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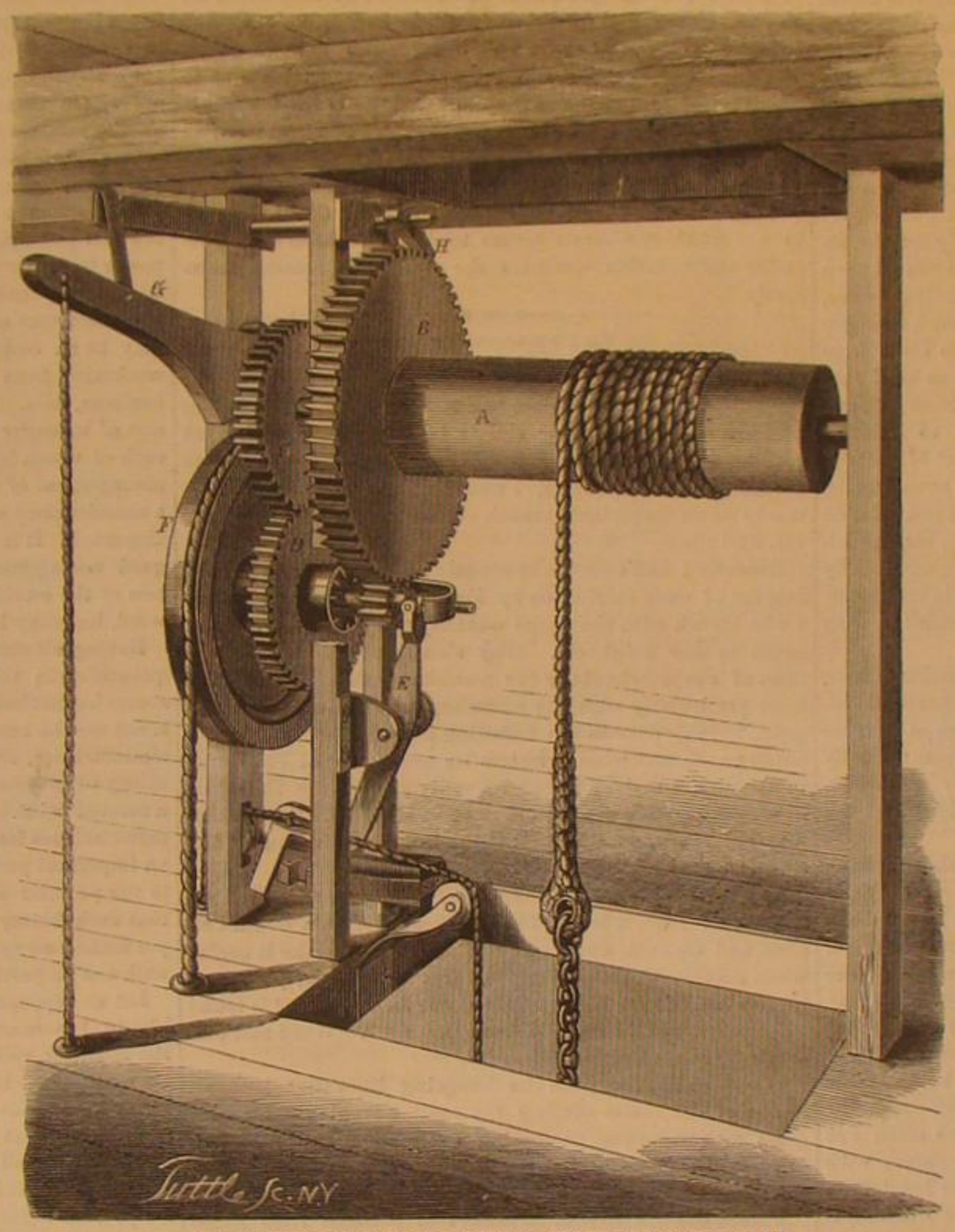
Hoisting Wheels for Warehouses, Etc.

The engraving represents the best hoisting wheel, we think, that has yet come under our observation. One of the annoyances of the ordinary hoist is that whatever the load to be raised, the speed is always the same, whereas a light load ought to be hoisted not only with less effort than a heavy weight but much more rapidly. This is what this hoisting apparatus does.

The beam, A, has secured to its shaft and moving with it, a large gear wheel, B, and a smaller gear wheel, C. This latter gears into the wheel, D, of the same number of teeth, which is loose on its shaft. Its hub is a gear with internal teeth, into which a pinion on the same shaft slides by means of the lever, E, working a clutch. The pinion is secured to the shaft by means of a feather and slot, as are ordinary clutches, so that while it can be slipped forward and back, in either position, its rotation secures the rotation of the shaft on which it works. It engages either with the large wheel, B, or with the smaller gear, D, according as the clutch is moved in one direction or another, or it may be held between the two, when the hoisting wheel, F, may be turned without moving any part of the machinery except the shaft on which it is fixed.

When, as in the engraving, the pinion gears with the large wheel, B, it is evident that by working the wheel, F, by the hoisting rope, an immense leverage is obtained and the speed of the barrel, A, will be slow. This is the position for raising heavy weights. But when the weight to be raised is light, the pinion is shipped into the hub of D and locks that wheel to the shaft. Now, if power is applied to the hoisting rope, the barrel, A, will turn as fast as the wheel, F, because the size of the gears on either shaft is the same. It will thus be seen that articles of light weight may be raised with great rapidity, while a shifting of the clutch will instantly throw the machinery into gear for heavy work. As will be seen. this shifting is readily managed from any floor by means of the lines attached to the lever, E. The edges of the teeth of the wheel, B, the pinion, and the internal gear of D are brought to a V-edge to insure locking whenever the pinion is shipped. G is a brake and unlocking lever, by means of which a load can be lowered. By pulling upon the line attached to it, the pawl, H, is lifted and the wheel, B, with the barrel, A, allowed to turn, while the velocity of their revolution may be regulated by the brake.



McMURTRY'S IMPROVED HOISTING WHEEL.

This hoisting apparatus has been in use for over seven years and has received the highest testimonials from those who have used it. It was patented by John McMurtry and is manufactured by S. H. Whitaker, 162 East Front street, Cincinnati, Ohio. For information relating to the invention, address John McMurtry, Lexington, Ky.

Improved Reamer.

The most expensive of the smaller tools used in machine shops is the reamer,and in a well managed shop no tools are so indispensable as a good set of standard sizes of reamers, enabling the workmen to keep a perfect uniformity of sizes of holes in the building of a number of machines of the same kind, and in various other uses where a similarity is required. Owing to this great expense, few shops are provided with them, above the smaller sizes, although just as much time might be saved by their use as in the smaller ones.

The engravings represent an article of manufacture which, at a trifling expense, will enable all shops to provide themselves with any sizes necessary for their work. It is a reamer made entirely of cast iron, excepting the cutters and shank,which are of steel. The manner of making them is simply this:—The steel for the cutters is cut off the required length and made dovetailing as represented in Fig. 2, or as the ordinary dovetail, which can be done in rolling the steel in bars, where a large number are made, placed in the mold, as is the shank, and the iron is allowed to flow through the mold uniting the steel and iron so firmly together that it is impossible to separate them. They are then turned off to nearly the size required, hardened, and again placed on centers and ground off to the size required. These reamers can be made any size, shape, or number of cutters desired, at a trifling expense over the price of common castings. They answer admirably for taper reamers for reaming large steam, gas, or water cocks, or for boring pullies by machinery, etc. The cast iron gives a firmness to the cutter which can not be obtained by simply using a cutter for the purpose of boring. They have been in use in a number of shops, made in a variety of shapes for different work, always giving good satisfaction.

Fig. 1.

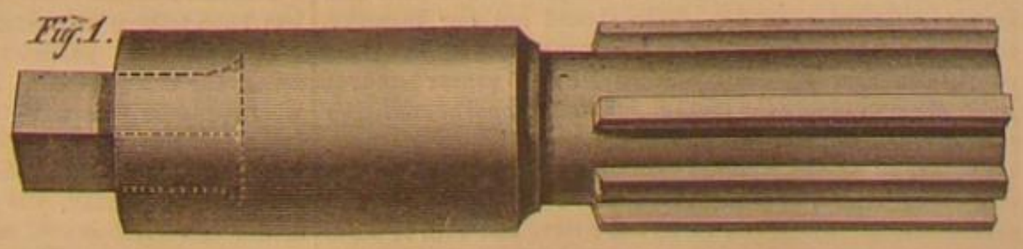


Fig. 2.

BURLINGAME'S REAMER.

This reamer was patented by W. Burlingame, Choate Mfg. Co., Exeter, N. H., through the Scientific American Patent Agency, Jan. 1, 1867. The patentee wishes to dispose of the entire right to manufacture them, and will furnish companies with samples at a reasonable price. State or shop rights for sale. For further information address as above.

ARTIFICIAL STONE FOR BUILDINGS.

For a number of years a Mr. Ransome of England has been experimenting in the manufacture of artificial building stone. From time to time an account has been published in these columns of his progress. In their issue of the 28th of June the *Engineering* gives the annexed interesting statement of the mode of manufacture, test of processes, etc. :—

If Mr. Ransome has not found the philosopher's stone, he has at least produced a stone worthy a philosopher, and which promises to become the stone of the ages. For it appears to have the elements of great durability, and it certainly possesses every other quality desirable in building stone, whether for structure or ornament. Although five years are not five centuries, chemistry has analyzed even the tooth of time, and can produce, within the period of a comparatively brief experiment, results identical with those of ages of atmospheric corrosion and disintegration. Mr. Ransome's stone has been boiled, and roasted, and frozen, and pickled in acids, and fumigated with foul gases, with no more effect than if it had been a boulder of granite or a chip of the blarney stone. It has been boiled and then immediately placed on ice, so as to freeze whatever water might have been absorbed, and it has been also roasted to redness, and then plunged in ice water, but without any sign of cracking or softening, superficially or otherwise. Nor does its durability rest alone upon such evidence as this, for it is of the simplest chemical composition; and chemistry and geology alike testify to the durability, if not the indestructibility, of a stone which is nearly all silica, like flint, and onyx, and agate, and jasper. It has no oxydizable constituent; for silica, or silicic acid, is already oxydized, and thus it is unalterable in air: and as the new stone is almost impermeable, it will suffer little, if any, injury from moisture or frost. We may, then, as the lawyers say, "admit" the durability—and if we insist upon further evidence, only posterity, say in the twentieth and twenty first centuries—can have the benefit of it, and no doubt Mr. Ransome will bequeath plenty of test blocks for their satisfaction—and the stone is everything else that can be desired of a building stone, or of a stone for external ornament, excepting, of course, that it does not polish.

And how marvellous, for its simplicity and beauty, is the process by which this stone is made! Some toiling mason or other, hewing in the quarry or in the builder's yard, must have wished, before now, that stone, like iron, might be melted, and run in molds, even though his own occupation were thus at an end. Did he ever, when by the sea shore or by a sand pit, think of cementing indissolubly together the countless millions of grains into solid rock? Mr. Ransome, no mason, however, unless he be, as he may be for any thingwe know, a member of the mystic brotherhood, did think of this. And he tried every cement he could lay his hands to, and did not succeed. The sand became little else than mortar by such sticking as he could effect. But he found out, at last —and we are speaking of a time more than twenty years ago —that the best sandstones were held together by silicate of lime. And so he set himself to work to produce this substance, indirectly, from flints, of which plenty could be found for the purpose. But the flints had to be liquefied first, and how could this be done? Not by heat, nor would caustic soda touch them, so the chemists said. Flints might be boiled in a caustic solution for a week together, so long as the boiler was an open one, and lose very little by the operation. But by-and-by, Frederick Ransome made one of the most unexpected discoveries in chemistry, viz., that when boiled in a caustic solution, under pressure, flints would melt almost like tallow before the fire. But we are not about to give the long history of the invention. With flint soup, or silicate of soda as a liquid, the question was what other liquid would, in mixing with it, turn both into an enduring solid? What other liquid would turn both into silicate of lime—the substance he was seeking? When he found that chloride of calcium (in solution) would, when mixed with silicate of soda, turn both into flint, or something very much like it, the road was clear, and the manufacture of stone from sand was as simple and as beautiful a process as the making of Bessemer steel from pig iron by blowing air through it when in the melted state. Chloride of calcium had been chemically considered a very respectable married couple, known as Ca and Cl. There was a little bigamy attaching to silicate of soda, but the principal parties to the marriage were silicium and natrium, or Si and Na. But, as has happened before now with organic bodies, these inorganic couples, on their introduction to each other, at once ran away with each other's husbands and wives. Si, although still keeping his wife O, took Ca and became silicate of lime, while Cl and Na were, like Lot's wife, turned into salt, or chloride of sodium, for their wickedness.

The sand, a clean-grained, slightly brownish sort, just such as a dishonest grocer might select for increasing the gravity specific or otherwise, of his sugar, comes from near Maidstone. There is no end to the quantity of it, and we believe it costs less than 5s. a tun in the Thames. There are flints, enough for a hundred years to come, brought up from the chalk pits at Charlton; and the caustic soda and the chlorine of calcium, the latter a waste product of the soda manufacture, are bought of the wholesale chemists. The silicate of soda is made from the flints and caustic soda as follows: The flints are heaped upon iron gratings within a series of cylindrical digesters, of the material, size, and form, of small steam boilers. A solution of caustic soda is then added; the digester is then closed steam tight, and the contents are boiled by steam of 70 lb., taken from a neighboring boiler, and led through the solution in a coil of iron pipes. The solution of caustic soda is prepared of a specific gravity of about 1,200.° The flints are dissolved into "soluble glass," and are drawn off in that state, as a clear though imperfectly liquid substance, which is afterward evaporated to a treacly consistency and color, and of a specific gravity of 1,700.°

The sand is completely dried, at the rate of two tuns an hour, within a revolving cylinder, through which hot air is forced by a centrifugal fan. A small portion of finely ground carbonate of lime, say Kentish rag, or even chalk, is mixed with the sand, the more closely to fill the interstices; and each bushel of the mixture is then worked up in a loam mill, along with a gallon of the silicate of soda. Thoroughly mixed with this substance, the sand has a sticky coherence, sufficient to enable it to be molded to any form, and, when well rammed, to retain its shape, if very carefully handled. In this condition—molded, of course, and any thing that can be done in founder's loam may be done in this sand, sticky with silicate of soda—in this condition it is ready for the solution of chloride of calcium. The instant this is poured upon the molded sand, induration commences. In a minute or so, we hardened little lumps of sand, so slightly stuck together by the silicate of soda that we could hardly keep them from falling to pieces within the fingers, into pebbles so hard that they might be thrown against a wall without breaking, and only a short further saturation was necessary to indurate them throughout. In other words, on the instant of contact, the silicate of soda and the chloride of calcium mutually decompose each other, and reunite as silicate of lime and chloride of sodium, the former practically indestructible in air, the latter, common salt, perfectly deliquescent and removable by washing, although the stone, after the washing, is impermeable to water. Plaster of paris does not set quicker than silicate of soda and chloride of calcium.

The chloric solution is first ladled upon the molded sand, and, the hardening going on, the objects are afterward immersed in the solution itself, wherein large pieces are left for several hours, the solution being boiled in the open tanks by steam led through it in pipes. This expels any air which may have lodged in the stone, and possibly hightens the energy of union with the silicate.

After this the stone is placed, for a longer or shorter time, according to the size of the object, under a shower bath of cold water. This is not, by bathing, to convert it into Bath stone, although were the Bath stone a sandstone, instead of an oolitic formation, this name would do as well as any. The salt, or chloride of sodium, deposited throughout the interstices, is sought out and washed away, in brine, by the water, and were it not that a portion of undecomposed chloride of calcium was also washed out, this brine might be profitably evaporated for common salt. Now this searching out of the salt by the water would appear to prove that the stone was perfectly permeable, but, by one of those paradoxes with which chemistry abounds, the stone, when once freed from salt, is almost impermeable. The action is one which, if it can be explained at all, can only be explained as one of the phenomena of dialysis, as experimentally investigated by Professor Graham. There is no doubt whatever that salt has been deposited everywhere throughout the stone, no doubt that is is afterward completely washed out, and yet the stone as effectually resists the passage of water afterward as if it were granite or marble.

It is not necessary to describe the variety of objects that may be made in the new stone. It is practically a fictile manufacture, although not indurated by fire, and, unlike fictile goods, having no shrinkage or alteration of color in the making. Whatever the required size of the finished stone it is molded exactly to that size, with no allowance as in molding fire-clay goods or in pattern making for castings in iron. The heaviest blocks for works of stability, and the most elaborately ornamented capitals, tracery, or copies of statuary may be made with almost equal facility. For any purpose for which natural stone has ever been used for construction or architectural ornament, the artificial stone will fitly take its place. Mr. Fowler has used it extensively in the stations of the Metropolitan Railway; Messrs. Lucas Brothers have used it with success in various works; several manufacturers at Ipswich and elsewhere have the bed stones of their steam engines, steam hammers, oil mills, etc., formed of the new stone. Mr. Ransome has molded a large number of Ionic capitals for the New Zealand post office, and still more richly embellished capitals, modeled from those of the Erectheum at Athens, for public buildings at Calcutta, beside a great amount of decorative work for English architects.—*Engineering.*

Novel Lifeboat.

There is now in process of construction at the yard of G. W. Alexander, in Philadelphia, a lifeboat of the ordinary form with detaching apparatus, and a peculiarity which was wanting in all the boats exhibited before the Commissioners. However successful each of them promised to be in keeping afloat in the most troubled sea, not one of them in any way insured its passengers from being washed away or submerged by a sea breaking on or over. This last desideratum, and not the least important one, this novel invention claims to supply. The boat proper is arched over by a light metal skeleton rib-work stretching from gunwale to gunwale, and there secured. Upon this frame work is extended a double covering composed of canvas and india-rubber, firmly secured to the boat. The double covering is capable of inflation, and thus renders the entire structure extremely buoyant. An opening in the cover, three feet by four, admits the passengers. This opening is around the mast, and by a peculiar arrangement can be hermetically closed when passengers and crew have entered. The mast, which is of metal and hollow, is used as a ventilator, and in conjunction with a small fan of simple construction and easy operation, serves as the means of producing two currents of air—one of foul air generated in the boat when tenanted, and another of pure air to take its place.

It is claimed for this boat that when completed, it can be prepared for launching as rapidly as any other; that owing to its not careening when weighed upon on either side, passengers will enter with safety; that it is certain to fall with its load as it ought to do from the davits, and that when on the sea, however tempestuous, it will be impossible to swamp it, being water-proof above and below. It is to be propelled by oars, passed out through apertures, so constructed as to admit of no leakage, and an arrangement in the cover permits a look-out to the steersman. This novel boat, in which, if practice will bear out theory, passengers can be rescued from shipwreck and sustained through the worst weather for many days, will undergo a test down the bay in a short time, where a severe trial will be made of the peculiar and valuable qualities she claims to possess exclusively.

For the Scientific American.

FLINT GLASS MANUFACTURE.

Knowing the deep interest you take in the manufacturing business and the working classes in general and with what readiness you receive in your columns anything tending to ameliorate their position, I would submit to you a few remarks on an important branch of our national manufacture viz. flint glass.

Recently I had occasion to consult a document showing the amount of trade carried on by France with Chili and Brazil. I was struck with the large quantity of glass that country sends to our neighbors. Why should it be so? Is it the fault of our merchants or our manufacturers? The fault is more particularly with our manufacturers and we will try to prove our assertion in the following lines:

Let us see first what resources we possess. We have sand in abundance and of the first quality such as the Berkshire in Massachusetts and St. Genevieve in Missouri. Sand is also found in Virginia fully equal to the Berkshire, in South Carolina, Georgia, Alabama etc.

As to fire clay, besides the superior quality found in Cheltenham in Missouri, it is found in Kentucky, Virginia, South Carolina and Georgia, awaiting skillful hands to make it useful, when manufacturers will get so far over their prejudices as to give it a fair trial. Potash is at our door and lead is found in abundance in Missouri, Illinois, Iowa, etc. Wood and coal is plenty in several localities.

It will be noticed from the foregoing lines that Missouri is one of the states offering the most advantages for flint glass manufacturing, containing every material needed and in sufficient quantity to furnish glass to the United States, for centuries to come.

France has but little or no lead, it is brought from Spain and England: Potash is sent from this country: Sand is scarce and of inferior quality compared with that found in this country: Fire clay is dear as well as coal and wood.

What is there wanting to enable manufacturers here to compete with the French in supplying markets at our door? If we consult manufacturers they will say that labor is much higher here than in Europe; this is true, but nature has given us advantages that more than offset this difference.

The fault in our opinion is to be found somewhere else. First our wares are as a general thing too heavy and clumsy: moreover they are not in accordance with the taste of other countries, such as Brazil, Chili etc., where light and tasty wares richly cut are better appreciated. Our wares necessitate a large quantity of glass, fully double of what would be required in France for the same purpose. It is established here beyond a doubt that French manufacturers have kept their superiority in this style of wares, and know how to take advantage of it by having styles adapted to the taste and uses of different countries. Why should not our manufacturers do the same? Workmen here are not inferior to those of Europe, they are only waiting for the proper hands to guide them to obtain the same result, and moreover our heavy clumsy wares are an imposition and a tax on our consumers who have to pay for a large quantity of materials of no use to them whatever, this however yielded no larger profit to manufacturer. What can we do but grieve and bear it when we have no choice and a prohibitory tariff is now in force to protect a branch of manufacture in existence in this country for a number of years. In consequence, manufacturers are nearly entirely indifferent in adopting means to improve their business.

The principal fault is in the management: our want of system and control in order to remedy abuses, and in a word, in a wrong application of the productive forces.

In France the management is always entrusted to the hands of a superintendent capable of managing every branch of the factory, and under his immediate orders are placed the subaltern employés. It is indispensible for him to know every particular in manufacturing, from the buying of the materials up to the sale of the wares. It is evident that no one better than himself is able to establish cost prices. It is well to note here that the cost price of an article is of more importance than the price of sale, as competition can only be overcome by reducing the former. Cost price therefore, is the thermometer of the manufacturer; it shows him whether he is able to maintain competition, shows him the reasonable limit to which it ought to go; it is by its agency that an approaching failure in business is foretold.

French workmen in glass manufactories are paid as follows.—They have stated wages, varying according to the intellectual capacity and skill of each, but the cost price, of each article is ascertained before hand from an average taken of the quantity made by each set of hands, and if subsequently the amount of work performed exceeds in value the amount of wages paid, the amount of this excess is distributed among each set of hands according to a certain pro rata, in the shape of extra compensation, thus stimulating the workmen to do their best for their own interest and that of their employer; for this reason they would not suffer the management to remain in the hands of incompetent parties who would be impediments in the way of their interest. Glass blowers moreover, are well paid and well thought of in France. Besides their ample pecuniary remuneration they are certain to possess the esteem of their managers who can appreciate their capacity. This is one of the surest stimulants to increased production.

Flint-glass manufacturies excepting a few in this country, are generally managed as follows. Often times the manager of the factory is an individual who is completely ignorant of the first principles of the business, he therefore delegates his power to a foreman who may be better acquainted with intrigue than with the practical knowledge required of him, he is therefore at the mercy of his hands. At other times it may be an ex-blower who, though he may be an excellent workman, from the want of a general knowledge of the business, fails. In either case it follows that each hand is a sort of manager from the pot maker to the man at the grates, each of whom is supposed to have a deliberative voice in the management of the establishment. In such a state of things a consciencious and skillfull workman becomes indifferent and disgusted. It is a self evident truth that where order and good management reigns, every one contributes to the success of the establishment with his good will and skill; in a word, harmony is pleasing to all.

Having alluded to fire clay, above, being found in large quantities in this country let me say why this immense resource has not been made as useful as it should have been. Were it not for the intelligent discrimination manifested by a glass manufacturer, now of Philadelphia, Mr. W. T. Gillender, the utility of Missouri clay for pot making would be to this day a mooted point. Each glass manufacturer as is well known, manufactures its own pots for melting, and the pot maker is an important personage, at least in his own estimation, owing to the peculiar state of things existing. It is a noted fact that each factory pretends to have the best pots and the best pot maker, an opinion easily formed by those not acquainted with the properties of fire clay.

Let us suppose that clay is given to a pot maker, keeping him in ignorance of where it comes from, in order to avoid the splitting rock of his prejudices. Let him make a pot in his usual way. If the pot is not successful, he having learned his trade in the old routine, it is useless to seek a remedy from him, for let him tread out of his usual circle, he is lost and will not fail to charge the failure to the bad quality of the clay, and as I said before, his all-powerful opinion will shape that of his employer. The success of a factory depending especially on the good quality of pots, care should be taken and researches made by the manufacturer to attain the utmost perfection in this important branch instead of being dependent upon ignorant pot makers. This would not happen if the manager was well acquainted with this business; the success of this branch would depend upon him entirely. American clay properly prepared and well proportioned without addition of any other clay, is capable of making as good pots as those made from clay brought from Europe at great expense. J. P. COLNE

Washington, D. C.

Correspondence.

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

A Mechanical Question.

MESSRS. EDITORS:—A gentleman in this section of country has been testing the draft of different wheel carriages to ascertain the most perfect construction that can be made to secure the ease of draft. His experiments show that 100 lbs. weight can be drawn up an inclined plane that rises four and a half inches in four feet, with 8 lbs. and 14 ounces draft and he expects to make the draft a few ounces less.

Be that as it may, the present development is a contradiction of correctness of scientific formulas upon which calculations are made. Not taking into account any allowance for friction, the formulas say that power is gained in proportion to the increased space through which it moves over that of the object moved.

According to the theory, four and a-half inches are contained in four feet, 10 and a little over $\frac{1}{10}$ times, which amount of hight the 100 lbs. weight is lifted, in moving four feet horizontally. Now if we divide the 100 lbs. lifted, by the draft of 8 lbs. and 14 ounces, it will be found that the draft is contained in the weight 11 and a little over $\frac{1}{10}$ times.

As much as 11 and $\frac{1}{10}$ is less than 10 and $\frac{7}{10}$ of 100, that much he has gained in power over what the popular theories in science says he could have gained, by the mechanical power up an inclined plane, added to this, he has gained the full amount of power that necessarily must be lost by friction Can you or any of your scientific correspondents explain this matter?

The gentleman alluded to, says that theories of science are wrong about not being able to create power by the application of the lever, and that the idea of creating power by moving through a greater space is only a coincident that attends the lever power by which it can be mathematically calculated. That it does not by any means follow that a gain of power is a necessary result of moving through a greater space. That an erroneous idea of the wedge being a mechanical power that could be mathematically calculated the same as the lever, has grown out of this mistaken theory.

To those who are disposed to treat his theory with contempt he can produce the ocular demonstration of the fact above stated, which to the practical man is much more important than fine spun theories. H. H.

Berlin, Wis.

[We see nothing strange in moving 100 lbs. four feet up an incline of four and a quarter inches by the weight of 8 lbs. 14 oz. provided the lesser weight is allowed space enough, an element which seems to have entirely escaped the attention of our correspondent. Is he not unnecessarily exercising himself about a problem which is solved every day in many ways?—[EDS.

Cleaning Marble.

MESSRS. EDITORS:—It may be of some value to telegraph operators, who have marble-based instruments and housekeepers who have marble-top furniture, to know that a common solution of gum arabic is an excellent absorbent and will remove dirt, etc., from marble.

First, brush the dust off the piece to be cleaned, then apply with a brush a good coat of gum arabic,about the consistency of thick office mucilage, expose it to the sun or dry wind, or both. In a short time it will crack and peel off. If all the gum should not peel off, wash it with clean water and a clean cloth. Of course, if the first application does not have the desired effect it should be applied again. C. G. F.

La Grange, Ky.

The Time Extended for Obtaining Patents in New Brunswick.

GENTLEMEN:—We forward you herewith notices of the granting of Letters Patent, to two of your clients, in the Province of New Brunswick. The new Patent Law for the entire Dominion will not come in force until after the meeting of the general Parliament some time during the coming Fall. In the meantime, by proclamation of the Governor General, under date of 1st of July, the present Lieut. governors of the Provinces are to hold office until further orders, and all existing laws to remain in force until repealed by new laws. The privilege of granting patents in New Brunswick, to foreign citizens, therefore still holds good, and will continue so until the passage of the new law. Any of your clients who may be desirous of securing their inventions, have therefore a few months left in which to do so. Of the provisions of the new law when passed, with reference to granting Letters Patent to foreigners, we have no certainty. Your clients had better take advantages of the present liberal law of New Brunswick, while the same is in force.

Your ob't serv't, L.

MESSRS. MUNN & Co., NEW YORK.

[Inventors desiring to avail themselves of the limited opportunity of obtaining patents in New Brunswick can have the business transacted through this office. Full information given on application to Munn & Co., office SCIENTIFIC AMERICAN 37 Park Row, N. Y.—EDS.

Delay at the Patent Office.

MESSRS. EDITORS:—Your appeals to the Commissioner of Patents to devise means so as to work up the accumulated business of the office, are well timed and just. As inventors pay the expenses of the concern, it is but just to them that promptness and dispatch should characterize the business transactions of the Patent Office. I have had a claim pending five months. How much longer I must wait remains to be seen. In a former patent I was twelve months in getting through to a finality. In reflecting over the delay I concluded that the efficiency of the attorney employed has much to do with the case. Having several more inventions for which I design making application for patents I have concluded, when I am ready, to try the editors of the SCIENTIFIC AMERICAN.

Some time ago I saw a notice of an invention to make glass from native ore, which the statement said had the tenacity of cast iron. Can you tell where it is made and the address of the manufacturers?

In a late number of your journal I see an article on the uses to which paper can be applied. Among them is that of making water tanks and pipes. If that branch is a success could it be used to advantage in the construction of pumps, that is, pump tubing? If so I would like to correspond with papier maché manufacturers. JOHN W. SHEAFFER.

Sterling, Ill.

[The inventors will be moved to hold an indignation meeting if a reform is not brought about pretty soon. The Patent Office was not established to yield a revenue to the government, and now when there is a surplus of money, it is a shame that it should be crippled in its efficiency.

The publication of our correspondent's inquiries will probably bring him in communication with the parties he desires to know.—EDS

Science Familiarly Illustrated.

Ventilation.

Look at an asthmatic sitting before an open window, regardless of the cold, though it be winter, with his chest heaving laboriously and his countenance expressive of exquisite anguish. What is the matter? Is he in pain? No. What, then, is the distress? It is simply from want of a due supply of fresh air. The spasm in his lungs not only prevents the free admission of air from without, but the free egress of that which is within, so that the air which is in the lungs is a mixture of foul and good air.

When so many died in the famous Black Hole at Calcutta, it was because the pure air was so shut out that they could not even get as much as the asthmatic does.

Here we have palpable results, and they startle us; and yet we may be suffering from day to day, in so small a way as to be imperceptible, the evil results of a deficiency of air, which may so accumulate as to impair the health, and even perhaps ultimately destroy life. It is only a few that occasionally lose their lives suddenly from want of air, but a comparatively slight but continuous deficiency in its supply is constantly destroying vast multitudes by a slow poisoning.

A good supply of fresh air is an imperative necessity. Such a supply it is easy to get when we are out of doors; but we do not get it when we are indoors unless we make special provision for it—or, in other words, unless we take measures to secure ventilation.

A proper supply of pure air in our habitations and places of public meeting *costs something*, at least in cold weather. That is the chief difficulty. Economy is in the way. Less fuel is required with defective than with proper ventilation.

A small room closely shut up is warmed at less expense than a large room with suitable inlets for fresh air, and outlets for foul.

The necessity for freeness in ventilation may be seen if we look at the amount of fresh air required for consumption. Each person requires a gallon every minute, that is fourteen hundred and forty gallons in twenty-four hours. It is easy to see that small and closely shut-up apartments, and large gatherings of people in public buildings, as they are ordinarily constructed, are incompatible with any such supply as this.

That you may see clearly what the necessity for ventilation is, observe what the lungs actually do with the air which they receive.

Pure air is composed of three gases, in certain proportions: oxygen, nitrogen, and carbonic acid; this latter being in very small quantity. These proportions are altered in the lungs, so that the air which is breathed out is different from that which is breathed in. It has less of oxygen and more of carbonic acid.

It is less vivifying by the loss of oxygen—that is, is thus negatively injured—and it has also acquired a positively bad character by the increase of the carbonic acid. Much increase of this renders the air palpably poisonous.

If, therefore, there be great lack of ventilation, as there often is in small rooms in dwellings, or in crowded public assemblies, much injury is done to the health by the diminution of vigor from the loss of oxygen, and by the direct poisonous influence of the added carbonic acid.

And if the exposure of these deleterious influences be frequent, there will inevitably be an accumulation of evil results, seen in a broken-down system, in positive disease, and at length in death.

Observe what provision is made in nature for the constant purification of the air, and how this is often more or less defeated by the arrangements of man. As oxygen is taken up in the lungs of all animals, and carbonic acid gas is sent forth from them, breathing is continually deteriorating the air. But this is remedied by a counter operation.

Every leaf that you see is doing just the opposite of what lungs do—it takes in carbonic acid and emits oxygen—so that there is an exchange going on between leaves and lungs. In this way the due proportion of the ingredients of the air is everywhere maintained, so that if the chemist examines air taken from various quarters of the earth, he always finds precisely the same proportions.

But this is true only of air that is free, and not of that which is shut up where there are sources of contamination. Wherever there is breathing going on, if ventilation be not properly attended to, there is a want of these natural proportions, and the deterioration is increased by fires and lights, for they, like lungs, use up oxygen, and return carbonic acid to the air.

There is still another important provision for the purification of air.

The three ingredients of the air are not of the same specific gravity. The carbonic acid gas is decidedly heavier than the oxygen and nitrogen, and therefore has a tendency to lie below them, as water lies below oil.

Now if this tendency were not obviated in some way, the carbonic acid, generated from lungs and fires and various decompositions, would accumulate all over the surface of the earth, pushing up the oxygen and nitrogen above it as water does oil, and would destroy life, and put out fires everywhere.

But this tendency is obviated by another—the tendency of gases to mingle together. It is just as the heavier water does not remain below the lighter alcohol poured upon it, but mixes with it. Agitation promotes this mingling, and therefore, in ventilation, the communication of motion to the air is an important measure, and should be accomplished so far as it can be done, without inconvenience.

There are other deleterious gases besides carbonic acid, produced in various ways, indoors and without, that are carried off by this same mingling and diluting process; but of these we will not speak, the carbonic acid being the most important.—*London Herald.*

London.

The growth of the town since the happy year when Londoners learned how, with proper accuracy, to count their own noses, presents us a record full of interest, and at the same time to us full of wholesome admonition to cultivate a grace rarely found in America—urban modesty.

In 1801 the population of London was	-	-	864,845
In 1811	"	"	- - 1,009,546
In 1821	"	"	- - 1,225,694
In 1831	"	"	- - 1,474,069
In 1841	"	"	- - 1,873,676
In 1851	"	"	- - 2,363,141
In 1861	"	"	- - 2,803,034

Taking the last census in each country as the standard of comparison, it appears that during the ten years preceding 1861 London added to itself a new city one half the size of New York, more than twice the size of Baltimore, nearly three times the size of Boston, more than three times the size of Cincinnati or St. Louis, and more than four times the size of Chicago. If the eight cities of Buffalo, Rochester, Albany, Pittsburg, Newark, Providence, Portland, and Milwaukee had been taken up bodily in 1861, put on shipboard, conveyed across the Atlantic, and deposited on the fringe of the skirts of London, they, with their united populations, would not have added to London so much as London quietly added to itself during the previous decennial period. Every twelve months a new city springs into being along the globous verge of London equal to the city of Cleveland.

Several years ago the metropolis, like some fabulous Cyclops, sprawled out upon its couch of 78,000 acres; but the original *city*, the venerable parent of this gigantean monster, is still content with that pigmy bed of 723 acres on which it has reposed for a thousand years. The *city*, though so small, is still the center of the trading, financial, and journalistic life of London, and has, it seems, a day population of 283,520 souls, and a night population of only 113,387 souls. Thus, every morning there come rushing into the city from suburb and rural cottage and country villa, to toil and get rich within the narrow walls of the old city, 170,133 persons, while there are 509,611 customers and clients who enter the city every day to deal with them. What tremendous energy, then, must be in the systole and diastole of this Cyclopean heart, whose throb can suck in and expel every day along its veins and arteries a living stream of 728,986 human beings!

Every morning nearly a million of men make a rush to get into a space of seven hundred acres, and every night they make a rush to get out of it. No wonder that in addition to streets on the level of the houses they are compelled to build streets under the houses and streets over the houses, and that in a few years there must inevitably be three continuous cities of London—terrene London, subterrene London and superterrene London. But the swollen and congested state of the veins and arteries of the mighty town is not the only source of anxiety. What shall London do for lungs? A meeting assembled some time ago, under the call of the Lord Mayor, to consider the peril arising from the disappearance of commons and open spaces in the neighborhood of the metropolis. The meeting was addressed by Thomas Hughes and other gentlemen of note. Mr. Benjamin Scott, the excellent and versatile chamberlain of the city, said that in dealing with the question before the meeting they should not confine their calculations to 3,000,000 inhabitants. He found that in 1861 there were 3,322,717 persons living within an area of sixteen miles, taking Charing Cross as the center. An increase of population had been going on within that area during the past half-century at the rate of $19\frac{6}{10}$ per cent every ten years. In fifty years, at this rate, the population of the same area would be 8,532,000 souls. What would be their position fifty years hence if they were allowed only the radius at present supposed to be sufficient? He found that in 1801 the people were twenty yards from each other, in 1851 about fourteen yards, and in 1866 something over nine yards. If this diminution of space went on for fifty years more, they would be more closely packed than his audience were at that moment—in fact there would be no standing room for them.

We may get some impression of the present magnitude of London by looking at a few details of its colossal state. Its houses number more than 350,000, and its streets, if placed in line, would extend from Liverpool to New York, and are lighted at night by 360,000 gas lamps, consuming every twenty-four hours about 13,000,000 cubic feet of gas. Of the water supply 44,383,328 gallons are used per day. The traveling public sustain 5,000 cabs and 1,500 omnibuses, besides all the other sorts of vehicles which human need can require or human wit invent. Its hungry population devour in the course of every year 1,600,000 quarters of wheat, 240,000 bullocks, 1,700,000 sheep, 28,000 calves, 35,000 pigs, 10,000,000 head of game, 3,000,000 salmon and innumerable fish of other sorts, and consume 43,200,000 gallons of beer, 2,000,000 gallons of spirits, and 65,000 pipes of wine. As a consequence 2,400 doctors find constant employment. London, finally, supports 852 churches which are presided over by 930 divines of greater or less note.—*The Nation.*

THE NEW ISLAND.—One of the vessels of the expedition which sailed in search of our new insular possession in the Pacific returned to San Francisco with only part of her crew, and taking on board a large force of men set sail again on the next day, under a fishing license. Public curiosity is much excited as to what the new land contains that the explorers are so anxious to secure. The position of the island is 40° 31′ north latitude and 151° west longitude, and the discoverer reports the land dotted with birds, and the water alive with seals and sea elephants.

Automatic Device for Holding Horses.

As a servant and companion of man the horse is a useful and valuable animal, but when he takes the bits between his teeth, when, as Job says, "he paweth in the valley, and rejoiceth in his strength," when he "swalloweth the ground with fierceness and rage," that is, takes a race-course gait, he becomes a troublesome customer.

Multitudes of accidents to life and limb are daily chronicled in the papers caused by runaway horses. Valuable lives are lost, persons crippled for life, and property to a large amount destroyed for the want of properly hitching teams, or neglecting to tie them at all. Hitching posts are not always convenient, and so the driver, hoping his team will stand during a momentary absence, leaves them; they are startled by a fluttering paper, a puff of steam, or the screech of a whistle, and he returns to find his vehicle a wreck and his team ruined.

There have been several devices to prevent horses from running away when the driver was absent such as the strap and weight used by physicians, as an anchor to the horse, and an attachment of a halter to the wheel by means of some mechanical device, but this one claims to possess advantages over any other which has yet been tried.

Fig. 1 gives an idea of the device as attached to a wagon, and Fig. 2 shows its construction and operation. It is a ring surrounding the hub of a wagon or carriage, and secured to the spokes by the lugs and screws, A. This ring has, on an inner projection, a series of ratchet teeth, as seen at B, with which a catch sliding into a receptacle in the shank of the loop, C, engages, being moved forward by a light spiral spring. The loop, C, forms a part of an exterior ring which turns freely on the ratchet ring and is secured in position by the back projection of that, and also by the outer casing or ring, D, which is represented as broken away, to show the inner ratchet, for about one fourth the circumference.

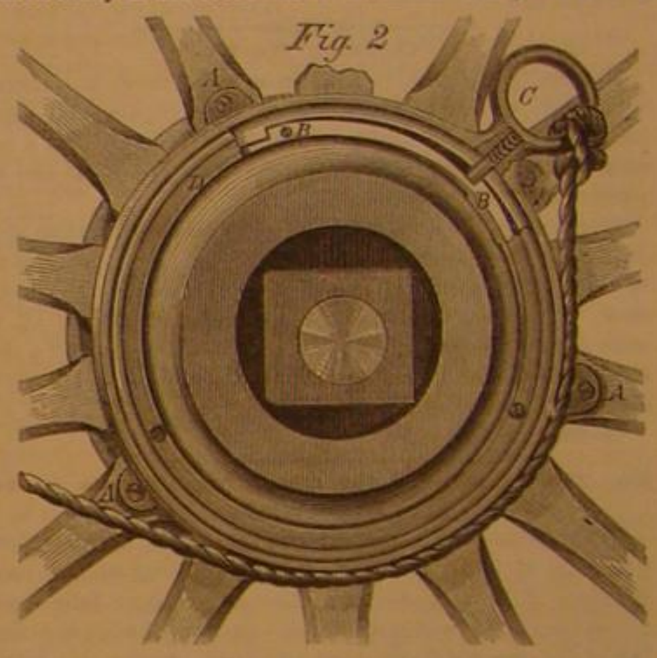
It will be seen now if the reins of the horse, or a halter, be secured in the loop, C, (in the engraving a common rope is shown,) any effort of the horse to start or run away will only result in winding up the line, and the further he draws the carriage the more the line will be wound around the hub. Of course the pull upon the horse's mouth will be very severe as the leverage is so great. In one direction, the pawl would, of course, merely slide over the teeth of the ratchet, while, in the other, the wheel could not be moved far until the pawl became obstructed by the teeth of the ratchet. The first is the condition of being "backed," the other the moving ahead. Beside being a preventive of danger, this device seems to be admirably adapted to break young horses to stand.

This improvement can be attached to any carriage, wagon, or other vehicle without making any alteration in the wheel hub, and is so simple as not to be liable to get out of order. It was patented through the Scientific American Patent Agency, Nov. 13, 1866. Further information regarding it may be obtained by addressing W. B. Chapman & Co., La Salle, Ill. [See advertisement on another page.]

Fig. 1.

CHAPMAN'S HORSE HOLDER.

Fig. 2



THE SIEMENS FURNACE.

There is a small collection of gas-furnace models exhibited at Paris by Messrs. Siemens, and now distinguished with the highest prize of the international jury, viz., the "grand prix." It may be said with justice that the Siemens furnace in this present Exhibition holds much the same position which the Bessemer process held in 1862, viz., that of the most important and most successful metallurgic invention of the day. It is hardly less important than the Bessemer process, and although its invention dates about as far back as Mr. Bessemer's patents, it has only lately attained commercial success. In the space of the last five years the Siemens furnace has not been very materially altered or improved, but it has been largely introduced and its success established in many different branches of industry. The first manufacturers in England who availed themselves of the new furnace, were the glass-makers. For purposes of metallurgy greater difficulties and prejudices required to be surmounted. Some of the steel makers on the continent led the way. Mr. Mayr, of Leoben, in Styria, we understand to have been the first to introduce the new furnace for crucible steel making on a large scale. In this instance the unfavorable position of the Styrian iron works with regard to the supply of mineral fuel, was the principal inducement to apply gas in the steel-melting furnace. The gas is made at Mr. Mayr's works, from lignite, which cannot be directly applied for melting steel, as the heat from it when burnt on the grate, is not sufficient to produce the high temperature required for this operation. Mr. Mayr erected ten gas furnaces, and they have proved a complete and perfect success, enabling him to make crucible cast steel by means of the cheap and very inferior lignite which exists in his locality. Within the last two years the Siemens furnace has been adopted in all the larger Bessemer steel works in England. In France, the Siemens furnace is gaining ground with equal rapidity, and there are now twenty furnaces in course of erection under Mr. Siemens' own superintendence at the Creusot Works.

There are two distinct principles embodied in the Siemens furnace, viz., the application of gaseous fuel, and the regeneration of heat by means of piles of bricks alternately passed over by the waste gases and by the gases entering the furnace before their combustion. The gas producer is a brick chamber about 6 feet wide by 12 feet long, with its front wall inclined at an angle of 45° to 60°, according to the nature of the fuel used. The inclined plane is solid about half way down, and below this it is constructed as a grate with horizontal bars. The openings for introducing the coal into the gas producer are on the top or roof of this chamber, and the air which enters through the grate effects the combustion of the coal at the lowest points of the chamber. The products of this combustion rise, and are decomposed by the superposed strata; they are, moreover, mixed with a quantity of steam which is drawn in through the grate from a constant supply of water maintained underneath the latter. The steam in contact with the incandescent coal also decomposes and produces hydrogen and carbonic oxide gas, which are mixed with the gases produced by the coal direct. The whole volume of these gases is then conducted to the furnace itself by means of wrought-iron pipes. The gases enter one of the regenerators. The regenerators are chambers packed with fire-bricks, which are built up in walls with interstices and air spaces between them, allowing of a free passage of gas around each single brick. Each regenerator consists of two adjoining chambers of this kind, with air passages parallel to each other, one passage destined for the gaseous fuel, and the other for the supply of atmospheric air required for combustion. Each furnace has two such regenerators, and a set of valves is provided in the main passages, or flues, which permit of directing the gases from the producer to the bottom of either of the two regenerators. The gases, after passing one regenerator, arrive at the furnace, where they are mixed with the air drawn in at the same time, and produce a flame of great heat and intensity within the body of the furnace itself. They then pass, after combustion, into the second regenerator, which forms a set of down flues for the waste gases, and ultimately leads them off into a common chimney. On their way from the furnace to the chimney, the heated products of combustion raise the temperature of the fire bricks over which they pass, to a very high degree, and the gases are cooled more and more the further they proceed through the regenerator. After a certain time the fire bricks close to the furnace obtain a temperature almost equal to that of the furnace itself, and a gradually diminishing temperature is arrived at in the bricks of the regenerator proportionate to their distance from the furnace. At this moment the attendant, by reversing the different valves of the furnace, opens the heated regenerator for the entrance of the gaseous fuel and atmospheric air, at the same time connecting the other regenerator with the chimney for taking off the products of combustion. The entire current of gases through the furnace is thus reversed. The cold air from the atmosphere, and the comparatively cold gases from the producer, in passing over bricks of gradually increasing temperature as they approach the furnace, become intensely heated, and when they are mixed in the furnace itself, enter into combustion under the most favorable circumstances for the production of an intense heat. The principle of this so-called regeneration of heat, therefore, consists in storing up the waste heat in one set of fire bricks, and afterward making use of that heat for elevating the temperature of the fresh gases introduced for combustion. The action of these regenerators is so perfect that, with a temperature of somewhat about 4,000° in the furnace, there is no more than about 300° to be felt at the base of the chimney, the escaping gases having a temperature no greater than is absolutely required for maintaining the draft.

This is the present state of this beautiful and important invention. It has supplied us with the power of maintaining an exactly regulated temperature in a furnace of any required size and shape; it has made us practically independent of the quality and nature of the fuel used for producing the required heat from the most moderate, up to the very highest temperature. It has reduced the expenditure for fuel to a very great extent, and it has given us one of the greatest desiderata in so many metallurgical operations, viz., a *clean* furnace, free from ashes, dust, and dirt, and perfectly suitable for the working of the more refined and purified materials which modern industry has produced and is still constantly improving upon. We have further to name as an important feature of the Siemens furnace, the possibility afforded by it of changing the nature of the flame at will, by altering the relative proportion of air and gas admitted through the flues. A surplus of oxygen in the mixture will produce an oxydizing flame, and will give all the corresponding effects upon the materials exposed to its action. By the admission of a surplus of gas, on the contrary, the flame can be made of a reductive character, and used accordingly for de-oxidation. In metallurgy, and particularly in the treatment of iron and steel, this is of the utmost importance. There are already several new modes of manufacturing steel direct from the pig iron, patented and practically carried out in France and in Germany, wherein the Siemens furnace is made use of as an indispensable condition for their success. The Exhibition contains a collection of samples of very fine steel made by M. Berard's process. This is called "Acier à gaz," and is made in a Siemens furnace direct from pig iron. M. Berard constructs a Siemens furnace with the bottom formed into two separate parts, each hollowed out like a dish, and with a bridge between them upon which the pigs introduced into the furnace receive a preliminary heating. The flame is maintained with a surplus of oxygen, and a quantity of pig iron is melted in one of the chambers or dishes. The oxydizing action of the flame decarburizes and refines the pig iron, and after a certain time a second quantity of pigs is thrown into the second dish and melted there. The flame is now reversed in its direction; the oxydizing flame is made to enter at the side where the fresh pig iron is placed. In passing over this, and oxydizing the carbon, silicon, and other impurities in the iron, the flame loses its surplus oxygen, and becomes of a neutral, or at least only slightly oxydizing character. In this state it passes over the other bath of molten iron, now partly refined, and it continues to act upon the impurities without attacking the iron itself. At a certain moment this portion of iron is completely converted into steel, and that part of the furnace is then tapped so as to make room for a fresh charge of pigs in that place. After that the current of gases is again reversed, the second bath now entering into the position previously taken by the first, and so the process is carried on continuously with two portions of iron, one freshly introduced and acted upon by the oxidizing flame, the other partly converted into steel and exposed to the neutral flame passing away from the first. M. Berard states that by protracting his process, and by adding spiegeleisen, he can remove sulphur and phosphorus from the iron, and make steel from inferior pigs. Such statements, however, have been so frequently made by inventors, without having been borne out by facts in actual practice, that we must be cautious in accepting them.

Messrs. Emile and Pierre Martin, of Sireuil, have also commenced steel making in a Siemens furnace. They melt a quantity of pig iron, and introduce wrought-iron scrap, puddled steel, or other malleable iron into the mass while exposed to the oxydizing influence of the flame. They have produced steel of excellent quality by this method, and are now about to introduce their process into several steel works in France. The great advantage obtained by them, and one which has not yet been arrived at by the Bessemer process, is the conversion of old iron rails and similar articles into steel. This is a great desideratum—particularly at this present moment of transition of the permanent way from iron into steel—is well known, and attempts have been made by Mr. Bessemer, Mr. Adamson, and several others, to effect the same thing in

the Bessemer converter. The first trials, although they proved the possibility of converting old iron rails into steel in that manner, gave an unsatisfactory commercial result. It was found that the rails required to be heated to a white heat before being introduced into the converter, that no more than one third of such rails could be added to the proportion of two thirds of very graphitic pig iron, and, with all this, that there was a greater waste in the converter, and more "scull" in the ladle, than with pig iron. Messrs. Martin, on the contrary, are able to use a proportion up to two thirds of old rails to one third of pig iron; they can manage the fusing very completely, and without excessive waste, and with a moderate consumption of fuel, advantages which are all due to the Siemens furnace which they employ. Mr. Siemens has himself very recently patented an application of his furnace to the manufacture of iron and steel direct from the ore, and he has exhibited a model of such a furnace in Paris, to which is added a small piece of steel produced in that manner direct from the iron ore. The furnace is constructed somewhat similar in form to the Rachette furnace, viz., with two parallel sides sloping downward so as to form a kind of trough between them. The ore is charged at both sides on the top of the furnace, and slides down the inclined planes of the two sloping sides. At the bottom of the furnace the gases from the producer and the necessary supply of air are admitted, and produce an intense flame, the products of combustion rising upward through the masses of ore, which are acted upon in a similar manner to that in the blast furnace. With very pure manganese ores it is possible to manage the process so as to decarburize the newly produced iron immediately after it is made, or rather the heat can be made sufficient for melting a metal which contains less carbon than common cast iron as made in the blast furnace, and at a lower temperature. This metal is natural steel, or "raw" steel, and, made from ores of sufficient purity, may have all the qualities of the best cast steel. The specimen exhibited by Mr. Siemens, and made, we understand, at his Model Steel Works in Birmingham, where the first experiments with this new process have been carried out, is of very fair quality as far as can be judged from its general appearance and fracture. We have been informed that Mr. Siemens is now erecting a similar furnace at Barrow-in-Furness, intending to make steel from hematite ore direct, at the Barrow Steel Works. Mr. Siemens' new process, if successful and economical, would do away with blast furnaces, and all other processes for making and refining iron now in use, but it is too little advanced at this moment to allow of a judgment of the probability of its practical success, to say nothing about relative economies. Its practicability remains to be established; but if we consider how much the same inventors have already established, how difficult it was to believe in the success of the Siemens furnace itself when first brought out, and how completely they have succeeded in this respect, we may be justified in entertaining some hope that this new invention will ultimately prove equally successful, although at present it may appear very revolutionary and contrary to adopted notions.—*Engineering.*

MEE'S HOSE COUPLING.

The intention of the inventor in this device, is to make a tight coupling without the aid of a washer, or of the loose setting-up ring, or of any device for forcing the two parts of the coupling together in the line of their axes, in order to form a water-tight joint. This coupling does not depend upon the mechanical force exerted to close the joint, but the pressure of the water itself makes the joint tight.

Fig. 1.

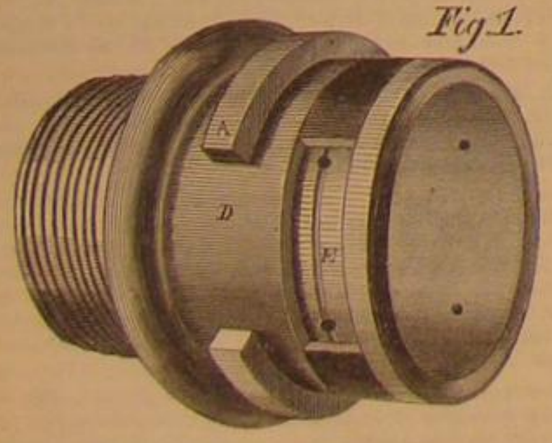


Fig. 2.

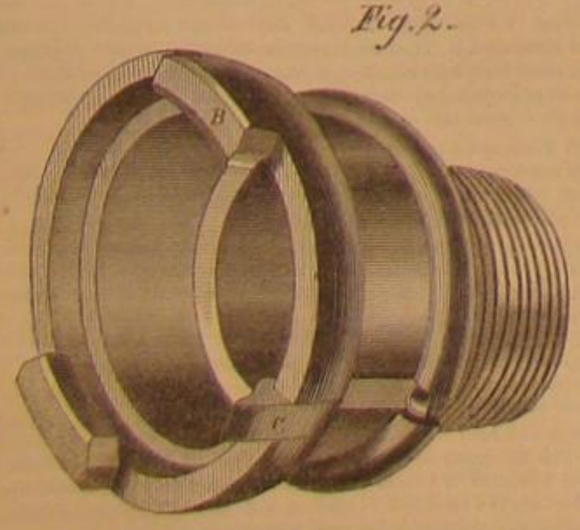
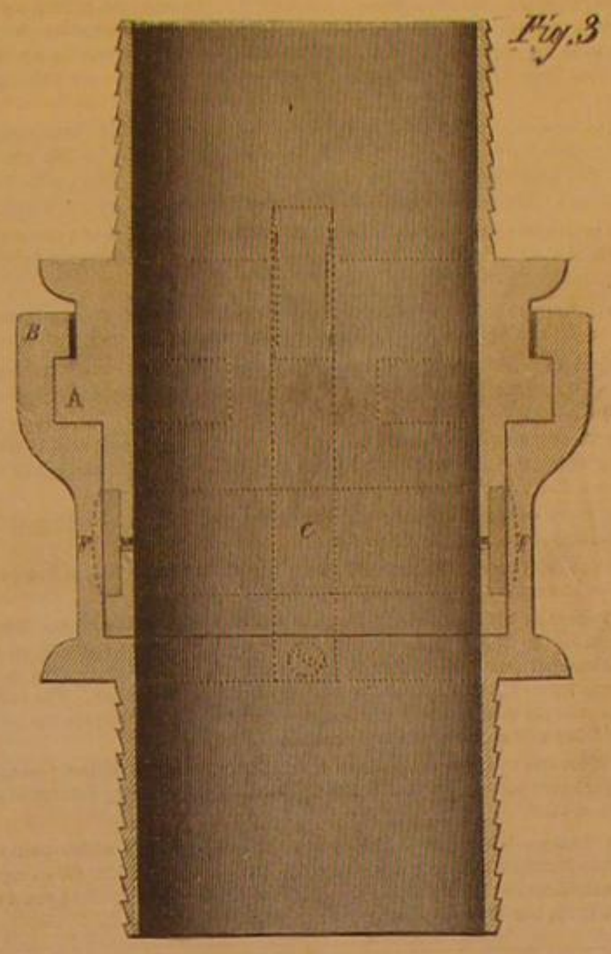


Fig. 1 represents one end of the coupling, formed where the cather or rubber is attached precisely like any other, but otherwise differing. It has a projecting ring, A, around the barrel part, a portion of which ring is cut away to receive the hooks or snugs, B, Fig. 2, which pass by the ring, A, and, by a slight turn of one or the other part, securely lock the two lengths of hose or the two parts of the coupling together. This partial turning is, of itself, a sufficient lock to the parts, but to render "assurance doubly sure" a spring catch, C, is introduced which springs into the space, D, Fig. 1, between the parts of the ring, A, and prevents the parts from unlocking unless force is used to raise it from its seat.

Near the end of Fig. 1 is turned an annular groove in which is seated a rubber ring, or a ring of some elastic substance to

Fig. 3



act as a packing. It will be noticed that a row of small holes is bored through from this annular recess to the inside of the coupling, the holes communicating on the outside with one another by a channel, E. Through these holes the water inside the hose or coupling finds its way, and its pressure forces out the elastic ring against the inner surface of the section shown in Fig. 2, making a perfectly water-tight joint. Fig. 3 is a longitudinal section, and will give a correct idea of the invention. It represents the parts, as connected, with a recess at F, which, if thought expedient, could be made to receive the extension of the flexible packing when the pressure is applied, although it is believed from numerous experiments this is not necessary.

A patent for this improved coupling was obtained by Barney Mee, May 7, 1867. It is manufactured by Mee & Jackson, Troy, N. Y. Applications for rights, etc., will be promptly attended to if addressed as above. It can be seen in this city in use at No. 99 Wooster street, on engine No. 13.

Mechanical Uses of Castor Oil.

We find in one of our exchanges the following remarks relative to the use of caster oil in the trades, more particularly its application to leather: It is much better to soften and to redeem old leather than any other oil known. When boots and shoes are greased with it, the oil will not at all interfere with the polishing afterward, as is the case with lard, olive, or any other oil. In Harrisburg, Pa, the old leather hose of some of the fire companies was greased with it, and found to become almost as soft and flexible as new leather. Leather belts for transmitting motion in machinery will usually last three to five years, according to the wear and tear they are exposed to; when greased with castor oil they will last ten years or more, as they always remain flexible and do not crack. Beside this advantage, castor oil will prevent slipping, so that a belt three inches wide, impregnated with it, will be equal to a belt four and a half inches without castor oil. It is necessary, however, to wait twenty-four hours, till the oil has disappeared from the surface and penetrated the leather, otherwise the freshly greased surface will cause slipping. The rats and other vermin detest anything impregnated with castor oil, and will not touch it;—another advantage.

Geography of Plants.

In an article on this subject by M. T. Lippincott, of New Jersey, the following rules were given, for determining the fitness of districts in the United States for the growth of certain varieties of wines.

Those places which have a summer temperature of 65.6°, a hot month of 70°, and a September of 60°, will ripen Delaware, Clinton, Perkins, Iona, Logan, Israella, with other hardy varieties. The temperature of their growing season corresponds to a mean of 65° and upward, and an aggregate of heat of about 8,000° Fah.

Those places which have a summer of 70°, a hot month of 72°, and a September of 63°, will ripen Concord, Hartford Prolific, Diana, Creveling, etc. Their season of growth corresponds to a mean of 67°, and an aggregate of 8,500°.

The Isabella requires a summer of 72°, a hot month of 73°, and a September of 65°, and a mean during its growing season of 70°, and an aggregate of 10,000°, of heat, etc. etc.

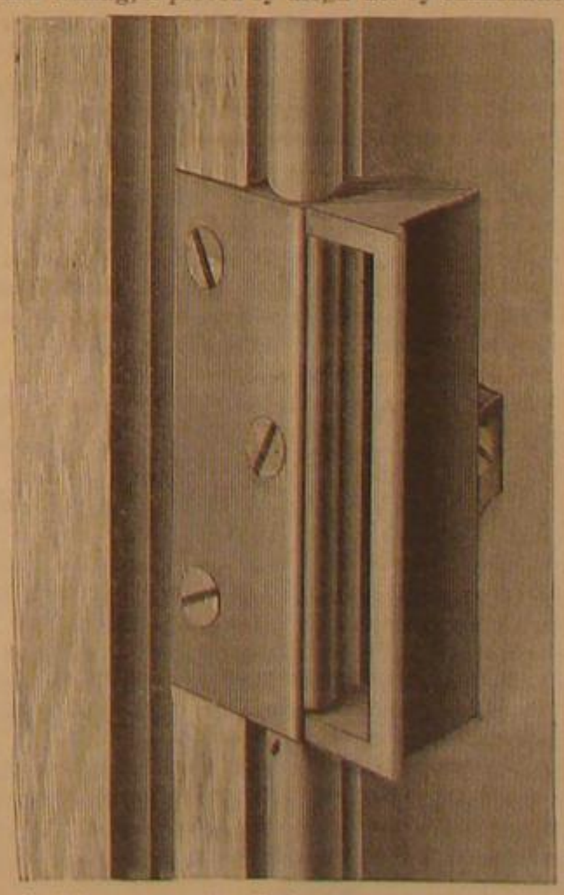
The summer temperature of Buffalo, N. Y., is 68°; it has a hot month of 72° and a September of 62°; and it is said that the temperature of places on the banks of the Niagara, north of the city, is from two to three degrees greater.

Washing the Streets.

To keep the streets of a great city clean is a problem which those who have thought the least about it are the most ready to solve. Those who understand it find their greatest difficulty in the cost. In the city of London, where every feasible scheme of street improvement may be tried, Mr. William Haywood, the engineer to the Commissioners, has been trying a series of experiments in "cleansing streets by washing"—a plan that seems very easy but is not very cheap—and has made a report from which the London *Journal of Gas Lighting* extracts the following reliable information. A portion of one of the principal thoroughfares was selected, 2,000 feet long, having a superficial area of carriage way of a little under 10,000 yards. Sixteen hydrants were fixed at a distance of 16 feet from each other. The first experiments were made in September last, and they were continued for a week at a time at different periods of the year; the weather, however, happened on each occasion to be tolerably fine. Ten men were employed with two jets, each morning for two hours and three quarters. Two men, who assisted in moving the hose, also swept the surface near the curbs while the water was playing, so as to save passengers from the annoyance of the jet being directed close to the foot-ways. The straw and refuse which would not go down the gullies was washed into the channels by the action of the water, and was then swept up and removed by scavengers. The quantity was scarcely a quarter of a load daily. The work was generally done between half-past two and six o'clock in the morning. The quantity of water consumed was about two gallons to each square yard. The streets were much cleaner than after ordinary scavengering, and this was most marked when rain came on after washing, for the surface did not become muddy until toward the end of the day, while the other streets of the city became muddy rapidly. On the whole, the comparison was greatly in favor of the surface cleansed by water. The cost of the machinery was £1175 per mile lineal; the cost of washing nearly 20s. for each washing, labor forming about half of that sum. There are about seven miles of thoroughfare in the city similar to those washed, and the annual cost of cleaning them by water would amount to £7932. These seven miles are leading thoroughfares. The cost of water at its present price would amount to £3282 per annum, and for the whole city, to £6000 per annum. But this is filtered water, of the same quality and price as that supplied to the breweries. Mr. Haywood suggests that the water should be obtained direct from the Thames, and if the washing system be adopted, the magnitude of the demand would justify some expense in pumping machinery for obtaining a cheaper supply. It would be objectionable to wash the streets in frosty weather, and in severe weather it would be impossible to use it; therefore the services of a staff of men, carts, and horses must be retained for emergencies. Pavements kept so clean will be more slippery during dry weather, and less slippery in damp greasy weather. The superior cleanliness will make the streets more noisy. Mr. Haywood thinks that the sewers would not be injured, and that the sewage about to be used for the reclamation of waste land would be improved by the admixture of street sweepings.

DA CUNHA'S LOCK CATCH.

Improvements in the form and style of articles in common use are not among those least valuable. Sometimes, indeed, an alteration which at first view appears to be quite superficial and trifling, is proved by use, if not by examination, to



be a radical improvement. Such, we conceive to be that represented in the engraving. It is a catch for ordinary door locks, those which are secured to the outside of the door, and differs from those ordinarily in use in being much stronger in construction, and much more securely attached. The common catch is held to the door jamb by two or more screws, the strain upon which tends continually to draw the screws from the wood.

This catch is of cast or malleable iron made with a project

ing lip to be let into the inside of the jamb, and held by screws, which, when the door is closed, are covered by its edge. On the back of the catch, is also another projection, through which one or more screws pass into the casing. These screws resist the shock of the spring bolt of the lock, and those on the inside of the jamb the strain upon the door itself, in a direction at right angles to their length. Thus it will be seen that the catch is secure against all chance of accidental displacement.

It was patented through the Scientific American Patent Agency May 21, 1867, by George W. Da Cunha, who may be addressed relative thereto at 311 West 36th street, New York City.

"Porter Spare that Trunk."

The Philadelphia *Ledger* says—and we know it is so—for we went traveling once, that at this season of the year the above is a daily and hourly request at the stations on all great lines of railway; but it is by far too often a vain request for down goes the trunk with a crash—the lock is broken and the contents of the unfortunate receptacle are scattered over the ground to the dismay of the owner and alarm of other travelers around, who are left to anticipate a similar mishap to their own baggage. If the sufferer be a lady, and, as happens every now and then, without a male escort, she is obliged to look helplessly at her dresses and articles of toilette rolled in the dust and dirt; and if gathered up and stowed away in the trunk by some good-natured person near, they are in a sorry plight. The porter or baggage man in place of apologizing for the mischief which he has carelessly done, will most likely be heard to growl and mutter words of insolence and defiance, as if he had only exercised one of his reserved rights. Baggage masters and their assistants are often equally as reckless as the surly porter, of a decent regard for the property entrusted to their charge, as shown in the way in which they toss our trunks and other luggage, or throw them from one part of the car to another. Ladies are not the only sufferers by this abominable practice. It may be alleged that these cases are exceptional, and of rare occurrence. Most travelers will tell us, in reply, they are incidents witnessed on every long line of railroad, and especially in the summer months, when so many leave their homes in pursuit of health and pleasure. Very pleasant indeed to have one's trunk smashed and clothes spoiled! There seems to be a fixed determination, on the part of porters who carry luggage to steamboats and depots, and from them to hotels, to test the strength of trunks, and as far as in their power, snap the iron bands, to break off straps, which they seize held of in place of the handles, and to wrench hasps and bolts of locks from their fastenings. There is an apparent trial to ascertain which has the greatest power of resistence—the trunk, or the pavement, or the platform, when the first is thrown down as if it were in the performance of some gymnastic feat for a wager. Is it not time that there should be a class of civilized trunk carriers—of men who understand that they should be careful of goods intrusted to their care.

New Base for Artificial Teeth.

Dr. G. F. J. Colburn, of Newark, N. J., has invented a substitute for rubber in dentistry, which promises to be of much value to the profession. It is in reality a cement of which the mineral asbestos is one of the ingredients. Asbestos is a very peculiar substance. It is exceedingly light, and so very fibrous in its nature that it may be spun and woven like cloth, in which condition it resists fire, water, and many of the acids with complete success. Taking advantage of these natural qualities Dr. Colburn has, by long study, discovered additional substances, which, when united, form an artificial base that possesses remarkable toughness, adherence, strength and lightness. The ease and freedom with which it can be molded is a strong recommendation. It can be readily applied to gold, platinum and other plates. We have seen some full sets of teeth on aluminum plates that were truly beautiful. This new base contains no ingredients injurious to the health of the mouth or system. It is not affected by acid secretions, is free from all taste, and is inodorous. We hope that its merits will be thoroughly tested. Patents have been allowed.

Agricultural.

There are 23 applicants for the position of Commissioner of Agriculture, made vacant by the death of the Hon. I. Newton, viz.: Norton S. Townshend of Ohio; John A. Warder of Cincinnati; Thomas Brown of Ohio; Col. Capron of Illinois; the Hon. John B. Clark of Missouri; the Hon. James Birney of Michigan; the Hon. L. Chandler Ball of New York; F. M. Blair of Washington, D. C.; William H. Ludlow of New York; Oliver H. Kelly of Minnesota; A. S. Paddock of Nebraska; the Hon. James R. Hubbell of Ohio; Isaac Newton, jr., of Pennsylvania; Thomas P. Robb and Solsom Dorsett of Illinois; E. C. Wilson of Pennsylvania; R. J. Powell, John H. Klippart of Ohio; the Hon. Frederick Holbrook of Vermont; James S. Grinnell of Massachusetts; William H. Russell of Washington; the Hon. W. T. Lemosy of Virginia, and the Hon. E. H. Hyde of Connecticut.

BUSINESS AND MANUFACTURING ITEMS.

The capital invested in agriculture in England amounts to £3,311,000,000, returning a profit of 13 per cent.; the capital invested in manufactures is £213,000,000, and the annual profit is 120 per cent.

The French ladies spend 8,000,000 francs per year for corsets, 15,000,000 for gloves, and 10,000,000 for bonnets. False diamonds cost them 1,900,000 francs, false teeth 1,500,000, glass eyes 84,000, masquerade dresses 730,000, perfumery and cosmetics 22,000,000, fans 5,000,000, artificial flowers 28,000,000.

The directors of a railroad in New Jersey are said to have offered to parties who will build on the line of their road, a free pass over it from three to five years.

Since the year 1861, there have been sunk in the United States 7,930 oil wells, yielding a total product of about 11,640,670 barrels of crude petroleum.

The universal belief in abundant crops this year, has brought a class of speculators into the field who have bought up all the grain bags in market, much to the disgust of the farmers. The market for reapers and mowers has also become quite active in preparation for reaping the new crop.

The works of the Boston Belting Company, at Roxbury, Mass., the largest establishment of the kind in the country, covers five acres of land and constantly employ 150 hands. Packing for machinery, engine hose, and tubing, are among its products. The consumption of stock at the present dull season reaches $75,000 per month.

Watch chains are now made by machinery by the pioneer firm in this line in New England—Sackett, Davis & Co., of R. I. The machine is their own invention, and is pronounced one of the most ingenious and elaborate pieces of work ever devised. By means of it bar gold is transformed rapidly and without noise into the most delicate, or substantial fob and vest patterns of chains.

In the exportation of coal, Erie, Pa., ranks second in the United States. Over 250,000 tuns was shipped from this port during the year ending Jan 1st, 1867. The bituminous coal is taken to ports on the upper lakes; principally to Chicago. The return freights are made up from Lake Superior copper.

The projected railroad from Atlanta, Ga., to Decatur, Ala., when completed, will effect a saving of more than 100 miles in the distance traveled between Memphis and Charleston.

The Chicago tunnel cleared forty-six thousand dollars for the contractors. The project of a great park at Chicago was defeated at the recent election.

Sargent & Co., of New Haven, have the largest hardware manufactory in the country, employing 800 hands, and turning out 4000 different kind of articles, valued at from $1,000,000 to $7,000,000 per year.

English authorities estimate the proportion of passengers killed in Great Britain by railway accidents, as only one in four millions; the number of employees killed is very much larger than that of passengers.

The American Steel Company will soon erect works at East Bridgeport, for the manufacture of cast steel.

A company of capitalists are about building an extensive mill at Paterson, N. J., for the manufacture of nails.

The Boston and Worcester railroad, on one day during the recent visit of the President to the former city, carried more than 21,000 passengers, the largest number ever transported over the road in a single day. Not one of these was injured, nor was there an engine or car off the track. The superintendent of the road has issued an order thanking his employees for their care, fidelity and attention on this occasion.

A road locomotive was successfully tried in the streets of Rome, recently, the experiment being made under the direction of the artillery officers of the Pontificial staff.

At St. Anthony's Falls, Minn., there are six mills, each of which turn out 6,000,000 to 12,000,000 feet long lumber, per year. Last year 30,000,000 shingles were manufactured in this vicinity. The flour mills at this point have a capacity of 3,000 barrels daily.

Editorial Summary.

DEATHS BY CHLOROFORM.—As early as 1859 Barrier de Lyon ascertained that there had been over two hundred recorded deaths from the administration of chloroform as an anesthetic. In the next five years, Diday reported twenty-one registered cases, and at least as many unregistered, in England alone. Some cases, like that at Bellevue Hospital last winter, could not be attributed to any impurity of the article or imperfection in the administration. Canter remarked that half his chloroformized frogs died, and hardly any of his etherized ones. Unlike ether, the action of chloroform continues after its application is stopped.

GIGANTIC omnibuses, on a new model, have been constructed in Paris, specially for horse races and other out-door sights. They are so contrived that upward of fifty persons can be seated on the roof, and they constitute a kind of traveling grand stand.

CALIFORNIA MARBLE.—A pure white marble of a superior polish, and rivaling the finest Italian, has been discovered near Colfax, Cal., and only two miles from the Pacific Railroad.

A LOVER OF POTATOES.—A wealthy citizen of Berlin has applied to the municipality of that town for a site on which to erect a statue to Francis Drake, as the introducer of the potato into Europe, and offers to subscribe $11,270 toward it.

SALMON IN AUSTRALIA.—The latest experiment in pisciculture has been the raising of the salmon in the river Derwent. Three years since the first batch of salmon ova arrived on those shores, having been transported sixteen thousand miles on ice. After this protracted journey the fish hatched from the ova, were turned out into the river, and now the inhabitants are rejoicing over a fine run of veritable salmon.

A MONSTER CHERRY TREE now growing in Reading township, Ohio, has attained the hight of 80 feet, and is four feet one inch in diameter. It is of the "black heart" variety, and the seed was brought from Berks County, Pa., in the year 1817.

PARISIAN PINE APPLES are made by saturating turnips with a sirup which the confectioners know very well how to manufacture. The resulting fruit is said to be delicious, and is quite popular among the Exposition visitants. In this city, a few days since, it was testified in court that the jellies sold as made from strawberry, pineapple, and other fruits were all formed out of apple jelly, colored and flavored with essences to suit the name.

SWITZERLAND has 3,500,000 inhabitants and 345 scientific and literary publications, while France, with ten times the population, has but about 500 journals and magazines. The solution of this is in the fact that in Switzerland the people all receive some education, and consequently can read, and take the papers, while in France less than one half can read.

TRANSPLANTING FULL-GROWN TREES.—Thirty beautiful elms fully forty feet in hight, were removed from their native forests, and replanted in front of the site of Congress Hall at Saratoga, to take the place of the trees destroyed by fire. They are now in full leaf and appear to be thriving under this singular treatment. The same thing has been successfully accomplished in Scotland, also in Paris.

THE BANK OF ENGLAND has 50,000,000 in gold coin now on hand, there being no call for it, notwithstanding the low rate of interest. This is owing to dullness in business, and the falling off in the foreign trade, which has been ten per cent since September last.

SHEEP-SHEARING BY WIND.—A man in Wisconsin has a patent sheep-shearing machine which operates just like a reaper or a mower, and mows a swath of wool an inch and a half wide. The motion is got by means of a little wind engine in the handle, which is to be driven by a force pump or bellows forcing wind into it by a flexible tube.—*Beaver Dam (Wis.) Citizen.*

A NEW method of vitrifying the surface of iron has recently been introduced in Paris. Instead of covering the surface of the iron according to the usual method with a very fusible glass in powder and then bringing the iron to a red heat, the materials of the glass are laid upon the iron, which is heated until perfect vitrification takes place. The consequence is that the iron becomes oxydized, and combining with the silicic acid, the iron and glass form one substance. The coating may be as thick as desired, but it is found in practice that a thick coat of glass soon breaks away, while a thin one lasts for a long time. The method is being applied or tried upon armor plates for ships.

THE STRAWBERRY growers of Vineland, N. J., during the season just ended raised nearly 275,000 quarts of strawberries, valued at $33,000. Of these, 65,000 quarts were consumed or canned at home, and the balance were shipped to Philadelphia, New York, and other points. . . An Ohio fruit grower succeeded this year in raising one bushel, three pecks, and three quarts of strawberries from a square rod of ground.

A ROOM FULL OF GOLD.—Pure gold is nineteen times as heavy as water, and as a cubic foot of the latter weighs a thousand ounces avoirdupois, the same dimension of gold would weigh 19,000 ounces, valued at somewhat more than eighteen dollars per ounce, or the whole would be worth a little more than a third of a million dollars. The amount of the precious metal now existing is estimated at $5,950,000,000, in value. If now this was melted, the resulting mass would have nearly 660 cubic yards, and might be placed in a room five yards high, eight yards wide and sixteen yards long.

SOME beef which was deposited in tins beneath a heap of stones in Spitzbergen, by Capt. Parry, in 1827, was recently discovered, and a portion was cooked and eaten at a supper in Stockholm, after being preserved for forty years.

MINERS' LAMPS.—Notwithstanding that every English miner who is detected in unlocking his safety lamp is liable by law to three months' imprisonment, the offense is committed with impunity by means of false keys. A simple plan has been invented by a manufacturer of these lamps, for sealing them without using any lock. When the staple has been put down over the eye, a small leaden pin is inserted in the latter, then being placed under a horizontal press fitted with two dies, the shank of the ping is formed into a head, and both heads are impressed by the dies with any lettering or device.

PARISIANS are fond of confectionery. According to the Chamber of Commerce about eleven millions of francs were spent in bon bons last year.

DEVILLE has lately made the observation that the addition of a little zinc amalgam to ordinary solder makes it applicable at low temperatures to aluminium bronze, cast iron, and also, no doubt, to other work in which quicksilver would not be objectionable.

THE SEVENTEEN-YEAR LOCUSTS have made their appearance over a belt of country, just northwest of Wilkesboro, N. C., extending far northeast and southwest, and being from thirty-five to forty miles broad. It is a singular confirmation of the claims of these insects to their popular name, that this identical stretch of country was visited by them in 1850 and not since.

FRANCE realizes over seven million dollars annually from the door and window tax, and on forests and fisheries more than eight millions; and from the sale of gunpowder, about two and a quarter millions. The sum of over forty-five millions dollars accrues from the sale of tobacco alone. For the administration and collection of the revenue she actually pays nearly forty million dollars.

FEMALE LABOR.—In Italy about one third of the whole number of laborers engaged in agricultural pursuits are women. In her manufactories 1,692,740 females and 1,379,605 males find employment. Out of 531,435 artists, nearly one fourth are women. There are 257,497 female landed proprietors there, and 313,497 maid servants. In France nearly one half the labor of almost all kinds is performed by females.

THE PANAMA RAILWAY.—Since the construction of this road across the Isthmus it has carried nearly 400,000 passengers and $675,000,000 of treasure, the latter from the Pacific to the Atlantic side of the isthmus. The silver shipments over the road are gradually declining, and most of the silver transported is shipped to the isthmus from the Pacific coast of South America. Of freight, the road has transported 614,535 tuns, but this year it is estimated the traffic will amount to 150,000 tuns. America now controls the road, which runs through the territory of New Granada, but England is making great exertions to get possession of it.

SINCE 1837 there have been established throughout the world 160,000 miles of telegraph lines, comprising 400,000 miles of wire, and working through nearly 14,000 stations. The total length of submarine cables laid is 19,923 miles. The price of telegraphing is higher in the United States than in England.

THE CONTINENTAL HOTEL at Long Branch, is 700 feet long. A continuous piazza fronting the ocean extends its whole length.

IT is calculated that 64,000 persons wear decorations of the Legion of Honor. A great legion, but no remarkable honor.

Recent American and Foreign Patents.

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

BRICK KILN.—Andrew S. McBride, St. Louis, Mo.—This invention relates to a new and improved brick kiln, so constructed that either coal or wood may be used as a fuel, and by it a great saving in fuel is effected and the bricks burned in much less time than hitherto. The invention consists in having the kiln constructed with a series of fire chambers at each side extending its whole length, with the smoke stacks at each end, and having the top of the kiln constructed of a series of dampers or adjustable slats, whereby the advantages above described are obtained.

GANG PLOW.—Robert R. Graves, Montgomery, Ala. Patented July 9th, 1867.—In this invention the dip of the plow is regulated, and means are provided by which upon encountering an obstacle the plow may be withdrawn without backing the team.

BROOM HEAD.—Lewis Allen, Berkley Springs, West Va. Patent dated July 9th.—The socket of the broom head is made of leather, pierced for the passage of the sewing twine and with a confining band, also pierced and retained on the socket by grooves in the latter.

SAWING MACHINE.—James R. Logan, Bellmere, Ind.—This invention relates to a cross-cut sawing machine and consists in a peculiar construction of the carriage on which the machine is mounted, whereby the frame of the machine may be retained in a horizontal position when placed on uneven or inclined ground. The improvement also consists in a modification of the construction of the standard or support to which the saw bar is attached when sawing felled timber; and, further, in the employment or use of a peculiar saw guide.

STEERING APPARATUS.—Thomas W. Murray, New York City.—This invention relates to a steering apparatus to be applied to the head of the rudder post of a vessel, whereby a very compact, simple and powerful mechanism is obtained for the purpose.

STRIPPING HIDES FROM BEEVES AND OTHER ANIMALS.—Christopher Brühl, Greenpoint, N. Y.—This invention relates to a useful machine for stripping hides from beeves and other animals, it being designed to supersede the manual prosecution of such work which is now clumsily practised at a considerable expenditure of time and labor.

RAKING ATTACHMENT FOR REAPERS.—John C. Hall, Monroe, Wis.—This invention has for its object to furnish an improved self-raking attachment for reapers which shall be so constructed and arranged as to imitate the natural movements in raking the grain from the reaper by hand.

MANUFACTURE OF BONE HANDLES FOR PARASOLS, CANES, ETC.—Joseph Harvey, Philadelphia, Pa.—Bone has long been used as a material for the manufacture of parasol, umbrella, and other handles, but it is not employed as extensively as it would be, provided sufficient stock could be obtained of proper size. This invention is to obviate this difficulty; it consists in constructing a bone handle of pieces connected together in a novel and very secure manner which will admit of a handle of the largest required size being made for various articles, including those enumerated.

GOVERNOR AND STOP MOTION.—F. J. Nutz and Philip Ester, Leavenworth Kansas.—This invention consists in an arrangement whereby the ordinary centrifugal governor is controled in its action and assisted to perform its proper functions as a regulator of motion, and also in a device for instantly closing the valve and stopping the engine in case of accident.

LADDER.—Benjamin F. Turner, Bridgeton, N. J.—This invention relates an improvement in ladders, for connecting several short lengths of separate ladders, in such manner that they may be readily and safely extended to be used as one long ladder, for a high elevation, or may be doubled upon each other to be used as a scaffold, or as a stage ladder, and thus be employed for various useful purposes.

LAMP BURNER.—William Robinson, Funkville, Pa.—This invention relates to an improvement in the construction of lamp burners and consists in making the cone or deflector movable by raising and lowering it within the outer perforated frame or case of the burner, to set the top nearer or further from the top of the wick tube.

COATING IRON AND STEEL WITH CAST IRON.—James Rigg, Iowa Falls, Iowa.—This invention relates to a method of producing a hard surface on iron and steel, and it consists in coating the said metals with cast iron, thereby producing a surface hard as the hardest steel, and which is susceptible of a high polish.

LATHE TOOL.—John C. Shackelton, Lawrence, Mass.—This invention relates to the manner in which a turning tool for lathes, in iron turning, is constructed and secured to the shank or tool holder, and it consists in forming the shank with a head in such a manner that the cutting tool is firmly secured to it and made adjustable by screws.

MOP WRINGER.—A. G. Starkweather, Burlington, Vt.—This invention has for its object to furnish a neat, simple, and cheap device by means of which mops may be wrung without its being necessary to take hold of the mop with the hands.

ANIMAL TRAP.—L. V. Badger, Chicago, Ill.—This invention has for its object to furnish an improved rat trap, simple in construction, not liable to to get out of order, and reliable in operation, and one which the rat, by escaping into the cage, will again set.

COTTON GIN.—A. Fessenden, Beaufort, S. C.—This invention relates to a cotton gin of that class in which the cotton is taken from a stationary platform and is carried between two rollers, which are so close together that the seed cannot pass through between them. The invention consists in the device for hanging the lower roller and adjusting it in the proper position. Also, in connection therewith, in an adjustable feed platform. Finally, in the shape of a self-adjusting seed-clipper or knife, and in the manner of hanging the same, so that it will assist in separating the seed from the fibers before the cotton comes to the rollers.

SPRING-BED BOTTOM AND BEDSTEAD.—E. Kreighoff, Rochester, N. Y.—This invention relates to a flexible spring mattress or bed bottom, which is so arranged that it can be easily removed or replaced when desired. When to be used as a bed bottom, the device is combined with a bedstead, which can also be easily taken to pieces, and to which it is secured in a novel and practical manner.

WOOD SCREW.—H. A. Harvey, New York City.—The object of this invention is to construct the head of a gimlet-pointed wood screw of a globular or spheroidal form, and to provide for driving it without cutting the ordinary nick across its face.

SPICE MILL.—H. W. Oliver, New Haven, Ct.—This invention relates to a new arrangement for keeping and grinding spices of various kinds, and the invention consists in combining and arranging a number of tubes or cylinders in such a manner that while the tubes severally contain different kinds of spices, either one may be ground separately from the rest.

MACHINERY FOR MAKING BUTT HINGES.—Adrian Rais, Waterbury, Ct.—This invention relates to improvements in machinery for the manufacture of butt hinges, and consists in mechanism so constructed and arranged that the two match blanks of a hinge are conveyed by automatic devices from two feed boxes or hoppers to the dies for bending the knuckles, thence to the milling wheels or disks, and thence to a central point where the leaves of the two match blanks are joined or interlocked, when another automatic device inserts the nail or rivet and the butt hinge is finished and discharged.

WATER ELEVATOR.—Samuel C. Lewis, Woodbridge, Mich.—This invention has for its object to furnish an improved apparatus for drawing water from wells, cisterns, etc.

GATE.—Ebenezer Young, Camden Center, Mich.—This invention has for its object to furnish an improved gate so constructed and arranged that it may be raised and will remain suspended so as to swing over snow or other obstructions, and so that its forward end may be lowered to rest upon the ground and hold the gate stationary in any position in which it may be placed.

AXES AND HATCHETS.—Daniel W. Callum, Laoni, Ill.—This invention relates to an improved form of ax, and consists in giving the edge a semi-circular shape.

RAT TRAP.—George Irwin, Elizabethtown, Ky.—This invention has for its object to furnish an improved rat trap so constructed and arranged that the caught rat, by locking himself in the inner apartment, will again set the trap.

WASHER AND WRINGER.—Wm. Bicknell, Hartford, Me.—This invention relates to a machine for washing and wringing clothes, and consists in the use of a tub in which a perforated reciprocating dasher is arranged, the removable cover of which is fluted on the under side, so that the clothes in the tub can be pressed between the dasher and the cover and are then submerged in water, and pressed again, until they are perfectly clean. They can then be wrung by pressing them between the dasher and the cover, and securing the former in place, gradually increasing the pressure until the water is removed from the clothes. The cover can be removed if desired, and can be used as a wash board.

WASHING MACHINE—Samuel Brackett, Port Huron, Mich.—This invention relates to a washing machine in which a flexible concave is so arranged in a box, around a revolving cylinder, that it can be closed completely around the said roller, thereby forming a cylinder of friction rollers around the clothes. The latter are secured upon the cylinder and revolve with the same within the flexible cylinder.

CARPET STRETCHER.—William W. Taylor, Newark, N. J.—This invention has for its object to furnish an improved instrument by means of which a carpet may be stretched upon the floor and held in place while the nails are being applied.

TUG TRIMMER.—Albert V. Hill, Limestone, N. Y.—This invention has for its object to furnish an improved instrument by means of which the edges of a tug may be conveniently, accurately, and quickly trimmed.

CLOTHES DRYER.—Henry Gransden, Dubuque, Iowa.—This invention consists in arranging arms upon an upright pole, in such a manner that while the arms are securely attached to the pole, and the cord or rope upon which the clothes are hung are attached to the arms, the whole may be securely folded up.

PETROLEUM FILTER.—J. Henry Smith, Pittsburg, Pa.—This invention relates to a method of filtering and purifying petroleum, and it consists in passing it through filtering pans containing proper filtering materials.

CAR COUPLING.—James Depeu, Peekskill, N. Y.—This invention relates to a self-operating car coupling, in which a link is used that is made in shape of a strong bar, having a head at each end. This head, when inserted in the coupling box, raises the hook-shaped front end of a pivoted bar, which as soon as the head has passed under the hooks, drops down over the head and locks the same between the inner end of the hook and a stop that is provided in the coupling box. For uncoupling the link, the front end of the hooked bar must be raised, which can be done in various ways.

BURGLAR ALARM GUN.—John Wilson, Anderson Court House, S. C.—This invention relates to a burglar alarm that consists of a swiveled horizontal gun barrel, so arranged on a frame that the said barrel can revolve on its vertical support. Suitable stops are arranged around the barrel, which are connected with wires that are spread across the room in which the apparatus stands, so that when a burglar or other party not acquainted with the arrangement of the wires, comes in contact with one of the same, the stop which holds the shot will be released, and the gun will swing around and strike against a stop, and point towards the direction in which the wire is stretched, whereby it will be discharged.

SPRING BEDS, SEATS, AND COUCHES.—Dwight Babcock, Seneca Falls, N. Y. This invention relates to a new manner of securing the upper slat of a spring bed bottom, seat, or couch to the spiral springs, and consists in the use of a ribbon which is laid across the slats, above a row of springs, and which is passed under the upper winding of each spring, thereby connecting and securely uniting the slats to the springs without the use of other fastenings or devices.

APPARATUS FOR DRYING LUMBER.—Richard P. Johnson, Wabash Ind.—This invention relates to an apparatus wherein wood of any description, whether sawed or split into lumber or not, may be steamed and dried, so as to be thoroughly seasoned.

LATHE FOR TURNING WAGON AXLES.—J. E. Cromwell, Jackson, Mich.—This invention relates to a machine for turning wagon axles, or the arms of axles that run in the wheel, and consists in the combination of saws and cutters that work in conjunction with each other in forming and giving the proper shape to the arm of the axle. It also consists in the novel arrangement of the feed works, which operate against a pattern which is duplicated by the machine in the most accurate and precise manner.

CREAM STRAINER.—George J. Bennett, Homer, N. Y.—This invention relates to a cream strainer, which consists of a cylindrical vessel with concave bottom, in which a seive or strainer is secured in such a manner that it can be easily removed or put on. A disk, having inclined wings similar to those of a screw propeller, is suspended directly above the strainer from a vertical shaft, and forces the cream through the meshes of the strainer when the shaft is revolved by a crank or other suitable device. Below the strainer is secured to the bottom of the vessel an inverted funnel, which protects the strainer and directs the flow of the cream after the same has been forced through the strainer.

DOOR HOLDER.—Edmumd Huddart, Prairie du Sac, Wis.—This invention consists in the construction and arrangement of parts of a door holder, in such a manner that one portion being attached to a door and the other part to the wall, the door may be held open, and in one position by friction.

Answers to Correspondents.

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

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

J. N. H., of Pa.—We think you will find pitch to be a suitable cement for your aquarium having the ground as a bottom, and sides of wood.

W. J. A., of Pa., suggests that instead of graduating the arcs of surveying and mathematical instruments on a flat surface, that the degrees minutes and seconds be determined by a train of gearing which shall be set in operation by the movable part of the instrument. The reading may be exhibited on a dial plate resembling a clock face or otherwise.

J. C. G., of Kansas.—You can procure Smee's and Napier's Electro-Metalurgy of J. Wiley and Son of this city. The cost of Smee's battery of a size suitable for electro-metallurgy, is about $5 per cup. You can procure an outfit of apparatus and materials of Butler & Smith, Broome street, this city.

F. H., of C. W.—Magnetic iron ore is found in great abundance in America. But specimens which have strong polarity are quite rare. Artificial magnets are easily made of greater power than natural magnets, and the latter (loadstones), are now only objects of curiosity for a museum or a mineralogical cabinet. For information on magnetism consult Ganot's or Silliman's Physics.

H. T. B., of Iowa.—"What is the best way to melt india-rubber, also where can I procure some of the pure gum?" India-rubber may be melted in a metallic or earthen vessel, and the care to be taken is that the heat be applied gradually and slowly It melts at about 248°. On cooling, however, it does not resume its original condition but remains in a semi-fluid adhesive state. Raw rubber can be procured at any of the rubber factories, and at some of the rubber stores in this city.

E. P., of Pa.—"The papers say that if his invention is perfected, it will revolutionize all previous systems." There's the rub, the success of the project depends upon its perfection. If our dreams were realities we might all be kings. We know nothing of the invention to which you allude.

N. K. S., of Vt.—For japanning, use the best quality of copal varnish.

A. T., of N. Y., is arguing with a friend who contends that the earth is not round like a ball but flat like a mill stone. A. T. seems to have been handled roughly and appeals to us for assistance. It is a pretty quarrel as it stands and we prefer not to interfere. But as some encouragement to hold on, we remind him that at last the truth is apt to prevail.

R. N. D., of O.—Chalk has not yet been found in America. It is imported from England, mostly as ballast.

R G. D., of Mo.—Carbolic acid is now extensively used here as a disinfectant, and is approved by the board of health and by the medical profession.

R. V. W., of R. I.—Alkali is an essential ingredient of soap, and we think, you are wasting your time in looking for a substitute for it.

E. W. N., of Mass.—We recommend you to get "The Draftsman's Book," published by H. C. Baird. 406 Walnut street, Philadelphia. You should procure other books in proportion to your means and to the extent you desire to pursue the subject.

T. L., of Mo.—The pressure on the pipe leading water from the pump into a boiler is greater than the pressure in the boiler. Otherwise no water would pass through into the boiler.

W. P. M., of Ill.—"We have a saw mill here (Ulin) owned by J. Bell which sawed on the 26th of June 42 poplar logs making 40,807 feet, square face, parallel inch boards by one double circular saw in 10 hours and 8 minutes." Mr. Bell appears to be the "top sawyer" of the Continent.

J. H. McC., of Ill., sends a recipe for a cement which he finds useful for vulcanized rubber or "anything else." Take best glue 4 oz., isinglass, 2 oz. and dissolve in mild ale, in a glue kettle, to the consistency of thin glue. Then stir in half oz., well boiled linseed oil. When cold it resembles india-rubber. It may be preserved in the form of cakes. When used it is to be dissolved in a suitable quantity of oil. It is an excellent cement for leather earthen ware, etc.

J. R., of N. Y., made a solution of chloride of silver in cyanide of potassium to which he added whiting. The mixture was put into two bottles, when shortly in one bottle it became reddish, while in the other it was not changed. The case is not extraordinary. Cyanide of potassium is a very powerful solvent of organic and metallic compounds, and the foreign matter to produce the color was introduced by some accident such as a dirty bottle or cork, etc.

J. B., of Iowa.—It is very doubtful if any of the processes of preserving wood by means of metallic salts are practicable for shingles in this country. The creosoting process (treatment with dead oil or coal tar) is however, economical and cheap. The strongest objection to it is that the wood is rendered more combustible.

D. S. C., of Mo.—A practical lithographer of this city says he is unable to give an opinion of the value of lithographic stone except an actual trial, and the sample you send is too small for the purpose. The appearance of the sample is favorable.

F. G. S., of Mass.—Your plan of measuring the curvature of the earth is correct and ingenious. The angle formed by plumb lines erected at the short distances from each other is so small that it cannot be determined with desirable accuracy.

A. G. C., of N. Y.—We are not aware that an ink is on sale, which fades completely in a short time after it has been used in writing with. It would not be very difficult, however to make such an ink.

J. Mc., of Ct., R. A. D., of Wis., page 7 says, people out there claim that a raft of lumber will travel faster than the current, etc. I know the people who say so, are right. The surface of a running stream is an inclined plane, and heavy bodies floating on its surface slide down the incline, and the heavier of two rafts will drift the faster. I am an old boatman and raftsman." The most rapid part of the current is generally in the middle of the stream, and if the raft be in it, the raft will travel faster than the current at its sides. Also it often happens that the current is a little swifter just below the surface, and for this reason a heavy body might float more rapidly than one which did not sink below the surface

W. P., of N. Y., has been told that a perfect sphere when elevated high in the air appears to the eye an oblate spheroid, and that the balls to be placed on steeples, etc., are consequently made of a prolate form to compensate for the optical illusion. . . . Mercury is a solvent for brass, and hence when rubbed on a brass wire, the wire becomes brittle. Observe how a lump of sugar becomes softer when wetted.

S. L. G. F., of Mass.—The sterility of land in a well watered tropical region is generally due to the impregnation of the soil with sulphate of copper or iron. . . . Coal is always associated with certain geological strata which are so disposed that they form a basin for the coal deposit. A knowledge of these facts is very important in making explorations for coal. . . . Mica is injurious to fire clay, and you will fail to make the best quality of fine bricks.

T. H. W., of N. Y.—For a given head and supply of water the larger the water wheel the better.

Business and Personal.

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

EXTENSION NOTICES.

Ephraim L. Pratt, of Boston, Mass., having petitioned for the extension of a patent granted to him the 4th day of October, 1853, for an improvement in machines for paring apples, for seven years from the expiration of said patent, which takes place on the 4th day of October, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 16th day of September next.

Harvey Lull, of Hoboken, N. J., having petitioned for the extension of a patent granted to him the 31st day of January, 1854, and antedated January 2, 1854, for an improvement in shutter hinges, for seven years from the expiration of said patent, which takes place on the 2d day of January, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 16th day of September next.

Joshua Gibbs, of Canton, Ohio, having petitioned for the extension of a patent granted to him the 4th day of October, 1853, for an improvement in machine for grinding plow castings, for seven years from the expiration of said patent, which takes place on the 4th day of October, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 16th day of September next.

PATENT OFFICE DECISIONS.—WHAT CONSTITUTES A PATENTABLE CONBINATION.

Elisha Foote for the Board of Appeals.

IMPROVEMENT IN FEEDING MILLSTONES.—The apparatus which the applicant claims to have improved is attached to grinding mills, and operates between the hopper or feed and the eye of the mill stone to blow out dirt and other impurities from the grain on its passage from the former to the latter. The applicant has changed the general structure of the apparatus, for which he claims many advantages, and has also added to it a new feature—that of separating and saving the light grain, cheat, and cockle, which before was blown off with the dirt. The first claim is for the separator, constructed and operating substantially in the manner described, and applied in the relation to the feeder and the eye of the stone, substantially as shown.

The reasons assigned by the Examiner for rejecting this claim are, that the combination claimed is not a valid one; that the "separator and feeder perform separate and distinct offices; and are not co-active in a legal sense;" that "if the action of the feeder depended upon the separator, or the separator upon the feeder, for a common result, such a condition of circumstances would change the action of the office, but the two devices act in succession and not together, and the two clauses of claim cannot be considered as in connection with the feed devices of a grinding mill."

We do not agree with the Examiner in respect to these grounds on which he has rejected the application. We do not regard it as essential that the several parts of a new combination shall act simultaneously, or that one part shall be dependent for its act on upon another. But, on the contrary, we hold that it is no objection that the separator and feeder perform separate and distinct offices; that the feeder does not depend upon the separator or the separator upon the feeder, and that the two devices act in succession and not together.

In the card-making machine, for example, one part draws the wire into the machine, another cuts it off, another bends it into proper shape, another punches the leather, another moves the carriage, etc. The whole is a combination of unsurpassed ingenuity. It was no objection to the patent that the different parts operated in succession and not together, and that one performed its offices without aid or dependence on the rest. It was enough that all contributed to a common result. In the present case, so long as the feeder and separator contribute to the purpose intended—the manufacture of flour—it matters not in what way they act, whether together or in succession, or whether dependently or independently.

There is no peculiarity in patent laws relating to combinations. Claims for them should be examined upon the same principles that apply to other inventions. In all there must be found invention and new and useful results. Mere aggregations of parts without invention to combine them—substitutions of merely equivalent devices for others—mechanical changes merely and variations of form, proportions, or arrangements, without new and improved results, do not consititute patentable combinations. It has been said that the several parts must be co-active—that means that the addition of something that is useless or does not co-operate in producing an improved result, will not be patentable.

But when invention has been brought into exercise to add a new feature to a machine, or to produce old results in a better or cheaper manner, we are not aware that patent laws impose any limitation as to the order or particular manner in which the several parts shall operate to produce the new results obtained.

The Examiner's decision is consequently overruled.

Inventions Patented in England by Americans.

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

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,395.—SELF-ACTING AND VENTILATING FEED BAG FOR HORSES.—Nathanie Knight, Auburn, Me. May 11, 1867.

1,440.—BILLIARD TABLE.—Hugh W. Collender, New York City. May

1,475.—TRUSS.—Wm. Pomeroy, New York City. May 18, 1867.

1,491.—INSTRUMENT FOR SHARPENING CUTLERY.—James Meyer, New York City. May 20, 1867.

1,499.—REAPING AND MOWING MACHINES.—Walter A. Wood, Hoosic Falls N. Y. May 20, 1867.

1,547.—STEAM GENERATOR.—Richard J. Nunn, Savannah, Ga. May 24, 186

1,551.—EMBROIDERING APPARATUS FOR SEWING MACHINES.—Louis Morris New York City. May 24, 1867.

1,697.—PROPELLER FOR STEAMSHIPS AND OTHER VESSELS.—Henry Rolle Boston, Mass June 8, 1867.

1,717.—APPARATUS FOR ELEVATING, WEIGHING, AND MOVING GRAIN.—Stephen W. Wood, Cornwall, N. Y. June 11, 1867.

THE "PUBLIC LEDGER" BUILDING.

No more decisive exhibitions, or rather demonstrations, of our progress are to be found than in the great improvement in the style and character of our buildings for the uses of the public, whether those buildings are intended for public charities or for public benefit through private enterprise.

Among this latter class we reckon the edifices for the production of the daily mental *pabulum* of the people. None are of better agreeable exterior or of more satisfactory and convenient interior than the magnificent edifice belonging to the *Public Ledger* of Philadelphia.

We made a brief notice a short time ago of the opening of this new establishment, but we present our readers, this week, with a view of its external appearance, and a description of its principal internal arrangements.

VIEW OF THE "PUBLIC LEDGER" BUILDING, PHILADELPHIA.

The building presents a splendid brown stone structure, 84 feet on Chestnut street, and 165 on Sixth, five stories in hight, with a Mansard roof as the finishing ornament. The architectural plan of the original building at the corner was followed in the additions, so far as outward appearances are concerned, thus giving to each story above the first a series of brown stone piers or pilasters to mark the divisions between the windows. Between each story the ornamentation in stone is simple and chaste, consisting of arches over the heads of the windows, with carved keystones and cornice, frieze and architrave as a relief to what might otherwise be the monotony of 116 windows above the first story on Sixth street, and 56 windows on Chestnut, or 172 windows on the two fronts. In the middle of the Sixth street front there is a slight projection, running the hight of the elevation. This tends still further to vary the architectural design. The first story is composed of heavy wrought-iron columns, supporting the stonework above. On the base a ribbon contains the inscription, *Public Ledger*, and also the monogram, "G. W. C." The whole design is exceedingly bold, and has been executed with skill and taste.

In addition to this ornament, the corner of Sixth and Chestnut streets contains a still more striking figure. Upon a stone column, two feet six inches in diameter, and eighteen feet in hight, set against the angle of the building, stands the statue of Franklin, cut from Pictou stone. The figure is ten feet six inches in hight, and is not only perfect in its details, but the face is the best likeness of the philosopher ever carved in stone. While Bailey, the artist, was engaged in modeling the figure, he received from the late Mr. William J. Duane a portrait of Franklin, painted in Paris, by Duplaisse, the celebrated miniature portrait painter. This is the best portrait of Franklin in existence. The figure stands erect, the left hand resting upon a pedestal formed by a pile of books to the left and rear of the statue. The right arm is elevated, and the hand grasps the lightning rod, while resting against the books is the traditional kite. The figure is clothed with the costume so familiar to us in the engravings of Franklin. The column upon which the statue stands is handsomely fluted, and has an ornate cap, around the neck of which is inscribed, "1866. *Public Ledger*. 1866." The face of the column will contain the bulletin board. As it stands, the top of the statue reaches to the third story floor, and an arrangement of gas is made, by means of which, at night, the four prongs of the lightning rod will emit flame.

The addition of the Mansard roof greatly increases the architectural effect of the whole structure. Without this roof the building has an elevation of sixty feet from the pavement to the elaborate cornice. This roof is rendered still more attractive by being arranged with domes at the corners fifteen feet in hight, from cornice, while the central elevation on Sixth street is a dome twenty-one feet in hight. The other portions of the roof are twelve feet above the cornice.

The Publication Office on the first floor, at the corner, measures twenty-three feet on Chestnut, by sixty-five feet on Sixth, and fifteen feet ten inches from floor to ceiling. The room is a marvel of delicate joinery work, and is one entire mass of dark walnut and buttonwood, or, as it is sometimes called, white walnut. Instead of plaster the sides and ceiling are wainscoted with these costly woods, while the counters, fixtures, furniture and general appointments are made to correspond in every respect with the elaborate design of the architect.

The labor and skill required in the construction of this magnificent office may be imagined when we state that there are nearly 4,000 pieces of wood of various shapes and sizes in the wainscoting, all fitted and joined together with the nicety and exactness of the most elaborate article of cabinet-ware.

The floor in front of the counter, as well as the floor of the Waiting Room, is laid with black and white marble tile in blocks. The contrast with the dark wood of the office is very fine. Heating apparatus has been introduced in the shape of coils of pipe inclosed in bronzed open-work iron stands, upon the top of which are white marble slabs. The result of this arrangement is, that instead of being in anywise an obstruction, they are rather an ornament to the room. In order to facilitate the transaction of business, a "dumb waiter" for "copy" is set in the side wall and leads to the third and fifth stories, the former being the editorial and the latter the composing rooms. Speaking tubes also communicate with the various apartments, 568 feet of tube being used throughout the building for this purpose.

The central dome on the top of the building is an observatory. From it a grand view of the city is obtained. A panorama of rare beauty passes before the vision of the spectator. East, west, north and south, for miles, every object of interest in Philadelphia is clearly discernible. Southward, the line of the Delaware and Schuylkill is distinctly marked until near the union of the two streams at League Island. Point Breeze Gas Works, the Alms House, County Prison, as well as hundreds of factories and founderies, are in view. North, Girard College, Fairmount Park, the Cathedral, and scores of prominent buildings are in plain sight. East, we have the Delaware with its shipping; and west, Mantua, and the whole region known as West Philadelphia. This "look-out" promises to be an attractive spot for those who wish to secure a bird's-eye view of Philadelphia, and in order to accommodate visitors, seats have been arranged around the flag staff. The whole is probably one of the best if not the best publication offices in this country, the basis of which is the establishment of a daily newspaper, that book for the million, at two cents a copy.

Squeaking Boots.

C. N. M. says that the unpleasant squeak of boot and shoe soles can be stopped by simply confining the layers of the sole by one or more rows of pegs, driven from the toe toward the heel, as the noise is caused wholly by the friction of one sole on the other. The only objection is that the rows of pegs unpleasantly stiffen the soles.

SLADE, our foreign correspondent, calls our attention to one or two singular statements made in his published letters, for which he is not to be held responsable. In speaking of the Austrian locomotive *Steyerdorf* (page 334 Vol. XVI,) its weight was given as four and a half tuns instead of forty-one and a half, as it should have been. Again, in describing the Walschaerts valve gear, it was stated that "the lead of the valve will be varied by shifting the radius rod in the link;" the reverse of this is of course true, the error in this case being caused by the omission of a line of the copy.

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VOL. XVII., No. 4....[NEW SERIES.]....*Twenty-first Year.*

NEW YORK, SATURDAY, JULY 27, 1867.

Contents:

(Illustrated articles are marked with an asterisk.)

NOTICE TO SUBSCRIBERS.

Those subscribers who wish to preserve the volume of the SCIENTIFIC AMERICAN just closed, can be supplied gratuituously with an illustrated title page and index, to bind with the sheets, on application at this office either in person or by mail, or through any dealers who supply the paper.

BINDING.—Subscribers wishing their volumes of the SCIENTIFIC AMERICAN bound can have them neatly done at this office. Price $1.50.

THE TRADES UNION ATROCITIES IN SHEFFIELD.

The cause of labor combinations in the form of trades unions must receive a severe shock from the revelations lately made in England before a Parliamentary commission. Although the crimes were committed by individual members without the sanction of the associations—at least this may be charitably supposed—yet it will be difficult to disabuse the public mind of a prejudice against the combinations which make these crimes possible.

For years a system of tyranny has been steadily pursued by some of the workingmen's organizations toward those who refused to associate themselves with the unions. If workmen, their tools were stolen, their tenements burned or blown up with gunpowder, all sorts of tricks were played with their work, and they themselves were brutally beaten and even murdered by hired assassins. If employers, their machinery was destroyed by midnight burglars, their shops, and factories burned or blown up, their workmen intimidated, and their persons brutally maltreated. At last, the local authorities being powerless to put a stop to these outrages, either from sympathy with the perpetrators or from the terrorism which seemed to have taken the place of law, a commission was appointed by Parliament to investigate the matter, and by promising immunity from punishment to the perpetrators on confession, it has succeeded in drawing forth the details of crimes as revolting and tyranny as absolute as that of Al Hassan, the "Old Man of the Mountain." Except for these confessions of the villains, themselves, it would be impossible to believe these tales of horror.

In this case the directing and presiding Thug was one Broadhead, secretary of the Saw Grinders Union, and Treasurer of a national association of trades whose members number over 60,000. The confession of this Broadhead and two of his tools show that he paid them out of the funds of the societies whose affairs he managed, ten pounds for blowing up a house or shop and fifteen pounds for maiming or murdering an obnoxious person. After the deed was perpetrated he would offer rewards for the detection of the criminals, and denounce the atrocity in public meeting. One man named Linley was murdered by Broadhead's assasins for the sum of seven pounds ten shillings each, two being employed. Broadhead states that he committed the crimes with "great regret!" One of his victims was pounded until almost dead, another crippled for life, another killed outright. Seven houses and factories he caused to be blown up, among which was the dwelling of a butcher whose offense was that he harbored a relative who was obxoxious to Broadhead.

The effect of these revelations will probably be to destroy sympathy for the workingmen who combine in unions, and either to suppress the associations by law or by the indignation of the people. It is difficult to believe that the associations for which Broadhead acted were entirely unaware of the uses to which their money was applied, for the crime of tool stealing appears to have been very generally prevalent, and the falsification of Broadhead's accounts seem not to have instigated any investigation. He states explicitly that the secretaries of two associations gave him money for the perpetration of his crimes. How far, however, his statement about others is worthy belief is a matter on which the reader must form his own opinion.

It would be hardly fair to denounce all labor combinations because some of their members behave like fiends. There is little doubt that these crimes were the offspring of ignorance and low moral sense, rather than of association. Intellectual, and especially moral education of the members is the only safeguard of the public and preventive of organized and systematized crime.

THE EARTH BECOMING TOO SMALL FOR THE HUMAN FAMILY.

It was formerly a common practice to estimate geographical distances by the time required to travel over them. The expression, "day's journey" occurs many times in the bible and in other books translated out of the ancient tongues. This measure of distance was a very convenient one and was sufficiently exact for ordinary purposes, for it was based on many centuries of the experience of mankind in traveling. The time consumed is generally the most important incident of a journey. This word journey, by the way, originally meant only the distance traveled in a day, and it held this meaning, until modern improvements in locomotion made it indefinite. A day's journey was equivalent to a distance of twenty to thirty miles.

The facilities for travel determine the extension of commerce and civilization. Where modes of travel are easy and rapid, more people can live, and can live in greater comfort. By reason of the improvements in locomotion made during the present century, it might be shown that the earth to day is capable of supporting twice as many people as formerly.

Instead of going only 20 or 30 miles in a day over a hard and dangerous road, we glide over 300 miles by sea, and 600 by land. We travel about twenty times faster than our grandfathers; our day's journey has increased in length twenty times, and at the same time it is cheaper and safer. Because travel is more rapid, cheap, and safe, every one now is on the move. Distances are practically so lessened that it is to be feared that the earth will turn out to be a narrow stamping ground for the human family. All the nations have become neighbors. We hold world's fairs and conventions; we hope shortly to have a universal system of coinage and weights and measures, and perhaps a universal language. There is to be a metropolis of the world where all tribes of men shall be represented: will it be Paris or shall we build it in America? The tendency is to bring all to a level, but it is a level whose plane is far above any former and local civilization. There is to be a universal community of interests and thus a practical community in property.

TO THE PRESIDENT.

We respectfully call the attention of the President to the deplorable condition of the business of the Patent Office, asking that he will inquire into the mismanagement of the present Commissioner, and do something to relieve the genius of the country from the oppressive delays occasioned by official stupidity. We understand that there are between three and four thousand models of new applications now waiting examination at the Patent Office. The examinations in many of the most important classes of inventions are half a year, more or less, in arrears, and the interests of thousands of dependent inventors are allowed to suffer, without any steps being taken for their relief. The Patent Office was established expressly for the encouragement of inventors, but it is at present so mismanaged as greatly to discourage them.

Nothing can be more dreary or disheartening to the inventor than the delays of the Patent Office in deciding upon the novelty of the application. In many cases the entire private business of the inventor and his associates, are suspended until the decision is rendered. In other cases the delays of which we complain, occasion the ruin of the brightest prospects of the applicant.

If the President asks for an explanation from the Commissioner, the latter will make his usual stereotyped excuses and assurances,—want of room,—want of aid from the Secretary of Interior—most positive, most prolific promises of immediate, instantaneous reform. But we warn the President that unless he issues a peremptory order to have the work brought up, nothing will be done. The Commissioner seems to be incapable of doing anything of his own volition, except to make and break promises. He evidently needs a galvanic shock from his superior officer, and we hope the President will lose no time in administering the proper kind of electricity.

AIR GUNS NOT NOISELESS.

We find the following in *Harpers' Weekly* for July 13th:

Air guns have been known for more than a hundred years, yet they are rather appendages to the lecture room of the professor than for practical purposes. By the compressed air in a metallic ball, permitted to escape by the opening of a valve, ten, twenty, and possibly fifty balls may be discharged in a single minute with the deadly force of powder. The larger the volume of compressed air the greater the momentum of the bullet. A question has come up why such arms would not be of the highest importance in the time of war. Cannon might batter a fortress into powder, and ten regiments attack a fortified city with showers of balls without alarming the sentinels, because there is no report.

We regret to see a periodical like *Harpers' Weekly*, usually so accurate in its statements, aiding in the perpetuation of a popular error. It is not correct to say that the action of compressed air in an air gun has the "deadly force of powder." While air cannot be compressed by any mechanical means now used more than about forty times, giving a pressure per square inch of about six hundred pounds, the lowest estimate made of the force of exploding gunpowder is a pressure per square inch of about twenty thousand pounds. Neither is it true that the discharge of the air gun is noiseless. The shock of a suddenly liberated gas against the atmosphere is the cause of the noise of the explosion of gunpowder; it is not its combustion. So in an air gun, the liberation of the compressed air makes a report proportioned to the force of its action on the atmosphere. In the recent case of the shooting of Carr, in Brooklyn, by Skidmore, the officer who witnessed the affair testified to the sound of a dull explosion, and although the murderer was within a few feet of his victim the projectile merely entered the head, instead of passing through, as would most likely have been the case if gunpowder had been used.

It is erroneous to suppose that the air gun is noiseless. The only reason its explosion does not make so loud a report as that of gunpowder is because it has a proportionably less force.

THE NATURAL COLORS OF FIBROUS MATERIAL.

Although Nankin cotton was for many years a favorite material for thin goods, and the woven fabric was quite popular not only for its endurance but for its color, many people then and many now suppose the yellow tint of the cloth to be given by the art of the dyer. This is not so. The deep yellow, or rather the faint orange tint of the Nankin cotton is inherent in the natural product and the art of the dyer has nothing to do with it. This cotton is of the variety known to botanists as the *gossypium arborem*, or tree cotton, and is supposed to have originated in Persia. The fiber is remarkable for its length, strength, silkiness, and yellowish tinge. It grows luxuriantly in some parts of India and China, from the latter of which our importations of Nankin cotton were originally made. The Sea Island cotton of our Atlantic coast is a variety of this cotton, and greatly excels the *gossypium herbaceum*, or upland cotton, in length and strength of fiber, and differs from it in its color. This makes the strongest thread cotton in use, and as its yellowish tinge is much fainter than that grown in the East, chemical science has discovered a way to bleach it.

The color is generally considered to be due not to the climate but to the constituents of the soil, which must contain ferruginous oxides to give it the orange shade. Its length of fiber, and strength however, is due mainly to its species, as no upland or herbaceous variety ever equals it in this respect. The last generation was very partial to the Nankin cotton. At that time buckskin breeches, having a buff color, or cloths of a similar hue, were considered "the thing," and in summer the love of the color could be gratified by the substitution of the Nankin cotton as being lighter and almost as tenacious and durable. The changes of fashion, only, can be quoted as an adequate reason why the Nankin cotton should not now as then be popular as material for gentlemen's pantaloons and vests and ladies' dresses. Certainly no such cheap and agreeable material has as yet succeeded the Chinese product.

It seems as though nature was chary of her extremes in color. She produces but little material for our manufacture which is either pure white or unmitigated black. Our cotton, however nearly it approaches white, is still impure in shade, and the wool of the blackest sheep appears a dingy dark gray. To make them either the one or the other we must have resort to the sciences as practically applied. Even the white silk dresses of brides are colored. They are not of the natural tint. If so they would show an unsatisfactory tinge neither white nor positive yellow. When the silk, imported from southern Europe, or China, or Japan is received in this country, it has a dirty half yellow half orange shade which is not at all agreeable to the eye The blueish silvery luster which is seen in white silks and satins is produced wholly by the art of the dyer. It seems impossible to produce any vegetable material for textile manufacture which shall have a positive shade.

In animal products it is different. We can have perfectly black wool, also wool which is a perfect white. If it does not appear so when first sheared, thorough washing and cleaning by chemical means will make it rival the driven snow. No need of the art of the dyer here. Possibly, however, the time will come when by the advancement in the arts we may be able not only to give different colors to the vegetable products used in the manufacture of textile fabrics, but be able to bleach tinged material to a perfect snowy white.

TINNING RIVETS AND TACKS.

T. M. H., of Mass., desires to know how to coat tacks with tin. He says he has tried for a long time, but has not yet succeeded. The process is very simple, but some manufacturers make a great mystery of it and endeavor to keep it a secret. Rivets, tacks, and other small articles are tinned in the same manner. First, the tacks should be thoroughly cleaned. For this purpose dilute sulphuric acid is used, only strong enough to remove the grease and whatever scale there may be on the tacks. From the acid they are put into water and rinsed, then taken out and drained. While still damp, powdered salammoniac is sprinkled over them and they are ready to go into the bath. This is merely a cauldron of melted tin. Until the tacks are hot enough to "take" the tin they float on it, but soon as they sink they are ready to be removed. This is done with a perforated ladle or skimmer, and the operator throws the ladle-full of tacks violently against a a screen of sheet iron to loosen the excess of tin and prevent the tacks from being soldered together. From the screen they slide down inclined troughs of sheet iron long enough to insure the cooling of the tacks before they reach the bin.

These inclines must have considerable pitch so that the tacks cannot stop on the way and become glued to the trough.

This is the grand secret of tinning tacks. The acid cleans them and the salammoniac acts as a flux. All the tin that rattles off in the form of scales can be saved and remelted. The sale value of tacks tinned is increased about five cents a pound, and the cost is about two cents.

USES OF NUISANCES.

Few people can look with pleasure, or even complacency, on the reptile tribe, but they have their uses. The snail is a *bon bouche* to the French and others, and frogs or "water chickens" we know by trial to be delicious. The inhabitants of Central America delight in the flesh of the huge lizard, iguanodon, and even the musky flesh of the alligator is not obnoxious to them.

Years ago we knew of a lady, refined and cultivated, who ate with gusto the crawling bugs found under stones in moist places, called by the country people "sow-bugs," and declared they had a delightful acid taste. The French saying, *chacon a son gout*, is perfectly right. Every one to his taste. What is poison to one is nourishment to another; and we find in one of our exchanges a statement that the common angle worm when fed for a few weeks upon sugar is said to furnish a very delicate and delicious jelly, which is peculiarly acceptable to the stomachs of dyspeptics and consumptives.

We have no doubt of the truth of this statement. We have known this reptile used as a material for soup as well as for a poultice, applied outwardly and inwardly with apparently good results in certain cases of disease. Whether the cure was the consequence of the prescription, we are not physician enough to say, but that a cure did follow from this almost inhuman treatment, we know.

In fact, we have no better reason for rejecting the lowest of God's creatures as a means of our advantage, whether in health or sickness, than we have for denying our appetites the gratification of animal food altogether. At first sight the use of the reptile and insect tribe is unpleasant, but when we consider that from the earliest times whole tribes and nations have considered them legitimate articles of food or means of cure, we pretend to a nicety of taste not supported either by the practice of others of our race or by the Word of God if we reject them.

As we understand the purpose of the Creator, nothing was created in vain, and possibly while we have been trying to curb the elements, we have forgotten that the lowest orders of animal life may be made to minister to our wants and our necessities, if not to our love of change.

"Haloxylin"—New Blasting Powder.

The vast importance to the miner of a thoroughly good blasting powder, causes considerable interest to attach to all inventions relating to the manufacture of that article; especially when additional advantages are obtained without a corresponding increase in the cost of production. For some time past a new blasting compound—the novelty of which, however, consists rather in the mode of manipulating the materials than in the materials themselves—has been extensively used in the mines and quarries of the Austrian empire, under the name of haloxylin, which appears to have given great satisfaction, both from the quantity of work done and the manner of doing it. It is one of those powders which has the property of merely burning away when in the open air, and yet exerting a great rending force when properly confined in the blast hole; while it is not liable to ignite spontaneously, and cannot be exploded by percussion or friction. The smoke resulting from the explosion is less in volume than usual, and, in addition to this, it is free from the usual suffocating character of powder smoke; in fact, there is nothing in the residue injurious to health, or even disagreeable, so that operations can be carried on without intermission. A pound of haloxylin will occupy nearly twice the space of 1 lb. of gunpowder; and as it does fully two-thirds the amount of work, bulk for bulk, as any powder now in use, it follows that a material saving of cost is effected.

The invention of this powder is due to Messrs. Wilhelm and Ernst Fehleisen, of Styria; it consists of sawdust, charcoal, saltpeter, and usually, ferrocyanide of potassium, although the latter ingredient is sometimes dispensed with. The proportions in which they are combined are generally 9 parts by weight of sawdust, 3 to 5 parts of charcoal, 45 parts of saltpeter, and, 1 part of ferrocyanide of potassium. The sawdust, which if not from a non-resinous wood should have the resin extracted from it, is passed through a fine sieve, and then mixed with finely-powdered charcoal (from light woods) and powdered saltpeter. The mass is moistened with about a quart of water to the hundredweight, and then stamped or crushed. By this means the whole is rendered homogeneous. The mass is now moistened again with water under ordinary circumstances, and with a weak solution of ferrocyanide of potassium when a quick powder is required. The subsequent processes of caking, granulating, and drying are conducted in the same way as is usual in the manufacture of ordinary powder, and the grains can, if desired, be polished as usual, but this is found to be unnecessary.

Owing to the great cost of carrying explosive materials, the importation of haloxylin from Germany is, commercially, out of the question; it is, therefore, proposed to manufacture it in this country. There are at present three factories in Styria, Hungary, and Moravia respectively, yet they are scarcely able to keep pace with the continually increasing demand, and it is to this circumstances alone that is to be attributed the fact that until now, no efforts have been made to introduce it into England. The Hunyad board of the Kronstadt Mining and Smelting Company made careful comparative experiments in their Telek iron mines, and obtained with half the weight of haloxylin the same results as with the powder in ordinary use; but such a high duty as this probably resulted from some exceptional circumstances not having been taken into account; that 2 lbs. of haloxylin, however, will do as much as 3 lbs. of other blasting powder appears to have been well ascertained. The Austrian State Railway Company certify, as the result of the experiments made at their mines in the Banat, that the trials in the coal mines of Doman, took place in a cross course when very dense vapors prevailed; nevertheless, the place could be approached immediately after blasting, no smoke being left. As to the effect, 2 to 2¼ ozs. of haloxylin are equal to 3 to 3¼ ozs. of blasting powder. The result of the experiment with this substance showed that a firmer inclosing wall was required than with powder; the effect upon the rock was more cleaving than crushing, and on account of this property it promises considerable advantages over powder for the blasting of coal. In the ironstone mines of Morawieza the experiment was made in less firm rock, with large bores, and a charge of 25 to 30 lbs. of haloxylin produced an effect exceeding by one-third that of gunpowder. Such evidence as this is sufficient to prove that the non-explosive has, at least, some advantage over ordinary blasting powder; and when the quantity of blasting powder annually used in Great Britain is taken into consideration, it will be readily understood that, assuming even the smaller estimate 30 per cent of saving, the inducement for the miners of this country to adopt it will be ample to insure, under any circumstances, a fair remuneration to those undertaking the manufacture.—*London Mining Journal.*

English Artisans at the French Exhibition.

On Whit-Monday, as we learn from the London *Times*, the first batch of English artisans, about one hundred and fifty, went to see the French Exhibition. A little encampment of huts has been built close to the most frequented entrance of the Champ de Mars—namely the Porte Rapp—for the working classes, the huts are clean and comfortable. Some contain two beds and some four. More than one hundred of these beds have been engaged for the use of English artisans during the next five months; and during the present holidays a still larger number have been engaged. It is calculated that the trip to Paris will cost the British workmen about fifteen dollars, and for this sum he can stay there a week. The cost of transit to and fro absorbs half the money. There are kitchens all over Paris which provide the workingman with a cheap dinner, wonderfully good; and at the Omnibus Buffet, in the Champ de Mars, he can fare well at a very moderate charge. All the food in Paris is rigidly inspected. There are people there whose business it is to examine even the eggs that come into the market; so that the artisan can have no fear that he will have carrion or horseflesh or anything false offered to him. This omnibus restaurant is an immense place, with accommodations for fifteen hundred people to dine all at once. "The food is really good, and I doubt not says the *Times* correspondent, that the British workmen will enjoy the change and think it glorious. The only thing bad about the dinner is the cheap wine. The beer is very good, as they have not yet learned the art of adulterating it; but the British workman does not see the use of coming to Paris, if he is to drink beer."

Native India Muslins.

Whatever relates to textile fabrics, especially those of cotton, cannot fail to interest American manufacturers. In our growing familiarity with the marvellous amount and delicacy of the products of power looms and other machinery worked by steam, we are in danger of forgetting what is daily accomplished by means of hand looms and the workings of the supple and sensitive fingers. To this day India cotton goods, especially the Dacca muslins, or those from Eastern Bengal, have been imported into England, recommended by their superior softness, richness and durability. So, also, of the calicoes, chintzes, and ginghams, which form the staple manufactures of Coromandel. Though nearly driven out of the European market by cheap and successful imitations, they are still preferred in the East, where the curious believe themselves able to distinguish by the touch and even by the smell these genuine products of the Indian loom. The highest qualities of the Dacca muslins are splendid examples of the superiority of intelligent labor over the most elaborate machinery. The hand of the Hindoo, to use the language of a writer in *Once a Week*, "is educated to a delicacy of touch that is marvellous, and that delicacy is transmitted through succeeding generations until the native manipulator acquires a kind of instinctive aptness, which gives him all the unfailing regularity of a machine, directed by the intelligence of man." The native women spin with the finger a yarn which surpasses in fineness the machine-spun yarn paraded, in the great Exhibition of 1862, as a marvel of European skill. The classes of muslin called "woven air" and "evening dew" are, as their names would import, of surpassing fineness of fabric. It is related that a weaver was chastised and driven out of the city of Dacca for neglecting to prevent his cow from eating up a piece of this quality of muslin which he had spread out and left upon the grass, the article being so fine that the animal could not see it on the herbage. So delicate is the manufacture of the shirt staple of the Dacca cotton that it can only be spun into yarn at certain times of the day. Preference is given to the morning, before the dew has left the grass; or, if spinning be carried on after that time, it is over a pan of water, the evaporation from which yields moisture enough to prevent the fiber from becoming too brittle to handle. The Dacca muslin, with all its delicacy, will wash, while European muslin will not. A piece of "evening dew," one yard wide and four yards long, weighs only one ounce and eighty-six grains.

Figured muslin is a still more costly and delicate work of the Indian loom. No approach has been made by Europeans in producing the charming effect of weaving gold and silver threads into the different fabrics made in India. The embroidery in the woven garments, in which the absolutely pure gold is employed, never tarnishes, and it washes just as well as the other threads of the garment.

What will our American manufacturers, who may look to competing at some future day with the English in supplying the Indian market, say to the following statement made by the writer whom we have quoted above: "A native with a rude bamboo loom will, with his fingers and toes, finish a piece of muslin which cannot by all the application of our most delicate machinery be produced in Europe." A like superiority is evinced in the Hindoo's almost instinctive appreciation of appropriate form and color in design. He has learned to print fast colors. The native fabrics are remarkable for the sobriety and harmony of hue which they present. The English colors will not wash, and even Prussia is gaining the advance in supplying dyed goods to India.—*Philadelphia Ledger.*

Product of a Fleece of Wool.

The product in thread or cloth from a fleece of wool is something astonishing. At Norwich, many years since, 39,200 yards, or twenty-two and a quarter miles of thread, were spun from a single pound of wool; and 60 years ago a Miss Ives, at Spaulding, spun 68,000 yards or about 95½ miles of woolen thread from a pound of wool, off a Lincoln ewe. But this seems nothing to the multiplication a fleece now undergoes at Bradford. From the manufacturer who generally buys by "clip," I obtained this bit of information. A 20 pound Lincoln fleece, used as an admixture with cotton in the finest Alpaca fabrics, suffices for upward of twelve "pieces," each piece of 42 yards in length; it might probably be extended to 16 pieces, or a total length of 672 yards, three feet in breadth. At 3s a yard, the sum realized would £100; and I suppose (though I am not much of a dressmaker), that the crinolines of 80 or 90 ladies were covered with a single fleece of wool.—*J. A. Clark, Long Sutton, Eng.*

Rose Crop.

Mr. Blunt, the British Vice-Consul at Adrianopole, in his report to the Foreign Office this year, gives an account of the rose fields of the neighborhood of Adrianople, extending over 12,000 or 14,000 acres, and supplying by far the most important source of wealth in the district. The season for picking the roses is from the latter part of April to the early part of June; and at sunrise the plains look like a vast garden full of life and fragrance, with hundreds of Bulgarian boys and girls gathering the flowers into baskets and sacks, the air impregnated with the delicious scent, and the scene enlivened by songs, dancing, and music. It is estimated that the rose districts of Adrianople produced in the season of 1865 about 700,000 miscals of attar of roses (the miscal being 1¼ drachms) the price averaging rather more than 3s. per miscal. If the weather is cool in spring, and there are copious falls of dew and occasional showers, the crops prosper, and an abundant yield of oil is secured. The season in 1866 was so favorable that eight okes of petals (less than 23 lbs.), and in some cases seven okes, yielded a miscal of oil. If the weather is very hot and dry, it takes double that quantity of petals. The culture of the rose does not entail much trouble or expense. Land is cheap and moderately taxed. In a favorable season a donum (40 paces square) well cultivated, will produce 1,000 okes of petals, or 100 miscals of oil valued at 1,500 piasters; the expenses would be about 540 piasters—management of the land 55; tithe, 150; picking 75; extraction, 260—leaving a net profit of 960 piasters, or about £8,11s. An average crop generally gives about 5 per donum clear of all expenses. The oil is extracted from the petals by the ordinary process of distillation. The attar is bought up for foreign markets, to which it passes through Constantinople and Smyrna, where it is generally dispatched to undergo the process of adulteration with sandal-wood and other oils. It is said that in London, the Adrianople attar finds a readier sale when it is adulterated than when it is genuine.

A Strange Telegraphic Freak.

A few weeks ago a couple of wires on the New York Central Railroad began to act very unreasonably. At ten o'clock in the morning they would "strike work," and resume at four in the afternoon. A careful examination of the line produced no result. The superintendent himself looked into the matter and saw nothing. It was a complete puzzle. An old Albany operator, however, was more successful. About sixty miles west of that city he found a point where the wires passed over the roof of a building, almost touching it. As the sun rose, the wires fell, and at twelve o'clock they lay snugly together on the tin roof. As the sun fell, they cooled and rose, and by four o'clock they were in their proper positions. Of course the trouble was rectified.

A PATENT has recently been taken in England for introducing into the liquid metal in the puddling or other furnace used for converting cast iron or steel, the vapor of nitric acid or chloric acid rich in oxygen, or their salts, and also the vapor of hydro-acids or other materials rich in hydrogen, or the salts of hydro-acids, or mixtures of the said acid vapor, either alone or combined with a blast of air; or liquid hydro-carbon in a state of vapor may be introduced into the liquid metal. By the introduction of the oxydizing gaseous liquid or solid compound the decarbonization of the iron and the oxidation of silicuous matters in the iron are promoted. When hydro-acids or materials rich in hydrogen, or the salts of hydro-acids, are passed through the melted metal, they are decomposed, and at the moment of decomposition, or when the elements are in a nascent state, they act upon the metal and improve its quality. The quantity of acid or salt employed will depend upon the composition of the iron acted upon.

OFFICIAL REPORT OF

PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JULY 9, 1867.

Reported Officially for the Scientific American

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66,440.—SEWING MACHINE.—Wm. W. Abbott, Boston, Mass.

1st, The movable plate, m, or its equivalent, in combination with the revolving cup, Z, the hook, h, when so constructed and arranged as to form the lock stitch, the embroidery stitch, and single chain stitch, at the will of the operator, substantially as set forth and for the purpose described.

2d, I claim an elastic metallic take-up upon the revolving cup, Z, constructed and operating substantially as set forth for the purpose specified.

3d, I claim the combination of a sliding collar with cams, 1, 2, and 3, and annular grooves, 4, with pin, b, lever, W, and spring, V, and pins, U, for changing or reversing the feed motions of sewing machines as described.

4th, I claim the combination of the stationary take-up, t, with an elastic metallic revolving take-up, s, as set forth, for the purpose specified.

5th, I claim the combination of a spool case and a grooved and slotted cup with its hook and movable plate, m, for purposes specified, as described.

66,441.—BROOM HEAD.—L. Allen, Berkley Springs, West Va.

I claim the handle, with its cross piece, B, pinned in the mortise at right angles to the handle, in combination with the perforated leather stock, C, and perforated leather band, E, retained by the recesses, a, in the extension, D, of the socket, substantially as described

66,442.—CLOTHES OR TOWEL RACK.—F. A. Balch, Hingham, Wis.

I claim constructing a folding clothes rack, with bars moving horizontally on a single pivot, with the ledges, G, behind said pivot, which will support said bars in a horizontal position equally well, whether partially or wholly extended, as set forth and described.

In combination with the folding bars, A, frame, B, plates, C D, and pivot, E, the ledges, G G, as set forth and described.

66,443.—RAILWAY CHAIR.—W. H. Baldwin and J. H. Blake, Brandon, Vt.

We claim the combination of the extension ribs, b¹, the rigid wedge gib, c, having lips, c¹ the chair, A, with wedge lips b, and rails, d, having receiving slots, d¹, when the parts are constructed, arranged, and operating as herein represented and described.

66,444.—COVER FOR GAS RETORTS.—B. H. Bartol, Philadelphia, Pa.

I claim, as a new article of manufacture, the within-described retort cover, made of plate iron, depressed in the middle and provided with a wrought-iron rib, b, at the back, with a central rivet or stud, c, all substantially as described.

66,445.—CHURNING AND WORKING BUTTER.—W. D. Baughn, Milford, Mich.

I claim the arrangement and combination of the plow or scraper, M, the cog wheel, I, the standard, K, and rod, N, and the beater, O, all arranged substantially as described for the purpose designed.

66,446.—MUCILAGE BRUSH.—W. W. Beach, New York City.

What I claim is a mucilage brush, formed with a tubular handle, into one end of which the brush is secured, and supplied with mucilage in the manner specified.

I also claim the elastic stopper or cover, fitted to slide upon the tubular handle, in combination with the brush and fountain, as and for the purposes specified.

I claim a tubular handle for a fountain brush, in which the hairs or bristles are entered within the lower end of such tube, and provided with a tube passing through said bristles, to allow the liquid or semi-liquid in the fountain to pass to the brush, as set forth.

I claim a mucilage or fountain brush, formed of a glass tube, composing the handle, an air hole in the same, and a brush entered within or secured to the end of said glass tube, as set forth.

66,447.—MUCILAGE BOTTLE.—W. W. Beach, New York City.

What I claim is a fountain brush for mucilage, formed substantially as shown, with a brush at the mouth of the fountain, and an opening through the same into the fountain, as and for the purposes specified.

I claim the receptacle, d, in combination with the fountain, a, and brush, b, substantially as and for the purposes set forth.

I also claim a fountain for mucilage in combination with a brush that is removable from said fountain so as to be changed for the purposes, and as set forth.

64,448.—INKSTAND AND MUCILAGE HOLDER COMBINED.—W. W. Beach, New York City.

What I claim is a mucilage receptacle and inkstand combined, substantially as and for the purposes set forth.

I also claim the displacer, d, formed with a screw on the outside for adjusting said displacer in the ink, and a cup on its inside for the reception of mucilage, substantially as set forth.

66,449.—MUCILAGE HOLDER.—W. W. Beach, New York City.

What I claim is a mucilage holder and brush, fitted as specified, so that the brush, when not in use, is pressed down into the mucilage, and when in position for use, is projected from the holder, as set forth.

66,450.—WASHING AND WRINGING MACHINE.—C. F. and F. Blood Gravesville, Wis.

1st, We claim the fluted springing pieces, B, arranged and operating substantially in the manner hereinbefore described and for the purpose specified.

2d, The combination of the suspending post, H, with the box, A, by means of the hinge, f, pin, h, and screw, i, substantially in the manner and for the purposes above set forth.

3d The combination and arrangement of the rollers, I and I', with the bed, B, for the double purpose of drawing the clothes from the latter, when washed, and wringing them at one operation, substantially as described.

66,451.—WATER ELEVATOR.—Azro M. Bowles and Hiram Preston, Orfordville, Wis.

We claim the combination and arrangement of the pawl, g, the ratchet on the shafts, B, the brake, E, and lever, F, and button, a, to operate as described and set forth.

66,452.—CONVERTING IRON INTO STEEL.—John F. Boynton, Syracuse, N. Y.

I claim the herein described method of converting iron into steel by passing over or through it, in a close oven or retort, and while in a highly heated state, a current of carbureted or carbonized gas, and at the same time dropping into the oven solid cyanides or solid ammoniacal compounds, substantially as described.

66,453.—INSULATOR FOR TELEGRAPHS.—John F. Boynton, Syracuse, N. Y.

1st, I claim supporting an insulating cap, the whole material of which is a non-conductor, by a non-conducting pin, when such pin is constructed separately from the cap, substantially as shown and described.

2d, I also claim securing a non-conducting pin to an insulating cap, both of which are composed entirely of non-conducting materials, by an insulating cement, as herein set forth.

3d, I also claim securing a non-conducting pin, composed entirely of non-conducting material, to the cross arm, bracket, or telegraph pole, by an insulating cement, as set forth.

4th, I also claim the combination of a non-conducting pin, composed entirely of a non-conducting material, with the slot, A, and binding wire hole, B, substantially as herein set forth.

66,454.—FARM GATE.—J. W. Brewster, West Lawrens, N. Y.

I claim the double track rail, C, when made adjustable, substantially as described and for the purposes set forth.

The blocks, e e e, bands or clasps, f, and keys, h, when used and combined with the posts, B, to operate as and for the purposes specified.

66,455.—CORN HUSKER AND STALK CUTTER.—Elisha Briggs, Sen., Fayette, Iowa.

I claim the combination and arrangement of the main driving shaft and pulley, A, the gears, B B, the corrugated crushers, C C, the pulley and journal, D, the cutters, E E, the driving pulley, H, the feed table, F, the belt, V, the boxes, I I I I, the frame, K, the legs, L L, the lever, O, and the bearing rollers, T T, arranged substantially as described for the purpose designed.

66,456.—WATER WHEEL.—E. Briggs, Sen., Fayette, Iowa.

I claim the arrangement and combination of the floats, A A A, etc., with the valves, a a a, etc., upon the endless apron, B B, carrying the pullies, E E, and the chains, K K, with the braces, H H, the wings, D D, the hitching bars, F F, the bolts, N N, and the slots, I I, and the whole attached and floated upon the frame or raft, C C, all substantially as and for the purposes described.

66,457.—BURGLAR ALARM.—O. M. Brooks and R. W. Soper, Janesville, Wis.

1st, We claim the construction and arrangement of a burglar alarm in such a manner that the movement, by the burglar, of the tripping lever, G, that is inserted in the keyhole of the door to be guarded, shall cause a match to be lighted and a cap or a charge of powder in an attached barrel to be fired, substantially as and for the purpose described.

2d, The combination and arrangement of the tripping lever, G, with the dog, H, and hammer, B, substantially as and for the purpose set forth.

3d, The match holder, D F, when constructed as described, and used to adjust a match either in front of the vent, k, or the orifice, u, substantially as and for the purpose described.

4th, The combination and arrangement of the hammer, B, nipple, S, and part, C1, with the match holder, D F, in such a manner that the hammer does not strike the match, but fires it by the explosion of the cap, substantially as, and for the purpose described.

5th, The combination and arrangement of the hammer, B, nipple, S, part, C1, barrel, C, and match holder, D F, substantially as and for the purpose set forth.

6th, Securing a burglar alarm in the keyhole of a door by means of the screw button, d 1, substantially as and for the purpose set forth.

66,458.—MEANS FOR HANGING MIRRORS.—Frederick Brown, Detroit, Mich.

1st, I claim the hollow standard, B, with the opening, V, the slot, W, and the spiral spring, O, the stem, D, with the set screw, T, and the arm, F, arranged substantially as and for the purpose specified.

2nd, The combination and arrangement of the hollow standard, B, the stem, D, the arm, F, the mirror or reflector, H, the spiral spring, O, the hollow screws, K K, the screws, L L, provided with the slot, d d, the thumb screws, N R T, the hooks, P P, the opening, V, the slot, W, and the gains, a a, all arranged substantially as described for the purpose specified.

66,459.—ATMOSPHERIC ALARM WHISTLE.—Samuel G. Cabell, Quincy, Ill.

1st, I claim the chamber, D, when constructed so that the air chambers, b b1, thereof communicate by means of valves, c c1, on either side of a dividing plate, a, with the whistle, J, for operation substantially as set forth.

2d, The arrangement and combination of the vacuum whistles, d d1, with the blast whistle, J, or their equivalent, for alternate operation, the former serving to supply air to the chamber, D, and the latter to give it vent, by means of valves suitably arranged, and operating substantially as set forth.

3d, The arrangement and combination of the funnel, G, with the chamber, D so as to serve as a gage for the level of the fluid in said chamber, as set forth.

4th, In combination with an air chamber and whistles, I claim the use of any compounds that will, by their decomposition or chemical combination, generate gas, and consequent pressure for operating or sounding said whistles, or their equivalents, essentially as specified.

5th, The combination with the vibrating weight chamber, D, of an air pump, M, and air chamber, I, operating substantially as described.

66,460.—OCTAVE COUPLING FOR REED INSTRUMENTS.—B. O. Church and Hervey Smith, Brattleboro, Vt

We claim the arrangement of the levers, C C and F F, in such manner that the lower levers, C C, pass over and work upon the lower fulcrum, B, and the upper levers, C C, pass under the upper fulcrum rest, E, substantially as and for the purpose shown.

66,461.—MODE OF NUMBERING COUPONS.—S. M. Clark, Washington, D. C.

I claim the method of numbering coupons, bank notes, and other tokens, substantially as herein set forth and described.

66,462.—STEAM-ENGINE LUBRICATORS.—Frank Colligon, Buffalo, N. Y.

I claim, 1st, The combination of a lubricating cup and pump, substantially as described.

2d, In combination therewith, I claim the stop cock, G, as and for the purposes described.

3d, The arrangement of the pump with reference to the cover, I, substantially as herein set forth.

66,463.—RIBBON MAP.—M. Coloney and S. B. Fairchild, St. Louis, Mo.

We claim the map, B, arranged with its end strip, b, in combination with the reel and its crank, C, and the casing, A, substantially as set forth.

66,464.—BRICK KILNS.—Charles B. Corey and Charles M. Turner, Cleveland, Ohio.

1st, I claim the arrangement of the furnace, Q, with side flues, R1, in combination with the kiln, B, for the purpose and in the manner substantially as described, when placed over the suspended charges as they are successively lowered and removed from the kiln,

2d, The shaft, D, roller, K, chains J, and bars, L, when operated conjointly by the screws, G, in combination with the bars, F, for the purpose and in the manner as set forth.

3d Supporting the charges or piles of brick in the kiln by the employment of cross bars, T, passed under said piles and for lowering them down into the the truck, V, and supporting the superimposed piles while the lower pile is being drawn from the pit, substantially as described.

4th, Holding or supporting superimposed piles or charges of bricks in the kiln while being burned, and then discharging the same from said kiln by one continuous automatic operation.

66,465.—CUPOLA AND OTHER FURNACES.—Andrew Cowan and Robert H. Starr, New Haven, Conn.

We claim, 1st, The combination with a cupola or other like furnace of an air or blast receiving or heating chamber, applied to the said furnace in the manner described, so that the heat and other products of combustion generated within the furnace may be brought into direct contact with the metal plates which constitute the inner wall of the said chamber, for the purposes set forth.

2d, The combination with the annular chamber for heating the blast, applied to the furnace, as herein described, with tweers, opening at different elevations into the interior of the said furnace, as and for the purposes shown and specified.

3d, The method of drawing in or contracting the walls of the furnace immediately above the blast-heating chamber, as and for the purposes herein shown and described.

4th, The application to the inner wall of the blast-heating chamber of one or more corrugated or other suitably formed plates for protecting the said chamber against the effects of excessive heat, as shown and set forth.

66,466.—CLOTHES DRYER.—Frank Crandall, Erie, Pa.

I claim the construction of the adjustable clothes racks, revolving one above the other, with notches, H, on the side pieces, E, to clutch the outside posts, A, so as to hold the racks in a horizontal position for the clothes to hang on, as described and set forth.

66,467.—RAILROAD CAR.—L. B. Chittenden, Pittsburg, Pa.

I claim, 1st, A close or latticed-work car frame mounted on trucks, such frame being made of boiler plate or angle iron, and furnished with angle-iron ledges, on which ledges to place brick bearing shelves or trays.

2d, The construction and use in connection with such car of a tongue, l, having an arm, l', the latter provided with one or more pawls, in combination with a corresponding central ratcheted rail, substantially as and for the purposes hereinbefore set forth.

3d, The combination and use, in combination with a car for transporting and drying brick, of a metallic brick-bearing tray, having flanges or projections on either or both of its opposite ledges, so that when such trays are placed side by side in the car, interstices or openings will be left between them for the free circulation of air, substantially as and for the purposes hereinbefore described.

66,468.—BRICK MACHINE.—L. B. Chittenden, Pittsburg, Pa.

1st, I claim the arrangement of devices in an off-bearing brick machine for supplying trays, from the inclined sliding frame, b, to the belts, d d', or rollers, e e', such devices consisting of the slide, o, with a projection, o', in combination with suitable gearing for communicating motion to and operating the same, and in such a way that a tray will be supplied to the belts, d d', or rollers, e e', as soon as each preceding tray shall have passed the foot of the frame, b, substantially in the manner and for the purpose above set forth.

2d, The rollers, e e', of an off-bearing brick machine, in any desirable number, and either with or without belts, d d', and arranged either horizontally or inclined, in combination with a ratchet or other equivalent device for producing intermittent motion, by which a tray resting thereon will be carried forward sufficiently to receive successively a brick at a time, substantially as and for the purposes hereinbefore set forth.

66,469.—CHURN.—James Davies, Mazomania, Wis.

1st, I claim the flutter wheel constructed as described, and arranged in the box, C, on the top of the main churn, with the grated opening at the bottom, as set forth.

2d, The pivoted lever, u, arranged to form the outer bearing for the shaft of the flutter wheel, so that by releasing said lever the band may be loosened, and the wheel stopped independent of the main dasher, as described.

3d, In combination with the ribs, n, secured to the inner wall of the churn, I claim the revolving dasher, B, having its arms constructed of triangular bars, b, with the rectangular perforated enlargement at their outer ends, as described.

66,470.—TWEER.—Hiram Dean, Clyde, Ohio.

I claim the rectangular or oblong opening, D, in combination with the stops, E, levers, F, and box, A, arranged in relation to each other, substantially as and for the purpose set forth.

66,471.—JOURNAL AND AXLE BOXES.—P. S. Devlan, Jersey City, N. J.

I claim the combination with a metallic or other hard journal or axle box, of strips of wood inserted in dovetail grooves therein substantially as shown and described.

66,472.—LINING FOR JOURNAL AND AXLE BOXES.—P. S. Devlan, Jersey City, N. J.

I claim an axle or journal box or lining thereto, constructed substantially as described, with recesses open at their one, but closing at their opposite, end alternately for the insertion of the anti-friction or lubricating material, essentially as herein set forth.

66,473.—CHECK HOOK.—Nich. Dieterich, Sandwich, Ohio.

I claim a check hook constructed substantially as and for the purposes specified.

66,474.—COUPLING, JOURNAL AND BOX.—D. H. Dotterer, Philadelphia, Pa.

1st, I claim a journal, D, in combination with the anti-friction rollers, C and C', turning on stationary axes when geared together, substantially as and for the purpose herein set forth.

2d, The hollow anti-friction rollers, C and C', arranged to turn on stationary spindles fitted to the case, B, as described.

3d, The trunnions, a a, on the box, adapted to and arranged to vibrate in the portion, A, of the hanger, and confined vertically thereto by set screws, f f, all substantially as set forth.

4th, The coupling journal, D, provided at one or both ends with tubular enlargement, F, constructed for the reception of a shaft, substantially as set forth.

5th, The hollow enlargement, F, its lateral opening for the introduction of the shaft, and the follower, h, adapted to the said opening and confined therein by the ring, G, or its equivalent.

6th, The tapering exterior of the enlargement, F, and the detachable follower, h, forming a continuation of the said tapering enlargement, in combination with the tapering ring, G.

7th, The combination of the follower, h, and its feather or projection, l, with the grooved end of the shaft.

66,475.—PAINT BRUSH.—B. Adams Drayton, Utica, N. Y.

1st, I claim thimble F, constructed in the form and manner herein described and for the uses and purposes mentioned.

2d, The thimble F, and cap E, and the shoulders B B, of the handle, in combination for the uses and purposes mentioned.

3d, The thimbles, G and F, and cap, E, in combination for the uses and purposes mentioned.

66,476.—HAIR CURLER.—Sallie Ann Early (assignor to Samuel R. Nagel), Philadelphia, Pa.

I claim the within-described hair curler, composed of the curved bar, A, of wood or other light material, and the retaining wire, B, hinged to one end of the said bar, and having a bent end fitted to a slot in the opposite end of the bar, all substantially as set forth.

66,477.—PLOW.—Henry H. Ebaugh, Hereford, Md.

1st, I claim mounting the supporting wheels, B C, in swing frames, D E, pivoted to the main frame, A, arranged and operating substantially as and for the purpose herein specified.

2d, I also claim the winding pulleys, N O, of different sizes, in combination with the chains, bands, or ropes, n o, and swing frames, D E, substantially as and for the purpose herein set forth.

3d, In combination with the foregoing, I also claim the pulleys, P R, crank, S, and its ratchet and pawl, substantially as and for the purpose herein specified.

4th, I also claim the gage wheel, I, when arranged and operating in connection with the swing frames, D E, as and for the purpose set forth.

5th, I also claim the arrangement of the pole or tongue, G, in the roller, H, and guide socket, g, as herein specified.

66,478.—CHURN.—James P. Edmonds, Rochelle, Ill.

1st, I claim the peculiarly-formed portable or removable supporting frame, C M B D, with the shaft, F, and wheel, E, arranged as and for the purposes set forth.

2d, I claim providing the bar, D, with a slot, d, when used in combination with the aforesaid portable frame and wheel and the dasher handle, as and for the purposes specified.

3d, I claim providing the wheel, E, with a series of unequal openings, u v x y z, in combination with the arm, N, upon the handle, B, as and for the purpose described.

66,479.—CAR-SEAT LOCK.—Martin P. Ford, Columbus, Ohio.

I claim recessing the cam, A, and spring lever, o, into the back of the plate, so as to present a flush surface as herein described.

66,480.—APPARATUS FOR EVAPORATING SORGHUM JUICE AND OTHER LIQUIDS.—Henry Fowler, Bronson, Mich.

I claim the arrangement of the steam chamber, D, pipes, a a a and E, connected with the water chamber, F, and discharging pipe, f, in combination with the eduction pipe, G, safety valve, h, lever, H, and weight, k, operating substantially as and for the purposes set forth.

I also claim the arrangement of the horizontal steam pipes, in such manner that the greatest heat will be in the center of the boiling pan, thus throwing the impurities and scum to the side and corners of the pan or evaporator, as and for the purposes herein described.

66,481.—BED BOTTOM.—F. S. Frost, West Cambridge, Mass.

I claim, 1st, The combination of the springs, e, connected by straps to the slats, d, the bars, b d, and the straps, g, as and for the purposes specified.

2d, The extended springs, e', in combination with the bars, b e, and the bar b, provided with the elastic pads, 1, as and for the purpose specified.

66,482.—ANTI-RHEUMATIC LINIMENT.—J Galette, N. Y. City.

I claim, 1st, The use of oleum crotonis and oleum creosoti, in combination with other substances, as a remedy against rheumatism.

2d, The compounding and mixing of the new anti-rheumatic liniment, substantially as herein described and for the purpose specified.

66,483.—TRUNK LOCK.—Sereno Gaylord, Chicopee, Mass.

I claim, 1st, In a catch lock placing two or more catches, A A' B B', on each side of the key pin, and working on pins, I I, at their lower ends, the distances between the key pin and key bearings being different on the upper and lower catches, so that by reversing the same a different lock may be formed, the parts arranged substantially as herein shown.

2d, In combination with the above the key guards, C and D, arranged substantially as and for the purpose shown.

66,484.—SAW SET.—John M. Geer, Holden, Mass., assignor to Dodge and Wellington, Worcester, Mass.

I claim the head, B, constructed in the manner described for supporting the head, C, with the extending jaw, E, and laterally-projecting arm, F, substantially in the manner set forth.

66,485.—CORN SHELLER.—H. A. Graeff, Birdsboro, Pa.

I claim the arrangement and combination as above set forth with which the shellers, A, in Figs. 1 2 3 and 4, are attached, and worked by the fork, E I, in Fig. 1, together with the knife, D, in Fig. 3, for cutting green corn from the cob.

66,486.—MODE OF DRYING BRICKS.—Isaac Gregg, Philadelphia, Pa.

I claim an oven, A, having openings at both ends, and containing or surrounded by one or more steam casings or steam pipes, in combination with endless bands or chains, e e, which extend through the oven, and to which either an uniform or an intermittent motion is imparted, all substantially as and for the purpose described.

66,487.—APPARATUS FOR HEATING CLAY.—Isaac Gregg, Philadelphia, Pa.

I claim, 1st, A casing or vessel, A, surrounded by or containing a steam casing or coil, in combination with a shaft, C, having blades or arms, D D, the whole being constructed and operating substantially as described.

2d, The combination of the above with a steam pipe, communicating with the casing for the purpose specified.

3d, A casing A, consisting of two detachable sections, b b', containing chamber, X, communicating with a steam boiler and adapted to each other, and enclosing a shaft having arms or blades secured to the same, all substantially as and for the purpose set forth.

4th, The combination of the above and the stuffing boxes, f, and followers, g, constructed as described.

66,488.—APPARATUS FOR TREATING CLAY.—Isaac Gregg, Philadelphia, Pa.

I claim the two tapering rollers, C and C', geared together and arranged to operate on the clay and stones contained therein as set forth.

66,489.—FOOT SCRAPER AND UMBRELLA STAND.—Charles Gudehus and F. Staake, Philadelphia, Pa.

We claim as a new article of manufacture the device consisting of case, a, drawer, b, scraper, d, umbrella stand, f g, and brushes, h i k m, combined and arranged substantially as shown and described.

66,490.—SPRING FOR BEDS.—D. F. Haasz, Philadelphia, Pa.

I claim the springs, d d, links, f f, and bar, b, in combination with the strap, A, sliding rod, a and disk, b, or its equivalent, the whole being constructed, arranged, and operating substantially as and for the purpose described.

66,491.—CULTIVATOR.—M. Haskins and D. B. Hart, Mentor, O.

1st, I claim the use and employment, specially, of cultivator shovels or plows, M, provided with perforations or open insertions, made transversely across the blade, or in any direction that will serve the purpose contemplated, as herein set forth.

2d, The use and employment of the blinds, N N, provided with slots, and with jogs, O O, in combination with the above described perforated shovels or plows, M, and operating substantially as and for the purpose specified.

3d, The use and employment of said described perforated shovels, M, with and without the said described blinds, N N, in combination with the slotted right-angled beam, H, cross tie, I, rods, G G, grooved clevis, E, beam, F, plow standards, P1, swivel braces, Q, brace, Q1, slotted bands, P4, band, P5, and bolts, P2, all arranged, combined, and operating as and for the purposes described.

4th, The graduated standards, J, plow handles, K, rod, R, and joints in beam, F, combined and operating as and for the purpose described.

66,492.—EGG TONGS.—W. F. Hellen, Washington, D. C.

I claim the construction and form of the tongs, A, to correspond with the shape of an egg, when constructed of any material with or without teeth, B, and with any kind of a handle to operate them, as herein described and for the purposes set forth.

66,493.—THILL ATTACHMENT.—H. R. Hoagland, Montezuma, N. Y.

I claim the combination of the thill attachment, D, with the clip head, B, when said clip head is provided with a uniform transverse bore open at both ends and also with a transverse slot whose sides shall form an acute angle with the arm, A, substantially for the purpose set forth.

66,494.—AUTOMATIC FEED FOR STEAM PANS.—Henry Holcomb, Painesville, Ohio.

1st, I claim the within described automatic feed apparatus, consisting of the reservoir, A, filler, B, supply pipes, C and H, stop cocks, E and I, and air pipe, F, arranged, combined, and operating as herein set forth and for the purpose specified.

2d, The combination of the said described apparatus with vapor pans, evaporators, tanks, and other articles used in the processes of the evaporation of fluids.

66,495.—CULTIVATOR.—Hanford Ingraham, Naples, N. Y.

1st, I claim the arrangement of the standards and cross bars with the molds or shares, as constructed in combination with the thills, substantially in the manner and for the purposes as herein described.

2d, The adjustment of the shares to the required angle, by means of adjustable plates, with flanges substantially in the manner and for the purpose as herein described.

3d, The adjustable clasps in combination with cross bar, E the thills, rods standards, and shares, substantially in the manner and for the purposes as herein described.

66,496.—TOP PROP NUT FOR CARRIAGES.—James Ives, Mount Carmel, Conn.

I claim as a new and improved article of manufacture, a top prop nut, constructed with a solid head on screw tapped socket.

66,497.—LOCK FOR VALISES, ETC.—Thomas James, New York City.

I claim the bolt, C, provided with a notch, a, and two or more hooked catches with corresponding staples in the opposite jaw, in combination with the sliding catch, E, and drop, F, the whole constructed and arranged substantially as and for the purposes specified.

66,498.—FIRE ANNIHILATOR.—Chas. T. Jerome, Minneapolis, Minn.

I claim the application of a quick match which will take fire at a low temperature, to an apparatus for extinguishing fires by the injection upon the same of a gaseous non supporter of combustion, substantially as described.

2d, Providing the gas generating vessel, D, with a water chamber, substantially as described.

66,499.—AMALGAMATOR AND CONCENTRATOR.—George Johnston and Edwin G. Smith, Auburn, Cal.

We claim, 1st, The revolving belt or apron, F, with its raised edges, O, having a shaking or rocking motion from side to side, substantially as and for the purpose described.

2d, The amalgamating plate, E, in combination with the revolving shaking belt or apron, substantially as and for the purpose described.

3d, The box, M, with its jets in the direction of the motion of the belt or apron, together with the roller, N, substantially as and for the purposes described.

66,500.—PROCESS FOR MANUFACTURING BANK NOTES, ETC.—George T. Jones, Cincinnati, Ohio.

I claim the combined process herein described for producing bank notes or other securities by plate and surface printing at separate operations and with various colors on unsized paper and subsequently perfecting the paper and locking up the prints therein by the application of size, which is subsequently rendered insoluble by heat.

66,501.—FARM GATE.—Henry H. Kelty, Northfield, Ohio.

I claim the gate, A, constructed with inclined bars, B C, in combination with the slotted stay, G, as and for the purpose herein substantially as described.

64,502.—PERMUTATION LOCK.—W. F. Kistler, Chicago, Ill.

I claim, 1st, The arrangement of a movable slide, F, of the arm, E, of the knob spindle, for operating the tumblers, substantially as and for the purposed [illegible].

3d, The combination with said movable slide, F, the arrangement of the cam, g, so as to operate said slide, substantially as specified.

3d, The arrangement of the auxiliary cams, e h' in combination with said cam, g, to bring the pin, f, at the proper position when it reaches the cam, g, causing it to operate as set forth.

4th, The combination of the tumblers and their drivers with said slide, F, and spindle, s, arranged and operating in the manner described.

5th, The combination of the dog, M, block lever, V V', click, V, and arm, b'', arranged so as to operate in the manner and for the purposes set forth.

6th, In combination with the last foregoing, the arms, W, and lip, w, and the stop, R, arranged substantially in the manner and operating substantially as described.

7th, In combination with said arm, W, the arm, Z, and its connections, with the dog, S, arranged and operating in the manner and for the purposes specified.

8th, In combination with the arm, b'', the arm, Z, provided with a shoulder, Z' and the connections, Y X, or the equivalent, for the purpose of raising up the dog, S, from the bolt, D, substantially as specified and set forth.

9th, In combination with the arm, W, the arrangement of an arm, a', upon the spindle, s, so as to operate in the manner and for the purposes described.

66,503.—FRYING PAN.—Geo. H. Knight, Cincinnati, Ohio.

I claim, 1st, The combination of the eccentric rim, F, with the vertical or nearly vertical fume duct, B, descending within the said rim, substantially as and for the purposes set forth.

2d, The combination of the ducts, D and B, with the skillet, A, and cover, C, substantially as and for the purposes set forth.

66,504.—SHADE HOLDERS FOR LAMPS AND GAS BURNERS.—Hezekiah Knowles, Brooklyn, N. Y.

I claim the extensible adjustable shade holder consisting of movable and fixed arms combined with each other and with the central support substantially as described.

66,505.—FEED BARS FOR SEWING MACHINES.—Sanford Littlefield, Grafton, N.Y., assignor to C. S. Smith and P. J. Marsh, Troy, N.Y.

I claim, 1st, The employment of an adjustable and removable part or piece, E, of vulcanized rubber or other suitable material, in combination with the feed bar of a sewing machine, and at or near the feed point or part which carries the feeding surface, so as to receive the wear from the action of that part of the machine which moves it forward, in the manner and for the purposes substantially as herein described.

2d, The employment and combination with the feed bar, B, of a sewing machine of an adjustable and movable vulcanized rubber piece, D, or its equivalent, in the manner and for the purposes substantially as herein described and set forth.

66,506.—WELL TUBES AND POINTS.—Ira A. Livingston, Hornellsville, N. Y.

I claim the solid metal point, A, shank, X, socket, y, in combination with the rectangular slot, b e, and projection, f, on the shank, to secure the main tube, C, in connection with the outer tube or shield, B, and coupling, D, operating in the manner as and for the purposes herein set forth.

66,507.—AUTOMATIC FAN.—Wm. O. Loeffler, New York City.

I claim, 1st, The fan, F, in combination with the roller, d, and oscillating frame, E, constructed and operating substantially as and for the purpose set forth.

2d, The slats, F, and slotted cross bar, g, in combination with the fan, F, and oscillating frame, E, constructed and operating substantially as and for the purpose described.

3d, The flexible connection, i, in combination with the oscillating frame, E, and rocking lever, J, constructed and operating substantially as and for the purpose set forth

66,508.—MOLDING BOX.—Thos. L. Luders, Olney, Ill.

I claim, 1st, In combination with a flask or box constructed substantially as described, the lifting levers, as and for the purpose set forth.

2d, The adjustable tapering and bevel edged guide, B, on one portion of a molding box, in combination with the lugs, h h, or their equivalents on the other portion of the box.

66,509.—COMPOUND FOR CLEANING GLASS AND POLISHING METALLIC WARES.—H. P. Marquam, Harrisburg, Pa.

I claim the above compound prepared as and for the purpose set forth.

66,510.—WINDOW BLIND FASTENING.—N. F. Mathewson, Barrington, assignor to himself and Nathaniel Grant, Providence, R. I. Antedated June 27, 1867.

I claim the improved fastening for blinds described, consisting of two independent latches, B and F, in combination and arranged to engage with appropriate catches, substantially as set forth.

66,511.—MANUFACTURE OF ILLUMINATING GAS.—George McKenzie, Glasgow, Scotland.

I claim the combining of pulverized coal and mineral oil to form a compound to be used for obtaining illuminating gas, substantially as hereinbefore describep.

66,512.—PROCESS FOR PREPARING WOOD FOR THE MANUFACTURE OF LABELS, TAGS, ETC.—John Melling, Rochester, N. Y.

I claim, 1st, The treatment of cedar or other suitable wood, with the solution, substantially in the manner and for the purposes herein shown and described.

2d, The proportions of the ingredients forming the solution for the treatment of the above mentioned substance, substantially as set forth.

66,513.—TAILORS' CRAYON SHARPENER.—Benj. W. Minor and Allen Colburn, Boston, Mass.

We claim the cutter as composed of the cross bar and tube arranged and slotted as described.

We also claim the combination and arrangement of the cutter and the waste-intercepting cup.

We also claim the combination and arrangement of the cutter, the waste-intercepting cup, and the base or weight, the whole being as and for the purposes described.

66,514.—PRINTERS' CHASE.—John N. Murray, Chicago, Ill.

I claim the combination and arrangement of the frame, A, the bars, B C, and slides, b c, and clasp, d, and set screws, S, operating substantially as and for the purposes described.

66,515.—GATE LATCH.—E. Nicholson, Rockport, Ohio.

I claim the construction of the latch, D, provided with the shoulders, b b', notch, c, and curved shoulders, F, as arranged in combination with the spring, E, slotted plates, C C', and gate, for the purpose and in the manner as set forth.

66,516.—STOVE PIPE SHELF.—Luther Olds, Battle Creek, Mich.

I claim a portable shelf which is adapted for being secured to and sustained by a stove pipe, substantially in the manner and for the purpose described.

66,517.—FRUIT PICKER.—Samuel Page, McAllisterville, Pa.

I claim the combination of the forked plate, A, with notches, A', recess, C, handle, B, shearing knife, D, and cord, K, said several parts being respectively constructed and arranged for use substantially as described.

2d, The combination of the fruit picker and adjustable rest, as shown in fig. 3, substantially as described.

66,518.—MANUFACTURE OF RUBBER HOSE.—E. L. Perry, New York City, and William A. Torrey, Montclair, N. J.

I claim, 1st, In the manufacture of india-rubber or gutta-percha hose, covering the joint or joints of the mandrel in which the hose is made, with a strip or strips of paper, substantially as and for the purpose described.

2d, In interposing between the inner tube or lining to india-rubber or gutta-percha, and the outer covering of whatever material made, a layer or layers of any suitable air and water-proof stock or material, substantially as and for the purpose specified.

3d, In the manufacture of india-rubber or gutta-percha hose, so winding the cotton, duck or other fibrous or textile fabric used, that the warp threads of the fabric, will intersect or cross each other, substantially as and for the purpose specified.

66,519.—PLANING MACHINE.—F. J. Plummer, Worcester, Mass., assignors to R. Ball & Co.

I claim, 1st, Supporting the matcher spindles and heads in a swinging frame constructed and operated substantially in the manner and for the purposes stated.

2d, I claim in a machine such as described, the combination of the swinging matcher head bed or frame, with the arms, H, cam arms, L, and shaft, M, substantially as herein shown and specified.

3d, The combination of the arms, H, and connecting bolts, o, with the slotted cam arms, L, in the manner and for the purpose described.

4th, The combination with the arms, H H, of the horns, J J, and the shaft, M, substantially as and for the purposes set forth.

5th, The combination with the rear ends of arms, H H, of the projections, I I, and oblong holes or slots, g g, for the purpose stated.

66,520.—CLOTHES DRYER.—W. F. Redding, Saratoga Springs, N. Y.

I claim, 1st, The combination of the sliding tube, D, mounted on the square post, and collar, E, provided with recesses for supporting the arms, substantially as shown and described.

2d, The metal belt, G, passing over the pulley, d, and fitting in the groove, l, when used in connection with the tube, D, and windlass, F, for raising and lowering the reel as herein set forth.

3d, The blocks, b c, or their equivalents attached to the post, B, for holding the arms when putting them up or taking them down as shown and described.

4th, Providing the base, A, with the staples, a, for securing the apparatus in place, substantially as described.

66,521.—TEA KETTLE.—Ezra Ridley, Troy, N. Y.

I claim a tea kettle having an edgewise swinging cover pivoted to or upon an inwardly extended part, b, of a rim around the opening in the top of the tea kettle, when the whole is so constructed that if the cover be partially or nearly closed and the tea kettle then inclined forward, as in pouring water out of the spout, the weight or gravity of the cover will then make or tend to make the cover swing shut and stay shut, substantially as herein set forth.

66,522.—PIANO FORTE STOOL.—George Schmidt, Dobbs Ferry, N. Y.

I claim, 1st, The combination of the seat, A, spindle, B, with a groove, C, in it, and spiral springs J, with the center plate, E, having a tongue, D, thereon and frame, F, as hereinbefore set forth.

66,523.—CLOTHES PIN.—Ebenezer Seaver, Boston, Mass.

I claim, 1st, A clothes pin composed of a base piece or clamp, A, a hinged clasp, B, and a locking device, C, substantially as described or its equivalent for securing the clasp in position.

2d, I claim the spring, c, or its equivalent in combination with the clamp, A, and clasp, B, as and for the purpose specified.

3d, I claim the toothed or corrugated edges, a a', in combination with the grooves, b b', in the clamp, A, and clasp, B, as and for the purpose set forth.

66,524.—WEIGHING SCALE.—Reuben Shaler, Madison, Ct.

I claim, 1st, The combination with flat springs, C, of a scale of the pieces, a, substantially as and for the purpose set forth.

2d, Making the springs, C, of a weighing scale constructed substantially as described, concave on their edges, so that they shall gradually diminish in width from the ends to the center, substantially as and for the purpose specified.

3d, The combination with the rack, I, and pointer, G, with the set screw, e, operating substantially as described for the purpose set forth.

66,525.—MANURE DRAY.—A. H. Shock, Piqua, Pa.

I claim the arrangement of the combined central runner, B, with the revolving hook shaft, S, and its bearings, s, in combination with the spring bolt, E, with its notched head, C, peg or shoulder, P, operated by the lever, L, in the manner and for the purpose specified.

66,526.—LAMP EXTINGUISHER.—G. Simpson and W. H. Edmunds, Waterbury, Vt.

I claim the combination of the socket, a a, with the hinged cap, B, connecting rod, b, crank, c, and wick tube, A, constructed and operating substantially in the manner herein described for the purposes herein set forth.

66,527.—STARTING ENGINES AND OTHER MACHINERY OFF THEIR CENTERS.—Alfred Sims, New York City.

I claim the presser, A A' attached to the frame of a steam engine or to any part in proximity to said engine by pivots, swivels, hinges or by movable slides or other equivalent devices to operate in combination with the crank, B, substantially as and for the purposes described.

66,528.—STAMP AFFIXER AND CANCELLER.—T. A. Slack, Peoria, Ills.

I claim the combination of an adhesive stamp feeder and affixer with a stamp canceller, substantially in the manner and for the purposes as herein set forth.

2d, The movable frame or arms, d d, rollers, e h and l, and spring, f, as arranged and operated in combination with the ink ribbon stamp, substantially for the purposes and in the manner as herein set forth.

3d, The arrangement of the arm, q, in combination with the lever shaft, p, for attaching and detaching the stamp feeder to and from the stamp canceller, substantially in the manner and for the purposes as herein set forth.

4th, The stamp feeding machine as described, in combination with the stamp canceller, substantially in the manner and for the purposes as herein described.

66,529.—AMALGAMATING THE PRECIOUS METALS.—H. J. Smith, Boston, Mass.

I claim, 1st, An amalgamating apparatus in which mercury is made to pass from an amalgamating chamber to a regenerating tank in which its amalgamative power is increased, as described.

2d, Renewing or increasing the amalgamative energy of mercury by passing it through or bringing it in contact with a solution of one of the compounds, or salts, of an electro positive metal, subjected to an electric current, as specified.

3d, Causing the mercury in an amalgamating apparatus after regeneration, to flow in a direction opposite to that taken by the comminuted ores on which it is intended to operate, so that the one least charged with metal shall encounter mercury of the greatest amalgamative energy as set forth.

4th, Directly and continuously supplying to mercury used in the extraction of metals from their ores, the waste of the amalgamative energy which occurs in the process of amalgamation, by bringing it into contact with a solution of one of the salts, or compounds, of an electro-positive metal acted upon by an electrical current, as described.

5th, Causing the ore to be operated upon, to pass through revolving perforated plates in the amalgamating chamber, in the manner set forth.

6th, The arrangement for conjoint operation in an amalgamating apparatus, of an amalgamating chamber, regenerating tank and electric battery, substantially in the manner and for the purpose described.

66,530.—HORSE HAY FORK.—Frederick Snyder, Hinkleton, Pa.

1st, I claim the combination of the brace handles, I I' with the tine handles, A B, above and below the tine heads, J K, to which the tines, L, are affixed together with the quadrant loop, H, embracing the tine handle, B, arranged and operating in the manner and for the purpose specified.

2d, I also claim the construction of the slotted cap, D, with its hook and prolonged arm, d, when held the end of the tine handle, B, by a pivot, F, in combination with the link, E, and tripper, C, with its shoulder, N, and loop, M, the whole arranged and operating in the manner and for the purpose specified.

66,531.—TOY GUN.—Ebenezer Sperry, Miami Village, Kan.

I claim the combination of the detent, E, with the guard spring, F, and check piece, f2, and the trigger, E', substantially as set forth

66,532.—FLOATING WHEEL FOR VESSELS.—John Spilman, Tonawanda, N. Y.

I claim the partially submerged floating wheel, A, consisting of the buoyant cylinder, C, helical wing or wings, E E, and case, f, for producing rotary motion by the resistance of the water when moved in contact therewith, substantially as and for the purposes set forth.

66,533.—STEELYARD.—W. A. Starratt, Boston, Mass.

I claim the combination of the elastic cushion, c, with the head, b, of the weight arm and with the weight, D, arranged to slide on such arm in manner and under circumstances, substantially as specified.

66,534.—MOSQUITO SCREEN FOR WINDOWS.—Theophilus Stover, Cambridgeport, Mass.

1st, I claim the application of sliding screens, C, to screen frame, B, substantially in the manner and for the purposes described.

2d, The netting strips, D D, with a passage between their lapped edges, applied to a frame and controlled by springs or their equivalent, substantially as described.

66,535.—SADIRON.—E. H. Taylor, Batavia, N. Y.

I claim the combination and arrangement of the rear end and side ribs, b b', with the bottom ribs, b2, for allowing a free air space all around the interior, and strengthening the sides and ends of the box against the blows of the heater, as herein set forth.

I also claim, in combination with the slide, D, provided with the rib guides, b b, the arrangement of the pivot stem, c, with the pin, g, and the guide socket, d, with slots, f, the whole operating in the manner and for the purpose set forth.

66,536.—MACHINE FOR GRINDING CLAY.—William H. Thomas, Chicago, Ill.

I claim the screw rollers, A A, having screw threads, B, running their entire length and alternate screw threads, C, extending to a point near the feed hopper, J, the depressions between the screws at the tail, I, of the rollers being made deeper than at the feed end, substantially as and for the purpose set forth.

66,537.—STEAM PISTON PACKING.—Theodore Thurber, Auburn, N. Y.

I claim the grooves or recesses in the edges of the packing ring, C, as and for the purposes herein specified.

66,538.—DOOR SPRING.—T. Van Kannel, Cincinnati, Ohio.

1st, I claim a door spring, made and operating substantially as herein shown and described.

2d, The extension bar, d, when made and operating substantially as herein shown and described.

3d, The rubber bolster, b, in combination with the rod, d, for the purpose of preventing the latter from being thrown against the door when the same is opened and to assist in throwing it back when the door is being closed.

4th, The swing lever, d, attached to the door, A, and operated by a spring, f, which is attached to an adjustable projection, g, from the lintel of the casing, as set forth.

66,539.—CARPET WADDING.—Enoch Waite, Franklin, Mass., assignor to himself and S. M. Weld, Sr., Jamaica Plain, Mass.

I claim an improved carpet wadding composed of one or more bats of fibrous material and one or more layers or sheets of paper combined by imbedding or pressing the fibrous bat or bats upon and into the paper while the latter is in the condition of partially hardened pulp capable of receiving the fibers of the bat or bats and when dry of adhering and holding them in place or in connection with the sheet or sheets of paper without the use of starch, paste, or an adhesive gum as heretofore employed for such purpose.

66,540.—JOINTS OF METALLIC CASKS, ETC.—Maximilian Wappich, Sacramento, Cal. Antedated June 29, 1867.

I claim my improved mode of rendering impervious the joints made in barrels, tanks, or other vessels which are constructed of sheet or plate metal by the insertion of a packing of soft metal or alloy in grooves provided for that purpose which are not in line with the rivets or bolts and are so constructed and arranged that such packing may be inserted after the riveting has been completed, substantially as and for the purpose described.

66,541.—CONDENSER.—N. W. Wheeler, Brooklyn, N. Y.

I claim, 1st, The combination of the piston, l, with the valved circulating heads or inlets, F F, or their equivalents, substantially as and for the purposes described.

2d, The combination of the valve, B2, with the pot, B, or its equivalent, substantially as and for the purposes described.

3d, The combination of the sniffling or air force pump, t u w, with a surface condenser, when the delivery valve, w, is loaded, substantially as and for the purposes described.

66,542.—REVOLVING FIRE-ARM.—Rollin White, Lowell, Mass.

I claim the rotating many-chambered cylinder and the frame constructed so that the cartridge or shells can be ejected without dismounting, the cylinder, in combination with the movable obstructor, pressing directly against the ends of the cartridges and detaining them in the cylinder as well when it is rotating as when in position for firing, and with a spring to force back the movable obstructor against the end of the cylinder, substantially as and for the purpose specified.

And I also claim, in combination with the rotating many-chambered cylinder, the vibrating anvil to support the primed portion of the cartridge, in combination with the hammer, or equivalent, for striking the opposite side of that portion of the cartridge which contains the fulminate priming, substantially as and for the purpose specified.

66,543.—OVEN OR FURNACE FOR HEATING THE BLASTS OF BLAST FURNACES.—Thomas Whitwell, Stockton on Tees, England. Patented in England Nov. 10, 1865.

I claim the construction of furnaces, ovens or chambers with internal walls or partitions for heating the blast for blast furnaces with openings at the top capable of being closed by means of plugs or doors and also with openings at bottom of the sides thereof capable of being closed by means of doors or valves and the whole acting substantially as herein described for the purpose of cleansing the interior of such furnaces, ovens or chambers from dust, as hereinbefore described.

66,544.—CARRIAGE-SHAFT COUPLING.—C. A. Willard, Bellevue, Ohio.

I claim the slide, G, as arranged in combination with the stay, B, and shaft, C, provided with a notch, F, for the purpose and in the manner as set forth.

66,545.—APPARATUS FOR CARBURETING AIR AND REGULATING ITS FLOW.—Joseph S. Wood, Philadelphia, Pa.

1st, I claim utilizing the interior of the double-case water vessel, A B, by the arrangement of the pump, G, inverted receiver, C, and pipe, D, operating as an air forcing apparatus, substantially as specified.

2d, I claim the valve, K, constructed with a head, K1, elastic seat, K2, and with conical plain sides tapering at the angles shown, and operating substantially as described.

3d, The construction of the vessel, F, with a chamber formed between the diaphragm plate, H, and the bottom, f', in which the carbureter, N n', or its equivalent, operates in combination with the inverted receiver, O, with a suspended valve pipe, R, and outlet, R', substantially as shown and specified.

4th, I claim the arrangement of the carbonizer, N, pipes, n', conical partition, H, valve, K, receiver O, and pipe, R, and vessel, F, substantially as described.

5th, I claim the air forcing arrangement, T, in combination with the carbureting air arrangement, W, substantially as described.

66,546.—ANNEALING SHEET IRON.—W. D. Wood, Borough of McKee's Port, Pa.

1st, I claim the use, in the process of annealing sheet iron, of boxes so constructed substantially as hereinbefore described that the sheets may be compressed between the top and bottom of the box for the purpose of preventing their discoloration.

2d, The use of annealing boxes so constructed as that the box piece and bottom piece may be clamped or securely fastened together for the purpose of preserving the shape of the box and preventing its warping while cooling, substantially as hereinbefore described.

3d, Annealing imitation Russia or other glazed or polished sheet iron in packs or layers forcibly compressed together and held under rigid compression during the process of annealing.

66,547.—COMBINATION OF PAPER WEIGHT AND PEN WIPER.—D. W. Wright, New York City.

I claim a paper weight and pen wiper combined, constructed substantially in the manner as and for the purposes set forth.

66,548.—BOOT AND SHOE SOLE.—Frederick Ashley, New York City.

I claim the method of securing the rear end of the detachable half sole by clamps arranged in relation to the notches, a, substantially as set forth.

66,549.—BED BOTTOM.—Dwight Babcock, Seneca Falls, N. Y.

1st, I claim securing the upper slats, D, to the spring, C, by means of ribbons, E, substantially in the manner and for the purposes herein specified and described.

2d, A head rest arranged in a spring bed bottom and consisting of the boards, F and G, springs, d d, and ribbons, f f, all made, secured and connected substantially in the manner herein specified and described.

66,550.—ANIMAL TRAP.—L. V. Badger, Chicago, Ill.

1st, I claim the combination of the connecting rods, C, and slide, D, having a trigger, d', formed upon or attached to its lower end with each other and with the pivoted doors, B, and side of the box, A, substantially as herein shown and described and for the purpose set forth.

2d, Forming a bait chamber in the pivoted platform, F, substantially as herein shown and described and for the purpose set forth.

66,551.—WASHING MACHINE.—D. S. Beckley, Toledo, Iowa.

I claim a washing machine in which the pressure upon the clothes, placed between the rubbing board F, and concave G, may be regulated by means of the spring E, lever H, cord I, and pulley K, when combined and arranged to operate substantially as set forth.

66,552.—CREAM STRAINER.—Geo. J. Bennett, Homer, N. Y.

1st, I claim the screw C, when arranged as described in combination with the removable strainer B, all made and operating substantially as herein shown and described.

2d, The hopper G, when arranged as described in combination with the strainer B, screw C, and bottom a, of the vessel A, all made and operating substantially as set forth.

3d, A cream strainer made and operating substantially as herein shown and described.

66,553.—WASHING MACHINE.—Wm. Bicknell, Hartford, Me.

1st, I claim the combination with the tub B, of the fluted removable cover C, and perforated dasher E, all made and operating substantially as and for the purpose herein shown and described.

2d, The dasher E, and cover C, in combination with the rods F and b, lever H, hook e, and rack f, all made and operating substantially as and for the purpose herein shown and described.

66,554.—BAG HOLDER.—Benj. S. Boydston, Richmond, Ind.

I claim the metallic hoop C, with its spurs, when secured to the board B, by means of the keepers m m, in such a manner as to be contracted or expanded to suit the mouth of the bag, as specified.

66,555.—WASHING MACHINE.—Samuel Brackett, Port Huron, Mich.

1st, I claim the flexible semi-circular concaves F F, when pivoted to sliding plates D, and operated by handle G, in combination with the revolving or oscillating roller C, all made and operating substantially as herein shown and described.

2d, The friction rollers E, when arranged adjustably around the roller C, by being secured in flexible frames d d, which are hinged to sliding plates D, the latter being operated by springs b, as set forth.

66,556.—CAR AXLE.—W. A. Brickill, (assignor to himself and J. A. Sterling,) New York City.

I claim the combination of the supporting pin B, the bored and enlarged inner ends of the two parts A, of the axle and the collars C, substantially as and for the purpose specified.

66,557.—ICE PICK.—James H. Bridgins, Astoria, N. Y.

I claim an improved ice pick made with a suitable handle or holder provided with a series of prongs or picks, substantially as described.

66,558.—MACHINE FOR STRIPPING THE HIDES FROM CATTLE.—Christopher Bruhl, Green Point, N. Y.

I claim the fluted rollers A A, in combination with the adjustable knife E, all arranged substantially in the manner as and for the purpose set forth.

66,559.—GRAIN DRYER.—John Burt, Westport, Mass.

I claim a grain dryer and saver, constructed and operating as herein set forth for the purpose specified.

66,560.—HAND STAMPS.—Dexter H. Chamberlain, West Roxbury, Mass.

1st, I claim mounting the type wheels of a hand stamp on a common axis or shaft to which the latter is secured, an eccentric disk serving as a centre or axis for one of the wheels, whereby wheels of different diameters may be used so that the lower part of their perimeters may be brought to bear in a common plane and in a small compass within the die plate.

2d, I claim the pivoted arm m, in combination with the stud S, and inking ribbon K, for the purpose of enabling the inking ribbon to be slackened when its position is to be changed upon the die plate.

66,561.—HAND STAMP.—Dexter H. Chamberlain, West Roxbury, Mass., assignor to Nathaniel L. Chamberlain, Boston, Mass.

I claim the type wheel b, having figures upon its sides, in combination with an indicator, when the said wheel is arranged between two wheels of smaller diameter as and for the purpose specified.

66,562.—DIES FOR RAISING LETTERS ON TYPE WHEELS.—N. L. Chamberlain, Boston, Mass.

I claim the combination of a tapering plunger e, with the segmental blocks b b, arranged within a die block and having letters or figures sunk on their inner faces as described and with or without the interposition of the inner segment c c, whereby, as the plunger is forced through the center of the die corresponding letters or figures will be formed on the outer face of a ring d, substantially as described.

66,563.—AX.—Daniel W. Colburn, Laomi, Ills.

I claim an ax having its edge shaped as a semi-circle, substantially as and for the purpose described.

66,564.—INVALID BEDSTEAD.—Daniel C. Colby, Washington, D. C.

1st, I claim the combination of the extra frame B, or its equivalent, with the ordinary spring bed bottom when arranged and operating substantially as and for the purposes set forth.

2d, The combination of the rod g', the elastic straps or cords l l, or their equivalent, the bars a a, and the staples j j, as and for the purposes shown.

3d, The use of the rods k k, in conjunction with the bars a a, straps l l, and staples j j, to sustain the frame B, in the various positions shown and described.

66,565.—DEVICE FOR STRETCHING AND DRYING SKINS.—Verplanck Colvin, Albany, N. Y.

1st, I claim the light frame of wire or bamboo or other suitable material braced substantially as shown in drawings, also the rings d d, the teeth e e, and the hook c, for the purpose hereinbefore mentioned, essentially as before shown and described.

2d, I claim the light, portable and adjustable wire or bamboo etc., drying frame and stretcher as aforesaid.

66,566.—BOOT CRIMPING MACHINE.—Heli Conklin, Kirkwood, N. Y.

I claim the form H, with its projections G G, in combination with the arrangement and construction of the machine substantially as described and for the purpose set forth.

66,567.—BED BOTTOM.—Henry A. Cooke, Charlestown, Mass.

I claim the arrangement of slats C C, connected by the rubber strips g g, and bars D D, said bars being provided with the loops a a, for connecting to the bed bottom as herein described and for the purposes set forth.

66,568.—MACHINE FOR MAKING SCREWS.—Edward Croft, Waterbury, Conn.

1st, I claim the revolving and stationary threading dies, when the same shall be constructed and combined substantially as shown for the purposes specified.

2d, In combination with the revolving and stationary dies C D, I claim the knurling dies, when the same shall be constructed and operated substantially as shown for the purposes set forth.

66,569.—MACHINE FOR FORMING WAGON AXLES.—J. E. Cromwell, Jackson, Mich.

I claim the arrangement of the pendent frame T, containing the gear wheels Y Y, and W, pattern N, resting on the gauge pulleys M, the movable frame A, saws and cutters I and H, lever nuts D2, screw feed shaft L, and weights G2, substantially as herein shown and described for the purposes specified.

66,570.—ROTARY STEAM ENGINE.—Jeremiah Darling, Cincinnati, O.

1st, The combination of the semi-circular valves E with their springs F and rollers G, operating as herein described.

2d, I also claim the cylinder when constructed with its valves E, and packings H, and operating against a stationary face plate C, having its eccentric L, guides M, abutments N, all arranged and combined as herein described and for the purposes set forth.

66,571.—CAR COUPLING.—James Depeu, Peekskill, N. Y.

1st, I claim the bar B, provided with hooks f f, in combination with the link C, inclined bottom plate d, and stop h, substantially as described for the purpose specified.

2d, The rock shaft F, in combination with the lever G, and loop or eye m, on bar B, all made and operating substantially as herein shown and described.

3d, A car coupling box and appendages, made and operating substantially as herein shown and described.

66,572.—GATE.—William R. Dugdale, Penn Township, Ind.

I claim combining and applying to gate posts, the attachment of braces, ties and arms, and also of combining and affixing the aforesaid attachments to gates, in the manner and for the uses substantially as herein set forth and described.

66,573.—COMPOUND FOR THE TREATMENT OF OILS FOR LUBRICATING.—Charles J. Eames and Charles A. Seely, New York City.

We claim the compound or preparation herein described for treating oils in the manner and for the purpose described.

66,574.—LOOM.—John Earnshaw, East Greenwich, R. I.

1st, I claim the shuttle T, arranged to operate vertically and crossing the head of the needle so as to interlace the shuttle thread with the filling thread substantially as set forth.

2d, The employment of two or more filling thread carriers in combination with a device for catching and retaining the filling thread at each movement of the filling carriers, substantially as set forth.

3d, A tubular needle or thread carrier constructed and operating substantially in the manner herein set forth.

4th, The notch c, in the shuttle race, in combination with a filling thread carrier and shuttle T, as and for the purpose specified.

5th, The depression E, formed at or near the point of a tubular filling thread carrier, substantially as and for the purpose set forth.

6th, The needle operator L, arranged to operate the filling thread carrier, substantially as described.

66,575.—CLAMP FOR ROPES OR WIRE.—John H. Elward, Mendota, Ill.

I claim a device for suspending a rope or wire, in which its own strain is made to act upon the long arm B2, of the cam lever B, thereby compressing the rope or wire between the short arm B', and a projection C, substantially as set forth.

66,576.—LAMP SHADE.—James Emery, Busksport, Me.

I claim the new manufacture of lamp shade, or the combination of the screen A, and the three pronged carrier B, constructed and applied together substantially in manner as specified.

66,577.—COTTON GIN.—A. Fessenden, Beaufort, S. C.

1st, I claim the roller G, when hung in the swinging plates H, in which it is adjustable up and down, in combination with the adjustable platform F, and adjustable seed clipper I, all made and operating substantially as herein shown and described.

2d, The yielding seed clipper I, when arranged substantially as herein shown and described, with rounded lower edge, in combination with the rollers E and G, of a cotton gin, substantially as and for the purpose herein shown and described.

66,578.—SEED DRILL.—J. P. Fulghum, Milton, Ind.

I claim the adjustable deflecting rack, K, secured either to the hopper, B, or any other part of the drill (and made adjustable by means of the slotted projections, S S, and screws, M M), or their equivalents, substantially in the manner and for the purpose described.

66,579.—GAGE COCK.—Albert Fuller, Brooklyn, N. Y.

I claim the arrangement and combination of the sliding collar, F, interior collar, d, and spring, G, with the body, A, and valve stem, C, said spring having a valvular or closing action at its opposite ends, essentially as shown and described.

66,580.—HYDRANT VALVE.—Albert Fuller, Brooklyn, N. Y.

I claim the valve, I, linked in an eccentric manner, by pin or stud, S, or its equivalent, to the tube, L, by the oscillation of which the valve, I, and waste aperture, m c, are controlled, substantially as set forth.

66,581.—PROCESS FOR MAKING POSITIVE AND NEGATIVE PHOTOGRAPHS IN THE CAMERA.—Franklin B. Gage, St. Johnsbury, Vt.

I claim in photography the employment of diffused light under the conditions herein specified so as to render visible slight gradations of shade both in the light and dark parts of the pictures, and to unite softness with strength, as herein explained and set forth.

66,582.—CLOTHES DRYER.—Henry Gransden, Dubuque, Iowa.

I claim, as a new article of manufacture, a clothes dryer consisting of the sliding sleeve, E, braces, D, pivoted arms, C, flanged band, a, and pole, B, all arranged to operate on the post, A, as herein shown and described.

66,583.—GANG PLOW.—Robert R. Graves, Montgomery, Ala.

I claim, 1st, The combination of the draw beam, C, having the segment spur wheel, c', with the vertical shaft, L, having the spur wheel, i, substantially as and for the purpose described.

2d, The combination of the movable frame, F F, with the shaft, I, wheel, M, endless chain, M', and wheel, m, worked by the crank, m', substantially as and for the purpose specified.

3d, The combination of the rails, K K, springs, k' k', arms, k k, trucks, f f, and frame, F F, substantially as and for the purpose described.

4th, The combination of the rod, N, spring, p', lever, P, and arms, r and r' substantially as and for the purpose specified.

66,584.—HARVESTER RAKE.—J. C. Hall, Monroe, Wis.

I claim operating the rake, C, by means of the curved staff, D, hinged levers, E and F, of different lengths, compound crank, L, and connecting rods, M N, substantially as and for the purpose set forth.

66,585.—SCREW.—H. A. Harvey, New York City.

1st, I claim constructing wood screws of the globular head form with the oblique holes, a a, in the heads thereof, substantially as shown and described in combination with the gimlet pointed screw, as a new article of manufacture.

2d, In combination with a screw thus formed, I claim the screw driver, B, constructed substantially as described for the purposes set forth.

66,586.—BONE HANDLE FOR CANES, ETC.—Joseph Harvey, Philadelphia, Pa., assignor to Harvey & Ford, New York City and Philadelphia, Pa.

I claim the bone handles for parasols, umbrellas, canes, and other articles constructed as described, consisting of the section, B, formed in one piece, sections, C C and D D, attached together by means of the metallic strip, b, covered with cloth, all secured together by means of the screw ferrules, E substantially as described for the purpose specified.

66,587.—HAND TOBACCO CUTTER.—E. K. Haynes, Hanover, N. H.

I claim in combination the finger looped bed piece, the priming lever, and the thumb looped secondary lever, when arranged in combination with a spring and otherwise, substantially as described.

Also, in combination with the foregoing, a receiver and its counterpart, arranged to operate substantially as described.

66,588.—CARPET FASTENER.—L. S. Hicks, Ornro, Wis.

I claim the carpet fastener consisting of the curved plate, B, provided with the inward projecting teeth, C, its inner side, D, attached to the side wall by means of spring plate, E, or equivalent, substantially as described for the purpose specified.

66,589.—TUG TRIMMER.—A. V. Hill, Limestone, N. Y.

1st, I claim the knives, G, and blocks, E and F, in combination with the adjusting screw, C, and frame, A, having a scale marked upon it, substantially as shown and described and for the purpose set forth.

2d, The combination of the roller, I, roller frame, H, and coiled springs, J, with each other and with the frame, A, substantially as herein shown and described and for the purpose set forth.

66,590.—STEAM GENERATOR.—James Howard and E. Tenney Bousfield, Bedford, England. Patented in England Jan. 11, 1867.

1st, We claim the inner tubes, F, provided with the slits near their tops whereby the differential water lever is obtained in combination with the transverse pipes, B, containing divisions, C, as herein described for the purpose specified.

2d, Securing a water-tight joint between the tubes and transverse pipes in the manner above described.

3d, The fire bricks, d d, constructed as described, when employed to fill the spaces between the outer tubes, B, as herein set forth for the purpose specified.

66,591.—DOOR HOLDER.—Edmund Huddart, Prairie du Sac, Wis.

I claim the arrangement of staple and plate, A B, the stud and plate, C D, and the spring, c c, substantially as shown and described for the purposes herein set forth.

66,592.—ANIMAL TRAP.—George Irwin, Elizabethtown, Ky.

I claim, 1st, The combination of the spring drop, I, upright arm or catch, K, horizontal arm, G, and shaft, F, of the outer grate, D, with each other, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the inner spring drop, O, shaft, M, and levers, R and S, and the wire catches, U and X, with each other for the purpose of unlocking the drop gates, substantially as herein shown and described.

3d, Connecting the looped shafts, M and E, to each other by the connecting rod or wire, A', so that the outer drop gate, D, may be opened and set by opening the inner drop gate, L, substantially as herein shown and described.

66,593.—BOILER SAFETY GAGE.—R. H. Jackson (assignor to himself and A. V. Van Tine), Sandusky, Ohio,

I claim, 1st, The pipes, K F and L, as arranged in combination with the cylinders, A and C, and boiler, G, for the purpose and in the manner described.

2d, The valve, O, when arranged and operated by the lever, N, and float, N', when in the relation to the piston, a, substantially as and for the purpose set forth.

66,594.—APPARATUS FOR DRYING LUMBER.—R. P. Johnson (assignor to himself and Eli J. Sumner), Wabash, Ind.

I claim, 1st, The combination and arrangement of the furnace, C, flue, D, and perforated plates, E, by which the products of combustion are discharged directly into the chamber, A, among the lumber being driven through such chamber and discharged through the chimneys, M, as herein described for the purpose specified.

2d, The tubes, N, arranged in relation with the flue, D, whereby the draft through the chamber, A, is accelerated, as herein set forth for the purpose specified.

66,595.—CUPBOARD LATCH.—A. D. Judd, New Haven, Conn.

I claim, 1st, The latch plate, a, having two holes to admit the screw or fulcrum of the latch, b, so as to allow the same to be reversed, as set forth.

2d, The cylindrical flange, e, in combination with the porcelain knob, f, and rivet, I, arranged substantially as and for the purposes set forth.

66,596.—MAGAZINE FIRE-ARM.—E. C. Kirk and E. Sneider, Baltimore, Md.

We claim, 1st, Confining the sliding magazine tube of a repeating fire-arm by means of a spring forming an adjustable detent permitting at pleasure the entire withdrawal of the tube from the gun, substantially in the manner herein set forth.

2d, The combination of an inner longitudinally slotted magazine tube, B, with an inclosing longitudinally grooved or slotted tube, A, and with the feeding mechanism of a repeating fire-arm, all substantially in the manner and for the purpose herein set forth.

3d, The combination and arrangement of slot, a, and offset, g, in the magazine tube, B, with slot or groove, b, and offset, f, in stationary inclosing tube, A, of a repeating fire-arm, for the purpose of automatically retracting and detaining the plunger, C, of the magazine tube, all substantially as herein set forth.

4th, The combination of a guard spring F, with the loading aperture, K, of a magazine tube, B, when said aperture is formed in the side of the tube, substantially in the manner and for the purpose herein set forth.

66,597.—SUBSOIL ATTACHMENT FOR PLOWS.—John A. Krake, Alden, N. Y.

I claim, 1st, The combination and attachment of a subsoil plow to a common plow in such manner that it shall be drawn in the line of draft of the common plow to which it is attached and be free to oscillate right and left and vertically without throwing it out of the line of draft, substantially as described.

2d, The connecting spring, I, applied and used for the purpose and substantially as described.

3d, The spring, J, applied and used in combination with the standard, F and bracket, G, for the purpose and substantially as described.

4th, The bracket, G, having a friction roller, h, as a means of supporting and guiding the standard of the subsoil plow, substantially as described.

66,598.—BEDSTEAD AND BED BOTTOM.—E. Kreighoff, Rochester, N. Y.

I claim, 1st, The combination of the metallic frame inclosing the springs with the rail and revolving pins, substantially as described for the purpose specified.

2d, The combination of the metallic spring frame with the adjustable head rest, substantially as described for the purpose specified.

66,599.—HAIR CURLER.—C. H. Lavis and James McMillan, Philadelphia, Pa.

We claim the stick, A, having a slot, C, formed in one end and an elastic loop, B, attached at the other end, substantially as herein shown and described.

66,600.—WATER ELEVATOR.—S. C. Lewis, Woodbridge, Mich.

I claim the combination of crank, F, spring, N, sliding rod, G, shaft, D, cap, E, and spool, H, with each other, substantially as herein shown and described for the purposes set forth.

66,601.—NAIL.—William E. Lockwood, Philadelphia, Pa.

I claim a nail shaped substantially as represented and having a hole through it with rounded edges, as described.

66,602.—SAWING MACHINE.—J. R. Logan, Bellemore, Ind.

I claim allowing the frame of the machine to conform to any inclination of the log by means of the slotted transverse bar, a, resting on axle, C, provided with pins, h, constructed as described and operating substantially in the manner and for the purpose specified.

66,608.—FELTING MACHINE.—W. A. Lyon, Danbury, Conn.

I claim, 1st, As an improvement in the process of felting hats the rolling of them between a pair of reciprocating beds immersed in hot water, substantially as described.

2d, The combination of the reciprocating beds, a and b, the former mounted on a track in the vat, C, and the latter suspended on the adjustable frame, B, arranged to operate substantially as described.

66,604.—BRICK KILN.—A. S. McBride, St. Louis, Mo.

I clrim, 1st, The arrangement of the series of fire chambers, C, upon each side of the kiln flooring, b, upon which the bricks are stacked between said series of fire chambers and the chimneys, B, at each angle or corner of the kiln, as herein shown and described.

2d, The arrangement of the double series of metallic plates D, upon the pivoted rods, c, the plates of each series overlapping each other, as herein set forth for the purpose specified.

66,605.—BRICK MACHINE.—Charles C. and J. McDermid, Cambria Mills, Mich.

1st, We claim the combination with a positive or cam like action to the lever F, which controls the motion of the follower of a weight to said lever arranged to give pressing power or force to the follower on relief of the lever from its positive lifting action on the follower, substantially as specified.

2d, The combination with the lever F, of the adjustable or sliding weight G, under control of a lever I, and rod I, or their equivalents substantially as and for the purpose or purposes herein set forth.

3d, The pusher or pushing frame J, actuated by a cam-like or positive action in its advance stroke and by a weight or weighted lever in its return stroke, substantially as specified.

4th, The gear of the rod R, which actuates the pusher J, with the weighted lever M, in a loose or independent manner under control of a weight O, essentially as and for the purpose herein set forth.

66,606.—BRUSH FOR MUCILAGE, PAINTING, GLUING, AND OTHER LIKE PURPOSES.—John W. McGill, Washington, D. C.

I claim a brush made by running the hairs or bristles for one half their entire length through the hole, c, in one end of the handle, then doubling down both ends of the hairs or bristles and bringing them into their proper perpendicular position below the end of the handle by running the neck or tube, d, down the handle over the hole, c, for the purposes set forth and described.

66,607.—TEA KETTLE.—Edward McGrann, Louisville, Ky.

I claim the swinging lid, B, having the doubly countersunk orifice, F e e', in the described combination with the bossed orifice, C D, conical headed and screw threaded pivot, F f f' f'', and nut, G, the whole being combined and arranged as set forth.

66,608.—DREDGING MACHINE.—J. H. McLean, St. Louis, Mo.

1st, I claim the dredger, the receiving and discharging apron, and the derrick for raising and lowering the dredger, when these respective plates are combined, constructed, and operated in relation to each other, substantially as described.

2d, In combination with the dredging vessel the pins, L, for the purpose of mooring the same, substantially as described.

66,609.—HARVESTER RAKE.—Jacob Miller, Canton, Ohio.

I claim, 1st, The combination of the swivel post, the sweep rod, fork, and driving arm, with the cam ledges for giving said fork its projecting and retreating motions in connection with its revolving motion, substantially as described.

2d, I also claim in combination with the fork, the post or tang on the driving arm for guiding the ends of the teeth of the fork, and for aiding in moving the grain from the platform, substantially as described.

66,610.—COAL STOVE.—George R. Moore, Lyons, Iowa.

I claim, 1st, In a heating stove the hearth, E, constructed as shown, and applied substantially in the manner and for the purposes specified.

2d, The bar or fulcrum, F, when used as a part of a stove or heater, substantially in the manner and for the purposes specified and set forth.

66,611.—CLOTHES BROOM OR WHISK.—Bernard Moraham, Brooklyn, N. Y.

I claim the combination of the scraper or rubber, A, or the equivalent thereof with a clothes brush or broom, substantially as and for the purposes described.

66,612.—BRUSH HOLDER.—Bernard Moraham, Brooklyn, N. Y.

I claim the frame, A, having an adjustable clamping jaw, G, screw socket, B, and nut, E, for the purpose and substantially as described.

66,613.—SUBMARINE TELEGRAPH CABLE.—S. E. and G. L. Morse, Harrison, N. J.

We claim, 1st, Laying a submarine telegraphic cable at assigned places on the line, over a floating body and then after the catenarian curves on each side are fully formed depositing the part of the cable included in these curves, on the bottom of the sea, at right angles or at nearly right angles with the main line so that it may be raised unbroken to the surface from deep water, substantially as described.

2d, The formation of a floating buoy whose lower, larger and more buoyant part shall always be in deep and comparatively still water, below the violent action of the waves, while the upper part which is to pass through and rise above the waves shall present a small surface to their destructive power.

3d, The combination of a sliding ring a lifting rope, a guiding wire or rope, and a hook with a barbed shank to lift a cable or weight in the water, substantially as described.

4th, The combination of a sliding ring a buoy or buoys loaded with a weight that sinks them, a guiding wire, a hook with a barbed shank, and an apparatus to attach the weight at the proper time from the buoy or buoys, to raise a cable or other body in the water.

5th, We also claim the hook, f, in combination with the tube bar hinged clasp, E, substantially as set forth.

6th, We also claim the combination of a rope, H, with hollow glass vessels fastened and incorporated therein so as to diminish the specific gravity of said rope, substantially as described.

7th, We also claim protecting the hollow glass vessels by casings of wood or other suitable material, and passing strands of the the rope over the casings in grooves made for the purpose substantially as described.

8th, We also claim connecting a buoy anchoring rope or a guiding rope with its encased buoys, and its floating buoy, by cushioned ferrules with projecting cushions to diminish the liability to wear at these points from the action of the wave on the floating buoy, substantially as described.

66,614.—BAG HOLDER.—E. S. Molton, Plymouth, Mich.

I claim the arrangement of the looped hoop, C, and cross-piece, E, when said loop is connected to the cross-piece by means of the braces, G G, for supporting the bag and secured upon the standard, A, by means of the eccentric lever, H, and bar, F, as set forth.

66,615.—STEERING APPARATUS.—T. W. Murray, New York.

I claim the collar, C, provided with the recesses, a, and fitted on and firmly secured to the rudder post, in combination with the pivoted dog, b, secured to the deck of the vessel or to a suitable plate or stock attached thereto, substantially as and for the purpose specified.

I further claim the steering apparatus arranged with the pendent toothed segment, D, on the rudder post with the pinion, E, gearing into it underneath, substantially as and for the purpose set forth.

66,616.—EXTRACT OF SEA CLAMS.—B. G. Noble, New York.

I claim reducing by evaporation the liquor or juice of sea clams, either alone or in combination with other alimentary material to a state of dryness, substantially as and for the purposes herein set forth.

2d, I claim as a new manufacture solidified extract of sea-clams substantially as herein specified.

66,617.—GOVERNOR.—F. J. Nutz, and Philip Estes, Leavenworth, Kan.

1st, We claim the governor valve operated upon by the pressure of the steam pressing upon the piston and rod, E, and lever, C, producing an effect substantially as described for the purpose specified.

2, We claim the spring, F, with its regulating thumb screw, J, arranged substantially as and for the purpose set forth.

3d, We claim the arrangement of the eccentric, H, whereby the governor valve can be entirely closed and the steam throttled, substantially as described.

4th, We claim the stop motion substantially as shown in fig. 2, whereby the steam is shut off and the engine stopped by the breaking or running off of the governor belt, substantially as set forth.

66,618.—LOCOMOTIVE ASH PAN.—A. Ohlenslager, Jersey City N. J., assignor to H. L. Lansing and G. H. Chase, Buffalo, N. Y.

1st, I claim a locomotive ash pan provided with openings, b b, through the bottom and a corresponding gate or disk plate, m, which may be moved and placed in a manner to entirely close such openings when the locomotive is running and opened for the discharge of the ashes and cinders at the proper time and place, substantially as and for the purposes set forth.

2d, An ash pan for locomotives divided into compartments having sloping sides, a a, for the purposes and substantially as described.

3d, The draft flue, B, passing centrally through the ash pan and the adjustable valve cap, D, and the inner inverted conical cap, D arranged and operating for the purposes and substantially as described.

4th, The rock shaft, d2, arranged in the recesses formed under the inclined sides, in combination with the vartical stem, C, and connecting link, I, as a means of raising and lowering the valve cap, substantially as described.

66,619.—SPICE GRATER.—H. W. Oliver, New Haven, Ct., assignor to M. H. Thorpe, Danbury, Ct.

I claim the tubes, a, more or less in number arranged and combined substantially as shown and described for the purposes specified, in combination with the tubes, a, I claim the method herein shown and described for feeding the spice to the grinding plate, I claim the flanged plate, e, the spring, k, and the index n, for the purposes set forth.

I claim the grinding plate, O, in combination with the tubes, a, I claim the case, S, in combination with the spice mill constructed substantially as described for the purpose set forth.

66,620.—COOKING STOVE.—D. E. Paris, Troy, N. Y.

1st, I claim a reservoir or heater tank situated in front of a diving flue cooking stove or range or placed and attached that it shall form the front wall or outer casing of the fire box or the ash way below the fire box or both for the purpose herein set forth, and in the manner set forth.

2d, I claim the ash chamber in front of and below the fire box covered by a water reservoir or tank in combination with door openings into said chamber at the lower front of the reservoir, substantially as here shown and described.

3d, I claim an opening through the front part of the stove top or through the hearth plate of the stone in combination with the open topped reservoir as herein shown and described.

4th, I claim a bail stone boiler, vessels, or kettles, so constructed that one end of said bail will operate on a shank or prong of the cover to said vessels so as to move it off its place and then on again horizontally by the shifting of the bail from side to side.

66,621.—HORSE HAY FORK.—S. W. Patterson and S. Dewey, Malnesburg, Pa.

We claim the metallic head or box, H, constructed and applied to the lever, B, as described and affording a bearing for the pulleys, A and R, as and for the purpose set forth.

66,622.—CARBURETING AIR.—J. C. Pedrick, Washington, D. C.

I claim feeding in or supplying air to carbureters or carbureting chambers by the means and substantially as herein recited.

66,623.—MECHANICAL MOVEMENT.—J. H. Pelton, Cleveland, Tenn.

I claim the arrangement of hand and foot levers, I I and J J, pitman, I I J J' and doubly crank shaft, B, for the purpose set forth.

66,624.—SELF-BAILING SURF AND LIFE BOAT.—Norwood Penrose, Philadelphia, Pa.

1st, I claim in a self-righting and bailing surf and life boat provided with a heavy keel and elevated buoyant ends in the usual manner, the amidships trunk or well, A, in combination with a deck or floor, E, and any suitable automatic valve, a', at its upper end, the said trunk or well, A, passing vertically downward through the kelson and the keel of the boat, substantially as described and set forth for the purpose specified.

2d, I claim in a self-righting and bailing surf and life boat provided with a heavy keel and elevated buoyant ends in the usual manner, the oblique trunks, B B', in combination with a deck or floor, E, and any suitable automatic valves at their upper ends, the said oblique trunks extending from the starboard and larboard sides respectively of the floor or deck, and opening into a vertical trunk or well, A, at points just above the kelson of the boat, so as to discharge their water vertically through the keel of the boat, substantially as described and set forth.

3d, I also claim in combination with a self-righting and bailing and surf boat, the air-containing elastic cases, D, the same being constructed as described, and applied within the respective compartments and bulkheads of the boat, as and for the purpose specified.

66,625.—HARVESTER RAKE.—G. M. Peters, Granville, Ohio.

1st, I claim a reciprocating and turning rake, operated from beneath through a slotted platform, and arranged to move in a path parallel to the finger bar during a part of its delivery stroke, and then to turn and sweep the grain from the platform in the arc of a circle, the center of which is at or near the outer corner of said platform, substantially as described.

2d, A grain platform, slotted as described, in combination with a reciprocating and turning rake, operating from underneath, and delivering the grain in rear of the inner or main frame end of said platform, substantially as described.

3d, The reciprocating turning rake in combination with the lever, J, and slotted sliding lever, L, operated as described.

4th, The reciprocating rod, O', working underneath the rear edge of the platform in guides, o' o', in combination with connecting rods or links, o o2, and slotted lever, L, as described.

5th, The rake lever, L, provided with the spur and friction roller as described, whereby a vertical reciprocation is imparted to said rake lever through the medium of ways or tracks, M N O, and latches, m1 m2, or their equivalents, for the purpose specified.

66,626.—MACHINE FOR MAKING BUTT HINGES.—Adrian Raris (assignor to the Scoville Manufacturing Co.), Waterbury, Conn.

1st, I claim the closing and opening wings, I, in combination with the milling disks, H, constructed and operating substantially as and for the purpose herein described.

2d, The guide caps, b, in combination with the milling disks, H, and the slides, C3, constructed and operating substantially as and for the purposes herein described.

3d, The lever clamps, d, and inclined cross bar, e, in combination with the slides, C3, and the milling disks, H, constructed and operating substantially as and for the purposes herein described.

4th, The clamp, P, and the guides, h, in combination with the wings, I, constructed and operating substantially as and for the purpose herein described.

5th, The slide, C5, and nail punch, m, in combination with the wings, I, and the guides, h, constructed and operating substantially as herein described.

6th, The combination of the feeding boxes, bending dies, milling disks, closing and opening wings, joint clamp, knuckle guides, and nail punch, constructed as described.

66,627.—COMBINED SEEDER AND CULTIVATOR.—B. W. Remy, Brookville, Ind.

I claim the main frame composed of the vertical arched iron bars, C D, and the horizontal frame, F, also made of iron bars, and the whole combined with the short axles, B B, by which it is supported in the carrying wheels, substantially as and for the purpose described.

I also claim, in combination with the main frame composed of iron bars or straps and supports as described, the pivoted bars, H I, to which a cultivator or seeding mechanism, substantially such as described, may be attached, as and for the purpose set forth.

66,628.—GRATE FOR FURNACES.—Jesse Reynolds, Philadelphia, Pa.

I claim the bearer, C, with its groove, e, and openings, 11, in combination with the recessed bearer, C1, the whole being arranged with a fire place for the reception of the grate bars, substantially as described.

66,629.—SCREW TAP.—J. F. C. Rider and G. B. Wiggin, South New Market, N. H.

We claim the combination of the ring, F, with cams, B B B B, the mandrel, G, with cams, D D D D, and cutters, C C C C, or its equivalent, substantially as shown and described, so that by turning ring F, by handle E, the cutters of the tap will be released from the thread in the hole, and thus allow the tool to be withdrawn as specified.

66,630.—MODE OF COATING WROUGHT IRON OR CAST IRON WITH A HARDER METAL.—James Rigg, Iowa Falls, Iowa.

I claim coating wrought or cast iron with a harder metal by first applying a suitable flux and afterward dipping it while hot into a harder metal in a molten state, as herein shown and described.

66,631.—HINGING TEA-KETTLE COVERS.—Ezra Ripley, Troy, N. Y.

I claim an edgewise swinging cover, hinged or pivoted to a tea kettle at one side of the line of its spout, and furnished with a stop, so that the cover can be swung off in a direction at first rearward or away from the spout, and that the weight or gravity of the cover when closed keeps or tends to keep the cover from swinging partly off when the tea kettle is inclined forward and tilted sideways, substantially as herein set forth.

I also claim a tea kettle having an edgewise swinging cover, and a bail hinged to lugs in line or nearly so with the spout of the tea kettle, and so constructed that the cover can be swung off over the rear bail lug, substantially as herein set forth.

66,632.—UMBRELLA.—Horace B. Robbins, Boston, Mass.

1st, I claim providing umbrellas with auxiliary braces, a a, and for the purpose specified.

2d, The combination of the runner, b, braces, a, and ribs, D, substantially as described.

3d, The arrangement of the stretchers, F, having slots, h, with the braces, a, substantially as described.

66,633.—GUDGEON FOR BOOMS.—Nathaniel Robbins, Jr., Rockport, Mass.

1st, I claim the use of the socket, D, and the pintle, E, as a bearing for a boom and connection with the mast, substantially as described.

2d, The construction and arrangement of the boom joint or connection, substantially as described.

66,634.—WINDLASS.—Nathaniel Robbins, Jr., Rockport, Mass.

1st, I claim the combination of the drawn, f, with the section, e e, the whole arranged with falls and brakes in connection with a windlass, substantially as described.

2d, The use of the gear wheels, i j k and e, in combination with the arms, h and m, and the drawn, f, substantially as and for the purposes set forth.

66,635.—LAMP BURNER.—W. Robinson, Funkville, Pa.

1st, I claim the construction of inclined planes, so arranged with respect to the cone and shell of a lamp burner, as to raise and lower the cone for adjustment vertically.

2d, The mode of adjusting the cone by means of inclined planes, e e, operating substantially as herein described.

66,636.—ASH TUB OR LEACH.—C. Roop, Middletown, Pa.

I claim an ash tub or box constructed and arranged substantially as herein specified.

66,637.—ADVERTISING APPARATUS.—J. A. Royce, Lee, Mass.

1st, I claim the endless band, E, furnished with suspended cards or tags, F, in combination with the openings, e, of the ceiling, d, substantially as and for the purpose specified.

2d, The wheel, C, constructed with radial floats, and arranged at or upon the roof of the car, in combination with the endless band, E, furnished with cards or tags, substantially as herein set forth for the purpose specified.

3d, The case, B, open at both ends, arranged upon the roof of the car and in relation with the wheel, C, substantially as herein set forth for the purpose specified.

4th, The wheel, C, pulleys, b, and belts, c, arranged in relation with each other and with the rollers, D, endless band, E, openings, e, and cards or tags, F, substantially as herein set forth for the purpose specified.

66,638.—SAFETY POCKET.—Fisk Russell, Cambridge, Mass.

1st, I claim a safety or armored pocket, the mouth of which is secured by a hasp which is sprung into a lock, substantially as described.

2d, Also so arranging the hasp that it may slide in lateral directions in the lock to enable the respective parts of the pocket to yield freely, substantially as set forth.

3d, Also in combination with the lock and hasp, constructed to operate as described, a spring bolt for locking the hasp in position, said bolt being thrown forward by tripping a catch and thrown back by a key, substantially as set forth.

4th, Also the arrangement together of a safety pocket, locking as described, and an ordinary pocket.

66,639.—MOP WRINGER.—H. Russell, New Richmond, Wis.

1st, I claim a machine for wringing water from mops consisting of a press box which is adapted for receiving a mop when applied to its handles, a follower for pressing the mop, and a movable lever for acting upon the follower, all being constructed and operated substantially as described.

2d, The construction of the frame and its press box for the purpose of receiving the mop and pressing devices, substantially as described.

66,640.—MACHINE FOR DRESSING HIDES AND SKINS.—John Schiffer (assignor to himself and Meyer & Mueller), New York City.

1st, I claim the bed, a', fitted with the clamps, r r', in the manner specified, in combination with the rotary scraper, c, formed with diverging blades, as and for the purposes set forth.

3d, I claim the bed, o, having an elastic surface upon which the hide or skin is to be laid, in combination with the rotary scraper, c, substantially as and for the purposes set forth.

5d, I claim the levers, s and n, and frame, n, in combination with the bed, o, as and for the purposes set forth.

4th, I claim the bolts, p p, and pinions, 3 3, in combination with the chains, x x, and frame, n, for the purposes and as set forth.

66,641.—Lathe Tool.—J. C. Shackleton, Lawrence, Mass.

I claim the combination of the tool holder, A B, tool, C, and set screws, e, when constructed and arranged as herein set forth

66,642.—Machine for Making Horseshoe Nails.—Wm. Sherts, Hudson, N. Y.

1st, I claim the anvil, G, constructed as described, in combination with the hammers, C and D, substantially as and for the purpose specified.

2d, Imparting to the anvil, G, a sliding movement with reference to the hammers and the nail rods, as described, during the foregoing operation, substantially as and for the purpose specified.

3d, The gripping jaws arranged upon the sliding plate, I, and in relation with the sliding anvil, G and the jaws, d' e', of the feeding tongs, substantially as and for the purpose herein set forth.

4th The cam wheel, A, with the several series of cams, a b, plain circumferential portion, c, and semicular ribs, d, in combination with the three hammers, C D, all constructed and arranged substantially as and for the purpose specified.

5th, The cutters, M N f', in combination with the system of levers and the wheel A, all constructed and arranged substantially as and for the purpose specified.

6th, The sliding bar, H, provided with the spur, h', and the levers, s u, arranged in combination with each other and with the slide, H, and the radial spur, n2, of the wheel, A, for the purpose of operating the jaws, d' e', of the feeding jaws or mechanism, substantially as and for the purpose specified.

7th, The combination of the spring catch, e', rod, c', sliding gripping jaw, s', and the vertically moving slide, K, substantially as and for the purpose specified.

8th, The sliding rod, c', spring catch, a', stud, b', arranged in relation with each other and with the sliding plate, I, sliding gripping pan, s', and spring catch, e', substantially as and for the purpose specified.

66,643.—Boot Jack, Wrench, and Nail Pull.—Otis Shepard, Alton, Ill.

I claim a boot jack provided with the tack extractor, c, wrenches, D, upon its sides, E and F, saw sets, H, and wagon wrench, I, in the support, H', as herein shown and described.

66,644.—Concussion Fuse for Explosive Shells.—A. J. Simpson, Philadelphia, Pa., and J. J. Janezeck, Washington, D. C.

We claim in combination with the tapering closed case, A, the plunger, D, fitting snugly therein, the fulminate chamber, B, fulminate tube, C, friction wire, b, washer, c, pin, d, and powder chamber, e, all arranged therein and constructed as herein described and for the purpose specified.

66,645.—Petroleum Filter.—J. H. Smith, Pittsburgh, Pa.

I claim the perforated distributing spout, a, filter, B, troughs, C, distributing spout, c, and filtering platform, D, all arranged in relation with each other and with the tanks, A E, in such manner that the oil may be filtered and evaporated by passing from a fine shower to sluggish streams, as and for the purpose specified.

66,646.—Churn.—Wm. C. Smith, Yantic, Ct.

I claim the connecting of the shafts, C C, of the gears, D D, to the shafts, a, of the beaters, by means of the pins, E, in said shafts, arranged with the springs, f, the sockets at the ends of the beater shafts, and the squares or dovetails, c, on the inner ends of the gear shafts, C, to fit into the sockets on the shafts, a, substantially as and for the purpose specified.

I also claim the butter worker, H, constructed as described, in combination with the churn, A, and right or flexible dead eye, G, as herein set forth for the purpose specified.

66,647.—Mop Wringer.—A. G. Starkweather, Burlington, Vt.

I claim the roller frames, A and D, constructed and combined with each other, and secured to the pail, substantially in the manner herein shown and described and for the purpose set forth.

66,648.—Car Starting Apparatus.—Joseph Steger, New York City.

1st, I claim the gearing device consisting of the spring, P S, provided with a foot button, and the ratchet, R, suspended from said spring, substantially in the manner and for the purpose specified.

2d, The car starting device consisting of the traction bar, T, lever, L, pivoted ratchet, R, ratchet wheel, W, spiral spring, S, and spring, P S, constructed and arranged substantially as herein specified.

66,649.—Carpet Stretcher.—W. H. Taylor, Newark, N. J.

1st, I claim the combination of the floor plate, A, toggle levers, B C, and tail block, G, with each other, substantially as herein shown and described and for the purpose set forth.

2d, Attaching the tail block, G, to the lever, C, by means of the adjusting screw, E, and nut, F, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the movable lever jaws, I, with the arms or stationary jaws, a', of the floor plate, A, substantially as herein shown and described and for the purpose set forth.

4th, The combination of the thumb screws, J, with the movable lever jaws, I, and floor plate, A, substantially as herein shown and described, and for the purpose set forth.

66,650.—Composition of Matters for Disinfecting and Preparing Fertilizers.—John A. Thompson, Auburn, N. Y.

1st, I claim the within-described composition of matter, consisting of charcoal charged with sulphurous acid, or other disinfecting gas, and gypsum, combined and prepared substantially as described and for the purposes set forth.

2d, I also claim the combination of the above-described compound with animal or vegetable substances, to produce a fertilizing material, whether with or without the addition of common salt, wood ashes, bone dust, or other fertilizing ingredients.

66,651.—Water Wheel.—John Todd, Bellefonte, Pa.

I claim, in combination with a water wheel and a curb arranged concentrically around the outside of it, and furnished with chutes leading to the wheel, as represented, a band at G, placed around the outer circumference of the curb, furnished with gates, I, operated to change the areas of the chutes or water ways, as described and represented.

66,652.—Tool.—Sylvester L. Tracy (assignor to himself and Henry Merritt), Cleveland, Ohio.

I claim the improved implement, herein described, as a new article of manufacture.

66,653.—Piano.—George Trayser, Indianapolis, Ind.

1st, I claim the lattice frame work, c c c and d d d, composing the reverberating chambers, F F F, in combination with the top casing, D, and bottom casing E, substantially as set forth.

2d, The manner of producing a convex sounding board by means of the curved surface of the ribs, n n n, as and for the purpose described.

3d, The bed plate, B, when constructed with recesses to receive wooden bridges, a', and with a central cross brace, B', said parts being arranged in relation to each other and the other parts of the bed plate, substantially as set forth.

4th, The angular brace, G, curved brace, G', combined with each other, and attached to a convex sounding board constructed and applied as and for the purposes set forth.

66,654.—Printing Machine.—S. D. Tucker, New York City.

I claim the lever, N or Y, or both, and adjusting screw, O or Z, or both, or their respective equivalents, when arranged to regulate the upward pressure of the rollers, E or Q, or both, against the distributing surfaces, substantially as described.

I also claim the lever, N or Y, or both, when provided with foot-plates, or their equivalents, as and for the purpose described.

66,655.—Ladder.—Benjamin F. Turner, Bridgeton, N. J.

I claim the arrangement of three separate ladders, or lengths, connected together with cross rods, e, working in slots, d d, in the ends, and recesses, k k, at the extremeties, fitted on the first round, b, to be employed in the several applications and positions, separately or combined, in the manner herein described.

66,656.—Method of Manufacturing Faucets.—William Westlake, Brooklyn, N. Y.

I claim the method herein described of making faucets or cocks partly of cast iron and partly of sheet brass, substantially as specified.

66,657.—Method of Manufacturing Faucets.—William Westlake, Brooklyn, N. Y.

1st, I claim the method of making faucets or cocks partly of sheet metal and partly of cast metal substantially as described.

2d, I also claim faucets or cocks constructed in the method herein described as a new article of manufacture.

66,658.—Uniting the Ends of Lead Pipes.—Nathan Foster Weston, Boston, Mass.

I claim the device for uniting the ends of lead pipes and dispensing with the use of solder, consisting of the hollow expanding plug A, sleeves c c', and nut c, combined and operating together, substantially as before described.

66,659.—Coupling Faucets to Pipes.—Nathan Foster Weston, Boston, Mass.

I claim the mode substantially as above described of applying a faucet or T to a pipe by which the use of soldering is dispensed with and other advantages gained essentially as explained.

66,660.—Washing Machine.—Chas. B. White, Candor, N. Y.

1st, I claim the series of rollers c, mounted in the frame H, pivoted at one end and having its opposite end supported by the springs p, substantially as described.

2d, The rubber block m, mounted in a suitable frame and suspended on the rods b, attached to the spring a, above and connected to the treadle or lever T, below substantially as shown and described.

66,661.—Dredging Box.—Thomas Williams, Boston, Mass.

I claim in combination with the body and perforated cover of a dredge box a perforated inwardly projecting hollow conical or pointed body c, arranged to operate substantially as described.

Also in combination with the body and perforated cover of a dredge box a perforated hollow body interposed between said cover and the contents of said body, when provided with asperities, substantially as and for the purpose specified.

66,662.—Burglar Alarm Gun.—John Wilson, Anderson Court House, S. C.

1st, I claim the arms G G, when pivoted as shown and when provided with pins l and m m, in combination with the springs H H, all made and operating substantially as herein shown and described.

2d, The gun E, when secured to a shaft B, in combination with the disk b, and spring catch c, substantially as set forth.

3d, The plate F, when secured loose on the shaft B, and when notched as shown and provided with a pin k, in combination with the pins l l, on the arms G, all made and operating substantially as set forth.

4th, The trigger e', when provided with a downward projection p, in combination with the pins m, as set forth.

5th, The arms, G, when connected with the wires, o, so that by pulling on or touching the wire the arms, G, will be moved and will serve to revolve the gun and direct it toward the disturbed wire and discharge the same, all as set forth.

6th, An alarm gun made and operating substantially as herein shown and described.

66,663.—Gate.—Ebenezer Young, Camden Center, Mich.

We claim the combination of the upright bar, D, pivoted bar, E, lever G, and pivoted bar, F, with each other and with the gate, C, substantially as herein shown and described and for the purpose set forth.

66,664.—Plastering Machine.—Josiah Keene, Washington, D. C.

I claim the combination of a mortar box, C, with a stand or frame having adjustable and extension guide ways, or standards, substantially as and for the purpose herein specified.

I also claim forcing the follower forward by the movement of the mortar box itself by means of a stationary rack or racks, D K, and a traveling pinion or pinions substantially as and for the purposes herein set forth.

I also claim the extensible way standards, B C, and stationary racks, D E, connected and retained in their extended positions, substantially as and for the purposes herein specified.

I also claim the combination of the adjustable points or dogs for holding the stand in position and the casters or wheels on which it is moved, substantially as specified.

I also claim the combination and arrangement of the windlass or winding shaft, F, and cord, f, for the purpose of raising the mortar box, substantially as herein specified.

I also claim a trowel, I, adjustable transversely to the machine, substantially as herein set forth.

I also claim the arrangement of the trowel, I, so as to have a separate movement upward in front of the mortar box in combination with the springs, T T, and catch, o, constructed and operated as described and for the purpose set forth.

I also claim the stand or frame, V, in combination with the plastering machine set forth, constructed and operating as described and for the purpose herein specified.

66,665.—Anchor.—G. A. Lloyd, and C. A. Stewart, San Francisco, Cal.

We claim the lugs, a a, on the flukes in combination with the stops or projections, d d, on the shank for the purposes set forth.

We also claim making the flukes to stand at different angles so that one will catch first when the anchor is one side up and the opposite one when the anchor is the other side up, substantially as described.

66,666.—Preserving Storing and Transporting Fruits Vegetables, and other Perishable Articles.—Reiter, Westchester, Pa.

I claim the herein described process of preserving and transporting perishable articles, said process consisting in placing inside the box, crate, barrel or car or other closed vessel in which the articles are placed for preservation and transportion, a water tight metallic vessel or its equivalent filled with ice or ice and salt or their equivalent, substantially as described.

Reissues.

2,669.—Magazine Fire Arms.—Valentine Fogerty, West Roxbury, Royal E. Robbins and Frank W. Andrews, Boston, Mass., assignees by mesne assignments of Valentine Fogerty. Patented Feb. 21, 1865.

We claim for use in a breech loading fire arm a divided or notched magazine or cartridge receiving-tube constructed to operate substantially as set forth.

2,670.—Machine for Cutting Paper.—Hervey Law, New York City. Patented Sept. 18, 1856.

I claim the combination of the rising and falling platform C, the clamp frame E, operating to clamp the paper or book as the platform rises, and to unclamp the same as the platform descends, by means of two double cams or toggles F F, having cranks G G, connected with them, the pintles of which work in curved grooves or otherwise actuated by any well-known mechanical device, substantially as and for the purpose set forth.

2,671.—Snow Plow.—Samuel Richards, Philadelphia, Pa. Patented April 15, 1856.

1st, I claim the long inclined plane for raising the snow gradually mounted upon two swiveling trucks with the lateral acting wedge elevated above the level of the surrounding snow and located on one side of the inclined plane in the position shown in Figure 1, for discharging the snow on double track roads.

2d, The inclined plane for raising the snow arranged so as to be adjustable up and down the plane and from side to side substantially as described.

2,672.—Snow Plow.—Samuel Richards, Philadelphia, Pa. Patented May 13, 1856.

1st, I claim the combination of a long inclined plane, B, mounted upon two swiveling trucks, the wedge piece, F, mounted upon said inclined plane with the point located above the level of the surrounding snow, so that the snow shall be elevated gradually by the plane, B, at or near the level of the surrounding snow before it is pressed laterally by the wedge.

2d, The wedge piece, F, so arranged as to be movable up and down the inclined plane.

2,673.—Toy Tops.—F. O. and W. W. Tucker, West Meriden, Conn., assignees by mesne assignments of themselves. Patented June 12, 1866.

We claim the combination of the whirling spindle, F, with the two cords, L and P, when they are constructed, arranged and fitted for spinning or whirling the tops, substantially as herein described and set forth.

2,674.—Scissors Sharpener.—Henry D. Ward, and William A Richardson, Worcester, Mass., assignees by mesne assignments of A. W. Gilfdrd. Patented Feb. 12, 1867.

We claim a scissors sharpener constructed substantially as described, of a serrated bar or file, B, in combination with and arranged between sides or guides, D C, of a frame or holder for use as specified.

2,675.—Safety Valve.—Henry Waterman, Hudson, N. Y. Patented Nov. 15, 1853.

1st, I claim the piston, F, attached to the weighted end of the valve lever, within the cylinder, G, and immersed in the liquid in the cylinder combined, operating in the manner and for the purpose herein described.

2d, I also claim the concentric rim or ledge, l l, and the overhanging part of valve, k k, constructed, combined, and operating in the manner and for the purpose herein set forth.

2,676.—Wood-planing Machine.—Joel Whitney, Winchester, Mass. Patented April 13, 1852. Extended seven years.

1st, I claim, in combination with a pair of feed rolls, one of which is yielding and the other is not, a pair of intermediate gears, one of which is fixed and the other is not, substantially as and for the purpose described.

2d, I also claim, in combination with a pair of feed rollers, geared and driven from both of their ends, and the duplicate sets of intermediate gears working in and with them, the connecting of said intermediate or driving gears by substantial shafts extending clear across from one set to the opposite set by which the lifting and driving is done at both ends of the rolls, and the twisting, bending, or straining of journals or bearings avoided, substantially as described.

2,677.—Bed Bottom.—George L. Gerard, New Haven, Conn. Patented March 26, 1867

I claim the combination of the clamp bolt, D, with the spring, A, and the bar, C, constructed so as to operate in the manner described.

2,678.—Lamp.—Thomas S. Williams and P. S. Page, Boston, Mass. Patented May 19, 1863.

We claim, 1st, The case or socket, A, in combination with a railroad car lamp or lamp fountain, C, substantially as and for the purpose specified.

2d, The springs, B, or equivalent guides or bearings, arranged between the lamp or lamp fountain and attached to either substantially as and for the purpose set forth.

3d, Projections, c, arranged in the case or socket, A, substantially as and for the purpose specified.

Designs.

2,694, 2,695, 2,696.—Cook's Stove.—G. W. Ball, Cincinnati, Ohio. Three patents.

2,697.—Trade Mark.—Isaac Cook, St. Louis, Mo.

2,698.—Burial Case or Coffin.—E. S. Earley, Philadelphia, Pa.

2,699.—Label for Bottles.—C. Gautier, Washington, D. C.

2,700.—Stove Plate.—Luther W. Harwood (assignor to Fuller, Warren & Co.), Troy, N. Y.

2,701, 2,702.—Rim Lock.—E. M. Mix, Westfield, N. Y. Two patents.

2,703.—Back Piece of a Stave Machine.—Owen Redmond, Rochester, N. Y.

2,704.—Group of Statuary.—John Rogers, New York City.

Note.—Forty-one patents in the above list were procured through the Home office of the Scientific American Patent Agency, exclusive of quite a number obtained by our Washington Branch agency.—Eds.

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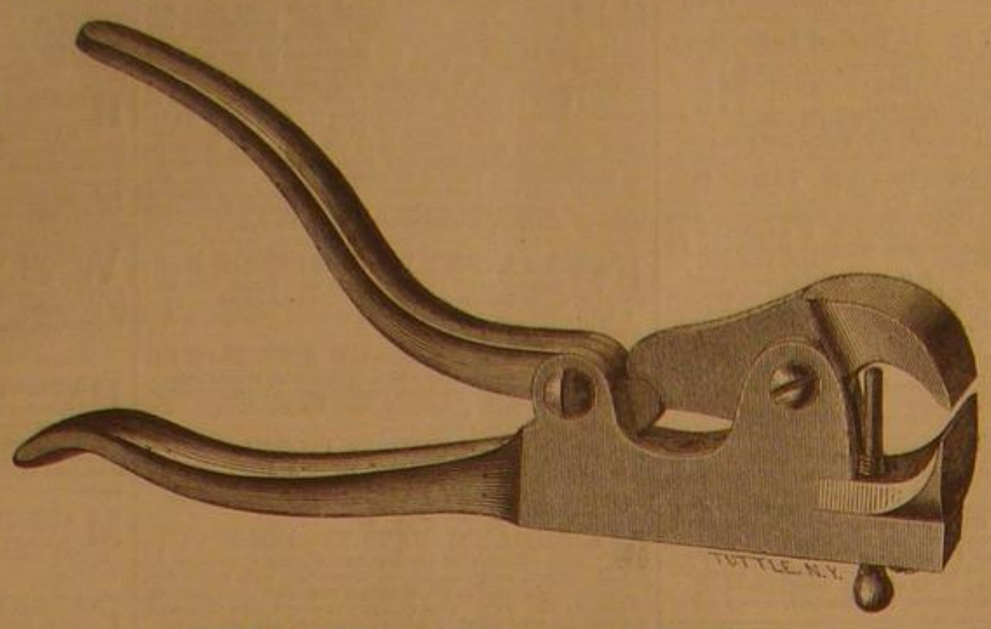

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It will be understood that by depressing the outer lever, or bringing the two handles together, an immense leverage is brought to bear upon the movable cutter, while a spring seated under it raises the cutting edge when the pressure is removed. An adjustable screw, passing through the lower jaws and coming in contact with the inside of the upper jaw when closed, prevents the edges from coming into injurious contact. The jaws are made of the best cast steel and tempered so as to cut pianoforte wire without showing a mark. All the parts are manufactured by gages, so that any portion, if injured, may be readily replaced by a duplicate. The patent for the United States was obtained through the Scientific American Patent Agency, May 14, 1867, and the Scientific American are now pending through the same agency. Further information may be obtained by application to Hall & Gifford, 187 Bowery, or at the office of the European Company, 85 South street, New York City.

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While cast iron is one of the most brittle substances known, yet the manipulations of the puddler, aided by fire and oxygen, readily change it to the toughest and most fibrous material. Yet even as cast iron it possesses much elasticity. A large steam cylinder if allowed to rest upon its side will sink by its own weight, so that if five or six feet in diameter it will be depressed from top to bottom of its diameter over an inch. Wire drawn from iron is worked just as wax would be by the moving of the outside particles over the inner as it passes through the dies; yet this process makes it almost as hard and compact as steel.