealousies which would be excited by fancied injustice or partiality, would tend to break up the association. The nearest approach to such an enterprise is the system of fairs, so general throughout the country, and even in these there is often much dissatisfaction expressed, not only at the awards of committees, but at the arrangement of the articles for exhibition. There are individuals in this city who sell patents on commission, which appears to be the most feasible method of agencies.

No improvement, be it never so superior, will sell itself, but a judicious system of advertising, with the efforts of a competent salesman directed singly and wholly to its introduction, will insure a market for a really useful article.

Correspondence

Nitro-Glycerin.

MESSRS. EDITORS:—I have been intending for some time to send you a few lines respecting the use and manufacture of nitro-glycerin. The explosions that occurred at San Francisco and Aspinwall should have given full warning to every person not to trifle with this greatest of all explosive substances, but those accidents have not had that desired effect, as has already been demonstrated in the laboratories of several very clever chemists, who have recently attempted experiments in its composition on a small scale.

The public should be cautioned in its use, as none but the very best materials, in exact proportions, and skillfully prepared, will make an article which is not liable to accidental explosion. From my knowledge of Mr. Nobel, the Swedish inventor, and my recent acquaintance with the members of the United States Blasting Oil Company, who are erecting works on a large scale for its manufacture, in New York, I feel safe in saying the public may rely on obtaining from them an article which can be more safely handled and transported than gunpowder. The violation of the patents upon the subject is of small importance, but the endangering of life by an imperfection of its manufacture is serious.

I have had, probably, more experience in the use of nitro-glycerin than any other man living—extending back many years—and I intend to prepare for you some instructions to miners how to use it, to the end that accidents may be prevented. I have never had any misfortune to life or person, and there need not be any by its use for blasting purposes. Proper precautions should be taken, but those precautions are not so many as those required to be observed in the use of gunpowder.

Recently, at the Hoosac Tunnel, I removed within three days and with 28 blasts, 60 $\frac{7}{10}$ feet, lineal, 14 feet wide, and five feet deep, far excelling any blasting ever before executed. Electricity was used to produce simultaneous explosion. The above, however, can be increased by another experiment to at least 80 feet. What other substance can effect such a wonderful achievement? The expense was less than the cost of the powder that would have been required to do the same execution.

Nitro-glycerin can be poured directly into the dril' hole, but I prefer to use a tin cartridge, with wooden stopper, firmly fixed, with fuse orifice. The cartridge should not be full, nor should any vessel in which it is placed. Some little space should always be allowed. In cans, a small quantity of water, one-half pint per gallon, should be kept upon the surface of the nitro-glycerin. When in store, the cans need not be stoppered, but the temperature should not exceed 70 degs., though it is not possible to explode it under 360 degs. The floor of the magazine should be plaster of Paris, or earth, never wood. Never use a vessel that has contained nitro-glycerin for any other purpose, and before using it for that place water in it for a few hours, always cleaning the vessel before using it for that purpose.

Nitro-glycerin is poisonous, and care should be taken not to allow it to touch the flesh, as it produces, with some people, a very severe headache. It should not be taken in the mouth. Forty drops have killed a dog, but a reckless man took much more without injury. It does not affect some people, while others suffer intensely with headache. These are simple precautions, and their observance will prevent accidents.

The manner of using it for blasting purposes, and the arrangements necessary to observe for the disruption of the greatest quantity of rock, I will reserve for another letter.

TAL. P. SHAFFNER.

Place of the Piston when the Crank Is Vertical.

MESSRS. EDITORS:—Your correspondent, A. S., gives, on the above question—on page 168 SCIENTIFIC AMERICAN, current volume—a rule which is evidently entirely wrong. He says:—"The hypothenuse of the right-angled triangle formed by the connect-

ing rod and crank, deducted from the sum of the lengths of the two, gives the distance which the piston has receded from the end of the cylinder opposite the crank shaft." When we test this rule by adopting the length of the connecting rod as 4 and the crank 3, we find this hypothenuse 5, this deducted from their sum, 7, leaves 2, which is only one-third of the length of the stroke, as in reality it moves more than two-thirds of the stroke, exactly 4·36 from the end of the cylinder. The editor's indifferent reply, page 115, is at least correct in stating, "that for a short rod and long crank it will never be midway, but for a long rod very near to it," in fact it will be always nearer to the crank shaft than half way the cylinder, but your correspondent's rule brings it always further than this point, which is evidently absurd.

The best test is always to take an extreme case; let the connecting rod be equal to the crank, say four feet, it is clear that the piston rod will be at the end of the cylinder nearest to the crank shaft when the crank is vertical, and will not move during one-half revolution of the crank; after your correspondent's rule the pistons would be at only about one-third of the length of the cylinder. The true rule is this, call the length of the piston rod, m, and the crank n, then the distance of the piston to the opposite end of the cylinder will be represented by this expression—

$$(m+n)-V(m^2-n^2)$$

this expression indicates also that the problem becomes impossible when the crank is longer than the connecting rod, as then $m-n$ becomes negative, and the square root of a negative quantity is impossible.

If the reader desires this formula transposed in words, nothing is simpler. Take the square root of the difference between the squares of length of piston rod and crank and subtract this difference from the sum of these lengths, the result will give the distance of the piston from the extreme end of the cylinder.

Any person who understands elementary geometry may easily demonstrate this rule by drawing the triangle made of the different positions of crank and connecting rod.

P. H. Vander Weyde, M. D.

Philadelphia, 1866.

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular meeting at its rooms at the Cooper Institute, on Thursday evening, Oct. 12, 1866, Prof. Tillman presiding.

PRELIMINARY TOPICS.

After a brief epitome of the latest European scientific news, furnished by the chairman, Dr. Bradley introduced a combined rheostat and tangent galvanometer, which he termed the Anthistometer, a full description of which is reserved for some future notice. The economical extraction of arsenic from mispickle, an ore extensively found in some sections of the country, was touched upon, but not exhaustively treated.

PETROLEUM.

Prof. P. H. Vander Weyde, formerly of Girard College, presented the important subject of petroleum and its products; and first as a lubricator. The rapid failing of the old sources, and the necessity for some new supply, make this a subject of the greatest importance. The requirements of a good lubricator are somewhat severe: an article is required that will neither freeze nor evaporate so as to leave a gum; the oil must never become rancid, which is the fault of all lubricators composed of fatty acids and glycerin; lastly, it should be neither too thick nor too thin. Petroleum fulfils all of these conditions, and is alike beneficial for the most delicate mechanism and the heaviest machinery. In composition this substance is a mixture of oils having different volatilities capable of being distilled off in succession. The first product is the peculiar odor from the crude oil; a great proportion of this gas escapes at the wells. By condensation of these first gases, the Professor has obtained a liquid, boiling at a temperature as low as 40 degrees, the evaporation of which produces most intense cold, and has received the name of Chimogene. At a low heat, gasoline, an inflammable explosive liquid, is produced. This may be safely used in metallic lamps filled with sawdust moistened with this liquid. By further increase of heat, naphtha, benzine, kerosene and paraffin are successively given off, till coke alone remains. The analysis of this last product, as compared with coal coke, presents a striking difference; while the latter gives evidence of having been formed of land plants, the former shows conclusively the composition of sea plants. By long continued distillation at a low temperature, hair oil, liniment, and a petroleum castor oil have been obtained. The product of benzole, treated with fuming nitric acid, is now sold for a flavoring extract, under the name of bitter almonds.

UTILIZATION OF REFUSE MATTER.

At the wells, large quantities of acid are employed for deodorizing, one carboy of sulphuric acid being used for every thirty barrels of oil. The combined oil and acid is a worthless material, from which fifteen or twenty per cent of oil may be abstracted; the acid being left may now act upon scrap tin, also a refuse material, resulting in the formation of stannate of soda from the tin, and several valuable substances from the iron; resulting finally with green vitriol.

Belladonna an Antidote for Opium.

A correspondent, a professional physician, in a letter to the *Medical and Surgical Reporter*, details the circumstances of a case where the patient had taken three ounces of opium tincture, or laudanum, which had exerted its effects three and a half hours. Fluid extract of belladonna was then administered in doses of twenty drops every ten minutes, which, in twenty minutes, arrested the progress of the opiate, and in about eight hours the patient was so far recovered as to sit up and converse. The writer says he is sure that belladonna saved this man's life.

Swedish Monitors.—Captain Ericsson, himself a Swede, has designed three monitors which have been built at Motala, in his native country. They are of the latest American pattern, and one if not all, mounts two 15-inch guns in a turret plated with twelve 1-inch plates.

NEW PUBLICATIONS.

Copyright and Patent Laws of the United States, from 1790 to 1866, with Notes of Judicial Decisions thereunder, and Forms and Indexes. By Stephen D. Law.

The necessity for some general summary of Statute Laws and Decisions, which should be accepted as authority in Patent and Copyright cases, led the author of the present volume, a few years since, to the preparation of the American Digest, a book that has admirably satisfied the demand, and has since been recognized as a standard. The volume to which we now refer is not designed to supplant the larger one, but is to be regarded more as a compendium, having the leading points of the latter presented in a convenient form, and referring to it for unimportant explanatory decisions.

For the purpose of comparison and convenience of reference, and for the more perfect understanding of those now in force, the laws which have become obsolete are inserted in full. The incorporation of annotations and notes referring to Judicial Decisions serves to explain the Statutes, and make the work invaluable for Patentees and Inventors. Bound in flexible covers and half-law binding. Published by Messrs. Baker, Voorhis & Co., No. 66 Nassau street.

Report of the Commissioner of Patents for 1865.—We have received from E. R. Jewett & Co., Buffalo, N. Y., advance sheets of the illustrations for the Patent Commissioner's Report for 1865. Messrs. Jewett & Co. have made a valuable improvement in this edition, by adding to each cut the name of the patentee, and the title of the patent, as well as the number. Heretofore the number only was used, and to ascertain the subject of the engraving and the name of the patentee, it was necessary to refer to the volume of descriptions. The engravings, themselves, also appear to be superior to those of former years. We are pleased to learn that the work will be prosecuted vigorously until completed.

Social Science Review.—This valuable Quarterly comes to us in an enlarged form, and containing a number of admirably written articles. A review and criticism of William B. Scott's Essay on Taxation and Reconstruction is an unanswerable defense of the rights of governments to levy taxes on those they defend. A notice of Herbert Spencer, with a portrait, is a just tribute to one of England's most earnest and honest men. The Review is published at 84 Nassau-st., New York, at four dollars per year in advance.

SPECIAL NOTICES.

Robert W. Andrews, of Staffordville, Conn., having petitioned for the extension of a patent granted to him the 18th day of January, 1853, for an improvement in operating the treadles of looms, it is ordered that the said petition be heard on Monday the 31st day of December next.

Notes and Queries

H. C. K., of Mass.—The conducting power of copper, as compared with other metals, shows that it is superior to brass, iron or zinc; the proportions being, copper, 89·82; brass, 44, iron, 37·41; zinc, 36·37. Zinc, therefore, will form a more effective sheathing to your boiler than any other of the above metals.

O. B., of N. Y.—If you use onion juice for ink, the writing will be invisible, but will plainly appear on subjecting it to heat. Dilute sulphuric acid and many other substances have the same property. We do not know any sympathetic ink which turns red on heating.

M., of Pa.—We are aware that wine is in high favor with some as a medicinal agent, but we doubt if it is ever prescribed by an intelligent physician. It is not a depilatory.

D. L., of Ohio.—We know of no specific to prevent the foaming of boilers. The best remedy is to pump often and fire evenly. Your boiler is probably new, and this treatment will cure it in time.

S. S. H., of Mass.—The only advantage we believe double cylinder engines to have over the single cylinder engines, is a greater ease and uniformity of working. We consider the working of steam expansively a system of doubtful economy; at least its benefits have not been satisfactorily demonstrated.

P. P. C., of Pa.—As the overshot wheel is propelled solely by the gravity of the water, it is apparent that the less of the power is expended in friction the more there will be available for other purposes. The lighter wheel is, therefore, the most efficient.

L. G., of Colorado.—The pressure of the atmosphere and the weight of all bodies is greater at the sea level than at an elevation of 8,500 feet. The water wheel at the first mentioned locality will be more effective than at the altitude of Central City, Colorado.

J. A. D., of N. H.—Your suggestion in regard to the employment of compressed air for city railroads is not new. This system has been long thought of, and frequently discussed among other propositions.

J. P., of Ohio.—We are not acquainted with the appearance or qualities of the "sea grass" to which you allude, and cannot say whether it is an indigo-producing plant or not. An experiment of macerating and fermenting the leaves in water, would easily determine the question.

J. H. W., of N. J.—Brass work, after stamping or casting, should be cleaned in a pickle of sulphuric, or nitric acid and water, to remove all surface impurities, washed in water and dried, preparatory to receiving a lacquer. Then for a gold color take seedlac, three ounces, turmeric, one ounce, digested in alcohol, one pint, for a few days, frequently shaking the mixture. Then decant and filter. If not dark enough add anotta or dragon's blood.

A. I. D., of Pa.—There is no metallic substance which will entirely intercept the electro-magnetic current. Lead is the lowest conductor you can use. Glass is so low in its conducting power as to be considered a non-conductor.

J. McG., of Ky.—There is no method known to us by which a cracked circular saw can be made whole. It depends, however, where the crack appears. If near the center a dovetail of steel might put it into shape for further service.

M. K. W., of N. J.—The paints used by toy makers are the ordinary pigments, spirits of turpentine or benzine being employed as a vehicle instead of oil. A coat of thin varnish gives brilliancy and protects the paint.

C. W. J., of Ill.—Light and heat have always been regarded as imponderable forces by the advocates of both theories—that of vibration and that of emanation. Newton, who held that light is an emanation of matter flying outward in all directions from luminous bodies, supposed that this matter differed from other matter in not being subject to the force of gravity; while those who hold that light is the vibration of an ethereal fluid, as sound is a vibration in air, regard this fluid as being free from the attraction of gravity. The passage of light in perfectly straight lines near by the edges of the moon and the stars, without being bent in the least from its course, is absolute proof that it is imponderable.

W. I. J., of Mass.—We are not aware that wood is "saturated" previous to being japanned. On the contrary, it should be perfectly dried in a kiln, or oven, before it is varnished. A white size or priming is made of parchment size two parts, isinglass one part, laid on thin and smooth, two or three coats. Seedlac and resin, equal quantities by weight, dissolved in alcohol, and strained, make a good coating or priming. Shellac dissolved in alcohol, is the best vehicle for all colors except white.

J. B., of N. Y.—You say your mill is on the north side of a ridge with a generally prevailing southwest wind. We judge from this statement that the ridge is interposed between the wind and your mill. If so, to insure a draft, your chimney should rise above the ridge. The data you furnish are, however, not definite enough for us to give a positive opinion. The distance of your mill from the ridge would affect the result. An ordinary fire-box will burn sawdust if the draft is good. Perforated plates should be used instead of grate bars 2. A fly wheel four feet diameter running 200 turns per minute would give but 400 turns to the two foot wheel; hardly sufficient, we think, to drive a small saw efficiently. If run by friction the small wheel should have a perfectly smooth face and the driver, or large wheel be covered with leather. Better use a belt; you will get more power.

NEW INVENTIONS.

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

PAPER HOLDER.—D. M. SMITH, Springfield, Vt.—This invention consists in providing a device by which sheets of paper may be held and hung upon a wall or other convenient places.

GONG BELL.—ISAAC A. BEVIN, Chatham, Conn.—The object of this inv. ntion is to construct a gong bell of that class in which the clapper strikes twice by one pull of the handle, so that a powerful spring may be employed and a heavy blow may be struck upon the bell, while the pull will be comparatively easy and very effective.

METALLIC BUSHING AND FASTENING FOR BUCKLES.—H. H. MANSFIELD, South Canton, Mass.—The object of this invention is to provide a simple and cheap article by which woven or leather straps may be securely attached to the loop part of a buckle, so that the end of the said strap will be well protected and prevented from raveling, and the most exposed parts of the strap will be prevented from wearing out too fast.

PEN HOLDER.—EDWIN DWIGHT BABBIT, New York City.—This invention relates to a combination of a spring with the barrel of the pen holder in such a manner that the said spring depresses the rear end of the pen and also acts as an elastic bolster for the pen, and also permitting an easy introduction and security of pens of different sizes in the same pen holder.

CREAM CRACKERS.—DANIEL M. HOLMES, Brooklyn, N. Y.—This invention relates to an improved cracker of a very light and friable kind, somewhat similar to those now manufactured by bakers under the name of egg crackers.

GANG PLOW.—S. F. DAVENPORT, Jerseyville, Ill.—This invention relates to a gang plow of extremely simple construction, and which will admit of the driver having full control over the plows.

MACHINE FOR HARVESTING GRAIN.—CHARLES DENTON, Pekin, Ill.—This invention relates to a machine for harvesting grain, whereby the labor of binding and shocking the same is avoided, and is of that class in which the team is placed behind so as to propel or shove the machine along in front of them.

DEVICE FOR RAKING AND LOADING HAY.—H. S. PALMER, Norwell, Mich.—Patented Sept. 25, 1866.—This invention consists in so combining an elevator to a hay rake that hay may be raked and at the same time elevated and deposited upon the load, and in providing or constructing a portion of the elevator in sections in such a manner that they will recede from each other while upon the ground, and approach each other while being elevated, so that a much wider space is raked over than the load or wagon is wide; thus, while the hay is being elevated it is brought transversely to the load and deposited thereon.

COMBINED ROLLER AND HARROW.—JAMES DAVIS, Laomi, Ill.—This invention combines the harrow and roller into one machine, and mounts both on wheels, and is so arranged that the driver may ride, so that the hardest work of the farm is made the easiest both for the attendant and team.

PORTABLE BORING MACHINE.—ROBT. ALLISON, Port Carbon Pa.—This portable machine is for boring or reaming shaft holes in large cast-iron cog and fly wheels, pulleys, spiders, etc., and is especially adapted to the use of machine shops in the interior of the country not provided with lathes of sufficient capacity for this kind of work. It obviates the slow and expensive hand labor of cutting key seats, fitting keys, and staking the shaft true.

DUMPING CARRIAGE FOR COAL, ETC.—M. G. SMITH and W. P. STEVENS, Kingston, Pa.—This invention relates to carraiges for coal and other mines, and other purposes, where loads are to be raised or lowered and discharged.

GANG AND SUB-SOIL PLOW.—ROBT. L. DODGE and E. M. WALKER, Gallatin, Mo.—This invention consists in constructing a gang of plows and arranging them in beams, and attaching them to a frame in such a manner that they may be either used for surface plows or for sub-soiling.

WEEDING AND HILLING PLANTS.—THOMAS BEALE, New Milford Ill.—This implement is for weeding and hilling plants, and is designed to supersede the hoe and other hand implements hitherto used for such purposes, by rendering the labor lighter, a person being enabled to use this implement without stooping.

MANUFACTURE OF POWDER.—FRANK S. ALLEN, New York City.—This invention relates to an improvement in the manufacture of that class of blasting and gun powder which is composed of an explosive compound mixed with any vegetable or other substance such as paper, saw dust, etc.

EVAPORATOR.—J. COOPER, Mount Vernon, Ohio.—This invention relates to a pan for evaporating saccharine and other liquids, which is provided with a sheet-metal bottom and partitions of gradually-increasing hight which are produced either by doubling the bottom up, or, if desired, the bottom can be in several sections, the ends of which are turned up and bent one over the other and over suitable wires used for streng thening the top edges of the partitions.

AXLE-BOX COVER.—F. K. HAIN, Renova, Pa.—This invention relates to an axle-box cover which is provided with two gudgeons intended to work in suitable eyes on the box. One of these eyes is open on top so that the cover when turned clear up can be removed, and in the other uncut eye a spring is placed which presses against the end of the gudgeons and forces the cover up against the inner shoulder of the cut or open eye. This shoulder is provided with a notch into which the cover catches so that it is prevented from opening spontaneously, and the inner edges or shoulders of both eyes form inclined planes which, in combination with the spring aforesaid, render the cover self closing.

BEEHIVE.—SAMUEL TAYLOR, Burlington, Me.—This invention consists in constructing the beehive in sections so arranged and connected together that any one of the sections may be removed at pleasure, and the sections arranged or disposed as may be required, in order to take all the surplus honey from the hive the colony of bees can spare without killing or injuring the bees in the least; the invention also admitting of old combs being removed whenever necessary.

REAPER.—HORATIO WHITING, New York City.—This invention relates to a discharging device to be applied to reapers for the purpose of laying the cut grain in a continuous swath so that it may be readily bound into sheaves, and a rake dispensed with entirely.

SELF-EXPANDING AUGER FOR BORING ARTESIAN WELLS.—J. T. PARKER, Farmington, Me.—This invention relates to that class of auger in which the tubing of the well is made to follow immediately in the rear of the auger, and owing to its expanding and contracting construction, the auger may be removed at pleasure through the bore of the tubing; it consists in a pod auger divided into two parts and hinged together in such a manner that when boring the auger is expanded by the resistance of the material which is being bored or acted upon.

RUNNING GEAR OF RAILROAD CARS.—B. HEIDERICK, Brady's Bend, Pa.—This invention consists in a novel manner of arranging the bearings of the axles, whereby due provision is made against accidents caused by the breaking of the axles. It also consists in a means for supporting the trucks whereby they will be retained in running position if a wheel should break. And further, it consists in a mode of connecting the two trucks together, whereby the same will be made to adjust or turn themselves in a radial position in turning curves on the road and the trucks prevented from running off the rails if a flange of a wheel should break, one truck serving as a guide for the other.

SAND PUMP.—JAMES BENSON, Bellair, Ohio.—The object of this invention is to construct a pump for removing sand, mud, and reduced rock from an oil or other deep well.

WINNOWER.—FRANCIS FRYE, Time, Ill.—This invention consists in so combining an eccentric to an upright lever which is connected to a screen or fan for cleaning grain as to produce a regular longitudinal reciprocating motion to the screen of a winnower.

DOUBLE SHOVEL PLOW.—JOHN CLARRIDGE, Pancoastburgh, Ohio.—This invention is designed to furnish an improved double shovel plow so constructed and arranged that by occasionally changing one of the shovels, the same plow may be used for cultivating the corn through the whole season.

COMBINED SINGLE ROW CORN DRILL AND PLANTER.—JOHN CLARRIDGE, Pancoastburgh, Ohio.—This invention is designed to furnish an improved machine which may be used for planting corn in drills or hills as may be desired.

SELF-UNLOADING WAGON.—HARVEY BARTON, Black Earth, Wis.—This wagon is intended for farmers' use for hauling dirt, for venders of different kinds of articles such as vegetables, etc., and for all uses where it is desirable to keep different articles separate from each other, as well as to produce a quick means for unloading the wagon.

TOP FOR FRUIT JARS.—J. F. WINCHELL, Springfield, Ohio.—This invention consists in the construction of a cap or cover for fruit jars, etc., with a convex upper face; and in the employment and arrangement of a cam lever and pressure lever upon a clamping or cross piece, in such manner that the cap can be pressed tightly upon the jar, and quickly released from pressure when desired, none of the parts being in any wise damaged by repeated use, but on the contrary, remaining in a proper position for continued use.

MINERS' FUSE LOCK.—GEBHARD HAGENMEYER, Big River, Cal.—The object of this invention is to provide an apparatus by means of which miners and others can light a fuse with safety to themselves and with certainty.

BUCKLE AND RING.—R. C. DUNHAM, New Britain, Conn.—This invention consists of a buckle or ring composed of a metal core covered with or protected by vulcanized india-rubber or other vulcanizable gum in such manner that a strong, cheap and durable buckle or ring is obtained which is not liable to wear out the leather straps, and which lasts much longer than an ordinary leather covered buckle or ring.

BRAIDING CIRCULAR WARP FRAME.—J. DALTON, Williamsburgh, N. Y.—This invention relates to a machine which produces a combined warp and knit stitch applicable particularly for covering skirt wires, cords or other materials, or for the manufacture of lamp wick, lacings, etc. The stitch is produced by a series of needles which are placed in a zig-zag position and which are operated easily by an independent lever in a circular frame, in such a manner that a perfect web can be produced of three or more strands or threads of the same or of different materials, each strand or thread being received by its own and unchangeable line of needles at every revolution.

MACHINE FOR MANUFACTURING MOLDINGS.—THOMAS J. CLOSE, Philadelphia, Pa.—This invention is designed to furnish an improved machine, by means of which composition moldings of any desired length and of any desired pattern, may be easily, quickly, and accurately manufactured.

PROCESS FOR PREPARING AND TANNING HIDES AND SKINS.—GEO. M. HERSEY, Greenbush, Wis.—This invention relates to a new and improved process for preparing and tanning hides or skins, with or without the hair, whereby a soft and pliable leather is produced in a comparatively short time and with little labor.

WINDLASS.—WM. GOODMAN, St. John, N. B.—The shaft in this ship's windlass is like those in common use, having two ratchet wheels and a center cylinder with ratchet teeth for detents. The ratchet wheels are operated on by a pair of jaws with suitable pawls attached to them, the jaws being placed at the end of wrought iron levers, each of which has on its inner end a roller fixed on a cast iron shoe, such rollers working on the surface of a horizontal cam, which is connected to the spindle of the capstan by means of a coupling collar and keys.

BEEHIVE.—ALVA E. ELLIS, Friendsville, Ill.—This invention has for its object the constructing of a beehive in such a manner that perfect ventilation will be obtained, superior facilities afforded for hiving the bees, and also for removing surplus honey from the hive.

BEEHIVE.—HENRY A. TOZIER, Littleton, Maine.—This invention relates to an improvement in the construction of beehives, whereby several advantages are obtained over the ordinary hives, such as a more thorough protection against the bee moth, proper ventilation, security against cold, etc., etc.

CORN CULTIVATOR.—L. O. STEVENS, Pekin, Ill.—This invention relates to a new and improved cultivator, designed for cultivating corn and other crops grown in hills or drills, and it consists in a novel construction and arrangement of parts, whereby the operator or driver has complete control over the implement, and operates the plows with the greatest facility in the prosecution of his work.

CORN PLANTER.—E. R. HOLFORD, Westford, Wis.—This invention consists principally in constructing, in a peculiar and novel manner, a slotted slide or valve to regulate the flow of seed from a corn planter, in combination with a lever and cam or ratchet wheel.

LATHE CHUCK.—D. E. WHITON, West Stafford, Conn.—This invention consists principally in a novel manner of holding and securing the pinion within the body or case of the chuck.

Inventions Patented in England by Americans.

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

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,514.—CONSTRUCTION OF REFLECTOR.—William M. Marshall, Philadelphia. June 2, 1866.

2,002.—SMOKE-CONSUMING HEATER.—George W. Fair, Dayton, Ohio. August 2, 1866.

2,041.—DOUBLE HYDROSTATIC SCALES FOR DETERMINING THE LOAD OF SHIPS OR BOATS.—Wilhelm O. Reim, Springfield, Ohio. August 8, 1866.

2,172.—MODE OF PREVENTING EGGS FROM SPOILING.—Jesse K Marsh, Terre Haute, Ind. August 23, 1866.

2,181.—IMPROVEMENT IN ORGANS, PIANOFORTES, AND MELODEONS, ALSO APPLICABLE TO OTHER MUSICAL INSTRUMENTS HAVING KEYBOARDS.—George B. Kirkham, New York City. August 24, 1866.

2,190.—COMBING OF WOOL AND OTHER FIBER.—Cullen Whipple, Cranston, R. I., and Elisha Johnson, Wethersfield, Conn. August 25, 1866.

2,198.—CHURN.—Sylvester F. Schoonmaker, New York City. August 25, 1866.

2,199.—STEAM ENGINE.—John F. Allen, New York City, and Charles T. Porter, Old Trafford, county of Lancaster, England. August 25, 1866.

2,215.—MODE OF PREVENTING OXIDATION OF LEAD BALLS IN FIXED AMMUNITION.—Barton H. Jenks, Bridesburgh, Pa. August 28, 1866.

2,229.—LOOM.—Thomas Robjohn, New York City. August 29, 1866.

2,231.—BREECH-LOADING FIRE-ARM.—Barton H. Jenks, Bridesburgh, Pa. August 29, 1866.

2,233.—LIFTING JACK.—Augustus B. Childs, Rochester, N. Y. August 30, 1866.

2,325.—NEW AND USEFUL MACHINE FOR SCOURING, SLEEKING, OR SETTING HIDES OR LEATHER.—Edward Fitzhenry, Oregon. September 10, 1866.

THE MARKETS.

There is no marked change in business matters since our last. The premium on gold continues nearly the same, with a present temporary inflation, and the prices of almost all commodities are steadily maintained. Money is plenty, and paper is sought for at five and even four per cent. Buyers purchase for immediate consumption, the general expectation of a change in values inclining to caution. For this, among other reasons, there is little disposition toward speculation. It is a gratifying fact that up to Sept. 30th, our public debt has been reduced $183,916,334, while we have in the treasury $86,259,909 in coin. There has been somewhat of a decline in flour and wheat, but most other articles of prime necessity maintain their former prices.

ASHES—Pots are in demand, but the supply is limited. Prices, $9 75@10 00 ₱ bbl. Pearls are scarce.

BRICKS—Common Hard, $12@$13. Croton and Philadelphia are $16@$17 for the former, and $30 for the latter.

COAL—Foreign scarce and in demand. Lehigh, at Elizabethport, $7 50. Cumberland, at Georgetown, D. C., $5 50. Freight on Cumberland $2 25. Stove retails at $7 50@$8 50.

COFFEE—Demand for Rio. Laguayra, 28½@19c., gold; 26c., currency. Costa Rica, 20c. Java, 25½c.

COPPER—Detroit, 31@31½c.; Portage Lake, 31½c.

COTTON—There has been a continued active speculative and spinning demand, and prices have further advanced 2c. ₱ ℔, and in some instances still higher prices have been paid. Ordinary, 32½c.; Middling, 38½@40½c.; Good Middling, 41@41c.

FLOUR—Prices have declined 25@50c. Common brands rule from $9 80@$11 75; Ohio fancy brands $11 80@11 85; Genesee, extra, $12 25@$14 50.

GRAIN—Wheat declined 5@10c. Milwaukee, $2 25@$2 31 Amber, $2@$2 88. Rye—$1 05@$1 08 for No. 1 Western; $1 25 for Canada. Barley, $1 35. Oats—50@55c. for Chicago; 55@58c. for Milwaukee; 57c. for Ohio. Corn—89c. for inferior Western mixed; 90@91c. for shipping, 96c. for choice White.

IRON—Scotch Pig, scarce. Prices have advanced. Glengarnock, $52@$53. American $48. Bar refined, $105@107 50

LATHS—Are firm, with sales of Eastern at $4, three months.

LEAD—Market dull. Pig 10¼ currency. Bar, 11; and Sheet and Pipe, 11¼c.

LEATHER—The market for Hemlock Sole is very firm, with a fair demand. We quote Rio Grande and Buenos Ayres Light Weights, 32½@33c.; Middle do., 34½@36; Heavy do., 37@38; California Light, 32@32½; Middle do., 34@35; Heavy do., 36@37; Orinoco, etc., Light, 30@31½; Middle do., 32@33; Heavy do., 31½@33; Slaughter Upper in Rough, 33@36.

LIME—The market for Rockland is steady at $1 70 for common, and $2 10 for Lump, cash. Rosendale Cement, $1 75, cash.

LUMBER—The market for Eastern Spruce and Pine is moderately active, with sales at $21@a$24, usual terms.

MOLASSES—Centrifugal and Clayed Cuba, part mixed, 45@47; Cuba Muscovado, 48@51½c. Barbadoes, at 58. Porto Rico, 50@75c.

NAILS—Cut may be quoted 7@7¼c., the lower rates for lots of 500 kegs and over—8d., 10d., 5d., and 3d. Fine are very scarce—Clinch, 8½ (8d are very scarce); forged horse, 32; pressed do., 22@24: copper, 50; yellow metal, 32; zinc, 20; and wrought ship and boat spikes, 7@8, cash.

SUGAR—Refining Cuba, 10¾@11¾. Refined, 16½@16½ for hard; 15¼@15½, soft white; 14¼@14¾, yellow. Crushed and granulated 16c.

WOOL—The demand for low and medium fleece has been moderately active, but at the low prices previously current, and the market is rather weak for all kinds, except those suitable for combing, which are scarce and wanted at slightly improved quotations.

ZINC—9½c. less 4 per cent. for gold; 13½c., currency, for Lehigh.

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.

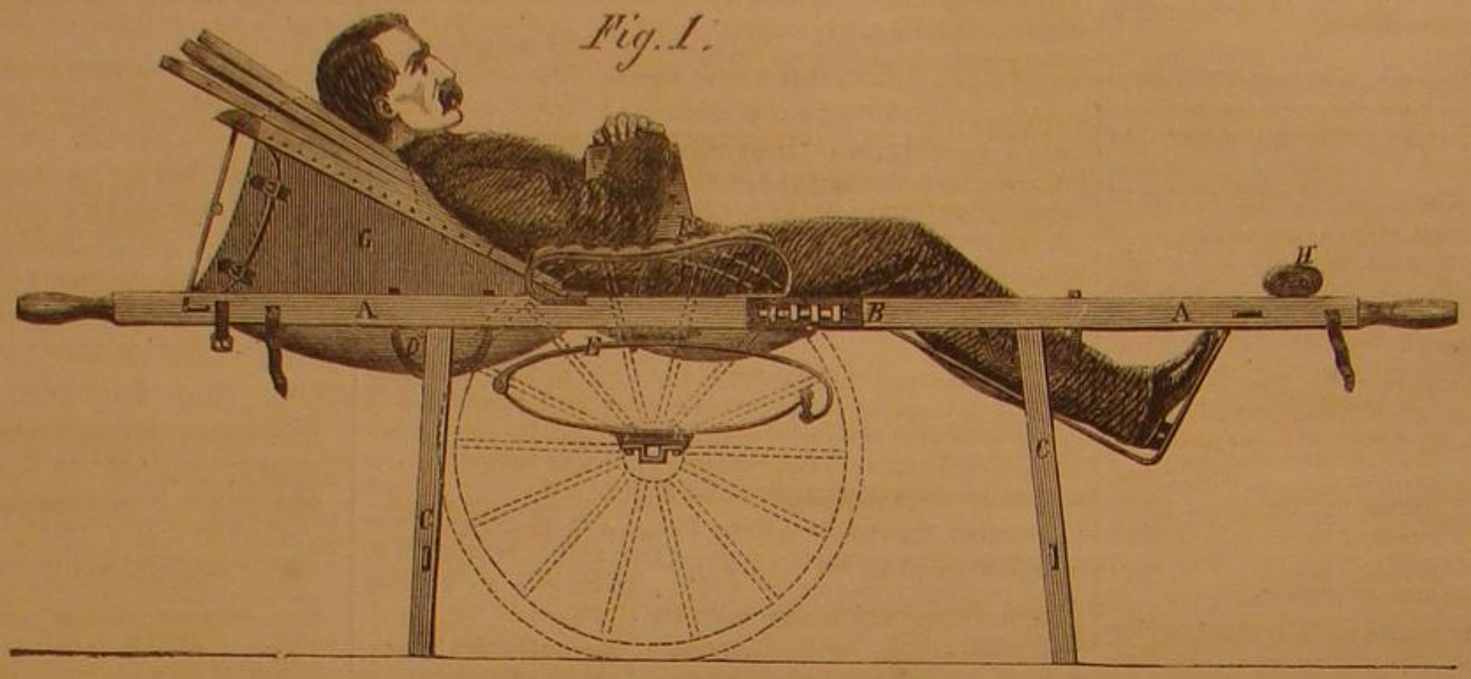
Improved Wheeled Litter and Ambulance.

The war created a demand for appliances to be used for the sick and wounded, appliances of which our service was, at the opening of the struggle, lamentably deficient. The invention illustrated in the engravings appears to be the best and most comprehensive device which has yet come under our observation. Nothing has been omitted that could be employed to diminish the torture of a wounded soldier or sick person. Surgeon General Barnes says that this litter should be used not only in the army, but should be adopted in all large towns and cities for conveying the injured and sick to their homes or the hospital. As will be seen, by examining Fig. 2, it can be put into a compact form for transportation when not in use.

Two longitudinal bars, with transverse connections, form the frame of the litter. These lengthwise bars have handles at each end to give facility for using the device as an ordinary stretcher. An axle can be added with wheels supporting springs, when the distance from the place of injury to the hospital is too great to be performed in the usual manner. The litter then becomes an ambulance.

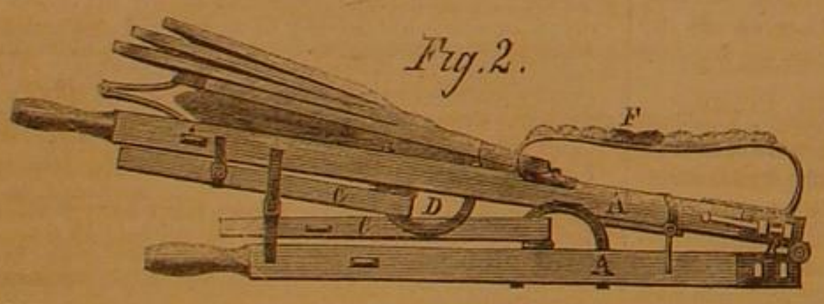
The longitudinal bars, A, are hinged at B, at which point is a sliding bolt, which rigidly secures the two pieces in one. The legs, C, are also hinged to the bars, A, and secured in a vertical position by the semicircular braces, D. At E is a sacking to support the person, which is attached at one end to a sliding bar, by which it can be fixed in a level or concave form, as the patient may require. The arm rests, F, are flexible and adjustable, and can be made to meet over the person at any convenient angle, for resting a wounded arm or arms. The head is supported on a flexible sacking, which also can be adjusted and secured as required, the space, G, under the head forming a receptacle for articles necessary for the patient. At the foot is a cloth, H, rolled, which can be used to cover the person. The top of G is an expansion top similar to that of a chaise or buggy.

Fig. 1.



GENERAL TOMPKINS'S WHEELED LITTER AND AMBULANCE.

Fig. 2.



The axle is made in two pieces, jointed at the center, and, when straightened, held by a sliding sleeve covering the joint. The wheels are held on the axle by screw collars which screw into the inner end of the hub, so that there are no nuts to be lost. The springs are attached to the bars by means of blocks having dovetailed or T grooves, which receive corresponding tenons on the spring blocks. The whole apparatus can be made ready for the reception of a patient in a few seconds, and can be as quickly folded for transportation.

Patented Aug. 7, 1866, by Brevet Brigadier General Charles H. Tompkins, U. S. A., Washington, D. C., who will furnish all additional information.

The Rose.

The trade in roses, as is well known, is of considerable importance in France. Rose trees are cultivated in different parts of the country in open fields, just as turnips or cabbages. Thus, there are 500,000 rose trees near Orleans, 200,000 near Metz, 1,000,000 near Angers, 1,500,000 near Lyons, 2,000,000 near Paris, and 2,000,000 in the thirteen communes of Bri-Comte-Robert. The varieties called Rose-The, the Bourbon, and Mousseuse flourish particularly in the environs of Paris and Orleans. These flowers are raised for distillation into extracts, used in perfumery as rose water and as a constituent of Eau de Cologne. The ottar of rose is manufactured mainly in the East and is exceedingly valuable. The city of Damascus is almost environed with rose gardens.

VULNERABILITY OF IRON-CLADS---THE SHOEBURYNESS EXPERIMENTS.

A trial has lately been made at Shoeburyness, England, with a nine-inch muzzle-loading Woolwich gun, firing a 250-lb. Palliser chilled shot, which is said by the London *Times* to demonstrate that no iron-clad can now be considered invulnerable. The facts, as nearly as can be ascertained, are, that a target built of eighteen inches of teak, faced with plates of solid rolled iron, eight inches thick, and backed by a plate of iron three-quarters of an inch thick, was pierced through and through by a nine-inch Palliser shot, or shell, weighing 250 pounds, propelled by a charge of 43 pounds of powder. From this bare fact the *Times* draws the inference that the supremacy of iron-clads and monitors no longer exists, and that as this was an English gun and an English shot, the lost sovereignty of the seas is restored to Britain.

But there are some considerations which do not seem to have entered into these sanguine calculations. We are informed that the target was exactly at right angles to the line of fire, and we are not informed as to the distance of the gun from the target; two very important points in the decision of the question of iron-clads against guns. It is not often that the side of a ship is presented to the guns of an enemy so that the shot shall strike fair. Our iron-clads "tumble home," offering a diagonal target, and the turrets of our monitors present always a segment of a circle for a mark. It may be doubted, also, whether this Shoeburyness target presented a resistance equal to that of our monitor turrets. They are made of twelve inches of iron and may be increased to twenty-four. It certainly makes some difference whether a shot strikes against a vertical wall or against one inclined at an angle or curved on a circle. Distance from the object is also another point of difference.

But the shot, from any point of view, was a remarkable one. The gun was smaller than those used in our Fortress Monroe experiments, and the charge of powder less. The effects of those trials were of such a nature as to demonstrate the worthlessness of granite walls as a defense against great guns, and those at Shoeburyness seem to indicate great progress in deciding the vulnerability of iron ships.

THE ship-rigged boat *Red, White and Blue*, now creating some excitement in England, is the identical metallic life boat which received the gold medal at the fair of the American Institute in this city last fall.

THE Mobile papers announce valuable coal discoveries within convenience distans of that city.

CLEANLINESS OF TOOLS.

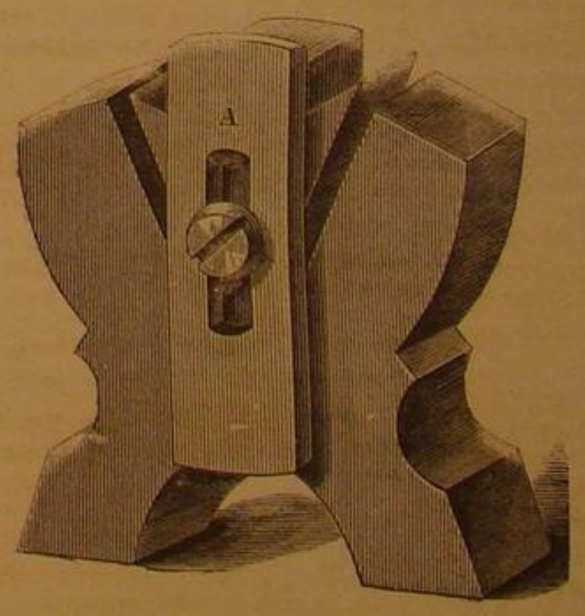
Dirt is a great disorganizer. Cleanly use will not half so rapidly wear a tool as uncleanly abuse. "Gurry" in the machine shop was at one time esteemed a saving ointment, and the workman who could most beplaster his clothes with oil and dirt, whose bench and lathe bore the marks of frequent contact with greasy filth, was considered a valuable hand; too busy to attend to the unimportant matter of cleanliness, and too much engaged with his work to look to the condition of his tools.

It is pleasant to note a change. It is encouraging to see that our master mechanics are unwilling longer to pay a premium on slovenliness. They care but little, perhaps, about the personal appearance of a workman—although he is not so pleasant when he appears as though just fished out of a barrel of petroleum—but it is not comfortable to find a tool, after being used, so coated with dirt that it has to be cleaned before being gaged.

Whenever tools are left coated with grease they gather particles of iron and steel, which, when they are put to use, act as so many particles of emery—grinding and wearing away the cutting edges. Latterly, in well-managed shops, there has been established a department for the care of small tools, and when the workman has done with them he must return them in a clean state, or he is charged with the time employed in cleaning them. The practice is a good one and should be generally adopted.

RUSS'S PATENT KNIFE AND SCISSORS SHARPENER.

The above little implement, which is engraved full size, needs but little explanation to exhibit its advantages. Dull knives and gnawing scissors are an abomination, as every householder and housewife can testify. With this sharpener these commonly used utensils can always be kept in order.



It is a block of hard wood with slots inclined to the central blade, A, the lower ones adapted to the edge of a knife and the upper ones adapted to the bevel of scissors blades. The blade, A, is a piece of very hard steel, the edges beveled to present a cutting surface. The knife or scissors is placed in the slot, and drawn toward the operator, being held, the while, firmly against the cutter. A slot and screw admits of the re-adjustment of the cutter when worn at one point, and it can be readily removed for grinding.

Patented through the Scientific American Patent Agency July 24, 1866, by James J. Russ. For rights and other particulars address Russ & Eddy, Worcester, Mass.

MR. BURNS, a telegraph operator in Worcester, Mass., recently sent 250 words, containing 1,166 letters, in six minutes and seven seconds.

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NEW YORK, SATURDAY, OCT. 20, 1866.

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THE COMBUSTION OF COAL---ECONOMY IN FUEL.

It is unpleasant to see the waste so generally practiced in regard to that high priced necessity, fuel. Our people for generations have used wood as a fuel. Coal, although extensively used, is comparatively a new substance, and hundreds of families who burn it, know but little practically, and understand less chemically, of its properties. It is simply a condensed carbon—condensed as compared with wood—capable of generating an intense heat when properly managed, and liable to disappoint the housewife when not properly managed. It requires a large amount of oxygen to produce perfect combustion, and as we have no ready means of producing this gas in our dwellings, apart from its natural admixture with the other gases which make up the volume of the atmosphere, we must use that atmosphere as a means of combustion.

But some, in the management of their fires, seem to suppose that an addition of fuel will insure an increased combustion, and develop an additional degree of heat. No idea can be more mistaken. Coal, and especially anthracite coal, should be always furnished with a sufficient amount of oxygen to keep the fire bright. It is only smothering and retarding the fire to put in a thick layer of coal, or, as some do, fill the fire box, from a layer of two inches of ignited coal, to its utmost capacity, with fresh fuel. The consequence is, that for a time the fire is choked; until the heat of the lighted or igneous mass has received sufficient vitality from the admission of air to impart a portion of its heat to the new coal.

Evidently, then, it is important in the management of coal fires that oxygen, sufficient to produce combustion, should combine with the carbon; but, as we cannot, except in a limited way, regulate the admission of oxygen, the element of combustion, or, at least, we cannot increase or diminish the amount contained in a certain volume of atmospheric air, it is requisite that we should do the next best thing; gage the amount of fuel subjected to the action of the atmosphere. No more coal should be put upon a fire at one time than will readily ignite and give off a pure white blaze—not a blue flame, which denotes the presence of unconsumed gases—and that the fire should be undisturbed on the top.

This is an important element in the management of coal fires. "Jack Downing" once said, in his celebrated letters, that a coal fire was like a politician, "poke him on the top, his popularity, and he went down. Punch him at the bottom, his character, and he went up." The trouble with some of our politicians now is, that they have so little bottom or character, that if poked they go out, like an insufficiently attended coal fire.

In clearing the grate in the morning there is a quantity of unburned coal, which has been externally subjected to combustion. It is covered with ash, and looks to the inexperienced eye like cinder. It is often relentlessly dumped into the ash box. The fact, in many cases, is, that the lump is only roasted on the outside, not even coked, and is in a better condition for igniting than the green coal. We have stated that coal is a *condensed* form of carbon. The superficially burned lumps found in our grates or among our ashes, sufficiently prove this. But take a lump of anthracite coal from the fire, red hot and all alive. Throw it into water until the ashes are washed from it, and it is black externally, and cool. Take it out and break it open with a hammer and you will find it red hot and glowing inside. This shows that time and a plentiful supply of air are necessary to burn coal, and that large amounts of what we call ashes and cinders are really excellent fuel.

To prove this fact, let any one carefully sift his ashes, throwing out the inevitable slate, which can be readily detected, and start his coal fire on wood or charcoal, kindling his coal fire with the savings. He will find that he can get a good bed of incandescent coal sooner than with green coal on the kindlings. We have experimented with coal for twenty years, both in the house and under boiler, and we know whereof we speak. We shall allude to this subject again, taking up the burning of bituminous coals and the different plans of stoves and furnaces.

MACHINERY VERSUS MANIPULATION.

Our mechanics are continually directing their endeavors to the object of making machinery do the work formerly accomplished by patient labor and skillful manipulation. Their success seems to be but an incentive to renewed effort in the same direction; for no sooner has one succeeded in making the automatic machine do a part of the work of the skilled mechanic, than he, or another, sets about an improvement, usually with success. The file, once a tool in constant requisition for almost every department of metal working, has been superseded by the planer, the shaping machine, and the milling tool. Indeed our founderymen and forgers have become so expert, that they turn out their work so that, in many instances, they leave very little, if any thing for the file to do. So with the cold chisel. Not half the work is done now with the chisel and hammer that was done in former years.

Machines are now in use, in all concerns of any magnitude, which were unthought of twenty years ago. Instead of a corps of old, experienced workmen, whose apprenticeship was a severe drudgery of many years, men are employed whose skill is confined mainly to the running of a machine—placing and adjusting the work and removing it when finished—while the machine itself performs the labor with remarkable rapidity and mathematical accuracy.

On a trip to Hartford, Conn., a few days ago, we were struck with the truth of the above considerations by a visit to the establishment of Messrs. Pratt, Whitney, & Co., who are widely and favorably known as the makers of superior machinist and gun tools. In their establishment—the main building of which is two hundred and fifty feet long, by fifty feet wide, and four stories high—are hundreds of almost self-operating machines, adapted to almost every detail of work, from the forging and casting to the final finishing. A modern machine shop seems like a miracle to one who remembers the experiences of twenty or twenty-five years ago. There is but little of the noise of hammering and the grating of files to be heard. Machinery, almost noiseless, untiringly shapes the thousand different forms, which, when "assembled," make the harmonious and complete whole.

Most of the forging is done by "drops" with dies which, at a blow, form the article desired. At this establishment we noticed a beautiful illustration of the value of this mode of forging. Messrs. P. W. & Co., are contractors for building the Weed Sewing Machine, which uses a shuttle. As our readers probably know, the sewing machine shuttle is a boat-shaped contrivance, about one and a quarter inches long, pointed at one end and blunt at the other. In the middle is a recess for holding the spool or bobbin. The ends of the shuttle are solid. The usual method of making the shuttle is to bend a piece of sheet steel to the form, and then forge the ends separately, which are afterward fitted and soldered in, the shuttle being, therefore, composed of three pieces. But at this establishment it is struck up from a bar of steel in one piece, the recess being formed perfect at one operation. While the cost of this important piece of the sewing machine is very much lessened, its durability is greatly increased.

Another device for saving manual labor is also worthy of notice. The various forged parts of the machines, whether of steel or iron, are subjected to immense pressure by an eccentric press, between two highly polished steel dies, which leave the surface perfectly smooth and susceptible of a high polish. They also condense the surfaces of the metal, making the article more durable and stronger. Whatever may be the form of the piece, dies may be adapted to it so that every portion of the surface can be acted upon. This saves the time and expense of milling.

The needles of the Weed Sewing Machine are straight, and at this establishment are swedged from the steel rod by power, instead of being turned, as is sometimes the case. Their strength and evenness of structure may be understood from an experiment which we witnessed. A machine was started, and, without stopping, sewed successively through sheet lead nearly one-eighth of an inch thick, the top of a cigar box, six thicknesses of pilot cloth, four of bleached cotton, fine muslin, dress silk, lace, and a piece of fractional currency, all without changing any part of the machine.

After witnessing the triumphs of ingenuity in adapting machines to the work of the human hand, one at first fears that the race of thorough mechanics will eventually become extinct; but further consideration shows the fallacy of this idea. Messrs. Pratt, Whitney, & Co., employ some of the best mechanical talent they can obtain. The perfection of the work requires it. The dies and swedges are made by experienced workmen, and finished only by the most patient and pains-taking effort. The gages, plugs, templets, and other tools required to insure perfect accuracy, demand the greatest judgment and skill. But in the inventor's department machinery can never intrude. It is but the creation of the brain of the mechanic. Here he reigns solitary and supreme. Machinery will continue to be his obedient servant, more and more valuable as it is more and more improved, but will never be his master.

Mechanics' and Agricultural Fair.

We have received the prospectus of the first Fair of the Association of the State of Louisiana, which is announced to open in New Orleans Nov. 20th, to be continued eight days. Premiums to the amount of $20,000 are offered, and the other arrangements are projected upon a liberal scale. We notice among the premiums the offer of a gold medal and $250 for the best steam machine for making levees; also a gold medal and $200 for the best and most practical steam plow; a gold medal and $50 for the best reaper and mower combined. All necessary information can be obtained by addressing L. Homes, Mechanics' Institute, New Orleans.

FRUIT JAR.—There exists a very well-founded objection to the ordinary tin fruit can, with its soldered top. It is inconvenient, and not so neat in its appearance, as a nicely-fitted glass jar. John J. Squire, of New London, Conn., has recently secured a patent in this country and Great Britain for a glass jar which possesses excellent features. The top is firmly secured in its seat by an india-rubber band, and is quickly adjusted and easily removed, no sealing process being necessary.



ISSUED FROM THE U. S. PATENT OFFICE
FOR THE WEEK ENDING OCT. 9, 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.

58,566.—GATE.—P. M. Ackerman, Webster, N. Y.

First, I claim suspending the sliding gate upon the swinging crane, substantially in the manner and for the purposes herein shown and described.

Second, The swinging crane or frame constructed, arranged and operating substantially as herein shown, and for the purposes set forth, in combination with the sliding gate.

58,567.—MANUFACTURE OF GUNPOWDER.—F. S Allen, New York City.

I claim the within described process of saturating paper or other substance with an explosive compound by boiling the same together, substantially as set forth.

58,568.—BORING MACHINE.—Robert Allison, Port Carbon, Pa.

First, I claim a portable boring machine for boring or reaming shaft holes in cog wheels, spiders, pulleys, etc., constructed and operated substantially as herein described and represented.

Second, I claim the base plate or ring, A, in combination with the vertical boring arbor, B, and guide bar, M, substantially as and for the purposes herein specified.

Third, I claim the vertical boring arbor, B, in combination with the base plate, A, clamping bar, M, or its equivalent and the feeding apparatus, arranged and operated substantially in the manner and for the purposes herein set forth.

Fourth, I claim the guide bar, M M, in combination with the base plate, A, and the boring arbor, B, arranged and applied substantially as and for the purposes herein described.

58,569.—MODE OF SECURING CROSS-CUT SAWS TO THEIR HANDLES.—Emanuel Andrews, Williamsport, Pa.

I claim, First, The removable stop, E, and series of holding places, B3, arranged for joint operation in fastening and liberating a saw plate, A, substantially as and for the purpose herein specified.

Second, A saw handle, B, and so arranged as to allow the removal and introduction of the saw blade, A, by a turning and literal movement without the necessity for passing the end of the blade through the bolt, all substantially as and for the purpose herein specified.

58,570.—VEGETABLE CUTTER.—Francis Arnold, Haddam Neck, Conn.

I claim the wheel, D, with knives cast upon one of its faces and with openings through which the pieces of vegetables and roots pass when said wheel is used with a frame, constructed substantially as herein set forth and for the purposes described.

58,571.—STAGING.—Wm. Arrouquier, Worcester, Mass.

I claim the combination and arrangement with pieces, C C', of the supporting pieces, D D, braces, E E, and adjustable bottom pieces, F F, with their rods, G, for supporting the foot boards, H I, from the window of a building, as shown and described.

58,572.—PEN HOLDER.—Edwin Dwight Babbitt, New York City.

I claim a pen holder constructed substantially as herein shown and described.

58,573.—HORSE SHOE.—Halsey H. Baker, New Market, N. Y.

First, I claim the attachment of the collar, B, to the shoe, A, by means of lips, i, formed upon the tongues, h, of the said collar hooked upon the shoulders, b', by the driving into its place of the filling of the calk, substantially as herein set forth for the purposes specified.

Second, The wedge-shaped projections, f, so arranged in combination with the tongues, h, and lips, i, of the collar, B, as to insure the rigid locking of the lip, i, upon the shoulders, b', by the act of driving the filling of the calk into its place, substantially as herein set forth for the purpose specified.

Third, The opening or openings, e, so arranged in relation with the shoulders, b' and with the tongues, h, and lips, i, of the collar, B, as to enable the said lips, i, to be disengaged from the shoulder, b', substantially as herein set forth for the purpose specified.

Fourth, The ice calks, D, arranged in relation with the collar, B, and with the wood or other suitable filling of the calks, substantially as herein set forth for the purpose specified.

Fifth, The combination of the layer or thickness, m, of india-rubber or other elastic material with the collar, B, and shoe, A, substantially as herein set forth for the purpose specified.

58,574.—METALLIC BAND FASTENING.—Arthur Barbarin, New Orleans, La.

I claim the herein described device for fastening metallic bands, the same consisting of a segmental plate recessed so as to have a C shaped and constructed and arranged for operation as set forth, so that the partial revolution of the plate shall effect the release or loosening of the band, substantially in the manner herein specified.

58,575.—DUMPING WAGON.—Harvey Barton, Black Earth, Wis.

I claim the combination of the drops, A B C, rock shafts, D, pawls, E F G, plates, H, I, J, levers, d e f, and springs, K L N, substantially as shown and described.

58,576.—HOUSE BELL.—Hiram Barton, East Hampton, Conn.

I claim the arrangement and combination of the vibrating cap plate spring and stop with the bell and hammer, constructed and operating substantially as described.

58,577.—MACHINERY FOR MAKING NAILS AND TACKS.—O. L. Bassett, T. R. Bearse, and W. B. Wilber, Taunton, Mass.

First, We claim the combination of a carrier or bearer for the tack blank with any one of the cutters, be they more or less in number, used for cutting the tack blanks when arranged and so as to operate together, substantially in the manner and for the purpose specified.

Second, The carrier or bearer for conveying the tack blanks to the die to be headed, attached to either one or the other of the arms to which the cutters are attached, in combination with a forked or other suitable lever, arranged with regard to the said carrier and so as to operate upon it in conjunction with the said cutter arm, substantially as and for the purpose described.

58,578.—CULTIVATOR.—Thomas Beale, New Milford, Ill.

I claim the bars, A A, having the bar, B, pivoted to them, with the spade or shovel, C, attached to the front end of the latter, in combination with the bar, E, connected to the bar, F, which is pivoted to A A, and connected to the pivoted bar, E, through the medium of the rod, b, and guide bar, D, and the scraper, and filling device, G, pivoted to the front ends of the bars, A A, and operated from one of the pendants, c, by the rod, H, substantially as and for the purpose set forth.

58,579.—SAND PUMP.—James Benson, Bellair, Ohio.

I claim the hinged ball, I, operating in combination with the linked piston rod, E, of the sand pump herein described, as and for the purpose specified.

58,580.—GONG BELL.—Isaac A. Bevin, Chatham, Conn.

I claim the construction of the gong-striking apparatus, substantially as herein shown and described, so that the pull will act between the spring and the striker, all as set forth.

58,581.—SHOVEL PLOW.—Jesse C. Boyd, Milroy, Ind.

I claim the beams, A A, in combination with the upright shovels and handles when connected to the beam, C, by means of the swivels, H H, and attached to the beam, B, by slotted bars, F F, and set screw, t, arranged substantially as specified.

58,582.—BASE BURNING STOVE.—Nathaniel A. Boynton, New York City.

I claim the combination of an outer case or exterior cylinder with an interior cylinder or case which is a reservoir of fuel above the fire-pot, the space between the outer case and the reservoir forming a combustion chamber with which the reservoir is in free communication at its upper portion.

58,583.—GALLOON TRIMMING FOR UNDER GARMENTS.—Ernst Bredt, New York City.

I claim a galloon trimming for under garments and similar articles, formed with a corded and scalloped edge to a fluted or corrugated fabric woven with a heading or center, as specified.

58,584.—GALLOON TRIMMING FOR GARMENTS.—Ernst Bredt, New York City.

I claim the galloon trimming for linen and cotton garments formed with flutes or corrugations connected in the manner and for the purposes set forth.

58,585.—BEEHIVE.—L. C. Bristol and C. T. Alverson, Victor, N. Y.

We claim the relative arrangement of the ventilators, C, with the ventilators, a, and double hives, A B, as shown and described and for the purposes set forth.

58,586.—SAWING MACHINE.—Nathaniel Brockway, Cambria, N. Y.

I claim the segment, i, and gibs, j, and saw, m, in combination, for the purposes described.

58,587.—SAFETY-VALVE TENDER.—Charles F. Brown, Ashly, Mass.

I claim the valve D, with its appendages, the inner cylinder, B, the frame, F, the outer cylinder, I, and hanger, K, or their equivalents, when in combination with the boiler and safety valve of a steam engine, substantially as and for the purposes set forth and described.

58,588.—SEED PLANTER.—C. P. Brown, Shortsville, N. Y.

First, I claim the arrangement of the wind guard, g, or its equivalent, with the delivery wheel, W, substantially as and for the purpose set forth.

Second, The adjustable clamping bar, E, in combination with the wheel, W, and the case, C, substantially as shown and described and for the purpose specified.

Third, The arrangement of a series of complete hoppers in the bottom of the grain box of seed drills in combination with the distributors, substantially as and for the purposes herein shown and described.

58,589.—POWER LOOM FOR WEAVING CONCAVE AND CONVEX SURFACES.—William Breitenstein, New York City.

I claim operating the sectional take-up roller by levers which are set by the jacquard and operated to take up the woven cloth by the beat of the lay or the motion of some equivalent part of the loom, substantially as and for the purpose specified.

I also claim, in combination with the sectional take-up roller, the series of pressure rollers and the frame in which they are hung with its connections so that while each can yield independently of the others the whole of them can be lifted from the take-up roller at once, or the tension of their springs increased, substantially as and for the purpose specified.

I also claim the thread pullers in combination with the jacquard and the intermediate mechanism by which the jacquard is made to determine when the said thread pullers shall be thrown in or out of action, substantially as and for the purpose specified.

And I also claim connecting the finger of the thread puller by means of a spring with the mechanism by which it is operated, so that it shall liberate the thread so soon as it shall have been pulled with sufficient tension, substantially as specified.

I also claim the adjustable bar on the lay, in combination with the levers that operate the sectional take-up, and the bar which gages the extent to which the said levers shall be pulled by the jacquard, substantially as and for the purpose specified.

And I also claim the shuttle carriers for operating the shuttle, or the equivalents thereof, as distinguished from the fly-shuttle system, in combination with the sectional take-up, or the equivalent thereof, substantially as and for the purpose described.

58,590.—APPLICATION OF BEDSTEADS TO APARTMENTS.—Julia P. Brown, Boston, Mass.

I claim an apartment, constructed with bedstead-receiving recess, formed in or at its ceiling, or upper part, and having a bedstead applied to such recess, by counterbalancing devices, substantially as and for the purpose described.

58,591.—DYEING HAT BODIES.—Alfred C. Brush, Norwalk, Conn., and George C. White, Danbury, Conn.

We claim the process of dyeing hat bodies, substantially as hereinbefore set forth, by applying the dye or coloring matter to them after the sizing has been commenced, and before it is completed.

58,592.—MEASURING FAUCET.—H. L. and J. A. Buckwalter, Kimberton, Penn. Antedated Sept. 30, 1866.

First, The arrangement of the regulating screw, M, grooves, N, eccentric, B, and cylinder, A, constructed and operating in the manner and for the purpose herein described.

Second, We also claim the register wheel, with two projecting cogs, m m, and a broad cog, p, to stop the revolution of the spindle of the faucet, and an open space, n, to allow the spindle to revolve freely when a measurement is not required, substantially as shown.

Third, We also claim the arrangement in relation to the foregoing of the follower, G, constructed as described, with the keepers, 3 3 of the cylinder, A, and spindle, J, in the manner and for the purpose herein described.

58,593.—TALLY BOX FOR MEASURING GRAIN.—Andrew J. Burke, Grundy Center, Iowa.

I claim the arrangement of the ratchet wheel, C, operated by the pawl, f, and provided with the index, r, the pinion, O, gearing into the wheel, D, on shaft, e, the latter being provided with the index, t, and pinion, n, operating the index, l, by means of the wheel, B, secured to the tubular shaft, i, all operating as and for the purpose set forth.

58,594.—TELEGRAPH INSULATOR.—W. H. Burnap and J. D. Brassington, New York City.

First, We claim a non-conducting ring or disk, fitted in the base of a hollow shell insulator below the point at which the pin is secured, substantially as and for the purpose herein set forth.

Second, We claim the non-conducting disk, M, m, fitted with springs, P1 P2, and adapted to be confined in the base of the shell, A, substantially in the manner and for the purpose herein set forth.

Third, We claim the within described combination and arrangement of the shell, A H, confining material, J, inverted cup, O, and removable non-conducting disk, M, as and for the purpose herein set forth.

58,595.—ELEVATOR BUCKET.—Charles Camp, Buffalo, N. Y.

I claim, First, The elastic or flexible elevator bucket composed of the materials described, or the equivalent thereof.

Second, In combination therewith, I claim the metallic rim, A, as and for the purpose specified.

58,596.—DOUGH MIXER.—Charles Chavanne, New Orleans, La.

I claim the revolving of the bowl, E, and the arms, a a a a, in the different directions, at the same time, and the scraper, M, as set forth and fully described.

58,597.—DOUBLE SHOVEL PLOW.—John Clarridge, Pancoastburgh, Ohio.

I claim the combination and arrangement of the arms, L and M, the toothed blocks, N and P, and the wedges or keys, O and R, with the beams, B and A, the plow head, G, and the handle, I, substantially as herein described and for the purpose set forth.

58,598.—SINGLE-ROW CORN PLANTER.—John Clarridge, Pancoastburgh, Ohio.

First, I claim the combination and arrangement of the elevator, I, shafts, H and F, pulleys, E and c', band, D, drive wheel, B, and spout, J, with each other, with the hopper, G, and with the frame, A, of the machine, substantially as herein described and for the purpose set forth.

Second, The combination of valve, T, lever X, and slide rod, A', with each other, with the hollow plow shank, K, and with the handle, B', substantially as described and for the purpose set forth.

Third, The combination of the concavo-convex head, k', of the hollow shank, K, with the concave bed plate, a5, substantially as herein described and for the purpose set forth.

58,599.—MACHINE FOR MAKING MOLDING.—Thos. J. Close, Philadelphia, Pa.

I claim, First, The cone-shaped hopper, formed by combining the inner case, J, and outer case, K, with each other, and with the frame, A, of the machine, substantially as herein described and for the purpose set forth.

Second, The combination with the hopper, J K, of the conveyer, W, substantially as described and for the purpose set forth.

Third, The combination of the die wheel, A', constructed substantially as described, with the conveyer, W, and with the frame, A, of the machine, substantially as described and for the purpose set forth.

Fourth, The combination with the conveyer, W, of an adjustable slide or scraper, B', constructed and arranged substantially as described and for the purpose set forth.

Fifth, The combination with the hopper, J K, of the screw, H I, constructed and arranged substantially as described and for the purpose set forth.

Sixth, The combination of the valve, E', arm, F', levers, G' I', and cam, K' L', with each other, with the hopper, J K, and with the frame, A, of the machine, substantially as described and for the purpose set forth.

Seventh, The combination of the rubber or cleaner, P', and scraper, T', with each other, and with the conveyer, W, substantially as described and for the purpose set forth.

Eighth, The combination of the oil cup, D', with the hopper, J K, and with the die wheel, A', substantially as described and for the purpose set forth.

58,600.—FAUCET.—Thomas M. Coffin, Plymouth, Mass.

I claim, as a new article of manufacture, the faucet herein described, consisting of the barrel, A, provided with a valve seat, a', and an eduction nozzle, C, the neck, D, connected to the barrel by a screw joint, a m, to afford access to the valve seat, the stem, E, cast in one piece, with the external head, G, and threaded at g, to fit an internal screw thread in the barrel, A, and the valve, E', mounted removably on the end of the stem, E, all as herein specified and for the purpose explained.

58,601.—MACHINE FOR RAKING AND LOADING HAY.—Munson Cole, Colebrook, Conn., and David Cole, Kent, Conn.

We claim, First, The gathering rake arranged in combination with the rods, r, springs, h, and bar, b', substantially as described.

Second, In combination with the above, the endless elevator and clutch arrangement, all arranged and operating substantially as and for the purposes set forth.

58,602.—ROTARY STEAM ENGINE.—M. H. Collins, Chelsea, Mass.

I claim the combination and arrangement of the chambered drum, F, made substantially as described, with the two pistons and their gates and ports, d d, arranged in the case or cylinder, as specified.

I also claim the arrangement and combination of the springs, q r, with each of the yokes, p, the same being as and for the purpose specified.

I also claim the construction of each piston, and that part of the case against which it operates, viz: curved on their peripheries, substantially as represented, in combination with the cylindrical drum, arranged with respect to them, as specified.

58,603.—PADDLE WHEEL.—Michael H. Collins and William H. Holland, Chelsea, Mass.

We claim the arrangement and combination of its obtuse angular plates or paddles, r r, with the three series of end and middle connections, n p n, and the three wheels composed of the rings, l k l, and the three series of spokes applied together and to a hub, as described.

We also claim the combination and arrangement of the external rings, m m, with the paddles, r r, the three series of connections, n p n, and the three wheels composed of the three rings, l k l, and the three series of spokes, applied together and to a hub, as described.

58,604.—STEAM GENERATOR.—William Conant, Geneva, Ill.

I claim, First, The generating conductor, A, and superheating receiver, C, the latter arranged within a contracted flue, through which the products of combustion pass in close contact with its surface, substantially as and for the purposes described.

Second, In combination with the generating pipe and receiver, arranged as described, I further claim the lining, D, employed to confine the products of combustion around the receiver, and prevent the radiation of heat.

58,605.—LATHE FOR TURNING SHAFTING.—J. J. Conley, New York City.

I claim, First, The annular block, A*, so applied in combination with the tubular spindle, B, and cutter head, C, as to support and steady the shaft during the operation of turning the same, substantially as herein set forth.

Second, The attachment of the smoothing cutter, u, to the annular block, A*, substantially as herein set forth for the purposes specified.

Third, The annular block, B*, fitted into the rearmost end of the tubular spindle, B, and operating in conjunction with the annular block, A*, to steady and support the shaft while being turned, substantially as herein set forth.

Fourth, The combination of the hollow spindle, B, cutter head, C, and the two sets of grooved feed rollers, D and E, one set for pushing and the other for drawing the shaft during the operation of turning the same, the whole arranged and operating substantially as herein set forth for the purpose specified.

Fifth, The swinging or self-adjusting shafts, C', furnished with tangent screws, f', and arranged in relation with the worm wheels, t, and grooved feeding rolls, substantially as herein set forth for the purpose specified.

58,606.—GAS BURNER.—John B. Cooledge, Boston, Mass.

I claim the split tip, c, in combination with the exterior tube, b, operating substantially as described.

58,607.—EVAPORATOR.—J. Cooper, Mount Vernon, Ohio.

I claim the ears, c, in combination with the guide strips, b, gate

openings, d, and partitions, D, constructed and operating substantially as and for the purpose described.

58,608.—SODA FOUNTAIN.—William Coughlan, Baltimore, Md.

I claim the valve, I, and opening, J, in the stud, C, at the side of the fountain, at or near the desired level, to act as a gage, and also as a blow-off opening for the discharge of air from the fountain, substantially as described.

I also claim the auxiliary tube, H, attachable or detachable from the faucet, to permit the fountain to be used in the upright or inverted position, substantially as described.

58,609.—LOOM.—Henry Dale, Philadelphia, Pa.

First, I claim the within-described arrangement with respect to the frame, A, and the jacks of the shaft, I, for the reception and removal of the cylinder, J, or its equivalent.

Second, The combination and arrangement on the loom of the cam shaft, c, wheels, x and m, and shaft, I, as specified.

Third, The combination and arrangement of the graduated pulleys, a a, the jacks, G, and the heddle cords, as set forth.

58,610.—KNITTING MACHINE.—J. Dalton, Williamsburgh, N. Y.

First, I claim the method herein described of forming a combined warp and knit stitch by the action of the series of needles which rise and fall in the needle cylinder, in combination with a revolving cam and spool carrier, substantially as described for the purpose specified.

Second, The detached levers, G, with their curvatures, e, in combination with the movable ring, I, substantially as described for the purpose specified.

Third, The reciprocating needles, n, arranged in a circular series, one portion thereof placed within and concentric to that in which the others are placed, or with those with each series at an inclination from a vertical line, substantially as described for the purpose specified.

Fourth, The segmental projections, e, on the upper edges of the levers, G, in combination with the top plate or ring, I, and fulcrum, a, constructed and operating substantially as and for the purpose set forth.

Fifth, The adjustable segments, f, in combination with the cylinder, H, levers, G, and cam, D, constructed and operating substantially as and for the purpose described.

58,611.—WARP DRESSING FRAME.—Alexander M. Damon, Lowell, Mass.

I claim the combination of the slotted bar, P, constructed as described, with the raddles, O, and the actuating gearing, G W, when operating as and for the purpose described.

58,612.—GANG PLOW.—F. S. Davenport, Jerseyville, Ill.

First, I claim the lever, P, rod, Q, and brake, R, arranged and operating as and for the purpose described.

Second, The hinged board, G, in connection with the reversible axles, substantially as and for the purpose described.

Third, The lever, O, and quadrant, N, for regulating the depth of the furrow, substantially as and for the purpose specified.

Fourth, Lifting the hind part of the machine by means of the lever or arm, I, in connection with the chain, J, wheel, K, and lever, L, these parts operating together substantially as and for the purpose described.

Fifth, Hinging the footboard, M, to the plow frame as described.

Sixth, Securing the tongue or draft pole to the footboard, M, in the manner and for the purpose described.

Seventh, The sliding plow standard, B', guide block, O*, lever, A*, and notched seat standard, C, when used together, and in connection with the other parts.

Eighth, Connecting the lever, L, with the tongue or draft pole, by fastening it to the footboard, the whole operating together substantially as and for the purpose set forth.

58,613.—COMBINED ROLLER AND HARROW.—Jas. Davis, Loami, Ill.

First, I claim the revolving harrow, L, in combination with the pinion, K, gear wheel, J and H, and traction wheel, B, for the purposes and substantially as described.

Second, I claim the levers, O O, in combination with the harrow, L, gear wheels, K J and H, substantially as set forth.

Third, I claim the roller, E, in combination with the pendants, F F, frames, A and L, all for the purposes and substantially as described.

58,614.—NEEDLE-FEED OF SEWING MACHINE.—Job A. Davis, Great Bend, Pa.

I claim, First, In sewing machines using a needle-feed the application and use, in combination with the needle-bar and needle, of the needle assistant or helper bar, G, for keeping the cloth smooth and preventing its gathering or bunching as the feed takes place, such bar being placed before the needle, and so arranged as to move up and down upon its fulcrum, and operating substantially as and for the purposes set forth.

Second, The combination of such helper bar with the pressure bar, so arranged in respect to each other that as one descends the other rises, and vice versa, and operating substantially as and for the purpose set forth.

Third, The arrangement of the slot, m, in the helper bar, and the pin, f, upon the pressure bar, or their equivalent, so that the descent of the needle bar or its equivalent will force down the helper bar and elevate the pressure bar, substantially as and for the purposes set forth.

Fourth, Operating the helper and pressure bars substantially as described, from or by means of the needle-bar, or its equivalent, substantially as and for the purposes set forth.

58,615.—ARTIFICIAL CAOUTCHOUC.—Austin G. Day, New York City. Antedated Sept. 29, 1866.

I claim mixing, heating, and sulphurizing vegetable and mineral oils, in combination with gum, resins, and resinous compounds, to form a composition to be used as a substitute for caoutchouc or india-rubber, substantially in the manner and for the purpose herein set forth.

58,616.—HAND WOOD SAW.—Charles M. Day, Ann Arbor, Mich.

I claim the combination of the rock shaft, K, provided with the springs, O, with the bifurcated lever, I, and pitman, J, connected to the saws, P, when arranged to operate as shown and described.

58,617.—HARVESTER.—Joseph Dick, Jr., Canton, Ohio.

First, I claim the sliding raker shaft, E, or its equivalent, and the joint ball, g, in combination with the driving pulley, B, or other suitable case, when the latter has a cylindrical axis within the hanger, A, entirely independent of the said joint ball, g, as shown and described.

Second, The arrangement, in combination with the sliding raker shaft, of the ball, g, and the pulley, B, or other suitable case within the hanger, A, the latter constituting cylindrical bearings for the axis of the said case or pulley, B, as set forth.

Third, The arrangement of the segments, G and G', upon the vertical sleeve, f, and the segmental pinions, C and C', upon the horizontal driving shaft, E', of the raker, as shown, so as to constitute collectively an entire circle of gearing, as shown and described.

Fourth, The combination of the detachable pulley, T, with the sleeve or ferrule, S, having one or more locking pins, c, substantially as and for the purpose set forth.

Fifth, The arrangement of the elevating lever, L, ratchet, O', head, Q, chain, U, and pulley, V, in combination with each other and the brace of the shoe, as and for the purpose set forth.

58,618.—SHINGLE MACHINE.—John B. Dougherty, Rochester, N. Y.

First, I claim the construction and relative arrangements of the saw guard, R and U, in the manner shown and described, to facilitate the removal or re-adjustment of the saw in the machine and for conducting the sawdust from the machine, substantially as set forth.

Second, The arrangement of the counterbalance, w, shaft, l, pinions, k, rocks, y, and clamping bar, g, in combination with the cams, m and n, substantially in the manner and for the purposes set forth.

Third, The arrangement of the screw gears and crank, G, with the slotted arm, H, attached to the axial shaft, C, of the bolt or clamping frame, B, substantially as and for the purposes shown and described.

Fourth, Providing the saw, S, in the within-described machine, with a collar, j, having a conical bore to fit the mandrel, as and for the purposes set forth.

Fifth, The arrangement of the pivoted or swinging circular track, W, as and for the purposes set forth.

58,619.—BUCKLE AND RING.—Ralph C. Dunham, New Britain, Conn.

I claim a buckle or ring composed of a metal core, a, and a covering, b, of india-rubber or other vulcanizable gum, substantially as and for the purpose described.

58,620.—HORSE COLLAR.—C. R. Durfee, Rochester, N. Y.

I claim the horse collar herein described, consisting of the curved draft bow or bar, B, plates, P, pads, A, and connecting strap or pad, F, the several parts being constructed, arranged, and operating substantially in the manner herein shown and for the purpose set forth.

58,621.—RAILWAY.—Zebina Eastman, Chicago, Ill.

First, I claim the axles, e e, each constructed in one piece, in combination with the tables or bed pieces, d d, connecting rod or reach, h, and transverse reach, i, the whole being constructed, arranged, and operated substantially in the manner and for the purpose set forth.

Second, I claim the axles, e e y, in combination with the reach, b, toothed frames, r s s, and transverse reaches, i i, the whole being constructed and operated substantially in the manner and for the purpose set forth.

58,622.—SEWING SWEAT LININGS INTO HATS.—Rudolph Eickemeyer, Yonkers, N. Y.

I claim the sewing in of the sweat lining of a hat by stitches passing once through the lining and through the hat body diagonally to the brim and sides, without being whipped over the edge of the lining, substantially as herein specified.

58,623.—INDIA-RUBBER AND LEATHER SOLE.—Lewis Elliott, Jr., New Haven, Conn.

I claim a waterproof sole for boots and shoes, formed of two thicknesses, one of india-rubber or its compounds, the other of leather, the two being united firmly in the manner specified.

58,624.—BEEHIVE.—Elva E. Ellis, Friendsville, Ill.

I claim the pivoted slats, C, at the bottom of the case, A, the hive in connection with the bottom, B, provided with an opening covered with wire cloth, a, and the openings, e', in the sides of the partition, D, substantially as and for the purpose set forth.

58,625.—STEAM-ENGINE GLOBE VALVE.—Theodore R. Fancher, Norwalk, Conn.

I claim the arrangement of the adjustable rubber ring, C, and screw ring, E, substantially as and for the purpose described.

58,626.—SPIKE PULLER.—R. A. Fish, Worcester, Mass.

I claim the combination of lever, A, with its bill hook end, a, with the base piece, B, having a bill hook projection, d, and flattened rear part, D, constructed and arranged for joint operation, as set forth.

58,627.—STRETCHER FOR CANVAS.—Jared B. Flagg, New Haven, Conn., and George Storer, New Britain, Conn.

We claim the perforated wedge, b, in combination with the groove, d, pins or screws, e, and frame, substantially as and for the purpose described.

We also claim, in combination with the above, the metal or wood pieces, c, substantially as and for the purposes described.

58,628.—CHURN.—John W. Forsyth, Leesburg, Va., assignor to himself, John W. Head, and Nelson Head.

I claim the combination of the platform, F, with the posts, E' E', their connecting cross piece, G, wheel, A, pinion, B, fly wheel, I, pin, N, shaft, C and O, the vessel, M, the hook, a a, securing the lid, L, the slotted strips, D D D, the hooks, t t t, the staples, h h h, as is described and for the purpose set forth.

58,629.—SADIRON HEATER.—Charles H. Frost, Peekskill, N. Y.

I claim bending up or flaring the front ends of the covers of sadiron heaters, so as to allow the nose or point of a sadiron to be inserted beneath said covers to raise them, substantially as set forth.

58,630.—WINNOWING MACHINE.—Francis Frye, Time, Ill.

First, I claim the eccentric, E, lever, D, in combination with the hopper, B, and screen, C, substantially and for the purposes set forth.

Second, I claim the lever, D, eccentric, B, in combination with the fans, G, for the purposes and substantially as herein shown and described.

58,631.—DENTAL DRILL.—William H. Gates, Louisville, Ky.

I claim a drill head having two or more of the longitudinally curved external surfaces, C, extending from B to H, in conjunction with an equal number of cutting edges, undercut by deep grooves running backward from the end spirally and diagonally to the stem or axis, substantially as described and for the purpose set forth.

58,632.—NUTMEG GRATER.—C. L. Gilpatric, South Dedham, Mass.

I claim the case, A, as constructed in combination with the spool, B, secured in said case, and provided with the perforated covering, D, in which is cut an opening, a, which discharges the ground nutmeg, which passes into the spool, and by means of which the spool may be cleaned internally, the several parts being arranged as and for the purpose herein specified.

58,633.—WRENCH.—Willis D. Gold, Philadelphia, Pa.

I claim the arrangement of the spring toothed lever, F, in combination with the movable jaw, E, operating with the rectangular shank, C, in the manner and for the purpose herein described.

58,634.—RAILWAY TRACK CLEARER.—M. J. Goodwin, Boston, Mass.

I claim combining with the car truck and brakes of a railway car, the clearers hung from the brakes in front of the car truck, and at a short distance above the surface of the track rails, substantially as described.

58,635.—HORSE HAY FORK.—Alexander Gordon, Rochester, N. Y.

I claim in combination with the point, P, the toothed adjusting bar, v, the hand lever, E, and the locking latch, D, they all operating conjointly in the manner and for the purposes specified.

58,636.—SHOVEL.—Samuel J. Goucher, Philadelphia, Pa.

I claim strips, E, secured to the blade and handle strap of a shovel, as and for the purpose set forth.

58,637.—NAIL MACHINE.—Simeon L. Gould, Skowhegan, Me.

I claim the arrangement of the slide plate, k, and the eccentric, h, with the vibratory cutter, carrying levers, and the cutter wheel and its shaft, or the same and the feed rollers and guide bar, as set forth.

I also claim the arrangement of the rotary cutters, their sockets, clamping and adjusting screws, and the wheel or cutter bed, as specified.

58,638.—COOKING STOVE.—Daniel Graves, Seneca, Ill.

First, I claim the combination and relative arrangement of the frustum plates, B C F and H, substantially as herein shown and described, in the formation of cooking stoves, for the purposes set forth.

Second, The broad annular hearth, G, when arranged to be heated by the caloric current passing under it, substantially as and for the purposes shown and described.

Third, The double frustum, B C, which constitutes the inner draft flue, and gives a radiating direction to the caloric current, as shown.

Fourth, The segmental reflector plates or cases, R, in combination with the frustum stove, constituting an annular heating or baking oven, as shown and described.

58,639.—MINER'S FUSE LOCK.—Gebhard Hagenmeyer, Big River, Cal.

I claim, as an improved fuse lock, the arrangement of the hammer, c, sere or dog, g, spring, e, pin, j, and barrel, b, relating to each other and operating in the manner as and for the purpose herein specified.

The pin, j, in combination with the spring, e, when used for the purpose herein represented and described.

58,640.—AXLE BOX COVER.—F. K. Hain, Renova, Pa.

I claim the cover, B, trunnions, a b, spring, f, eyes, d e, with inner inclined planes, the eye, d, being open and provided with notch, g, and the box, A, combined and arranged substantially as described for the purpose specified.

58,641.—PAPER SKIRT FOR LADIES.—J. Henry Hayward, New York City.

First, I claim, as a new and useful article of manufacture, the paper skirt as herein described, made by the combination of one or more sections of sheet paper, of any and every kind, quality and color, water-proof and fire-proof inclusive, arranged adhesively together, and strengthened by means of cords, tops, or other suitable material and devices, as fully described.

I claim the peculiar manner of arranging and connecting the said skirt at the waist by the means and for the purposes specified.

I claim the joining of two or more skirts made, as above described, on the same band, bodice or waist hoops, as above set forth.

58,642.—WASHING MACHINE.—George M. Heine, Brownsville, Ind.

I claim the combination of the supporting frame, A B, rod, C, flywheel, E, crank, H, connecting rod, I, arm, J, and barrel, D, all constructed and arranged to operate substantially as and for the purposes described.

58,643.—PROCESS FOR TANNING.—George W. Hersey, Greenbush, Wis.

First, I claim soaking the hides or skins in salt water mixed with soft soap previous to liming, substantially as and for the purpose described.

Second, The use for tanning leather of a liquor containing glauber salt and common salt in combination with terra japonica, substantially as and for the purpose described.

Third, Also applying to the flesh the sulphuric acid, glauber salts, and alum and borax, to all furs, with swab, or brush, or paste to the same.

58,644.—MANUFACTURE OF CREAM CRACKERS.—Daniel M. Holmes, Brooklyn, N. Y.

I claim a cracker composed of the ingredients in the properties named, and treated in the manner substantially as set forth.

58,645.—PUNCH FOR HORSE SHOES.—Charles Huie, Lockport, N. Y.

I claim a punch, the point, e, of which is provided with the flange, f, serving both as a guard and gage, when constructed and operating substantially in the manner and for the purpose set forth.

58,646.—ROCKET.—E. S. Hunt, Weymouth, Mass.

I claim the arrangement of the spring, m, and its case, m', with the rocket charge tube, A, and its priming vent, h.

58,647.—HUB.—Allen Huston, Cincinnati, Ohio.

I claim casting a hub in two concentric parts, one about or within the other, so that while the parts are inseparable each may revolve freely in relation to the other, substantially as described.

58,648.—CONSTRUCTION OF OIL TANK.—Thaddeus C. Joy, Titusville, Pa.

I claim the method, substantially as described, of constructing metal tanks for the purpose of rendering them portable.

58,649.—FEED CUTTER AND BOX.—Abraham B. King, Camden, Ohio.

First, I claim the arrangement of box or manger A a a', shiftable cutting apparatus, E, and hinging and supporting devices, C C', D D', F F', G, substantially as set forth.

Second, The bar, H, pivoted to the top of the trough, for the purpose set forth.

Third, The combination of knife, I, adjustable wedge, J, screw, K, and stump, L, for the purpose explained.

58,650.—DRIVING PIPE FOR OIL WELLS.—Geo. L. King, Philadelphia, Pa.

First, I claim the combination of the inner pipe, B, strengthening bands, D, and thimbles, C, the several parts being constructed and arranged in relation to each other, substantially in the manner hereinbefore described and for the purpose specified.

Second, The combination of the shoe or cutter, A, with the lower end of the pipe, B, and lower strengthening band, D, substantially in the manner described and for the purpose above set forth.

58,651.—HOOP FOR SKIRT.—Judah Levy, Philadelphia, Pa.

I claim a skirt, each hoop of which consists of two light wires, rigidly clasped together at intervals, as and for the purpose set forth.

58,652.—MEDICINE.—N. C. Lincoln, Brunswick, Maine.

I claim the compound of ingredients for a catarrh medicine, mixed in the manner and proportions above described.

58,653.—CARPET STRETCHER.—Carl A. Lindner, Cincinnati, Ohio.

I claim herein, as new and of my invention, the carpet stretcher composed of the handspike, A, grapnel, B, substantially as set forth.

58,654.—APPARATUS FOR MAKING BUTTON HOLES.—Ferdinand Lindner, Dayton, Ohio.

I claim a button-hole regulator, made of steel or any other suitable material, having the jaws, A B, bow spring, H, levers, D D, and handles, G G, as herein described and for the purposes set forth.

58,655.—SASH SUPPORTER AND FASTENER.—J. W. and S. A. Livingston, Hartford, Conn.

We claim the friction roller, D, and spring, f, when combined and arranged substantially as and for the purpose specified.

In combination with the foregoing, the use of a pin, K, or its equivalent, as and for the purpose described.

58,656.—BLASTING CARTRIDGE.—Herman S. Lucas, Chester, Mass.

First, I claim a cartridge for blasting, made of solidly compressed gunpowder, containing either nitrate of potash or nitrate of soda, or granulated, or of any other suitable explosive material capable of being safely compressed into a suitable form for blasting purposes, and provided with any suitable device for igniting the same from the interior.

Second, The combination of a cylindrical cartridge of solidly compressed gunpowder or other explosive materials for blasting, with a central perforation extending partly or wholly through the same, constructed in the manner and for the purpose above described.

Third, The combination of a cartridge of solidly compressed gunpowder or other explosive materials for blasting with a fuse, when said fuse is inserted into its interior, in the manner and for the purpose set forth.

Fourth, The combination of a cartridge of solidly compressed gunpowder for blasting purposes with an envelope of paper or other textile material made impermeable to water, or with envelopes or casings of sheet metal, cartonware or wood, the same being attached to the fuse in the manner and for the purpose set forth.

58,657.—Metallic Fastening for Buckles and Straps.—H. H. Mansfield, South Canton, Mass.

First, I claim the metallic plate or bushing, A, constructed substantially as and for the purpose herein set forth and described.

Second, The manner of attaching the strap, C, to the buckle, B, substantially as herein set forth and described.

58,658.—Hollow Augers.—Jacob McClure, Rockland, Maine.

I claim adjusting the cutters to different sizes of tenons, by means of inclined cutter bearing pieces, sliding upon inclined supporting pieces and made adjustable thereon, and used in combination with a receding center, arranged to operate substantially as described.

58,659.—Pruning Knife.—Cole McCrea, Leavenworth, Kansas.

First, I claim the combination with a pruning hook of a revolving wheel, A, substantially as and for the purpose described.

Second, I claim the combination with a pruning hook of an extension handle, B, substantially as specified.

58,660.—Composition for Removing Incrustation from Steam Boilers.—Charles McKee, San Francisco, Cal.

I claim the combination of camphor, potash, ammonia and alum with petroleum or other oleaginous matter, substantially as described and for the uses and purposes hereinbefore set forth.

58,661.—Submarine Torpedo Boat.—Scovil S. Merriam, Springfield, Mass.

First, I claim the construction of the lower portion or bottom of a submarine vessel of heavy cast iron bed plates containing the water tanks, in combination with the ends of the vessel, and arranged substantially as and for the purpose herein set forth.

Second, The arrangement of the rope or cable, guide pulley and windlass with gearing, for the purpose of operating the suspended ballast in a perfectly air-tight box, operating and being operated substantially in the manner and for the purpose described.

Third, I claim, in combination with a submarine vessel, the arrangement of a torpedo bar near the bow, at the bottom of the vessel, and the manner of operating said bar from the inside of the vessel, in the manner substantially as described.

Fourth, I claim the arrangement of a chamber, X, capable of being closed perfectly air-tight, and surrounding one or more of the doors in the bottom of the vessel, for the purpose substantially as specified.

Fifth, I claim the construction of a submarine vessel, consisting of a heavy cast iron bottom plate with an iron or copper hull, in combination with the water tanks arranged in the bed plates, the air chambers around the side, top and ends of the working compartment, the suspended ballast weight, the screw propeller worked either by hand or by a compressed air engine, and the torpedo bar with exploding shell at its end, when the whole is arranged and combined in the manner and for the purpose substantially as set forth and described.

58,662.—Fire and Burglar Alarm.—Edward Middleton, Cleveland, Ohio.

I claim the spiral springs, Q, yoke, R, cross piece, X, arm, Y, levers, S, and cords, Y', as arranged, and in combination with the spring, E, wheels, F K K', hammer, o, and bell, P, arranged in the manner and for the purpose set forth.

58,663.—Attaching Thill or Tongue to Vehicles.—Jonathan S. Miller, Everton, Ind.

I claim the combination of a clip formed in two parts, C and C', brace, G, and bolt, E, when said several parts are respectively constructed and arranged for use substantially as set forth.

58,664.—Saw.—Warren P. Miller, San Francisco, Cal.

I claim an insertable tooth for saws, when said tooth is constructed upon lines having a true circle and comprising more than one hundred and eighty degrees of the circle, and inserted into a cavity in the saw plate of a shape to fit said tooth, substantially as described.

58,665.—Manufacture of Spoons.—G. I. Mix, Wallingford, Conn.

I claim the spoon blank cast and subsequently rolled, as described, as an article of manufacture.

58,666.—Annealing Furnace.—Hiram W. Moore, Bridgeport, Conn.

I claim the openings, a a, at the base of the annealing case, in combination with the annular flue, F, and perforated plate, J, for admitting atmospheric air to promote the combustion of the carbon in contact with the wheels, substantially as described.

I also claim, in combination with the case, A, the opening, b, the horizontal air flue, G, and the vertical flue space, H', for conveying air to and cooling the hubs of the wheels, substantially as described.

I also claim, in combination with the annealing furnace for containing a pile or series of wheels, the series of perforated and flanged rings to be placed between said wheels for regulating and controlling the combustion of the charcoal therein, as and for the purpose described.

58,667.—Paper Fastener.—George G. W. Morgan, Washington, D. C.

I claim a paper or other fastener formed out of a rhomboidal blank and bent into a bow or staple form, and capable of piercing and cutting its way into or through the paper or other material, and of being bent down or clinched by the thumb and finger or hand of the user, and overlap each other as shown at the line, b, figs. 2 and 5, without the use of any special instrument for inserting and clinching it, all as herein described and represented.

58,668.—Window Curtain.—William Henry Morrison, Indianapolis, Ind.

I claim the combination of the roller, E, and the double curtain, F F, having the apertures, x x x, in the opposite parts, substantially as described, when the combination is used for the purposes specified.

58,669.—Clothes Wringer.—Hiram Nash, Cincinnati, Ohio.

I claim the combination of the inclosing case, D, made up of the plate, f, and cover, h, and provided with the concentric bearing, K K, with the set of gearing, 1, 2, 3, 4, arranged as described, the whole used in connection with the rollers, B B, substantially in the manner and for the purpose specified.

I also claim the tightening buttons or wedges, p p, in combination with the clamps, G G, and standards, A A, arranged and operating as set forth.

58,670.—Hemming Guide for Sewing Machines.—S. D. Ogburn, Springfield, Tenn.

First, I claim the plate, B, arranged, as shown, with several curved slits as measures of quantity for different widths of hem.

Second, I claim, in combination with the above, the removable pin, E, in the plate, D, as and for the purpose described.

58,671.—Evaporator.—Samuel Page, McAllisterville, Pa.

I claim the arrangement of the pans, A E G, with the connecting pipe, C, strainer, B, and the furnace flues, substantially as described and represented.

58,672.—Well Borer.—John T. Parker, Farmington, Maine.

I claim the combination of the slotted part, B, part, A, stop pin, e, and hinge, c, operating substantially as described for the purpose specified.

58,673.—Paper Collar and Bosom.—Moritz Pinner, New York City.

First, I claim a substitute for a shirt collar and a shirt bosom, such substitute being made in whole or in part of paper cut in one or more pieces, and made to fit or adjust itself around the neck and over the collar bone and chest of the wearer, substantially by the means and in the manner herein set forth and described.

Second, Combining the collar part, A, with the bosom part, B, of the above invention by means of one or more strips, g, for the purpose of strengthening, connecting or holding in place such parts, A and B, or either of them, all substantially as herein set forth and described.

Third, Bending, creasing or indenting on line, d, the product embraced in the above invention, for the purpose herein set forth and described.

Fourth, Making the above described article open and adjustable on any side or part of the neck of the wearer.

Fifth, Printing on and embossing the above described article, or the material of which it is made, in whole or in part, all substantially as herein set forth and for the purposes specified.

58,674.—Fruit Jar.—George A. Reynolds, Rochester, N. Y.

I claim the arrangement of the clamping bar, B, having the inclined planes or hooks, c, formed upon its ends, and provided in the center with a fixed elastic packing, t, for the vent formed in the apex of the cover in this class of self-sealing cans or jars, as and for the purpose shown and described.

58,675.—Heel Iron.—W. M. Rice, Boston, Mass.

I claim, as a new article of manufacture, the above described heel irons, to wit: heel irons made thickest on that part or side which usually wears out fastest and beveled on the inside, as described, so as to be held on to the heel by the leather nailed or pegged in the inside of said irons.

58,676.—Machine for Punching Sheets of Metal.—J. M. Riter and L. J. Farquhar, Pittsburgh, Pa.

First, We claim the combination of the adjustable diagonal rack, E, with the rack table, D, and its ratchet, h, for the purpose of regulating and varying at pleasure the length of each separate movement of the rack table.

Second, The combination of the rack table, D, and the turning frame, K, attached thereto by a rivet for the purpose of producing a curvilinear movement.

Third, The combination of the rack table, D, and frame, K, pivoted thereto with the adjustable angle plate, L, and rollers, g' g'', or other similarly arranged bearing surfaces, constructed substantially as and for the purposes hereinbefore set forth.

Fourth, Also, in combination with the devices specified in the third claim, the slide, q, with screw, J, and spiral springs, u, constructed and arranged substantially as hereinbefore described for the purpose of pressing the frame, K, against the rollers.

58,677.—Car Spring.—Archibald H. Rowand, Allegheny, Pa.

I claim an elliptic spring, composed of a single strip of steel, formed in the shape substantially as shown, so that it will retain its form without the use of clamps.

58,678.—Steam Generator.—Esau Rowing, Parkersburg, W. Va. Antedated September 23, 1866.

I claim so arranging a series of inclined tubes, a, with reference to the drum, f, that the water line intersecting the drum at its center shall leave a gradually increasing steam space in the tubes, a, from the lower or furnace end of said tubes to the point of their junction with the drum, substantially as and for the purposes set forth.

58,679.—Bed Bottom.—Rufus S. Sanborn, Ripon, Wis.

I claim a bed bottom formed by interweaving with the ordinary slats, cords or bands of india rubber or other suitable elastic material, substantially in the manner described and shown.

58,680.—Observatory.—L. B. Sawyer, Charlestown, Mass.

First, I claim the employment, in combination with a tower, of a car of an annular form working upon guides upon the exterior of the tower and a hoisting apparatus for raising and lowering the car, substantially as described.

Second, The employment, in combination with the tower, of the projecting arms of the frame, D, to which the guys are attached, by which the car is permitted to rise to the top of the tower without coming in contact with them, substantially as described.

Third, I claim the annular counterpoise working within the tower in combination with the annular car working upon the exterior of the tower, substantially as described.

58,681.—Machine for Splitting and Skiving Leather.—Samuel H. Schenck, Zionsville, Ind.

First, I claim the checks, 7 7, the adjustable skiving block, 1, the knife, 2, and its attachment to the lever, 3,

Second, The roller, 5, in connection with the skiving fences and the set screw, 6, all arranged and operating substantially as set forth and described.

58,682.—Chair.—Charles C. Schmitt, New York City.

I claim a chair frame susceptible of being adjusted to any inclination desired, from a horizontal to a vertical plane, or nearly so, in combination with a seat and back composed of a continuous strip of cloth so hung to the chair frame that it can be lengthened or shortened, in the manner herein specified and for the purpose set forth.

58,683.—Fly Fan.—J. G. Schwemmer and S. Mueller, Philadelphia, Pa.

We claim the flaps, A A, when operated by the described cam movement through a sliding rod, E, bell cranks, B B', and links, c c, and when arranged for the purpose of giving access to the articles thereby protected from insects, substantially as set forth.

58,684.—Eraser and Burnisher.—A. G. Shaver, New Haven, Conn.

I claim, in combination with the blade or handle of an eraser or desk knife, a burnisher tip, substantially as described.

58,685.—Steam Generator.—Simeon Sherman, Weston, Mo.

First, I claim the central chamber, F, and outer chamber connected by the vertical pipes, I, which operate as described, in combination with the tubes, K, and mud valves, L, for the removal of sediment.

Second, The revolving arrangement of perforated troughs for dripping the water upon the heated surface, as described.

Third, The plates, R, attached to the heated surface for the retention of the water, as and for the purpose described.

58,686.—Manufacture of Cigarettes.—Samuel Shuck, Bedford, Pa.

First, I claim the method herein described of filling a wrapper with fine-cut tobacco by means of a tube and piston, the wrapper being drawn over the tube and receiving the core as the same is pushed out of the tube by the piston, substantially as shown and described.

Second, The method herein described of forming the wrapper preparatory to filling, by means of the forming plate, Fig. 2, and the hinged plate, Fig. 3, substantially as described.

Third, I also claim the within-described method of filling and packing the wrapper by inserting the fine-cut tobacco through a tube inclosed in the wrapper, and moving the said tube up and down in the wrapper during the process of filling, as described.

58,687.—Paper Holder.—D. M. Smith, Springfield, Vt.

I claim the construction and arrangement of the coil spring provided with a point, B, that pierces the eye or hole, C, and all from one piece of wire, substantially as and for the purposes described.

58,688.—Lock.—Amos W. Snow, Norwich, Conn.

I claim the arrangement of the latch bolt, C, with its arm, f, the spring tumblers, b b, as described, and guard plate, l, constructed and operating in combination with a suitable handle and key, in the manner herein specified.

58,689.—Horse Rake.—Jacob A. Spear, Braintree, Vt.

I claim the arrangement upon the carriage, A B C, of the boards, E J, and bars, I 11 12, as and for the purpose herein described and represented.

I further claim, in combination with the above, the hinged rock shaft, F, levers, G G, connecting bars, G' and P, reaches, M [illegible],

Q, and the sectional jointed rake, o o' R R S, when constructed and arranged in the manner and for the purpose specified.

58,690.—Hair Restorative.—John Sprink, Council Bluffs, Iowa.

I claim the proportionate quantities of the ingredients as compounded and made for a vegetable hair tonic, substantially in the manner and for the purpose as herein specified.

58,691.—Dough Mixer.—John M. Stanyau, Milford, N. H.

I claim the improved dough mixer, made substantially as described, viz.; of the pan and cover with the handle socket and the journal applied and arranged in manner as specified, such cover and pan being provided with suitable connections, as set forth.

58,692.—Vise for Holding Saws.—G. N. Stearns, Syracuse, N. Y.

I claim the herein-described vise as a new article of manufacture, for the purposes set forth.

58,693.—Corn Cultivator.—L. O. Stevens, Pekin, Ill.

I claim the frame, D, arms, N N, and beams, A A, combined and operating substantially as described for the purpose specified.

I further claim the curved or arched bars, M M, in connection with the frames, K K, for supporting the shaft, L, substantially as and for the purpose specified.

58,694.—Clamp for Wringing Machines.—James Stimpson, Baldwinsville, Mass.

First, I claim the adjustable rods, H, attached to or cast with horizontal bars, G, which are fitted loosely on the pendent bars, a, of the end pieces, A, and provided with screws, I, to bear against the edges of sector projections, J, for the purpose described.

Second, The springs, K, in combination with the adjustable rods, H, set screws, I, and pendent bars, a, arranged as and for the purpose set forth.

58,695.—Sheep Shears.—James A. Strong, North Wolcott, Vt. Antedated Sept. 30, 1866.

First, I claim the flanges, A' B', in combination with the blades, A B, and spring, C, as and for the purposes herein specified.

Second, The swelled or turned-up front, A*, arranged relatively to the flange, A', blades, A B, and spring, C, substantially as and for the purpose specified.

58,696.—Beehive.—Samuel Taylor, Burlington, Maine.

I claim a beehive constructed of a series of sections, A A' A'', in combination with sliding frames, E, applied or fitted to the sections, and constructed substantially in the manner shown and described for the purpose set forth.

58,697.—Beehive.—Henry A. Tozier, Littleton, Me.

I claim the removable plate or board, D', placed within the body, A, of the hive, substantially in the manner as and for the purpose herein set forth.

58,698.—Cotton Tie.—Charles W. Wailey, New Orleans, La.

I claim the metallic tie or buckle, A, when constructed as described for the purpose set forth.

58,699.—Balance Slide Valve.—John W. Wait, Portsmouth, Ohio.

I claim the valve block, A, and steam channels, C C', of the two balanced slide valves, D D, constructed, arranged, and operated substantially as and for the object specified.

58,700.—Machine for Pressing Bricks.—William H. Walrath, Chittenango, N. Y.

First, I claim the arrangement of a stationary table, H, upon the upper surface of the revolving mold table, C, in combination with revolving blades, g, which are so arranged as to sweep the bricks from the followers, F, upon said stationary table, substantially as described.

Second, In combination with the pug mill, B, and revolving mold table, C, I claim the upward moving followers, F', and a plate, G, which is sustained by means of the brackets, J J, bolted upon the frame, A, so that the resistance to the upward pressure of the followers will be sustained by said plate brackets and frame, substantially as described.

Third, Providing for adjusting the elevated portion of the track, E, at the point where the made bricks are discharged from the mold, by means substantially as described.

Fourth, Communicating motion to the mold table directly from a horizontal driving shaft, L, in combination with the shaft, C', and spur wheels, b1 b3, so that the stirring shaft of the pug mill, as well as the mold table shall receive motion from said main shaft, substantially as described.

Fifth, Communicating motion to the revolving blades, from the shaft, L, which moves the mold table, C, substantially as described.

Sixth, In combination with a revolving mold table, C, I claim the device which will discharge the bricks from the follower plates upon a stationary table, H, or its equivalent, substantially as described.

58,701.—Plastering Mold for Cornices.—C. P Walter, Aston Township, Pa.

First, I claim the combination of the former, B, with the guides A A', in the manner and for the purpose substantially as shown and described.

Second, The slotted plate, E, and screws, c, or their equivalents, in combination with the former, B, and the guides, A A whereby the mold is made adjustable to angles of any degree, substantially as described.

58,702.—Reaping Machine.—Horatio Whitney New York City.

I claim the adjustable toothed chain or bolt, N, in combination with the inclined plate, M, arranged and operating substantially as described.

58,703.—Mop Head.—Ruel W. Whitney and Abner C. Stockin, South Berwick, Me.

We claim the improved mop head made as described, viz., of the bearer, the yoke and the collar, constructed, arranged and applied together and to the handle, substantially as specified.

58,704.—Chuck.—D. E. Whiton, West Stafford, Conn.

I claim the chuck consisting of the jaws, B, scroll disk, D pinion, F, and hollow shouldered nut, M, combined and operating substantially as described for the purpose specified.

58,705.—Cooking Stove.—William Wilson, Boston, Mass.

First, I claim in cooking stoves the use of the removable intermediate plates, e e, and slab, f f, arranged as described, and for the purpose specified.

Second, In combination with the above, the arrangement of the draft chamber, k k, as and for the purpose specified.

Third, The use of an elevating damper, r r, arranged and operating in the air box, o o, substantially as and for the purpose herein set forth.

58,706.—Corn Harvester.—James F. Winchell Springfield, Ohio.

First, I claim the cutting apparatus consisting of the revolving disks, R P, or their equivalents, in combination with the stationary blade, L, when said parts are arranged to operate as set forth.

Second, The combination of the tilting rack, D, stop bar, a, and lever, b, and spring, H, when arranged to operate as herein shown and described.

58,707.—Grain Separator.—S. M. Wirts and F Swift, Medina, Mich.

First, We claim the movable shaking spout or trough, L, operated by means of the bar, K, and the shoe, C, substantially as herein specified.

Second, The screens, a and 6, as constructed and combined in

the supplemental shoe and with the carrier board, e, as and for the purpose specified.

Third, The combination of the rod, o, with the main shoe and supplemental shoe for regulating the inclination of the latter, as and for the purpose set forth.

Fourth, The employment of the rod, i, in combination with the lower screen, I, for the purpose of adjusting the inclination of said screen and imparting a bounding motion to it, substantially as set forth.

Fifth, The supplemental shoe pivoted at its inner end to the main shoe so as to allow of adjustment of its outer end, as and for the purpose specified.

58,708.—Take-up for Narrow-ware Looms.—Martin Wolf, New York City.

I claim the arrangement of a movable roller, F, attached to a sliding block, C, and operated or acted upon by a weight, in combination with a stationary roller, G, when applied to the woven material at any place between the breast beam roller, A, and the take-up roller, B, in the manner and for the purpose substantially as set forth and described.

58,709.—Speculum.—Thomas D. Worrall, Central City, Colorado.

First, I claim so constructing a vaginal speculum that the motion of its valves shall be confined exclusively to that portion of the vigina which is inside the pelvic bone.

Second, I claim so constructing a speculum that the whole of its valves may be worked simultaneously or one or more separately at the pleasure of the operator.

Third, I claim the use of rubber or other flexible material either securely fastened to or loosely surrounding a valved speculum and operating with it for the purpose set forth.

Fourth, I claim the screw, F, in combination with the joint, J, and the nut, C, for the purposes set forth.

Fifth, I claim the joint, K, in combination with the screw, F, and the nut, C, for the purposes set forth.

Sixth, I claim the ring, D, in combination with the tube, A, the nuts, H, the nuts, C, the screw, F, the joints, J and K, and the valves, B, for the purposes set forth.

58,710.—Railway-car Window.—J. K. Andrews, Antrim, Ohio, assignor to J. C. Tilton, Pittsburgh, Pa.

I claim the curved screens, K K, with their convex side turned inward, in combination with the curved grooves, M M, situated between the panels, H and E.

58,711.—Machine for Picking and Opening Fibrous Materials.—Samuel Baxendale, Boston, Mass., assignor to himself and Thomas H. Denham, of the same place, and Samuel B. Thaxter, Abington, Mass. Antedated Sept. 23, 1866.

I claim a series of divisions or partitions so placed as to form passages or channels leading to the wire cage of a picking, blowing, or separating machine, and causing the floating fibers to be deposited upon the cage in separate slivers or fillets, substantially as herein described and for the purpose specified.

58,712.—Adjustable Shelf for Stovepipe, etc.—S. V. Beckwith, Hamden, Conn., asssignor to himself and I. B. Carpenter, New Haven, Conn.

I claim the combination of the adjusting band, B, the socket, C, and the shelf, D, provided with a shank, F, constructed and arranged so as to be adjtable, substantially in the manner set forth.

58,713.—Adjustable Railway-car Seat.—W. N. Bragg (assignor to himself and Wm. H. Trainham), Richmond, Va.

I claim the arrangement and combination of the slotted scroll, D, and rest, B, with the adjustable foot rest, F, and foot lever, G, when constructed and operated as herein described and for the purposes set forth.

58,714.—Machine for Fitting Axle Spindles to Skeins of Wagons.—Cornelius L. Campbell (assignor to Washington W. Wheaton), Binghamton, N. Y.

I claim the manner of fitting the arms or spindles of axletrees for wagons to cast-iron skeins or thimbles, by means of the revolving slide cutter, J, in combination with the adjustable way or guide-plate, L, fig. 3, the feed screen, E, and the hinged nut, K, substantially as and for the purposes described.

58,715.—Elevator.—Thomas F. Christman (assignor to himself and Willie Daniel), Wilson, N. C.

I claim the arrangement and combination of the base frame, A B, cylinder, C, guide rollers, a a, on the bent arms, b b, with the top windlass frame, D E, windlass, F G, chain pulleys, h h, adjustable endless chain, H H, and elevating buckets, I I, to operate at various hights, substantially as and for the purposes herein set forth.

58,716.—Pen Rack and Bill Holder.—C. P. Crossman (assignor to himself and Pembroke Churchill), West Warren, Mass.

I claim, First, The pen rack, B, in combination with a bed piece, A, substantially as specified.

Second, I also claim the bill holder, C, in combination with the pen rack, B, and bed piece, A, substantially as specified.

58,717.—Connecting and Supporting Stovepipe.—Solomon Crowell (assignor to himself and James B. Rae), Syracuse, N. Y.

I claim the coupling, b, and the flange on the coupling, c, and the tension rod, e, when the same are constructed, combined, and used in the manner as substantially set forth and described.

58,718.—Composition for Pavement, etc.—Geo. W. Davis, Fitchburg, Mass., assignor to Silas Pratt and E. S. Russell.

I claim a compound for covering walks, and for other similar purposes, composed of the above named substances, substantially in the proportions specified.

58,719.—Grinding Mill.—Chester F. Dean, St. Johnsbury, Vt., assignor to himself, Horace Paddock, Halsey R. Paddock, and Moses E. Barrett.

I claim the combination of the grinding cylinder, the stationary grinders, and the foraminous apron, arranged as specified.

58,720.—Harvester.—Charles Denton, Pekin, Ill., assignor to himself, Samuel E. Barber, and Samuel F. Hawley, Decatur, Ill.

I claim, First, The attaching of the spout, P, to the front part of the framing by means of springs, g g, substantially as and for the purpose described.

Second, The arrangement of the racks, a a, on the guide, I, attached to frame, A, in combination with the pinions, J J, secured to the pole or tongue, G, as shown and described, for adjusting the sickle higher or lower, as described.

58,721.—Pipe for Oil Wells.—John H. Duck and Elias K. Whitcomb, Elgin, Ill. Said Whitcomb assigns his right to J. T. Whipple, Chicago, Ill.

We claim the tube or screw, S, suspended within the main tube, L, by means of flanges, v v'', in combination with the several parts of the within described device, for the purpose specified.

58,722.—Wood-scraping Machine.—Erastus S. French (assignor to Joshua W. Partridge), Templeton, Mass.

I claim the combination, as well as the arrangement of the guide, E, reciprocating driver, G, the two scrapers, and the mechanism for advancing and receding the driver, and clutching and unclutching its drum, with respect to the driving shaft, the whole being so as to operate as explained.

58,723.—Car Coupling.—D. C. Guttridge, Canton, Ohio, assignor to himself and William Cluff, Stark county, Ohio.

I claim the rod, C, provided with the prong, F, and connected to the coupling pin, p, when used in combination with the movable coupler, B, and rod, g, as herein set forth.

58,724.—Corn Planter.—E. R. Holford (assignor to himself, Abiah Kingsley, and Clark Alvord), Westford, Wis.

I claim, First, The cam, D, in combination with the lever, E, and slides or valves, G, for the purposes and substantially as described.

Second, I claim the cam, D, in combination with the bar, F, levers, I and I', for the purposes and substantially as herein set forth.

Third, I also claim the arrangement of the levers, I' and R, for the purpose of elevating and lowering the plows, substantially as herein described.

58,725.—Buckle.—O. L. Hopson, Waterbury, Conn., and H. P. Brooks, Wolcottville, Conn., assignors to the Turner & Clark Manufacturing Co., of the latter place.

We claim, First, The buckle frame, formed with double bends in the sides, between the main portion and the loop, one portion of said double bend at each side of the frame, forming the axis for the tongue, substantially as specified.

Second, We claim the wire tongue formed with eyes, connected by the central portion of the wire, in combination with the aforesaid buckle frame, having double bends in its sides, substantially as set forth.

58,726.—Sawing Machine.—Jerome Hoyt (assignor to himself, Edwin Hoyt and Lafayette Farrington), Stamford, Conn.

In sawing machines I claim the combination of the grooved uprights, a a, sliding frame, B, saw frame, D, guides, i j, spring pawl, H', and rack, J, when arranged and operating substantially as described for the purpose specified.

58,727.—Apparatus for Generating Steam.—Elias S. Hutchinson (assignor to himself and Hugh L. McAvoy), Baltimore, Md.

I claim, First, The combination of an air-forcing apparatus and carburetor, with the engine and the boiler, for the purpose described.

Second, In combination with the engine, air-forcing apparatus, carburetor, and boiler, I claim the chamber for reserve of compressed air, as and for the purpse described.

Third, I claim the boiler tubes, constructed with a spherical or equivalent enlargement, as and for the purpose described.

58,728.—Solder-casting Machine.—E. M. Long, Portland, Me., assignor to himself and Isaiah Gilman.

I claim, First, The combination and arrangement of the balance wheel, A, geared wheels, B and C, and mold, D, substantially as set forth.

Second, The combination and arrangement of the receptacle, E, and cooler mold, D, or their equivalents.

Third, The combination of the receptacle, E, bar, h, joint, f, uprights, m and n, arranged in the manner and for the purposes described.

58,729.—Barrel Machine.—P. H. Lawler, Rochester, N. Y., assignor to himself and D. W. Roche.

I claim, First, Hanging the clamping frame, F, upon an axis arranged diagonally with relation to that of the clamping collars, and parallel with relation to that of the saw, as and for the purposes set forth.

Second, The arrangement of the adjustable tappet bar or cam, m, with the pin, n, substantially in the manner and for the purposes shown and described.

Third, The arrangement with the sliding mandrel, I, in the swinging frame, F, of the spring, s, the pivoted lever, N, and cam, M, substantially as shown and for the purposes set forth.

58,730.—Machine for Pointing Wire.—Eli J. Manville, Waterbury, Conn., assignor to O. L. Hopson and H. P. Brooks, Litchfield, Conn.

I claim, First, The shaft, a, formed with a cross mortise or slot, containing the dies, c c, in combination with two or more pairs of toggle blocks around the said shaft, said pairs of toggles acting alternately upon the dies, in the manner substantially as set forth.

Second, I claim the conical or tapering pointed screws, i i, in combination with the cap, f, dies, c, shaft, a, and toggle blocks, d d, all arranged as and for the purposes set forth.

58,731.—Gas Meter Register.—William McDonald (assignor to himself, Donald McDonald, and Noel E. Sisson), Albany, N. Y.

I claim, First, One or more intermediate wheels employed to communicate motion from the measuring bellows to the registering wheels, and so connected to the latter that either a forward or backward motion of the intermediate wheel or wheels will communicate a forward motion to the registering wheels.

Second, The arrangement and combination of the wheels, F and G, when constructed and operating in conjunction with the wheels, A B C D and E, substantially as and for the purposes set forth.

58,732.—Fountain Pen.—George R. Metten, St. Louis, Mo., assignor to Horace Baldwin, Painesville, Ohio.

First, I claim in atmospheric fountain pens, causing an automatic flow of ink by reason of the act of writing, substantially as described.

Second, I claim in atmospheric fountain pens supplying the place of the ink discharged from the ink reservoir with air during and by reason of the act of writing, substantially as described.

Third, I claim so constructing a fountain pen that the act of writing will open and close a vent hole for the admission of air into the ink reservoir, substantially as described.

Fourth, I claim so constructing a fountain pen that the amount of ink discharged from the ink reservoir, and the amount of air admitted therein, shall be in proportion to the stroke of the pen, whether light or heavy, substantially as described.

Fifth, I claim attaching the pen, g, to an oscillating or hinged disk, c, substantially as and for the purposes described.

Sixth, I claim the rod, k, in combination with the disk, c, substantially as and for the purpose described.

Seventh, I claim the spring, n, and cushion, n', in combination with the rod, k, substantially as and for the purpose described.

58,733.—Manufacture of Japanned Leather.—Jeremiah L. Newton, Boston, Mass., assignor to himself and William Wickersham.

I claim, First, The treatment of raw hide with japan varnish, or other suitable varnish, as and for the purpose above set forth.

Second, The preparatory process by immersing the hide in some volatile substance, in combination with and preparatory for japan varnishing, substantially as above set forth.

Third, The subjecting of raw hides to a breaking process as a preparation for and in combination with japanning, all substantially as described and for the purposes set forth.

58,734.—Ladder Hook.—Joseph G. Rockwell, Cortland, N. Y., assignor to Calvin Eaton, Webster, N. Y.

I claim the extension ladder hook, constructed and operating substantially as shown and described, and for the purposes herein set forth.

58,735.—Water Meter.—Gerard Sickels, Boston, Mass., assignor to himself, James W. Preston, and Rufus S. Lewis.

I claim, First, Operating the valves by means of two sliding yokes in connection with a weight, or its equivalent, substantially in the manner herein set forth.

Second, I claim the sliding yoke, B, attached to the pistons, and provided with the wedge-shaped projection, E, or their equivalent, for the purpose of changing the position of the valves, substantially as and for the purpose set forth.

Third, I claim the yoke, C, provided with the horns or projections, b b, as and for the purpose set forth.

Fourth, I claim the weight, H, or its equivalent, in combination with the inclines, D, as and for the purpose specified.

Fifth, I claim the combination of the yoke, C, with the levers, F, and valves, s, as and for the purpose set forth.

Sixth, I claim the combination of the yoke, B, the yoke, C, levers, F, valves, s, and weight, H, or its equivalent, when operating substantially as and for the purpose specified.

58,736.—Dumping Car for Coal Mines.—M. G. Smith and William P. Stevens (assignors to M. G. Smith), Kingston, Pa.

We claim, First, The tilting or adjustable guides, G' G', constructed and operating substantially as shown an described.

Second, The use of the fan, J, or its equivalent, for the purpose of tilting or inclining self-dumping carriages, so as to dump or unload the car without removing it from the carriage while slacking off, substantially as herein shown and described.

Third, The combination of a fan or support, with the adjustable guides, substantially as herein shown and described.

Fourth, The combination of the weighted arm, L, with the fan, a, or support, substantially as herein shown and described.

Fifth, The combination of the dog, N, with the weighted lever, L, and fan, J, substantially as herein shown and described.

Sixth, The combination of the hook, n, with the arm, L, and fan, J, substantially as herein shown and described.

Seventh, The combination of the latch, S, with the arm, L, substantially in the manner herein shown and described.

Eighth, The combination of the bar, O, and arm, P, with the fan, J, and guide, G', substantially as and for the purpose herein shown and described.

58,737.—Magazine Fire-arm.—Christopher M. Spencer (assignor to Spencer Repeating Rifle Company), Boston, Mass.

I claim the combination of the forked cartridge guide, m, with the stop, s, in the face of the carrier block, for the purpose of arresting the movement of the latter at the proper point for the introduction of a cartridge, substantially as set forth.

58,738.—Magazine Fire-arm.—Christopher M. Spencer (assignor to Spencer Repeating Rifle Company), Boston, Mass.

I claim controlling the action of the shell drawer and of the carrier block by means of the swinging stop, z, in combination with the cartridge guide, m, in the manner set forth, for the purpose of converting the arm from a self-loader into a hand-loader, or vice versa, as described.

58,739.—Anti-friction Device for the Axles of Machinery.—N. Bailly and C. Durand, France, G. H. Mesnard and Z. Pozier, Eng.

We claim the combination and arrangement of the several parts for the production of an anti-friction bearing for rotating shafts, substantially as herein set forth.

58,740.—Ship Windlass.—William Goodman, St. John, N. B.

I claim, First, The cam, F, loose on the capstan spindle, in combination with the coupling ring or collar, D, whereby the cam is connected with the spindle, substantially as described.

Second, I also claim the coupling collar, D, made with lateral teeth, E, and vertical teeth, Q, substantially as described.

Third, I also claim the combination of the revolving cam, F, with the pawl arms, I, substantially as described.

Fourth, I also claim the combination of the grooved upper collar, G, of the cam, with the teeth, E and Q, of the coupling collar, and the keys, S, substantially as described.

58,741.—Car Wheel.—Richard C. Mansell, Ashford, Eng.

I claim the exclusive use, as of my invention, of the improvements in the construction of wheels for engines and vehicles used on railways, by the adaptation and application thereto of retaining rings or tire fastenings, formed with outer flanges to support the part of tires which project over the sides of the bodies of wheels, and also the exclusive use of the adaptation and application to wheels of retaining rings or tire fastenings, made from flat bars of metal, the whole substantially as herein set forth, described and illustrated in and by the annexed sheet of drawings.

58,742.—Construction of Ships.—John Weems, Johnstone, England. Patented in England November 20, 1865.

I claim obtaining and distributing buoyancy or weight in ships by regulating a pressure of air or other fluid on the water in which they float, substantially as herein described.

Also the removal of parasites from ships' bottoms after the manner hereinbefore described.

58,743.—Application of Rudders to Spindle-shaped Hulls.—William Louis and Thomas Winans, London, England. Patented in England December 8, 1863.

We claim, First, The rudders, d, placed between the brackets, c, and the midship of the spindle-shaped hull, its leaves occupying respective sides of the single propeller shaft, substantially as described, for the purpose specified.

Second, The central rudder, d, placed between the brackets, c, and the midship of the spindle-shaped hull, when arranged with more than one propeller shaft, substantially as described for the purpose specified.

58,744.—Propeller.—William Louis and Thomas Winans, London, Eng. Patented in England June 20, 1863.

We claim, First, The adaptation to and combination with a spindle-shaped vessel, such as was invented by Ross and Thomas Winans, and for which Letters Patent were granted to them Oct. 26, 1858, No. 21,917, of one screw propeller placed at one end of the vessel, with its shaft coinciding with the center line or longitudinal axis of the vessel, or nearly so, the outside diameter of the hub of the propeller at one end corresponding with the outside diameter of the end of the vessel, and the other end of the propeller hub being continued to a point, thereby completing the spindle form of the vessel.

Second, The combination of the flanged hub, f, shaft, d, webs, f f', projection, h, propelling blades, i, and feathers, i i, arranged with the grooved portion, b, of the body, a, of the spindle-shaped hull herein described, substantially as and for the purpose specified.

REISSUES.

2,372.—Cooking Stove.—James Spear, Philadelphia, Pa. Patented Feb. 19, 1861. (Div. A.)

I claim the combination of the sifting and ash drawer, A and B, with the curved or guide plate, D, when used in connection with a stove or range, in which the oven extends under the fire-grate.

2,373.—Cooking Stove.—James Spear, Philadelphia, Pa. Patented Feb. 19, 1861. (Div. B.)

I claim the arrangement of the ash drawer, B, having bail, G combined therewith in an ash pit or chamber of a stove or range, and in combination with the fire grate or fire chamber thereof, so as to receive the ashes or cinders falling therefrom, and thereafter to be removed, substantially as described.

2,374.—Cooking Stove.—James Spear, Philadelphia, Pa. Patented Feb. 19, 1861. (Div. C.)

I claim the arrangement of an ash pit under the hearth, and in front of a long oven stove, constructed and operating substantially as described.

DESIGNS.

2,487 and 2,488.—Trade Mark.—John W. Carrol Lynchburg, Va. Two Cases.

2,489.—Trade Mark.—William Freudenau (assignor to the Union Steam Mill Company), St. Louis, Mo.

2,490.—Drapery Trimming.—Catholina Lambert, New York City.

2,491 and 2,492.—Shawl Border.—Morris M. Peyser, Boston, Mass. Two Cases.

2,493.—Child's Long Comb.—Leonce Picot, Hoboken, N. J., assignor to the Rubber Clothing Company, New York City.

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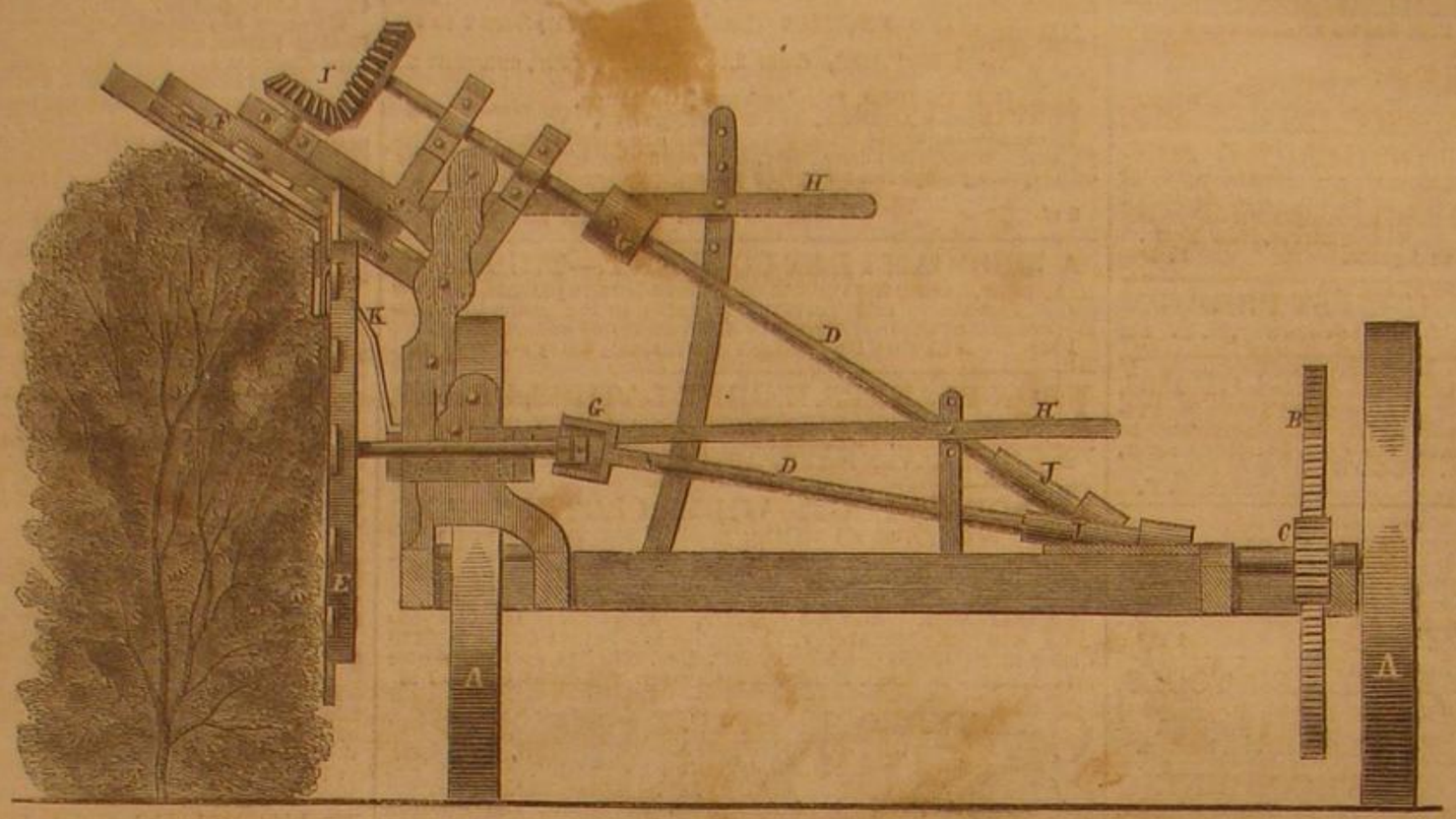
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15 4] Lehigh Valley Brass Works, Bethlehem, Pa.

Improved Hedge Trimmer.

In England the hedge, or "live fence," has been the favorite means of inclosing farm lands for many generations. The hedge forms a beautiful feature in the landscape, and, when attended to, is impervious not only to cattle, but to most of the smaller animals. The increasing value of land in England has, however, drawn attention to the necessity of substituting a fence requiring less room and casting less shade. In our Western prairies no necessity exists for thus carefully preserving every foot of arable soil, and the Osage orange, and other closely-growing shrubs, are utilized as fences.—The principal objection to them is the care required to keep them properly trimmed, so that they shall be induced to confine their growth to the limits best calculated to insure an impenetrable barrier. This work is now done by hand, but the improvement herewith illustrated, contemplates a revolution in this department of Western farm work. The engraving represents a frame carried upon two wheels, A, the treads of which may be corrugated to insure their rotation. The apparatus may be drawn by horses, attached to a tongue and axle which has two wheels, not shown. To the main shaft, which carries the two wheels on which the body of the machine rests, is secured a large gear, B, which drives two pinions, C, one on each side. These give motion to the shafts, D, one of which carries the vertical cutter head, E, and the other the oblique cutter head, F. The shafts, D, are jointed at G, by Baylor's universal joint, so that any angle desired may be given the cutter heads by means of the levers, H. The head, F, is revolved by the intervention of two bevel gears, I. Sleeves, J, which are adjustable, allow of the extension or contraction of the shafts, D. By means of a fixed disk outside the heads, E and F, which carry cutters corresponding with those on the revolving heads, the knives operate similar to the blades of scissors. A guide, K, passes out and in front of the cutting heads, which serves to bring every twig under the operation of the blades.

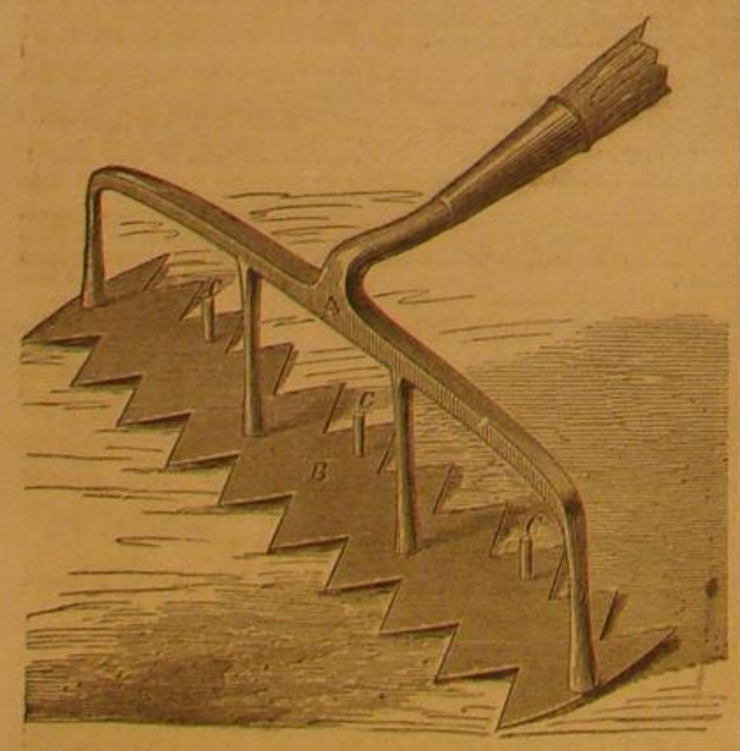
Where, as at the West, vast fields, on nearly level ground, are under cultivation, it seems as though this machine might be used to advantage. It was patented through the Scientific American Patent Agency, March 6, 1866, by David Oliver, whom address, Box 572, Galesburg, Ill., for additional particulars.



OLIVER'S HEDGE TRIMMER.

ALLEN'S WEEDING OR SCUFFLE HOE.

Few farm or garden crops require more thorough culture than onions, carrots, beets, etc., which are usually planted in drills. While growing they must be kept free from weeds if the farmer intends to get a decent crop. The simple implement here shown will commend itself to every practical farmer and gardener as an efficient and handy article. The frame, A, is of wrought or malleable iron, the supports being lozenge-shaped across their transverse section, to act as pulverizers and looseners of the soil. To them is attached a steel blade, B, having serrated teeth sharpened from the under side. Pins, C, project from the upper side to catch the weeds and also to loosen the soil. They can pass through, if desired, to more effectually subserve this purpose. By having the teeth formed like those of a saw they are less liable to become dull. They cut the weeds, and the end supports serve as guides in working close to the rows.



Patented through the Scientific American Patent Agency, April 24, 1866, by George P. Allen, Woodbury, Conn. Address as above for further information.

GSCHWIND AND GRETHER'S COMBINATION HOOK AND HOLDER.

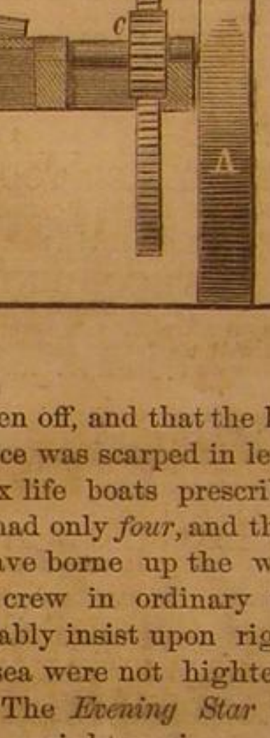
This neat little implement may be called the traveler's convenience. It combines a cigar holder, hat hook, and toothpick, in a neat, portable and handy form. The engraving exhibits it of full size. It is made of brass gilded, or any other metal. The ornamental jaws, A, are hinged at the other extremity, and are held open by the spring of the metal passing round the pivot at B. An embracing clasp, C, can be slipped down the shank, when the two jaws are brought together, and grasping a hat, cap, or other article, it can be hung to the wall by means of the hook, D. Pivoted to the rivet, B, is an ivory toothpick, E, and a metallic one, F. When used as a cigar holder the springs inside the bow, at G, embrace the weed, while the ring, H, is worn on the finger.—The toothpick blades close into recesses in the shank. It can be made small enough to be used by ladies for holding their sewing and also for fastening up the skirts of their dresses.



This ingenious device was patented through the Scientific American Patent Agency, Aug. 14, 1866, by Charles Gschwind and John Grether, Union Hill, North Hudson county, N. J., to whom apply for further information.

The late Marine Disasters.

The appalling wreck of the steamship *Evening Star* has been very generally commented upon by the local press, but no light has been thrown upon the cause of the disaster, though the owners of the vessel are very generally censured for the meager number and character of the life-boats in proportion to so large a body of passengers. The public have a right to a thorough investigation of all the facts connected with the disaster, and it is to be hoped that such investigation may lead to a searching scrutiny of the present system of inspection. It is stated by a morning contemporary that, about the month of July last, the *Evening Star* went ashore on the Florida Reef, from which she received considerable damage; that a hole was stove in her bottom, and her keel was partially broken off, and that the keel was then cut away, and a piece was scarped in level with the keel. In place of six life boats prescribed by law, it is said that she had only *four*, and that even these would scarcely have borne up the whole number of passengers and crew in ordinary weather. The public will probably insist upon rigid proof that the perils of the sea were not hightened by the defects alluded to. The *Evening Star* was a side-wheel steamer, with upright engines, and that she was considered by her owners a seaworthy vessel is inferred from the fact that, although valued at $500,000, she was uninsured.—*Shipping and Commercial List.*



THE Russian army numbers 1,135,915 men in addition to 119,540 Cossacks liable to serve.

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