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Derrick for Loading Hay.

This engraving is a representation of a novel and useful machine for loading hay on wagons. It facilitates and lessens the labor and is readily and easily operated by any one not skilled in the use of machinery. This last feature is one of considerable importance at the present time when the "help" farmers hire seem to be a little more stupid than any other class of men on earth.

The machine, or derrick, is intended to perform the whole labor of transferring the hay from the field to the cart, and this it does with great ease and certainty. The details are as follows:—The framing, A, carries a circular table, B, which revolves on a spindle in the center. The timber, C, is fastened to the table and moves with it; the boom, D, has a fork at the upper end, which is loaded by lowering the boom and taking on the hay. The boom is raised and lowered by the rope, E, which runs over a roller at the top of the upright, and it is retained in place while the hay is being thrown off by a catch, F, fitting in a recess at the bottom of the upright, as shown. After the fork is unloaded the catch is thrown out by working the lever, G. The shank of the fork is at H, and is provided with an orifice on the end in which a pin works, as at I. This pin holds the fork together while the load is on, and can be withdrawn to trip the fork by the rope, J. The derrick is provided with wheels to draw it to different points where it is to operate, and one of the wheels, K, is made to turn on a center so that it can be thrown out of line and thus act as a drag or anchor, to prevent the whole derrick from moving when a load is to be taken on. The circular table can be turned in any direction by the handle, L, and the rollers, M, keep it from tipping up and also ease its motion. When the machine is to be drawn the brake, N, is turned out so as to bring it in line with the central hole in the guard, O; this jams the hauling line below, so that the derrick can be drawn over the field, as mentioned. The inventor takes the hay from the swath just as it was left by the machine or after tedding, and deposits it on the wagon, thus saving the expense and labor of raking and piling it up.

In this machine all the usual operations are combined in one and it will doubtless prove a valuable assistant to getting in crops.

It was patented through the Scientific American Patent Agency on the 10th Jan., 1865, by S. R. Higgins, of Parma, Mich., for further information address R. E. Aldrich, at that place.

An Ice Factory.

We paid a visit, day before yesterday, says the *New Orleans Times*, to the ice factory, corner of Orange and Tchoupitoulas streets, and are indebted to one of the members of the firm of Chas. A. Hensler & Co., for the pleasure of inspecting the same. They are turning out about two hundred pounds

length, nine in width, and about three in thickness. A visitor to this establishment can almost realize an Esquimaux's conception of heaven, which is to sit without breeches on a cloud and such icicles.

The Manufacture of Glue.

Ordinary glue is made by boiling the scrapings and clippings of hides, hoofs, horns, or feet of horses, cows, sheep and pigs, which has the effect of converting a certain substance, known to chemists as *ossein*, and existing naturally in these parts of the animal into gelatine or glue.

The raw material is first placed in large pits or tanks, containing milk of lime. The lime, being a strong alkali, removes the hair from the skin in the course of a few days, the time varying with the heat of the weather and the age of the stuff. When all the hair is removed, the skins are taken out of the lime pits, washed with large quantities of water to free them from the lime, which would act upon the skin in the same way it acted on the hair. When sufficiently washed, they are placed under a powerful hydraulic press and as much of the water as possible squeezed out of them. Sometimes, instead of being washed after their immersion in the lime bath, they are simply spread upon frames in the open air to dry. The action of the atmosphere soon converts the lime into common chalk, which being perfectly neutral, has no further corrosive

action on the skin. Manufacturers appear to be divided as to which of these methods of preparation is the better one.

The whole of the hair and most of the fat being removed from the skins, they are next thrown into a huge wrought-iron boiler full of water, which has a false bottom provided with a light framework of iron, to prevent the smaller pieces from sticking to the bottom and sides. Some manufacturers put the skins into a large network bag, made of rope, which is wound in and out of the boiler by a windlass, but generally they are thrown in without this accessory.

The hair and waste pieces of the skin and fat left in the lime pits are collected into heaps, allowed to rot, and then sold to the manure manufacturers.

The boiling gradually converts the *ossein*, which, as we have before stated, exists in the skins already formed, into gelatine, which dissolves in the water. The solution of gelatine thus made is, when suf-



HIGGINS'S DERRICK FOR LOADING HAY.

per hour of ice, equal to any ever manufactured by dame Nature herself. The entire strength of the machinery does not exceed two-horse power, and consumes about two-thirds of a cord of wood and one pound of coke in twenty-four hours. The process of manufacture is quite simple. A large retort contains concentrated aqua ammonia, which, being moderately heated, passes, in the form of gas, through a worm surrounded by a bath of water, of the temperature of the atmosphere, and there by pressure it is liquified. This liquified gas is then passed in very small quantities through a worm in a bath of highly concentrated salt, where it is volatilized. To acquire that state it is obliged to deprive the bath of all its caloric. By constant passage through the worm the temperature of the bath is reduced from 15 to 25 degrees below zero—centigrade. The ice is formed in moulds. We saw large piles composed of it, each block measuring twenty-seven inches in

sufficiently strong, run off into a settling vat, where, while still being kept warm, the mechanical impurities gradually fall to the bottom. When pretty clear the solution is run off into a long trough, which communicates with a number of smaller ones, 6 feet long by 2 deep, and 1 broad. As it runs into the trough a little alum is added, which appears to have the effect of clarifying the solution still further. As the solution cools in the trough, it forms a firm mass of the consistency of ordinary calf's foot jelly. The troughs are then carried into the cutting-up shed, where a man runs a knife round the sides to separate the glue from the wood, and, afterwards, divides it into "bricks," 2 feet deep by 1 long by about 8 or 9 inches wide. These "bricks" are then taken out, and cut with a wire or a sharp knife into slabs about two inches thick. The slabs are carried on piles to the drying-houses, where they are laid upon network frames, a thorough draught of air being constantly maintained over their surface by the sides of the shed being open to the four winds of heaven. The slices are turned from time to time, and gradually dry into the hard compact form in which glue enters the market.

This part of the process is a most critical one, a slight variation in temperature being sufficient to spoil a whole batch in a very short time. In winter a sudden sharp frost will do a hundred pounds' worth of damage in a few hours by freezing the soft cakes, and cracking them into an infinite number of fissures. A sudden rise in temperature will have a disastrous effect from the opposite cause. The rise in the heat will sometimes increase the solvent power of the water contained in the glue to such an extent, that the cakes partially liquefy and drop through the meshes of the network. Again, in damp foggy weather, a sort of fungoid vegetation is apt to form on the surface of the cakes, destroying the transparency of the glue, and rendering it unsaleable. Several remedies have been tried for this latter misfortune, but none appear to answer perfectly.

To transform glue into the gelatine of the shops, it is simply necessary to dissolve it in water and allow it to settle. Clarifying agents are also used to destroy the last vestiges of color. But this is a branch of manufacture which does not concern the ironmonger.

There is almost as much fashion in glue as there is in bonnets, workmen showing themselves absurdly ignorant and capricious in their choice of various forms of glue. We say forms designedly, for many carpenters are not aware of the fact that the best glue is that which is made with the greatest care, whether in London, Salisbury, or Scotland, whether it is in long, broad, or thin cakes, has a piece of string run through it, or is destitute of that appendage. Others, again, have a fancy that the darkest glue is the strongest; but this is also a decided error. Thus, the principal difference between "Scotch" and "London" glue is, that the former is cut a little narrower than the latter, and has a string run through several cakes.

Size hardly comes within the province of the ironmonger; we shall therefore merely mention that it is a weak solution of glue allowed to gelatinize. About size, too, the most erroneous notions have obtained credence among workmen, most of whom fancy that the darkest size is necessarily the best. This absurd notion has led certain manufacturers to adopt artificial means of coloring their size.

The cakes being dry and hard they are taken off the nets, the marks made by the meshes appearing in cross-barred impression on the surface. If the glue has "caught the mildew," or has become dusty, each cake is scrubbed with a brush and hot water to give it a clean and polished appearance. The cakes are then stacked in stores, in which every particle of moisture is driven out of them by artificial heat.

Such is the simple process of glue-making, the real secret of success in which is care and cleanliness.—*The Ironmonger.*

RAG CATS.—A lady informs the *Maine Farmer* that she saved her cherries from the birds by making some cats out of old rags. "Be sure," she says, "to make the eyes out of large, yellow beads or bright brass buttons, and the birds will not come near when one of these cats is perched in the tree."

[N. B. This cat is not patented.—*Eds.*

PATENTS AND MONOPOLIES.

Many of us enter this world on a Patent bed. If we are "brought up by hand," it is on Patent food administered through a Patent feeding-bottle. Those who, when ill, imprudently attempt to cure themselves by taking a so-called "Patent" medicine, are almost certain to die, and are likely, if rich enough, to be enclosed in a Patent coffin, and transported to their last and least unhappy home in a Patent hearse. Thus, with all the incidents of life and of death, articles or processes for which Her Majesty has granted her Letters Patent, are intimately associated. There is but one striking exception. No Patent has yet been obtained for an improvement on the old-fashioned plan according to which the earth is replenished. Before long, this matter will doubtless attract the attention of Patentees ambitious of showing how to do by artificial means what is assuredly nobler, as well as more difficult, than to cause two blades of grass to grow where but one grew before.

There can be no question, then, as to the universality of the interest attaching to Patents. Hardly any man, woman, or child, is unaffected by them. Yet among the multitude whom they concern, there are but few who think seriously about the expediency of granting or withholding them; and, among those who have made up their minds on the subject, there are very great differences of opinion.

It is held by the opponents of Patents that to grant them at all is both a mistake and an injury; a mistake in principle, and an injury to trade. Only a few days ago, we read in *The Times* that the fact of a certain French firm having been able to supply locomotives to an English Railway Company at a lower price than any firm in this country, was chiefly owing to the operation of our Patent laws. It was not alleged that French or Belgian manufacturers were freed from the operation of such laws; but it was maintained that they did not suffer nearly so much from them as all English firms do. The short and conclusive answer to this is, that in France to every million of the population, there are at present one hundred and sixty-two Patents in force; in Belgium three hundred and twelve, and in England one hundred. As the number of manufacturers is much less in those countries than in this, the restrictive action of Patents must be infinitely greater there, than here. Hence, Patents cannot hamper the action of English firms exclusively. Even if they did have that effect, it would not follow that to grant them was an error. This proposition has, however, been gravely advanced in an elaborate article in the current number of *The Edinburgh Review*. Moreover, it is stated that Copyright is as defensible a privilege, as Patent rights are oppressive monopolies. We consider the distinction drawn between them to be wholly illusory. For the present, however, we shall confine ourselves to an examination of the arguments, contained in that article, against granting Letters Patent for inventions.

These arguments are based on two theories; first, that Patents, being monopolies, are injurious; second, that they are hindrances to free competition. We admit that monopolies, properly so called, "are odious." We desire that every enactment tending towards protection, as opposed to freedom of trade, should be swept away. We maintain, however, that modern Patents differ so essentially from the old Monopolies, as to be necessary in order to insure unrestricted competition.

The article in *The Edinburgh Review* begins by referring to the effect produced when the list of Monopolies granted by Queen Elizabeth was read over in the House of Commons. A member exclaimed, with justifiable indignation, that bread would be soon included among the number of the things for which monopolies were accorded. We are then told by the writer in *The Edinburgh Review* that "if the list of such monopolies were now read over in the House, it would be found that the case of which the mere imagination once provoked such wrath in Parliament has been realized—bread is among their number, and a man shall hardly mix flour and water and bake them into bread in any manner which has not been granted by the Crown to the exclusive use of some patentee." If this statement were wholly accurate, then it would be impossible for any one to bake bread without a licence. Is this a fact?

Taking the illustration thus furnished, let us endeavour to dispel the confusion of ideas which the writer seems to labor under, as to the difference between a monopoly such as that granted by Queen Elizabeth, and a Patent for making bread granted by Queen Victoria. Her Majesty has empowered Dr. Daughlish to have the sole right of making aerated bread for a fixed period, in consideration of his having paid certain fees and disclosed the nature of his invention. Having paid the fees and obtained the protection, he is entitled to sue anyone who shall infringe his Patent. He cannot interfere with any baker who chooses to bake bread in a manner different from his own. He may charge what he pleases for his loaves; but no one is obliged to buy or eat them. In fact, his whole power is limited to bringing a new sort of bread into the market, and persuading consumers to purchase it in preference to all other sorts. In enabling Dr. Daughlish to do this, Queen Victoria does not, we think, render him any unfair assistance.

Queen Elizabeth would have acted otherwise. She would have bestowed upon him the "Monopoly" of making bread, and have empowered him to hinder anyone from interfering with his exclusive right. Dr. Daughlish would then have had nothing to fear from competition. Whether his bread were good or bad, the public would have been compelled by necessity either to purchase it at his own price, or else to dispense with the "staff of life" altogether. Moreover, no family would dare to make bread for home consumption, because to do so would be to interfere with his monopoly. The result would be that under Queen Elizabeth, Dr. Daughlish would rapidly accumulate wealth, to the detriment of his fellow men, whereas under Queen Victoria he cannot acquire any money without benefiting his fellows. The modern Patent means the power to compete; the ancient Monopoly the power to restrain. To characterize both Patents and Monopolies, as alike oppressive, is to assert that which cannot be substantiated.

An inventor who trusts in the honor of his fellows is like a banker who refuses to lock up his safe. To discover a process, and apply it in practice, involves not mental labor only, but an expenditure of money also. For instance, a man invents a steel pen which will write, if not spell better than any other ever made. This would be a useful discovery; and it would be the means of largely remunerating him who had the good fortune to make it. Let us suppose that he sets to work to produce the improved pens without first having acquired the privilege of making them during a period of fourteen years. He would fail frequently before attaining the desired result. Much of his time and means would have to be bestowed on erecting the proper machinery and making his invention generally known. If it answered perfectly, the demand for the pens would be great. Rival pen-makers would be unable to find customers for their inferior articles. Would they placidly watch the rising reputation of the clever inventor? We should regard them as very bad men of business if they did. They would be obliged either to produce a better pen, or else to manufacture that which had proved to be so good, and had become so popular. Starting with the knowledge imparted to them by the ingenious inventor, and thus released from the necessity of wasting their time and energies in disheartening failures, they would be able to erect machinery at a less cost than he had incurred, and, consequently, to sell pens at a lower price, and yet at a greater profit than he could sell them. The inventor would starve, and the pirate would grow rich. Hence, in these days, without Patent Laws there could be no competition. Competition implies equality. It is a monopoly of the most obnoxious kind, if one man have the opportunity of snatching from another the fruit of his toil and the result of his outlay, if one may reap where another has sown. A Patent Law prevents this.

If this inventor were working under the protection of a Patent, he would have the same difficulties to overcome as before. But he would be freed from the apprehension of losing all return for his outlay. Whilst his Patent continued in force, he would have the sole right of manufacturing a particular article, a right which would be useless unless he could manufacture that article so cheaply as to compete with all others of a similar kind. Thus, his Patent privilege

would merely give him the opportunity of competing on equal terms with everyone else.

These are the leading principles according to which the bestowal of Patents can be defended. But the provisions of our Patent Laws cannot be supported on these or any other grounds. Our Laws, as now framed, give the greatest possible amount of annoyance to the public with the least possible protection to the Patentee. Because a Law is bad, it does not follow that its principle is erroneous or obnoxious, any more than it follows that, because a man is a fool or a lunatic, therefore he ought to be tortured or slain.

So long as inventors can obtain Patents, the public gains quite as much as inventors can do. By taking out a Patent, they bind themselves to disclose the nature of their invention, and also to make it over to the public after the lapse of a few years. If they cannot receive legal protection, they make no disclosure, because unless they work in secret, the fruit of their labors will be filched from them. In the one case, it is their interest to strive to furnish the public with the most perfect machine, process, or article they can produce. In the other, their energies must be chiefly expended in concealing from the public their methods of working, or the construction of their improved machinery. The absence of a Patent Law is a premium on secrecy.

We are disinclined to cite the example of any other country in support of the course which should be pursued in our own. But in the present case, we must make an exception in favor of the United States. There, it anywhere, Patent Laws would not be maintained for a day, if they proved so detrimental to trade as some would have us believe. Now, the Americans have afforded us as much reason for concluding that they desire the dissolution of the Union, as for maintaining that they are dissatisfied with the operating of their Patent Laws. In his report for last year, the Commissioner of Patents assures Congress, with reference to what had been said in England against Patents, "that to most inventors in this country [America] it would seem not less preposterous to question the right of property, or the fundamental laws of morality, than to inquire into the right and policy of granting Patents for inventions."

The cases of individual hardship which are constantly urged as reasons for abolishing Patents, have nearly always arisen from the defectiveness of our Patent Laws, and the inefficiency of the tribunals which decide questions relating to Patents. Thus, we should support any well-considered plan of reform of those laws as heartily as we should oppose their injudicious repeal. Bad though they are, yet they do less harm than would ensue were there no law in operation. To abolish those Laws, in place of amending them, would be at once unwise and indefensible.

REPORT OF THE SMITHSONIAN INSTITUTION.

We have before us the Annual Report of the Board of Regents of the Smithsonian Institution for the year 1863. It is a book of 418 pages, and being a Congressional document we presume may be obtained gratis by any of our readers on application to their Representative in Congress. From the report of the Secretary we make a few extracts—

FINANCES OF THE INSTITUTION.

It will be seen by the report of the Executive Committee that the finances of the Institution are in as favorable a condition as the state of public affairs would authorize us to expect. First. The whole amount of money originally derived from the bequest of Smithson is still in the treasury of the United States, bearing interest at six per cent, paid semi-annually, and yielding \$30,910. Second. Seventy-five thousand dollars of an extra fund are in bonds of the State of Indiana, at five per cent interest, also paid semi-annually, yielding \$3,750. Third. Fifty-three thousand five hundred dollars of the same fund are in bonds of the State of Virginia, twelve thousand in those of Tennessee, and five hundred in those of Georgia, from which nothing has been derived since the commencement of the war. Fourth. A balance of upwards of \$32,000 is now in the hands of the treasurer of the Institution.

INFLUENCE OF THE SUN AND MOON ON THE MAGNETIC NEEDLE.

In several of the preceding reports an account has

been given of a series of reductions of the magnetic observations made from 1840 to 1845, inclusive, at Girard College, Philadelphia, by Professor Bache. The first two of the papers of this series related to what is called the eleven-year period of the variation of the needle, which corresponds with the recurrence and frequency of the spots on the sun. The third paper relates to the influence of the moon on the variation of the needle. The fourth refers to the change in the horizontal part of the earth's magnetism coinciding with the eleven-year period of the spots on the sun. The fifth relates to the effect of the sun in producing daily and annual variations in the horizontal component of the magnetic force. The sixth relates to the lunar influence on the horizontal magnetic force.

A particular account has been given of the result of all these investigations, which tend fully to corroborate the conclusions arrived at from observations in other parts of the world, that both the sun and moon are magnetic bodies, and exert an influence upon the polarity of the earth; and also that the magnetism of the sun has variations in intensity which are in some way connected with the appearance of spots on its surface, giving rise to the variations in those perturbations of the needle which have been called magnetic storms, and which present a periodical recurrence at an interval of about eleven years.

The influence of the moon is much less marked than that of the sun, and appears to be more analogous to the temporary magnetism induced in soft iron.

In an appendix to this paper the connexion of the appearance of the aurora borealis with the disturbances of the direction and force of the earth's magnetism is discussed. From the result of this discussion it appears that there is a periodicity of about eleven years in the recurrence of the aurora, as well as in that of the great disturbances of the needle, and that these are coincident with each other and with the appearance of the spots on the sun.

FORETELLING STORMS.

For several years previous to the commencement of the war a large map was exhibited in the Smithsonian Institution, on which was daily represented the direction of the wind and face of the sky over the greater portion of the United States; and in previous reports we have frequently called attention to the fact that a properly organized system for giving daily changes of the weather in distant parts of the United States would be of great practical importance to the shipping interests of the country; we have also stated the fact that we are much more favorably situated for predicting the coming weather than the meteorologists of Europe. The storms in our latitude generally move from west to east, and, since our seaboard is on the eastern side of a great continent, we can have information of the approaching storm while it is still hundreds of miles to the west of us. Not so with the meteorologists of Europe, since they reside on the western side of a continent, and can have no telegraphic dispatches from the ocean. The proposition, however, to furnish constant information of this kind could not be carried out by the limited means of the Smithsonian Institution, and, indeed, can only be rendered properly and fully serviceable under the direction and at the expense of the government.

New and interesting features have been introduced into the daily meteorological bulletin published by the Imperial Observatory at Paris. As mentioned in the last report, these bulletins are lithographed each day from records of the barometer, thermometer, wind, and face of the sky, compiled from telegraphic reports transmitted to the observatory from various parts of Europe. In addition to these, they now contain daily a small outline chart of Europe upon which are drawn diagrams showing the barometric curve of the day through the various stations, together with the temperature and direction and force of the wind. For the use of vessels about to leave port, a statement is also given of what will probably be the direction of the wind the next day. Chambers of commerce and intelligent seamen have acknowledged in strong language the benefit of these daily bulletins, thus adding to the ever-accumulating testimony in favor not only of the speculative interest but also practical benefits of meteorology. At Bordeaux, Havre, and other im-

portant ports, as soon as the bulletins are received, the telegraphic announcement of the weather and the probable direction of wind for the following day are posted in public places and furnished to the principal newspapers for publication.

Improvement in Amalgamating Gold.

Mr. Crooke, editor of the London *Commercial News* has discovered a peculiar action of sodium in mercury.

One of the difficulties met with in the extraction of gold and silver from their matrices by amalgamation is what is known amongst miners as the sickening and flouring of the mercury used for that purpose. In this state the mercury is tarnished on the surface, its amalgamating action is greatly reduced, and when triturated in the amalgamating machines it breaks up into minute particles, which will not again unite, and are carried off with the slimes, so that with many ores the loss of mercury forms a considerable item in the cost of extracting the precious metals. Mr. Crooke has found that if 1-20,000th part of sodium is added to the mercury, this flouring is prevented. Mr. Thomas Belt has made a series of experiments on the amalgam, and we find the following results in the *Mining Journal*:

"1."—When a little of the sodium amalgam was added to the ordinary mercury the affinity of the latter for gold was greatly increased, so that when dipped into it they were instantly covered with mercury to which no sodium had been added amalgamation was very slow, and difficult to obtain.

"2."—Floured mercury immediately ran together into a single globule on the addition of a little sodium amalgam.

"3."—When iron pyrites (bisulphuret of iron), magnetic iron pyrites (sulphuret of iron), or copper pyrites (sulphuret of copper and iron) were triturated sodium amalgam, the pyrites were decomposed, and on the addition of water a black precipitate of sulphuret of iron was obtained.

"4."—Triturated with sodium amalgam—*a.* Arsenical pyrites was decomposed and arsenic amalgam formed.—*b.* Galena (sulphuret of lead) was decomposed, and lead amalgam formed.—*c.* Blende (sulphuret of zinc) was decomposed, and zinc amalgam formed.—*d.* Litharge (oxide of lead) and white lead (carbonate of lead) was decomposed, and lead amalgam formed.

"From these experiments it appears that sodium amalgam has an energetic action upon both the oxides and sulphurets, reducing both; and as the sickening and flouring of mercury is supposed to be due to the formation of the protoxyde and the sulphuret of mercury its beneficial effect appears to lie in the reduction of these; but if added in excess it will, after effecting this operation, attack the ores of the baser metals, and with many of them form amalgams. The mercury then becomes loaded with the baser metals, and its action upon silver and gold is greatly reduced. When arsenical pyrites is contained in the ore treated the arsenic amalgam formed by the action of the excess of sodium floats on the surface of the mercury, and prevents the gold from coming in contact with it. It is thus seen that only sufficient sodium should be added to reduce any mineralised mercury, and to keep it in an efficient state. The quantity added, and the duration of its effect, will vary with different kinds of ore treated, as it is well known that some minerals sicken and flour the mercury much more quickly than others. The whole question of the fouling of mercury when used for amalgamation requires a much more careful chemical examination than it has yet received, and it is a matter of great importance to miners that the attention of so able a chemist as Mr. Crooke has been directed to the subject. Already a discovery of unquestionably great value has been made, which will soon be taken advantage of whenever gold is extracted from its matrix, and we can only hope that the discoverer will participate largely in the profits which will be realised by the use of his discovery."

A \$1000 race between a horse and a steam carriage, at New Haven, lately, resulted in the signal defeat of the latter. But they are going to try it again, as the steam man alleged that his fodder, which means coal, injured the speed of the locomotive.

Improved Ruling Machine.

This attachment to paper ruling machines is intended to expedite and facilitate the process by providing simple and reliable mechanism for regulating the pens, both in the angle at which they work on the paper, and also laterally, so that they may be set at any distance apart or otherwise adjusted, as the work may demand. The pens are also made to work properly, or with their faces on the paper, and can be used on fine ruling, such as railroad and commercial work, without danger of blotting or blurring the heads or double lines.

The following description explains the principal parts and the operation of them. The paper to be ruled is placed on the cylinder, A, and the pens which rule it are set in the beam, B. This beam has to be placed in different positions, to conform to the work to be done or the habit of the workman who is ruling; this latter is quite a feature, for if a man is obliged to work on a machine which is unsuited to his peculiar tastes, he gets nervous, and is unable to accomplish so much, or do it as well as if he had every thing to suit him. The pen beam can be set at any angle by simply moving the screws, C, in or out. These screws work a nut, D, in the bracket, E. The pen beam shaft sets in this nut, so that by moving the screws, C, in or out the beam is altered accordingly. The lateral or side adjustment of the pen beam is effected by another screw, F; by turning this the beam is drawn over to one side, and can be held at any point by bringing the jam nut, G, up to the screw shank. Vertical alteration can be made in the pen beam by the screws, H, at the bottom; these latter raise the standards, I, which support the pen beam, and in this way change the angle which the pens have with the paper to be ruled. The standards are carried in slides, J, which are held in place by a nut, K; by slacking this nut the slides can be moved in also, thus giving a very wide range of alteration to the pen beam.

The advantages of this attachment are a great saving of time in adjustment both in setting the pens and securing it to the machine, also great accuracy in ruling complicated work in fancy inks. The pens also work with much freedom, and give clear distinct lines through being properly adjusted with the paper or working with their faces instead of their edges. The inventor is a practical ruler of fourteen years' experience and finds great advantage in this machine, which he has in daily use.

A patent is now pending on this machine through the Scientific American Patent Agency by J. C. Forman; for further information address him at No. 20 Hamilton street, Cleveland, Ohio.

THE fact that there are no less than fifty tunnels to be passed between Bologna and Pistoja will suffice to give a tolerable idea of the engineering difficulties encountered upon the line of railway which at present forms the sole means of communication (omitting, of course, the old postal road,) between the northern and the central provinces of Italy. Some of these tunnels are very short, it is true—a mere momentary plunge into the darkness of the abyss; but others are of considerable length—one about a quarter the length of the Mont Cenis tunnel.

A 62-INCH Fourdrinier machine, at Elizur Smith's paper mill in Lee, recently turned off 4,479 lbs. of paper in 24 hours, running 103 feet and 4 inches per minute, or 20 miles in 24 hours.

Deterioration of Bituminous Coal.

The leading article in the last number of *Newton's London Journal* commences thus:—

With every shipment of coals at Newcastle, it is customary for the fitter to make a declaration to the effect that the article then shipped is "fresh wrought" from the mine: a tacit acknowledgment on his part that his coal is supposed, in some way or other, to deteriorate by keeping. Nor is this supposition the result of mere prejudice, for it is an established fact, although, like many other facts, it is far too little known and appreciated by the public at large. Coal of every description deteriorates by being kept in contact with the air, and some kinds suffer much more rapidly than others; but all are liable to damage from two causes, that might not inaptly be called the

authenticated table of their deteriorating quality, would be a great boon to the coal-consuming public, needs no argument at our hands. The practice of the coal-fitters at Newcastle is a sufficient proof of the importance and necessity for some such guide, and there we leave it.

The article is signed L. T., and the author announces himself as the L. Thompson, some of whose experiments on fuel are cited by Ure. He says that the deterioration of the coal is due to oxidation, but he does not say whether this explanation is founded on direct observation, or whether it is an inference only from analogous changes in similar substances.

Velocities.

A heavy body falling from a height, for instance from a balloon, falls during the first second $16\frac{1}{2}$ feet, 3 times as far the next, 5 times as far the next, and so on, with increasing velocity, in the ratio of the successive odd numbers 7, 9, etc.; hence it will fall 1,200 feet in 9 seconds, and three miles in $31\frac{1}{2}$ seconds. A cannon ball fired perpendicularly ascends with decreasing but falls with increasing velocity, and describes each portion of its path upward and downward, respectively, in identically the same period of time.

Sound moves at the rate of only 1,142 feet per second. Therefore we see a train of cars at a distance fairly across a bridge long before the sound of their crossing reaches the ear.

Light moves with a velocity of 192,000 miles per second, which, for terrestrial observations, is instantaneous. But so remote are the fixed stars that the light of the nearest occupies more than three years in its journey to the earth of twenty billions of miles. Some idea of the inconceivable velocity of light may be obtained by comparing its speed with that of a cannon ball. The latter moving at the speed of 1,200 feet

per second would require upwards of one million three hundred and eighty thousand years, to accomplish the distance of ten millions of millions of miles, the probable distance of Sirius from the earth. The light of Sirius is supposed actually to be 60 times greater than that of the sun. X.

Plow Attachment.

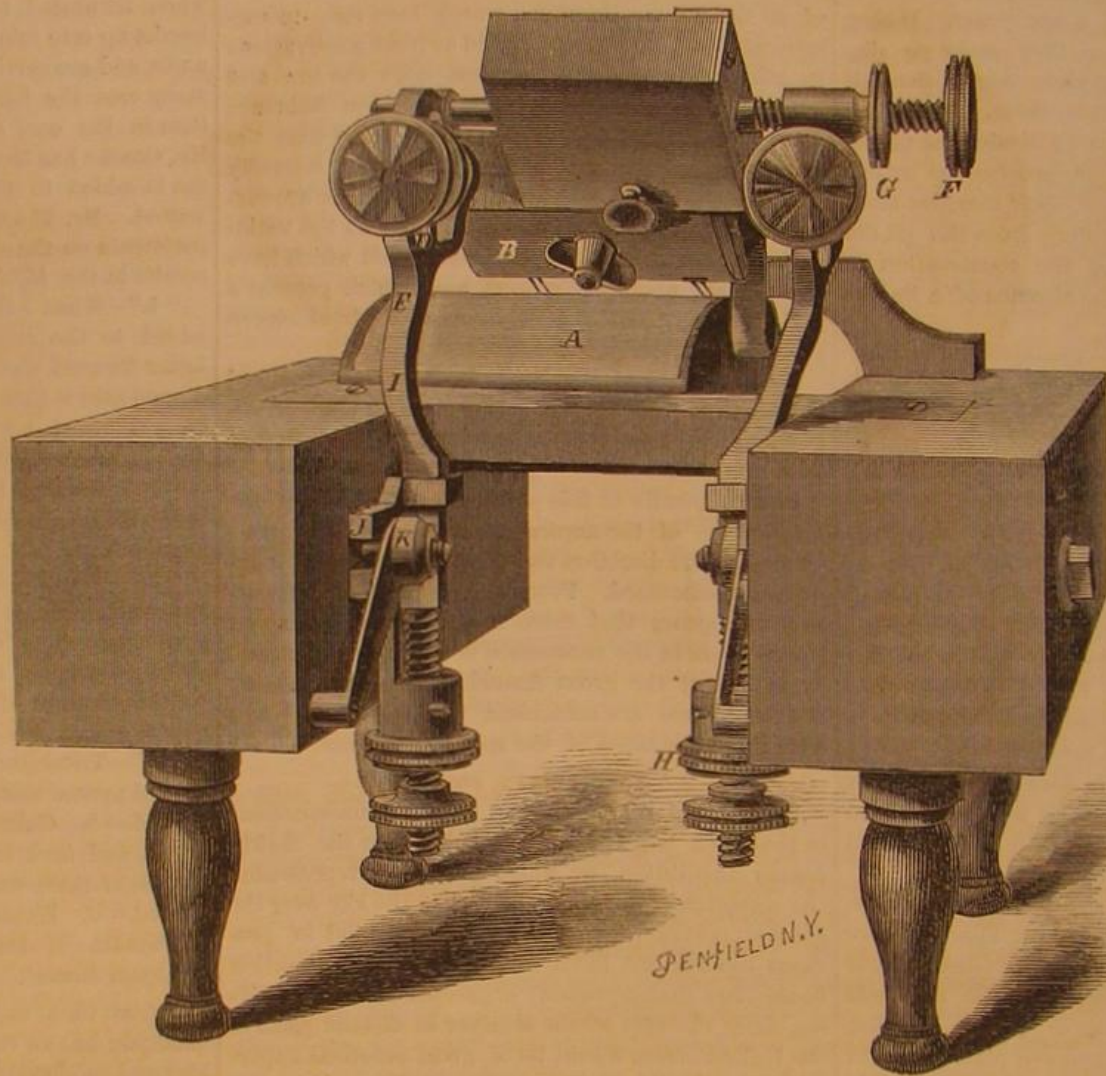
The *Country Gentleman* says, Messrs. J. & A. Kilmer, Barnerville, Schoharie Co., N. Y., have patented a device for regulating a chain attachment to plows, so as to enable them to turn under and cover all growth of whatever kind, which may be standing on the soil. We witnessed its operation on a field thickly covered with a rank growth of coarse weeds, three or four feet high. Its success was complete, every particle of the weeds being entirely put out of sight by the furrow.

[This invention was illustrated on page 354 of the last volume.—Eds.]

THE boot and shoe manufactories in Massachusetts are now in full operation, and all the workmen find employment with fair wages. Good workmen make from \$2 50 to \$3 50 per day.

[So much for machinery. Disciples of St. Crispin would have been utterly unable to earn any such sums without the aid of machines.—Eds.]

THE wettest place in the world is Cherrapoorjee, situated in the Cossya hills, 25 miles from Calcutta. The rainfall at that spot is upwards of 600 inches in the year, or 20 times that of the very worst climate of western Ireland.



FORMAN'S RULING MACHINE.

"dry" and the "wet rot." Thus, when coal is exposed to the air, its surface, and to a certain extent its substance, becomes oxidized, by which it gains in weight, but loses in calorific value; in fact, we might say that a part of it is burnt, but not removed: this is the "dry rot." Then, again, when coal in large heaps or masses is moistened, it undergoes a sort of fermentation or heating, which expels a portion of the hydrogen, and oxidizes a part of the remainder, so as very much to diminish the heating power of the coal; this is the "wet rot." Upon some varieties of coal these changes are extremely slow, whilst upon others they take place with great rapidity, and, to an extent that may well be regarded as very serious in a pecuniary point of view. The fact itself, however, appears to be altogether ignored by our governmental authorities, for it is never once alluded to in any of our "blue-book reports" upon fuel; and it unfortunately happens that there are no physical or external indications in the appearance of the several descriptions of coal by which we might, upon inspection, form an opinion of the keeping quality of any particular sample. We ourselves have made many experiments upon this deterioration, and are therefore able to say, that generally speaking the heating power of dry coal is diminished in the ratio of 13 to 12 by a six months' exposure to the air and the ordinary action of daylight; but when the coal is moistened, the loss becomes much greater, and even this is evidently increased if the bulk of the material is very large, so that in such a case the coal seems gradually to be converted into mere lignite, at the expense of nearly one-half of its calorific value. That a list of the different kinds of coal, with a well-

Improved Rowlock and Tackle Block.

The common thole-pins which have been used so long in boats propelled by oars are very rude contrivances for the purpose. They not only add very greatly to the labor of rowing, but they are liable to break, afford inadequate support to the oar, and in a sea way often throw it out altogether.

The rowlock here shown is in every respect preferable to the old-fashioned wooden pins. It is light, neat in appearance, and above all far more efficient than the other spoken of. It conforms to the motion of the oar in changing from one stroke to another, and therefore does not strain the arms and back so much, and tends greatly to lessen the fatigue. This invention is important to oarsmen and boat-builders as the whole strength of the gunwale is retained, which is an entirely new feature in the manufacture of swivel rowlocks. Swivel rowlocks have always been objectionable, especially for light boats with narrow gunwales, as one half or more of the gunwale had to be cut away to put on the rowlock, which impaired the strength greatly. In this invention the plate of the rowlock is fastened firmly on top of the gunwale. It can be easily attached or detached, as occasion may require; it works smoothly and with little noise, and its strength is at the point where it is most needed.

In construction it is a metallic jaw, A, formed in one piece, having a base, B, which is grooved as at C. The body of the jaw has a hole in it which fits over a pin, D, as shown in the dotted lines. The base is screwed fast to the gunwale and the jaw or rowlock turns in it with the pin for a center. There are also two projections, E, one on each side of the rowlock, which work in the groove; by turning the rowlock so that the projections come fair in front between the opening, the rowlock itself can be taken out and laid in the bottom of the boat, a painter or chain in the eyebolt, F, serving to prevent it from falling overboard. The oar can be shipped at the small end near the blade, if desirable, and the neck or opening between the two jaws of the rowlock made so narrow that the oar cannot unship even in the heaviest sea—thus the oarsman can keep all his energy directed to propelling the boat. Patented May 9, 1865.

The tackle block illustrated by the side of the rowlock, is peculiar in construction, inasmuch as the strap sheaves, becket and hook, are all cast in one piece, thus rendering it much cheaper to manufacture and durable in use. The becket, A, is cast of a proper shape to receive the line or rope to be run through it, and is smooth, so that the same will not be chafed or frayed out from use. They are made from one-fourth of an inch to one inch, both single and double sheaves. The block was patented through the Scientific American Patent Agency Sept. 27, 1864, by Capt. J. W. Norcross. For further information on both of these articles address the manufacturers, Messrs. Wilcox & Hall, Middletown, Conn.

TIN—HOW SAMPLED, ASSAYED AND SMELTED.

The tin mines of England are confined to its southwestern extremity. They are worked by two different classes of laborers, distinguished from each other by the mode in which they are remunerated for their work. One of these classes undertakes to remove a given area of ground for fixed wages, totally irrespective of its mineral contents; the other sinks a shaft, or drives a level, of specified dimensions, being paid for the same by a percentage on the mineral contained in the ground he removes. The former class are called *tutworkmen*, the latter *tributers*. From the above two kinds of labor it results that a portion of the stuff dug from the mine is owned wholly and entirely by the adventurers, or shareholders, in the mine, while the remainder is only theirs after the miner has deducted from it the percentage for which he undertook to remove it. Now, since in a large

mine there are many gangs, or pares of men, as they are called in Cornwall, between whom and the shareholders contracts are entered into on tribute, and since it would be quite impossible to keep each parcel of ore separate in its passage through the innumerable stages which tin has to undergo in its cleansing, it consequently becomes necessary, as well to protect the adventurer as the tributer, to ascertain by assay the amount of black tin in each parcel before it is mixed in the common heap, to be stamped, washed, and calcined, all processes necessary to bring the ore to that condition of purity required by the tin smelter.

Having used the word black tin, it may be as well here to explain that the term is applied to the pure

substances to rise toward the right edge of the shovel, the poor sand being washed to the back of the deposit, and the worthless being drawn towards the opposite side, whence it is thrown over by a shake. The ore, thus enriched, contains some rough grains; so the assayer places his shovel on the pedestal, and taking one of the heads of the mallet in his left hand, and the handle in his right, he rubs the sand vigorously. He then re-washes the assay, or, as it is termed in Cornwall, *re-vans* it, and drying his shovel over the fire, carefully brushes off every particle into the clay crucible. This crucible is then placed on a slow fire, and the assayer keeps continually stirring the charge, until the whole of the pyrites so commonly admixed with tin or in nature, is destroyed, and the charge is roasted quite sweet.

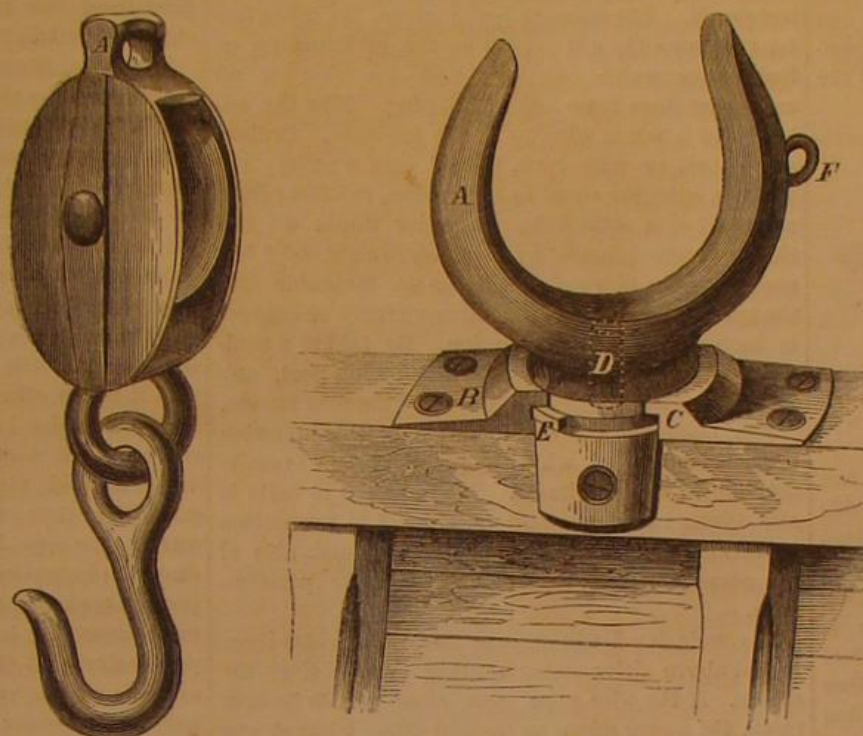
The roasted mineral is then replaced on the shovel, washed, bruised, re-washed, dried, and weighed. The black tin obtained is weighed by the lb. troy, and they reckon it by grains and penny-weights. Now, to deduce from the result of the assay the quantity of black tin contained in a parcel of ore, the assayer has a table calculated supposing the assay to be made on half a noggin. On this hypothesis it is generally allowed that for 9 grains found in the assay there exists 1 cwt. of black tin to 100 sacks of ore, each sack containing 12 gallons by measure. It is needless to go into the calculation, and all that need be observed is that the principal of the valuation consists in the admission of the equality of the ratios $\frac{1}{2}$ noggin of dry sand = 9 grains; 100 sacks of moist particles = 1 cwt. Experience has led to the adoption of these figures, so that account may be taken of the water

passing from the ore, and that there may still remain a bonus for working it.

In cases where the ore is weighed, instead of measured, the whole calculation is, of course, totally different, and certainly much more satisfactory to the miner. In this case the assayer operates on 2 ozs. avoirdupoise, and weighs the black tin obtained by troy, and a table is made based on the fact that 1 gr. in the assay corresponds to 2 lbs. 8 ozs. in 1 tun of ore.

By the above process all the ores of tin in Cornwall are assayed for black tin; and by it the miner estimates the quantity of tin contained in any given piece of ground. At first sight it would seem to be a method to be practised by anyone, but it is not really so, for the washing of the ore on the shovel, termed *vanning*, requires the greatest dexterity on the part of the manipulator, or he will wash away a large quantity of tin with the refuse. In it, as in all processes for dressing tin on the large scale, the success depends on the specific gravity of the tin ore being greater than that of the worthless matter mixed with it; but the difficulty of applying this property to the assay on a small scale on the shovel is immensely enhanced as compared with the difficulty of using it to collect the tin when in bulk and spread over large areas. In truth, without continued practice and great experience a vanner will invariably lose some ore, whilst to the initiated it is a method very accurate and trustworthy; also to the traveling miner its value can hardly be overestimated, for with his vanning shovel and crushing hammer he can roughly estimate the value of any gold or tin vein he meets with.

Now, the tin miner probably labors under greater disadvantages than any other class of miners, because he is obliged to cleanse and purify his ore to a greater extent than they are before he can sell it to the smelter. Pure black oxide of tin contains 77 per cent of metallic tin, and unless a tin ore can be cleansed as to contain nearly 60 per cent of metallic tin the smelter rejects it. This is certainly a fact which has not received the attention it deserves, for the great cost of tin mining is in the expense and labor of purifying the ore after it is dug out of the mine before it is fit for the smelter. It may be safely



NORCROSS'S ROWLOCK AND TACKLE BLOCK FOR BOATS.

black oxide of tin, in which form nearly all the tin in Cornwall occurs in nature. Well, having thus seen the necessity of ascertaining the quantity of tin in each parcel of ore, we will proceed to describe the manner in which it is arrived at, and which is termed, trying tin samples.

Each parcel of stuff which is known to contain mineral is, when brought to the surface weighed or measured, to ascertain its exact bulk or weight. Immediately this has been done a sample is carefully taken of the whole pile, and placed in a small tray, some 10 in. square. The tray is then removed to the sampling-house, and its contents emptied on to an iron plate in the floor. Then, under the superintendence of one of the mine agents, it is roughly crushed by flat hammers, and a fair sample, about one-third of the whole, taken. The rest being rejected, this one-third is replaced on the iron plate, and crushed much finer. Of it is, again, taken a sample, about one-third of the whole, and the remainder again rejected. This is again and again repeated, until the sample is reduced to about half-a-pint, which quantity is placed in a small bag, with a label indicating the parcel from which it is taken, and then carried to the sample trying house. The tools of the sample tryer are a large shovel, slightly concave, with a handle fixed in it nearly parallel with its face; a large tub almost full of water; a wooden upright, placed on one side of the tub, and fitted with little hooks to hold the shovel when roasting on it; an iron mallet, with two heads for bruising the ore on the shovel; a small clay crucible; and, lastly, a low fire. The mode of procedure is as follows:—The assayer measures the dried and pulverised ore in a small cylinder, holding one-fourth of a noggin; this full, he upsets it on to his shovel, previously dried, and returns it again to the measure to ensure great accuracy; emptying it again on the shovel, he moistens it with a little water from the tub, and taking the shovel in his hand he gives it a series of movements, difficult to describe; they, however, resolve themselves into two principal actions—first, a cleansing by a rapid agitation, which imparts a rotatory motion to the liquid, and makes the muddy water run off; second, the rocking by little shakes up and down, and forth and back, which cause the heavier

said that no greater boon could be conferred on the tin miner than the discovery of some method of tin smelting by which the necessity of extreme purity in the ore was not an essential. When we come to speak of tin smelting we shall see that there is a method by which impure tin may be smelted, but we shall then also see that there are so many practical objections to the process that it can never be commonly adopted. It is known by some tin miners, although we believe not generally, that acid may be most successfully applied to the purification of tin ore when mixed with certain readily soluble bodies, and it is almost a wonder that its power is not more generally applied. For a long time the use of acids for this particular purpose was thought to be a great secret, and its application was rigidly, when made use of, hidden away in back sheds; now, however it can no longer be called a secret, so that the more generally the fact is diffused the greater the boon to the miner.—*Mining Journal*.



The Power of Belts.

MESSRS. EDITORS:—Facts appear to be wanting concerning the power of belts. Here are some, well observed and conclusive, so far as they go:—

The towers of the Cincinnati bridge are 200 feet high, and contain 16,000 perches, or 400,000 cubic feet, of masonry each. This material has been raised by engines of 10 inches bore and 20 inches stroke, working with a pressure of 60 to 80 pounds, making 80 to 150 revolutions per minute. The power is transmitted by a 9-inch leather belt, from a 4-foot iron pulley, keyed upon the crank shaft to another 4-foot pulley, fixed upon a pinion shaft. This pinion is $14\frac{1}{2}$ inches in diameter, and drives a spur wheel of 6 feet diameter; another $14\frac{1}{2}$ -inch pinion on the shaft of the lathe moves a second spur of 6 feet, fixed upon the same shaft, which turns a 3-foot drum, which winds and unwinds a hoisting wire rope, of $1\frac{1}{2}$ inches diameter. By this rope the weights are hoisted direct without any further tackle or appliances. By 25 revolutions of the engine the wire rope drum revolves once, and pays off or receives 10 feet of rope. This makes the speed of the belt 50 times the speed of the wire rope.

A block of sandstone, measuring 60 cubic feet, and weighing 8,400 pounds, is a full-sized stone for the work. The belt will run up each a block, the engine making 125 revolutions per minute, at the rate of 50 feet per minute, which task requires the tightening pulley to be pressed down hard, so that about $\frac{3}{4}$ ths of the circumference of the 4-foot pulley are closely hugged. The same belts have been performing this duty nearly three seasons with ever falling. On the contrary a limestone of the same cubic contents weighing 170 pounds per foot, or 10,200 pounds, cannot be raised without the slipping of the belt, and without such hard application of the tightening pulley, as to endanger its splittings and safety. A weight of 8,000 pounds may be considered in this case as the fair working limit of the power of the belt. A strain caused by 10,000 pounds is altogether too much for safety and economy.

The speed of engine being 125 revolutions per minute the speed of belt is $4 \times 3 \quad 1416 \times 125 = 1571$ feet per minute. The duty performed in this case is equivalent to $50 \times 8,000 = 400,000$ foot-pounds. With a load of 8,000 pounds the tension of the belt is $254\frac{1}{2}$ pounds. Its speed being 1571 feet per minute, its performance is $1571 \times 254\frac{1}{2} = 400,000$ foot-pounds. Assuming the width of belt at 10 inches we have 40,000 foot-pounds for one inch of belt. The old rule allows one inch for every horse-power of 33,000 foot-pounds, and I think this is a very good rule for ordinary mill practice, provided the speed of belt is equal to about 1,500 pounds per minute.

Blocks weighing 8,000 pounds have been frequently raised 150 feet high in $2\frac{1}{2}$ minutes without the slipping of the belts. This speed is equal to 60 feet per minute and the duty performed is equivalent to $60 \times 8,000 = 480,000$ foot-pounds = 15.44 horse power; speed of belt = 1,885 feet.

The principal element which determines the power

of a belt is its speed. A slow moving belt cannot transfer much power, any more than a slow moving piston. The higher the speed the more power will be run off. Now the question of speed can only be qualified by the question of wear and tear, and by adhesion. If the speed is too high the belt will slip, more pressure becomes necessary, and a greater wear and tear will result. Where there is no absolute necessity, the speed should never exceed 1,500 feet. A less speed of 1,000 to 1,200 is preferable and will be found more economical in the end. Where a higher speed, say 2,000 feet and more are essential, as in the driving of fans, economy must be neglected.

The absolute strength of a belt is a fixed and invariable quantity at any one time. Speed, on the other hand, may vary, say from 500 feet, per M. to 3,000 feet per M. The strength being given, the other factor (the velocity) will determine the performance, or foot power which can be raised—provided in all cases that there is no loss by slipping. Now the adhesion of a belt is directly as the pressure. Ordinarily a belt or wire rope, passed over a pulley, will produce adhesion equal to its tension, resulting from a contact of a semicircle. In other words we can elevate 2,000 pounds by a counterweight of 1,000 pounds, if the physical conditions are favorable and the speed is slow. As the circumference of contact is increased so is the adhesion. By taking a sufficient number of turns around a snubbing post, any line or rope may be broken, provided the post stands.

The mathematical consideration of this question is very complicated, while the practical issue is easily determined by experiment. The adhesion of belts is also favored by large pulleys, but not in proportion to the size. The conditions of the belt and also of the atmosphere will likewise influence its performance.

In conclusion I will observe that the engines mentioned above drive other hoisting gear, besides the drums. If the wire rope gear alone was to be operated, the power might be applied direct without any belting.

JOHN A. ROEBLING.

Cincinnati, Ohio, July 8, 1865.

Defence of Patent Sale Agents.

MESSRS. EDITORS:—I have noticed in your last issue an article signed, "J. T.," in relation to the "Trials of Inventors." It would appear by that article that J. T. fell among thieves, or would, had he not proved too smart; that he makes a faithful record of the facts, so far as his experience is concerned, I would not doubt, although his experience always kept him from their clutches. Many persons have visited this city, and instead of buying goods of a regular house wended their way to a mock auction shop, and finally left the city in disgust at the prevailing wickedness of the metropolis. It is legitimate for your house to solicit patents, and for the United States to grant them, I would ask why it is not legitimate to sell patents; at what particular point does knavery necessarily begin; and why, of necessity, is a patent sale agent a knave? I am aware by seeing advertisements, that there are several parties in New York engaged in the sale of patents; as to their mode of doing business I have no knowledge, as I have not the honor of an acquaintance with a single party in the business. I sell patents, and require a model, patent papers and power of attorney, in order to close a sale when the purchaser is ready without delay. I make no charge to the inventor for receiving a patent, and none whatever unless I make a sale. There are dishonest men in all departments of business, but that is no reason why the entire community, or the whole of any class should be subject to wholesale charges, without comment, thus leaving the impression that no one in that particular branch is worthy of confidence. Judged by this rule every kind of business would suffer.

J. H. BEARDSLEY.

New York, July 6, 1865.

Cutting Hard Steel.

MESSRS. EDITORS:—Seeing in your last number an article upon cutting hard steel with a soft iron disk rotating at a high velocity, and having had some experience in using the like, I send the following:—A few years ago I made a considerable quantity of gimblets, and finding the old way of cutting the screw by hand to be slow and hard upon the eyes, I constructed a machine to cut the screw with a sheet iron

disk, $3\frac{1}{2}$ inches in diameter, making about 3,000 revolutions per minute. The disk was supported by plates $\frac{1}{2}$ an inch less in diameter than itself. I could with this machine cut from two to four dozen gimblets per hour.

P. S. Will the lubricating coal oil injure leather belting? I find it makes the belts very soft.

[We should suppose that heavy coal oil would injure leather belts, but as our correspondent is trying it, we hope he will communicate the result.—Eds.]

Length of Steam Pipes.

MESSRS. EDITORS:—We are building a factory four hundred and fifty feet from a dyehouse; we wish to put in a boiler large enough to supply both places; will it work well to carry steam through so long a pipe from the factory to the dyehouse, and how should it be laid?

JOHN C. GARDNER.

Hingham, Mass.

[Steam pipes should always be as short as possible, but in the Gould & Curry mine, Cal., steam is carried 1,100 feet, with a loss of only five pounds pressure. The pipe is cased with ashes.—Eds.]

The Jet and Ball Problem.

MESSRS. EDITORS:—"C. H. A." asks an explanation of the philosophy of the suspension of a sphere (leaden ball) in a perpendicular jet. I have studied the matter a little heretofore and convinced myself that it is the effect of compensated friction on the lower or under half of the ball. If the jet strikes centrally the ball is raised centrally; whenever it varies a rapid upward motion is given to the inner portion, or that part directly over the jet, and consequently the opposite hemisphere moving in a reverse direction is exposed to greatly increased friction and pressed back to its original position. This continues until something breaks in upon the regularity or perpendicularity of the steam. If it can be shown that any other than vertical revolutions are made by the ball, of course my theory fails.

R. H. A.

Bath, Md., July 13, 1865.

The Sandwich Islands.

Among the foreign countries engaged in commerce with our northwest Pacific States, there is none that is establishing with them more intimate commercial relations than the Sandwich Islands, which are located in the North Pacific, in latitude 20° , about 2,100 miles southwest from San Francisco, and directly in the track of vessels bound from that port to China. The prospect of a speedy establishment of a line of monthly steamers across the Pacific, under contract to perform the American Mail service between California and China, touching at Honolulu and Japan, both in going and returning, gives increased interest to the agricultural progress of the group. Postmaster General Dennison has officially invited tenders for the performance of this important mail service; and as it is understood that parties are ready to place the steamers on the route at once, it is expected the line will be in operation during the next year at the farthest. The establishment of a steam line will reduce the time required to make the passage from San Francisco to Honolulu from fifteen days to eight, and tend to greatly increase the commerce with this group, which is practically an American colony, as a large majority of the foreign population are Americans. We propose in two or three brief articles, to notice the agricultural progress made there during the past few years, most conspicuous among which has been the

MANUFACTURE OF SUGAR.

The cultivation of sugar cane in the Sandwich Islands dates back more than twenty-five years; but it was not till after the settlement of California, and the consequent opening of a near and permanent market for sugar on the Pacific coast that any impetus was given to the business. Since 1850 foreign capital has been slowly becoming interested in cane culture and in the manufacture of sugar and molasses, till now there is no less than twenty-five plantations, valued at over two million of dollars, and capable of manufacturing twenty millions of pounds of sugar annually, with two hundred thousand gallons of molasses. The sugar mills are generally of the largest size, well made, with all the modern improvements, such as steam clarifiers, centrifugal machines and other late inventions, and are surpassed by no other sugar mills in the world. They have been man-

manufactured mostly in Boston or Scotland, but a large iron foundry is now established in Honolulu which has turned out some very superior mills, though smaller than those imported from the above-named places. A first class plantation has machinery capable of manufacturing a thousand tons of sugar per annum, and several of them, it is thought, will produce that quantity this year. Such a plantation requires about 150 laborers and workmen. The latter are generally mechanics from the United States, England or Germany. The field laborers are wholly natives of the Islands, who, when well managed and treated, are found to be as reliable and efficient as any plantation laborers in other sugar countries. Indeed, some assert that the plantations in the Sandwich Islands are conducted with fewer hands, in proportion to the product, than in other countries. There has been no lack of laborers thus far, and if we may judge from the number of unemployed men living without any regular means of support, it will be some years before any great scarcity is felt. The Island Government has wisely taken measures to provide for any future deficiency that may arise, by making provision for the emigration of Asiatic laborers to the Islands, whenever any are found ready to migrate thither with their families.

The quantity of sugar manufactured in 1864 was about eleven millions of pounds, most of which found a ready market in San Francisco, Oregon and British Columbia. It is estimated that the production for 1865 will be fifteen millions of pounds, and that the annual increase will be about 33 per cent. In quality, the Sandwich Island sugar ranks in the San Francisco market equal to the best New Orleans or Cuba for consumption; and for refining purposes it is far superior to them, on account of its peculiar crystallizing or graining properties; and in this respect it is preferred to the best Manilla or China sugars. The cost of its manufacture in the Sandwich Islands has been estimated at four cents per pound; but on old-established plantations it probably does not exceed three and a half cents—prices which enable the planters to compete successfully with Manilla, India or China.

The climate of the Islands has been found to be peculiarly adapted to the growth of cane, and though the average yield does not exceed two tons of sugar to the acre, yet as high as five or six tons of sugar have been frequently produced from a single acre. There is a large extent of cane land still unoccupied. The island of Hawaii alone, it is estimated, is capable of producing one hundred millions of pounds of sugar annually. This being so, there is a prospect that this group may, before many years have elapsed, become to the Pacific coast what Cuba now is to the Atlantic States. For its development this business must rely in future as in the past on foreign capital and management; but with a stable government and with permanent steam communication between its chief ports and our Pacific States, its progress will be sure and rapid.

H. M. W.

[We are indebted for these interesting statements to H. M. Whitney, Esq., editor of the *Pacific Commercial Advertiser*, which is published at Honolulu.—Eds.]

RECENT ENGLISH PATENTS.

CONSTRUCTION OF PUMPS.

This invention relates to that description of pump which is usually termed a rotary pump, and consists in the adaptation to the purposes of pumping or forcing of a modification of an improved construction of steam engine. The improved pump consists of a circular annular chamber, constructed with two castings, with semicircular grooves or spaces formed in them, so that, when the two castings are brought together, a circular annular chamber is produced, in which works a disc or piston, made water-tight by means of suitable metallic packing. This piston is attached to a hollow boss mounted on a central shaft, which passes through stuffing-boxes formed on the sides of the cylinder casting, at the central part of which there are water chambers, with which the supply and delivery pipes of the pump communicate. Spaces are cut out of each side of the hollow boss (which carries the piston), and these spaces communicate in succession with the openings of the water chamber as the piston moves round. Two trans-

verse discs, mounted in suitable grooves or ways, in which they can be moved in and out, are adapted to the annular chamber, and are worked by eccentrics as the piston moves round in the cylinder. These transverse discs act as stops, to divide the cylinder into separate chambers or compartments, into one of which the water will rush behind the piston as it moves forward, while the water is expelled from the other compartment or from the front of the piston. In this way a lift or force pump is constructed which will act equally well in either direction, and does not require a separate air vessel.

APPARATUS FOR EMPTYING THE CONTENTS OF CASKS, SHIP'S TANKS OF PETROLEUM, PARAFFINE, &c.

This invention is carried out as follows:—To the end, side, or other part of the vessel, the inventor fixes a flange and tube by screws, rivets, or other means, which tube projects into the interior of the vessel, and its interior is screwed as a nut. Into this screwed part of the tube he screws a tubular plug, open at the front and closed at the back, there being in the body of the plug near the back a number of perforations, and at the front end two or more notches or recesses. The end part of the discharge tap or pipe is screwed to correspond with the interior of the tube fixed to the vessel, and its extreme end has two or more projections corresponding with the aforesaid notches in the plate, and when the contents of the vessel have to be withdrawn, the projections are entered into the notches, and the end of the tap or pipe screwed into the tube, and as the projections and notches move together, the plug is unscrewed from the tube, thereby allowing the perforations to be open to the contents of the vessel, which then escape through the interior of the plug to the tap or pipe. When the tap or pipe is required to be moved it is unscrewed from the tube, and at the same time it turns the plug and draws it into the tube and closes the perforations, so as to make the vessel perfectly tight, and thus prevent leakage. For supplying and shutting off air to the vessels he uses vents formed in a similar manner, the pipe having the projections being connected to a valve or tap. Similar apparatus is also applicable to the mains of water and gas pipes. Not proceeded with.

CONSTRUCTION OF SHIPS AND BOATS.

This invention consists in bending the ribs used in the above constructions into a serpentine form, so that the sides of the adjoining ribs touch each other at certain points where they are joined together by bolts, rivets, or otherwise. Also, in a variation of the same principle, which consists in the intertwining of screw-shaped coils of metal or other material, and used in the same manner as the serpentine ribs. Not proceeded with.

VALVES FOR REGULATING THE FLOW OF STEAM IN STEAM ENGINES.

This invention refers—first, to an improvement upon such piston valves as are described in the specification of a patent granted to the present patentee, in conjunction with W. McNaught, dated 27th December, 1856 (No 3079). The ring constituting the valve is made in one piece with the boss, which is mounted upon the valve rod. The patentee forms the said boss and ring in separate portions, the one being provided with a part which connects it loosely to the other, but admitting the required motion to be given to the valve. The spring for expanding the ring he mounts independent of the valve rod, and by these two improvements the central position of the said rod is not interfered with. Another part of the invention relates to an improvement upon the arrangement for which letters patent were granted to the present patentee dated Feb. 24, 1858, and consists in a method of communicating motion from the governor to the regulating valve. The two valves specified under the above patent, the patentee still mounts upon the same central line, but the governor, by means of levers, imparts a sliding motion to the rod which passes into the valve case.

OBTAINING AND APPLYING MOTIVE POWER FOR THE PROPULSION OF NAVIGABLE VESSELS.

The inventor's object is to obtain power by forcing or compressing into a space or spaces, or a container or containers, in or on the ship, air, or other elastic incompressible fluid, at high pressures, either when a vessel is in port by the employment of a steam engine and pumps, hydraulic or other power; or when the ship is on a voyage, by employing small steam or

or other power to force air into the spaces or chambers above mentioned, and so as to have it stored ready for use when required. Not proceeded with.

APPARATUS FOR THE PREVENTION OF ACCIDENTS IN CONNECTION WITH STEAM BOILERS.

This invention consists in apparatus for preventing the explosion of steam boilers in which a float inside a steam boiler, or in a vessel in communication therewith, is so arranged in combination with a loaded valve or cock, situated outside the boiler, that closes a passage through which the water space of the boiler, or other receptacle containing water, can communicate with the fire, that, upon the water line of the boiler falling below a certain level, the said float is caused to act upon and open the said valve or cock, so as to allow of the water from the boiler or elsewhere being injected upon the fire in order to extinguish the same. The said valve may also be arranged as to be acted upon and opened by the pressure of the steam in the boiler, so as to inject water into the fire.

NEW ROWLOCK.

This invention has for its object improvements in propelling boats, by means of which the necessity of looking back to see the direction in which the boat goes is obviated, and consists, First, in using two rowlocks, or fulcrums, on each side of the boat. Secondly, in using jointed oars, the joints of which work between the said rowlocks or fulcrums, so that in pulling the handles of the oars towards the stern of the boat, the blades of the oars will be forced through the water in the same direction as the handles, thereby obviating the necessity of the rower or rowers turning round. Thirdly, the oars are each made in two parts, and in connecting them together each flange of the two joints or hinges is fastened securely to each part of the oar, and united together by a centre pin, thereby forming a hinge, as is well understood. The rowlocks are attached to the gun wale of the boat, the outer one projecting about six inches from the inner one, the joint of the oar or skull working at about the centre between the two rowlocks.

Useful Plants.

According to a German author, the number of useful plants has risen to about 12,000; but it must be remembered that these researches have been completed only in certain portions of the earth. There are no less than 2500 known economic plants, among which are reckoned 1,100 edible fruits, berries and seeds; 50 cereals; 40 uncultivated edible graminaceous seeds; 23 of other families; 260 comestible rhizomes, roots, and tubers; 37 onions; 420, vegetables and salads; 40 palms; 32 varieties of arrowroot; 31 sugars; 40 saleps. Vinous drinks are obtained from 200 plants; aromatics, from 266. There are 50 substitutes for coffee; 129 for tea. Tannin is present in 140 plants; caoutchouc in 96; gutta percha, in 7; resin and balsamic gums, in 389; wax, in 10; grease and essential oils, in 330; 88 plants contain potash, soda, and iodine; 650 contain dyes; 47, soap; 250, fibres which serve for weaving; 44, for paper making; 48 give materials for roofing; 100 are employed for huddles and copses. In building 740 are used; and there are 615 known poisonous plants. According to ENDICHER, out of the 278 known natural families, 18 only seem up to the present time, to be perfectly useless.—Cosmos.

THERE are said to be underground creeks in the limestone regions of Georgia with currents of sufficient velocity to carry a mill. There is a government tannery, the bark mill of which is driven by one of these subterranean streams.

THE famous vessel *Alexandra*, intended for a blockade runner, has been turned into a river boat, and now plies between London and Gravesend. She is a novelty on the Thames, as she is the only boat that has cabins upon deck, in the American style.

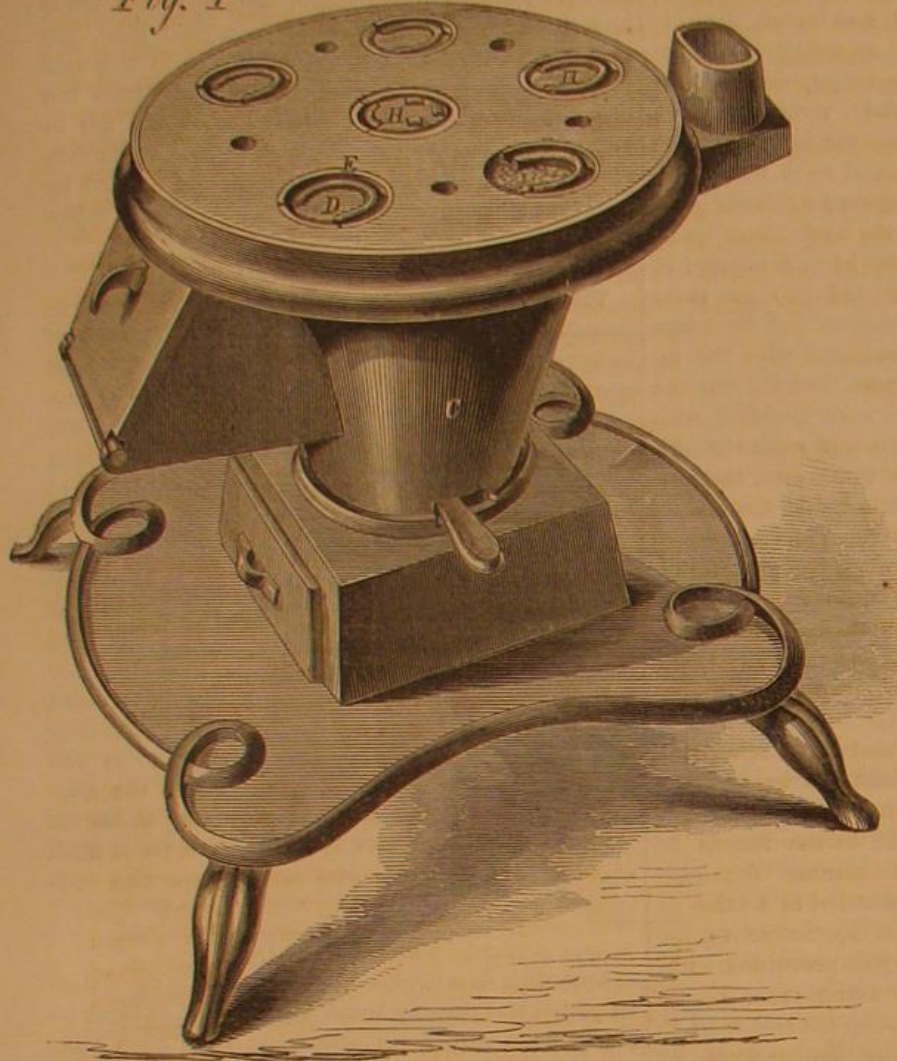
THE *Philadelphia Mining News* says:—"Inventors should give their best efforts to the improvement of machinery for crushing quartz; success would meet a rich reward."

BARON LIEBIG's extract of meat is attracting attention at the International Exhibition at Cologne. Its price is twenty-four shillings per pound, and a pound would make sufficient soup for a battalion.

Improved Soldering Furnace.

These engravings represent an ingenious method of soldering fruit, paint or other cans that require to be air-tight and rapidly completed. The invention consists in forming the cans with a circular groove in the tops and bottoms, as at A, Fig. 2, and in filling this groove with a coil of solder in wire form, as at B. The can so provided is then placed on a furnace, C, which has covers of a peculiar kind. These covers, D, have grooves, E, in them corresponding in shape to the bottom of the can. The part where

Fig. 1

**FICTITIOUS AMETHYSTS.**

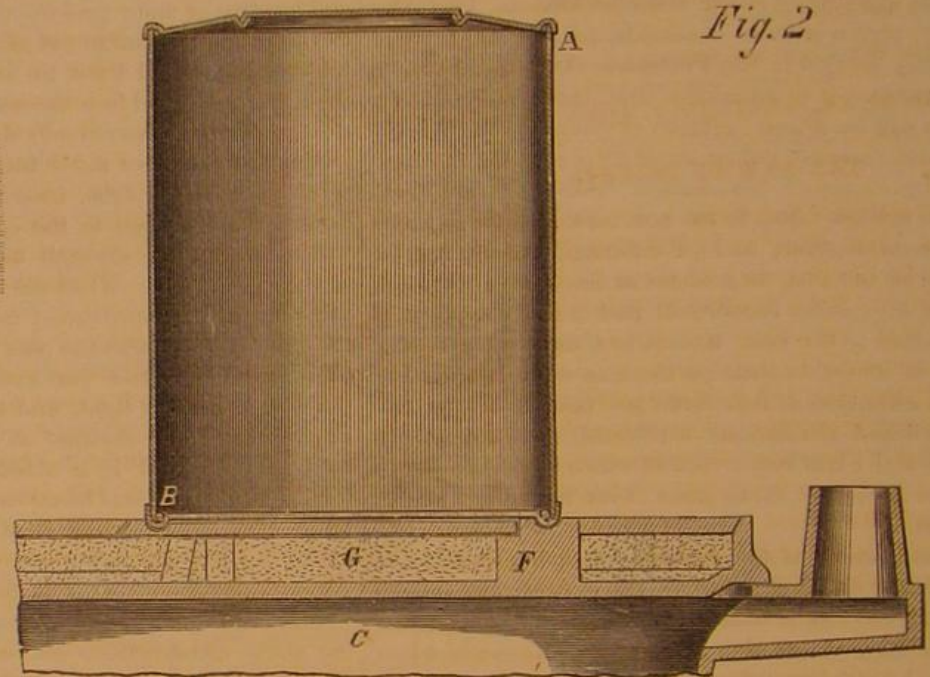
A very singular passion for wearing ponderous jewelry has been noticeable of late. Rings of fine gold, set with amethysts (?) an inch broad are not at all uncommon, and little remark is excited by the spectacle of a show window in some country town filled with gems fit for the cabinet of a king.

It is needless to remark that these are not all real gems, and that true stones of the size described are so rare that few persons could afford to wear them. Amethysts of one carat weight are worth from three

THE LEAD INDICATOR.

This indicator was constructed as follows:—A wooden cylinder, covered with paper, was secured to the cylinder head close to the valve stem, in such a position that it revolved with the main engine shaft. This cylinder was equal in circumference to one stroke of the engine, so that a line traced upon it would represent in length the travel of the piston; a pencil-holder was fixed near the cylinder in such a manner that it could be thrown in or out of contact with the paper—the same, in fact, as an ordinary indicator. The pencil-holder had, further, a wedge-shaped spur on one side, and the valve stem had two such spurs, which were fixed at the lead points of the main valve. The pencil holder was nearly in line with the spurs on the stem, so that the one on it and those on the valve stem, came in contact slightly when moved past each other. It is easy to see, therefore, that when the main cylinder is rotated by a line from the engine shaft the pencil will draw a straight line, except at the lead points, where the valve-stem spur and that on the pencil holder come in contact, when a sharp, triangular break will appear in the line. The original lead line is traced when the engine is cold, and, to be a verification of it, the line should appear the same when actually

Fig. 2

**HOLLINGWORTH'S SOLDERING FURNACE.**

the grooves are solid, as at F, Fig. 2, while the surrounding portions are hollow and filled with non-conducting material, G. The operation is as follows:—When the can is set in the grooves the heat causes the solder to flow around and completely fill the grooved bottom, so that a neat and air-tight joint is formed almost instantly; a slight agitation of the can causes the solder to fill every crevice. The solid part of the furnace cover confines the heat of it to that particular spot, and the non-conductor inside prevents heat from radiating to the sides, and thus destroy the joint which has previously been made. The ashes or non-conductor are filled in through the covers, H, when needed. The top of the can is treated in the same manner as the bottom, to secure the joint, and the rapidity of the operation does not affect the soundness of the side seam in the least. This is an expeditious, convenient and economical process for soldering cans, as the use of irons is avoided, and the amount of solder for each can may be accurately graduated so that none is wasted. The employment of children or unskilled labor is available here, and we recommend an examination into the merits of this system.

A patent is now pending through the Scientific American Patent Agency by R. J. Hollingsworth, of Cincinnati, Ohio. For further information address him as above.

SCREW SOLED SHOES.—We were shown a few days since a new style for making shoes, a rival to the copper nail shoe—and which we are informed, can be made equally cheap. The improvement consists of a brass screw inserted by machinery and cut off smoothly upon the outer sole. We see no reason why a pair of shoes screwed together would not be more durable than a pair nailed.—*Shoe and Leather Reporter.*

to five dollars. They are frequently imitated by fluor spar, oftener by a composition of paste. This is composed of the following substances:—Strass, or colorless crystal glass, 1,000 parts; oxide of manganese, 8; purple of Cassius, 0.2, and oxide of Cobalt, 500. This formula is from "Feuchwanger's Treatise on Gems," and is described as being so accurate a resemblance of the real that good judges can scarcely tell one from the other.

HOW TO SET A SLIDE VALVE.

Some steam chests are made with the bonnets cast on—a very foolish practice—so that the chests are merely hollow boxes, with the bottom out; it is impossible to see the valve or the lead here, and it may be set separately, and the chest put on afterward, by breaking the connections and using circumspection in putting them together again, so that nothing is damaged by false measurement.

LEAD.

A point discovered in some experiments lately made in this city is the absorption of the lead of the slide valve by expansion of the valve and cylinder, and springing of the rods when at work. Valves are set when the engine is cold, and the change which takes place subsequently is sufficiently large to affect the character of the work very much. The valve on the engine in question was set with one-eighth of an inch lead, but it was found that when actually at work it opened an eighth of an inch too late, although the parts were as strong as usually made for engines of the class under trial. No reliance could be placed on the indicator to test the actual time of opening and closing of the valve, and an engineer, Mr. W. T. Selden, contrived a novel indicator, which caused the valve to register the lead accurately, so as to determine the loss between the two conditions of the engine—that is, when hot and cold.

running, but, as before stated, the difference was very marked.

This is a simple and beautiful instrument, for the purpose, and, as it is cheaply constructed, it should be on every engine, since the time of the opening and closing of the valve are as easily seen as one's face in a mirror. The common indicator exhibits only the apparent time, while this apparatus shows the real time. Since the value of expansion, according to the law of the celebrated and immortal Mariotte, of whom so much has been said lately, depends wholly upon the extent of it, it will be seen that the lead is an important element in computing the actual volume of the steam—versus the apparent volume. It is also important as regards the mechanical action of the steam engine, for shafts have been screwed up too tight in their bearings, pillow blocks shifted, and connections keyed up, with a view to stop thumping, which was caused entirely by the valve opening too little, or at improper periods.

TOGGLE JOINTS AS POWER.

A number of engineers and others have written communications to this office relative to Bickel's Power Multiplying machine, illustrated in the *SCIENTIFIC AMERICAN*, with the inventor's own description, a couple of weeks ago. It is hardly necessary to criticize the correctness of Mr. Bickel's theory but we insert a closing paragraph from our correspondent's letter, which will portray the conclusions of most of the other writers:

"Mr. Bickel says he has gained eight times the power applied; if so how many more toggle joints will enable him to propel a steamboat twenty miles per hour?"

EXHAUST steam is used in some instances to ventilate mines.

THE Scientific American.

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VOL. XIII. NO. 5. [NEW SERIES.]... Twentieth Year.

NEW YORK, SATURDAY, JULY 29, 1865.

THE LAW OF PATENTS.

During the past few years a considerable discussion has been going on in the British journals in reference to the propriety of protecting invention by letters patent. Some wealthy English manufacturers, like Sir Wm. Armstrong and others, have found it quite disagreeable in their business to recognize the rights of patentees, and the London Times, true to its illiberal sentiments, has allowed itself to become the mouthpiece of that class, who destitute of genius, and unable to produce a really good invention, would be glad to have the patent laws abolished in order to enable them to appropriate without let or hindrance the fruits of other men's labors. The numbers who have advocated the abolition of the patent laws are comparatively few, yet they are bold and determined and readily avail themselves of every open channel through which to convey their ideas. The venerable Edinburgh Review has taken up the subject, and with calmness and ability, undertakes to show that the system of granting patents has been a positive hindrance to industrial operations.

The Review cites a number of well-known inventors, who it alleges were injured by patents, though it utterly fails to show in what sense, or yet how the granters of patents inflicted the injury. Whatever real or imaginary injury may have resulted to the early inventors of Great Britain from the grant of letters patent, we are sure that no such state of facts can be deduced from the history and experience of American inventors. Chief among these are the well-known names of Blanchard, Goodyear, Howe, McCormick, Burden, Morse, Wilson, Hoe, Bigelow and Ericsson. We venture to say that not one of these eminent inventors could or would assert that the patent laws had not conferred upon them signal advantages. If this were not true why in the name of reason have these inventors been so persistent in their efforts to perpetuate an extension of their patents? The answer to this inquiry is readily suggested to every intelligent mind. These patentees would not spend time and money in endeavoring to procure an extension of their patents, if by so doing they were heaping grievous burdens upon their own backs. That there are exceptions to this general rule, we fully admit, but we are not now hunting for exceptions, which are found equally among all classes, trades and professions. Without attempting to follow the Review through its entire argument, we will notice a single point in the article in order to show the woe and warp of which it is made. It declares that "Arkwright's invention was most profitable to him after his patent had been annulled and the expenses of litigation had ceased with the monopoly it gave him." This is, indeed, a very strange circumstance. After infringers had ceased to trouble him, and after he had established himself

as a manufacturer, of his power loom, "Arkwright," says the Review, "realized a princely fortune." Now we would enquire what enabled him thus to establish himself in a lucrative business. Certainly no one will pretend to deny that this success resulted from the fact that, encouraged by the grant of letters patent, which promised to secure him the exclusive right to his invention for a term of years, he sought to enter upon the enjoyment of his rights. These rights were invaded by unscrupulous infringers, who preferred not to pay him for the use of his patent, and while Arkwright was endeavoring to defend his much-abused patent, he was all the time laying the foundation of that princely fortune he afterward realized. The grant of a patent stimulated his energies and encouraged him to believe that his rights under the patent would be respected. In this, however, he was mistaken, but, nevertheless, he ultimately got rich out of his invention.

That the position taken by the Review is indefensible we refer our readers to a very able article on "Patents and Monopolies," reprinted on another page, from the Reader, a prominent literary journal, published in London.

WORK AND POWER.

In the pages of the Journal of the Franklin Institute, a discussion is going on between De Volson Wood, Professor of Civil Engineering in the University of Michigan, and J. W. Nystrom, Acting Chief Engineer, U. S. N., on the subject of work, force and power. The main purpose of Mr. Nystrom seems to be to deny the position that work is independent of time, and he succeeds in involving the question in considerable confusion. The facts of the case are simple and plain enough.

Work is the overcoming of mechanical resistance of any kind, either by raising a weight, dragging a body along, turning off a shaving, or by any other action. The question, whether it is independent of the time depends entirely upon the meaning of the language employed. A foot-pound of work is the raising of one pound of matter one foot in vertical height, and this foot-pound is precisely the same quantity whether one second or one thousand years be consumed in the operation.

We may say that a machine is doing the work of raising one foot at the rate of one inch per second; then the work done by the machine will depend upon the time that it is in operation; it will take it twelve seconds to do one foot-pound of work, and twenty-four seconds to do two foot-pounds.

In this case, however we have attached to the word, "work," a meaning for which the word, "power," is employed by the standard writers on mechanical philosophy. To keep our ideas clear it is better to regard the machine as exerting a power of one inch-pound per second, and to confine the word, "work" to the aggregate resistance overcome.

One writer argues that 2 and 2 do not always make 4, sometimes making 22. By analogous tricks of language we may confuse our minds in regard to any problem whatever; but a more useful aim of discussion is to free our minds from confusion, and to accomplish this, one of the most important steps is to use words always in their exact signification.

Regarding work as the overcoming of physical resistance, it is plain that the aggregate amount of any given quantity is independent of the time required for its performance.

There is probably no higher authority on the philosophy of mechanics than Arthur Morin, and from his "Leçons de Mécanique Pratique," translated by Bennett, we take the following extract:—

"The Idea of Work is Independent of Time.—We see, from what precedes, that in the measure of work we have only regarded the effort exerted, and the space described in the direction peculiar to this effort. It is therefore independent of time.

"Thus, in raising goods, the effect is not measured by the duration of labor, but by the product of the load into the height of its elevation."

WHAT CAME OF IT.

Some time ago an intelligent machinist while looking about a factory in this city noticed that a large and small boiler were connected by a pipe upon which was a globe valve, intended to be opened or

shut by hand whenever one boiler was to be used and the other shut off.

As such an arrangement as this has frequently caused disaster the machinist spoke to the proprietors, warned them of the danger they were in, and insisted that it should be altered. They replied that the boiler was in careful hands and they considered it quite safe, but upon further consideration, asked the cost of changing the pipe and valve so that it would be wholly safe. Our friend answered, "fifty cents; just turn the thread off the stem," said he, "put the valve back again, and it will regulate itself. If you will bring the valve down to the shop," he continued, "I will turn it off for nothing." "Fifty cents," and "for nothing," was altogether too insignificant to be thought of, so no further attention was paid to the subject. This is what came of the neglect:—The boiler blew up on the 15th inst., killing the fireman, scalding the engineer very severely, and destroying a large amount of property. All this was caused in the first place by putting a valve where there was no occasion for it, and, secondly, by culpable neglect on the part of the proprietors in not removing this valve or arrangement when called upon to do so by an expert.

The explosion of this boiler under such circumstances should be a warning to all others having them in the same condition and such changes ought to be made as will insure safety and not allow it to be dependent upon the opening and shutting of a globe valve between one boiler and another. It is also another evidence of the only true theory on which to base boiler explosions, that is the "careless theory," for to this source most of them may be traced.

STEAM JETS IN FIRES LENGTHENING THE FLAME.

The practice of introducing small jets of steam into furnace fires is very rapidly extending; at one machine shop in Providence two kinds of apparatus for supplying the jet are manufactured on a wholesale scale, so large is the current demand. The steam is usually employed to create a blast, a small quantity of steam at a high velocity carrying along several times its volume of air, by the well known dragging action, by which one current produces another in any fluid with which it comes in contact. The creating of a blast is not, however, the principal object in employing a steam jet, as it is generally understood to be a wasteful mode of using steam for this purpose; one high authority has stated the quantity of steam necessary to produce a given blast when applied in this way, to be fifty fold greater than when the steam is worked through an engine to drive a blower.

Under certain conditions, and for certain purposes, there can be no doubt that a small jet of steam increases very considerably the action of the fire. At one wrought iron forge, it is said the number of heats per day of a certain sized bar have been increased by this simple expedient from six to ten, equal to nearly seventy per cent. If with a blast of dry air the combustion be perfect, it is impossible to increase the quantity of heat generated, by throwing either water or steam into the fire, as we have repeatedly shown; the cause of improved results must therefore be looked for in some other action of the jet.

In fires of anthracite coal and of some other kinds of fuel, one effect of a steam jet is to lengthen the flame. In coal fires of any considerable depth, a portion of the carbon escapes from the surface of the bed of coals combined with one equivalent of oxygen in the form of carbonic oxide. If this inflammable gas meets with atmospheric air at a red heat it immediately combines with a second equivalent of oxygen, becoming carbonic acid, the carbon giving out in this second burning more than twice as much heat as it did when it was burned into carbonic oxide. Now if the carbonic oxide be mingled with a swift current of steam, it may be carried along much farther from the bed of coals before its several atoms encounter each an atom of oxygen, in the air blast, thus transporting the burning to a distance, in other words, lengthening the flame. This action may be of very great utility in coal-burning locomotives, and in other places where a lengthened flame is desired. Though the aggregate quantity of heat would not be augmented, its intensity in the interior of the tube

might be greater, and, as the rapidity with which heat is transferred from one body to another is in proportion to the difference in their temperatures, it is possible that the quantity of water evaporated by a given quantity of fuel might be very materially increased.

LAUNCH OF THE "DUNDERBERG."

It has frequently been asserted by those who opposed the monitor iron-clads that the Government never gave other plans a trial, and was unwilling to admit any other inventors or designers to compete with them. This is incorrect. The first iron-clad built in this country was a broadside, casemated ship, and there have been in all four sea-going casemated vessels constructed. These are, the *Galena*, the *Keokuk*, the *Ironsides* and the *Dunderberg*. This last vessel was successfully launched on the morning of the 22d inst. A large concourse assembled to witness the event, which was an entire success.

The *Dunderberg* is a wooden vessel; she is solid throughout, and the work is of the most massive character.

THE HULL.

The hull of the *Dunderberg* is massive, being solid from stem to stern; it is 378 feet long and 68 feet wide, and 32 feet deep. The frames are twelve inches thick, and are built of oak, firmly bolted and fastened together. The model of the ship is very peculiar. The floor is dead flat for the whole length, and the sides rise from it at an angle everywhere save forward, where they are very nearly vertical. The bow is as sharp and has as fine lines as it is possible to give it, and the stern and run aft are very clean and handsomely modeled. The hull is divided by several water-tight compartments, both longitudinally and transversely—a precaution, common to nearly all modern sea-going ships, which has been found indispensable. The frames are strapped diagonally with heavy irons, 5 inches wide by $\frac{7}{8}$ of an inch thick, blunt bolted to them. There is a slight sheer on deck, but it is almost invisible to the casual observer at a short distance. There is but one rudder; provision is made, however, for steering by an auxiliary apparatus of a peculiar nature, should the main steering gear be shot away. The frame timbers, 12 inches thick, are ceiled inside 5 inches thick, planked outside 5 inches thick, and over the planking two courses of heavy oak beams, 12 inches thick, are again laid, making in all an aggregate amount of nearly five feet of solid timber on the ram's sides. The planking is all caulked, and the seams payed before the last protection is applied, and the entire mass is as firmly bolted together as it is possible to do it.

THE RAM.

The ram on the *Dunderberg* is about as formidable a looking object as one can conceive; the entire fore-foot of the vessel is prolonged thirty feet from the hull proper, and, rising easily upward from the keel about half the distance from the water line, is there rounded, presenting a blunt end in shape like the profile of an ax edge; it then runs back toward the stem again. The mass of wood which forms this ram projects inside of the hull almost as far as it does outboard, and is there substantially secured to the main timbers. The sides and edge of the ram will be iron-plated, and even should the whole of it be knocked off in an affray, the builders say that the hull will be water-tight.

THE CASEMATE.

The *Dunderberg* has, on top of the main deck, casemated quarters for the guns and crew. This casemate slopes at an acute angle from the sides to the top; it takes up a large portion of the vessel amidships, and is an elongated octagon in shape; it is made of heavy timber plated with iron $4\frac{1}{2}$ inches thick; it is pierced on each side for three broadside guns, and has one port forward and another aft in the casemate, for bow and stern firing. The hull of the ship is built out from a distance below the water-line to meet the edge of the casemate above, so that the broadside of the *Dunderberg* will present an acute angle to the line of the enemies' fire. The mass of wood and iron presenting a resistance to the enemy's rams or projectiles at this point amounts in all to seven feet. The deck of the casemate, and so the main deck, will be plated bombproof, and

the quarters for the officers and crew, being in the fortress on deck, will be thoroughly ventilated and open to the light and air. The *Dunderberg* will draw about twenty feet of water. Her speed is not stated. Her engines are estimated at 6,000 horsepower, and were designed by Erastus W. Smith.

THE SKY NOW.

The heavens present at this time an unusually brilliant appearance. The bright planet which makes its appearance in the southeast in the early evening, and slowly climbs the sky as the night advances, is Jupiter. As his orbit is exterior to that of the earth, and as the earth is now nearly between him and the sun, we are about the nearest to him that we ever approach, and as in this position his illuminated hemisphere is turned most nearly towards us, he now presents his largest and most brilliant appearance. By the aid of an ordinary spy glass three feet long his four moons can be seen forming nearly a straight line with the center of the planet. If the spyglass be a good one the belts can also be made out.

Still farther to the west, and somewhat nearer the zenith, in the constellation Virgo, is Saturn with his ring. The ring is very clearly brought out by a three foot telescope.

In looking at the planets with a glass, the instrument should be firmly secured so that it will remain in position without shaking or trembling. At the optical instrument establishments clasps for supporting telescopes may be bought, arranged to screw into window frames, or other supports of wood, and provided with a universal joint for turning the instrument in any direction.

SPECIAL NOTICES.

Wm. Kenyon, of Steubenville, Ohio, has petitioned for the extension of a patent granted to him on the 14th of October, 1851, for an improvement in machines for making nuts, washers, etc.

Parties wishing to oppose the above extension must appear and show cause on the 25th of September next, at 12 o'clock, M., when the petition will be heard.

Thos. J. Sloan, of New York City, has petitioned for the extension of a patent granted to him on the 21st of October, 1851, for an improvement in machinery for shaving, nicking, and re-shaving wood screws.

Parties wishing to oppose the above extension must appear and show cause on the 2d day of October next, at 12 o'clock, M., when the petition will be heard.

Identification of the Dead.

The *Alta California* of March 16th, reports that Dr. L. J. Henry, by the consent of the coroner of Alta, brought into use the process of Dr. Richardson of London for restoring the features of a dead man who had undergone such change from decomposition that he could not be identified. The man had been murdered and buried in a very shallow grave; the body was discovered from some animals having partly removed the earth. On the body being brought to the dead house it was quite unrecognisable. Dr. Henry placed it in a water tight shell, and then covered it (the body) with water containing twenty pounds of common salt and one pound of hydrochloric acid. After immersion for three hours, the body was removed; the face was washed first with simple water, then with chlorine water, and finally a free current of chlorine gas was passed over the face. After the operation, by which the face was bleached, the friends of the dead man were able positively to recognize him as one Charles T. Hill, and on his identification a man was arrested in whose possession various articles belonging to Hill were found, and who is believed to be the murderer. The restoring process seems in this case to have been entirely satisfactory, and to have served a purpose which a few years ago it would have been considered impossible to carry out.

Among the colossal engineering projects of the present day is a scheme for constructing a railway tunnel under the bed of the Severn, for the purpose of connecting the South Wales Union line with the Principality. The tunnel will be about three miles long, and is estimated to cost \$3,750,000.



ISSUED FROM THE UNITED STATES PATENT-OFFICE
FOR THE WEEK ENDING JULY 18, 1865.

Reported Officially for the Scientific American.

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

48,781.—Water Wheel.—Jason A. Allen and Alanson Allen, Oakham, Mass.:

We claim, First, Providing the lower side of the wheel case with a flanged rim, K, for the purpose of causing the water to press on the lower side of the wheel, substantially as and for the purposes stated.

Second, In combination with the detachable flanged rim, K, applied to the lower side of the wheel case, the grooved flange, G, on the lower side of the wheel, substantially in the manner and for the purposes described.

Third, The application of turbine shafts and to the lower face of the turbine wheel, of the adjustable supporting collar, I, substantially as and for the purpose described.

48,782.—Method of Treating Hemp, Flax, Jute, Grass, Etc.—Stephen M. Allen, Woburn, Mass.:

I claim, First, A fiber composed of flax, hemp, jute, china grass and other long line substances dew or water rotted, steeped or fermented and submitted to a stranding and flossing process by drawing rollers, scutchers, scrapers, bar heaters, pickers, cards or any suitable machinery for the purposes of reduction in the manner and for the purpose set forth.

Second, I claim a yarn, cloth, felt or paper stock made from long fiber such as flax, hemp and other like substances which has been line submitted to dew or water rot, steeping or fermentation, in combination with stranding and flossing by mechanical means, substantially as herein set forth.

Third, I claim a yarn, cloth, felt or paper from long line fiber treated as above and when mixed with any other fiber, substantially as set forth.

48,783.—Cultivator.—Parker H. Allstott, Jesse Conville, Ind.:

I claim the relative arrangement of the shares and beam and the construction and arrangement of the connecting rods, bars, bolts and screws and taps so far as they assist in effecting the purpose and object of changing at will the angle between the shares and beams and thereby altering the draught of the tiller.

48,784.—Belt Clasp.—A. D. Ansell, Hartford, Conn.:

I claim the employment of the inclined planes, b, in combination with the plate, a, and jaws, c, substantially as and for the purpose described.

48,785.—Drill for Boring Rocks, Etc.—William Bickel, Pottsville, Pa.:

I claim the combination of pick and chisel described, the points constituting the former extending longitudinally beyond the latter, for the purpose set forth.

48,786.—Churn.—Caleb C. Bishop, Poughkeepsie, N. Y.:

I claim the adjustable screw blades, E, bearings, e, arranged relatively to the hub, D, and handle, C, of a reciprocating churn dash, substantially in the manner and for the purposes herein set forth.

48,787.—Car Coupling.—John W. Boughton, Appleton, Wis.:

I claim, First, The latch pivoted and held in place as shown, and for the purposes set forth.

Second, The movable tumbler, working in combination with the latch and pin in the rear, in the several combinations as shown and described, and for the purposes set forth.

Third, The spring box or rod, I, located above the tumbler for the purpose set forth.

48,788.—Carpet Slipper.—Daniel Bowker, Boston, Mass.:

I claim as a new article of manufacture a carpet slipper provided with a waterproof inner sole and having the quarter united to the upper by means of a rivet or rivets in connection with the ordinary stitching, as herein described.

48,789.—Inhaling Tube.—Charles Bullock, Cambridge, Mass.:

I claim combining with an inhaling tube, an auxiliary mouth tube, in the manner and for the purpose substantially as set forth.

48,790.—Harness.—Jerome Calkins, Hudson, Mich.:

I claim arranging and connecting the straps, D D, with the rings, E E, strips, C C, ring, a, and with the ring, F, substantially as and for the purpose specified.

48,791.—Cooler for Beer and other Liquids.—Justus Chollar and Charles W. Cunningham, Washington, D. C.:

We claim the above described cooler, B, provided with the ice space, C, and discharge tube, F, in combination with the outer vessel, A, when arranged and operated substantially as set forth.

48,792.—Artificial Leg.—John Condell, Morristown, N. Y.:

I claim, First, The supporting appendage consisting of the straps, K K, and elastic straps, N L, substantially as and for the purpose described.

Second, I claim the central bar, a a b, in combination with a socketed axial bolt or bolts, c, substantially as described.

48,793.—Shaft for Boring Tools.—Daniel G. Copplin, Cincinnati, Ohio:

I claim the improved coupling for the sections of a well boring rod, consisting of the collars, C and F, the tongue, D, jaws, E and E', the dowel, G, socket, H, and the counter sunk screw key, I, or their equivalents combined and operating as set forth.

48,794.—Cover for the Exhibition of Samples.—C. O. Crosby, New Haven, Conn.:

I claim making a depression in the cover of boxes for the purpose described, when the said depression is formed from the same material as the cover, substantially as and in the manner described.

48,795.—Construction of Vessels.—John P. Curry, New York City:

I claim a combined tubular iron and wood frame for vessels so united as to conjointly receive, resist or transmit the strain throughout the whole, whilst the tubular iron frame is free to expand or contract by atmospheric changes without injury to itself, or to the fastenings of the wooden frame, as herein described and represented.

48,796.—Machine for Preparing Wool for the Manufacture of Hair and Grass Cloth.—James Downie, Paterson, N. J.:

I claim the combination of the hollow shaft or spindle, s, with the flyers, x, and the feeding apron, W, the whole operating substantially as described and for the purpose stated.

48,797.—Pipe Coupling.—William Dutemple, Malden, Mass.:

I claim the recess, l, and lip or ring, k, for reception of the male

end of the coupling, and the cement by which the parts are packed. I also claim giving to the lip or flange, b, an inclination, in manner and for the purpose substantially as set forth.

48,798.—Horse-shoe Nail.—Lucius H. Dwelley, Dorchester, Mass.:

I claim the former, F, having a gaining or progressive motion, substantially as set forth.

I also claim the vibrating cutters, a' b', operating substantially as described.

I also claim causing one of the cutters, by the act of carrying the rod forward to the other cutter, or by any other moving part of the machine brought up against the bent portion of the rod, to feed in a sufficient length of rod for the next succeeding nail.

I also claim feeding in the rod previous to the nail, already formed on its end, being cut off.

I also claim gaging or determining the length of rod fed into the machine, by means of the cutter, b', substantially as described.

I also claim making the cutter, b', adjustable, so as to allow more or less of the rod to be drawn forward previous to cutting off, substantially as described.

I also claim equalizing the throw of the hammers, G, by means of the belts, q, arm, s, and spring, u, so as to cause them to strike at the same instant upon the nail, substantially as set forth.

I also claim the revolving arm or segment, E, carrying a succession of rolls placed at unequal distances from the center around which they are carried, in combination with the hammers, G, and a movable former, substantially as described.

I also claim the revolving arm or segment, E, carrying a succession of rolls placed at unequal distances from the center around which they are carried, in combination with the hammers, G, and a movable former, substantially as described.

I also claim attaching the springs, o, which operate the hammers, G, to movable carriages, as set forth, for the purpose specified.

48,799.—Stake-holder for Platform Car.—E. A. Eddy, Racine, Wis.:

I claim, in combination with the stake, B, and holder, C, the employment of the latch, A, arranged and operating substantially as herein shown and described.

48,800.—Stake-holder for Platform Car.—E. A. Eddy, Racine, Wis.:

First, I claim the casting, A, constructed substantially as shown and described, and provided with one or two recesses, a, for the purposes specified.

Second, I claim the combination and arrangement of said stakeholder, A, with the slotted stake, D, center bolt, C, and projection, b, operating substantially as and for the purposes set forth and shown.

Third, I claim the combination of the stake, D, provided with the projection, b, with the stakeholder, A, provided with the recesses, a, arranged and operating as and for the purposes specified.

Fourth, I claim the combination of the stake, D, provided with the slot, d, and the pin or bolt, c, arranged and operating substantially as described.

48,801.—Boot and Shoe Holder.—James Ellison, Boston, Mass.:

I claim a boot and shoe holder, consisting of the fixed arm, A, pivoted lever, B, handle, K, ratchet, C, and pawl, D, or their equivalents, constructed, combined and operating substantially as set forth and for the purpose described.

48,802.—Shirt Collar.—A. A. Evans, Boston, Mass.:

I claim rounding and narrowing the lower corners of turn-over or stand-up shirt collars, when constructed with concave bottoms, substantially as set forth and for the purposes described.

48,803.—Pruning Shears.—Joseph Evans, Newark, N. J.:

I claim the arrangement and combination of the parts of the shears, in the manner and for the purpose specified, when used in combination with my already-patented pole or holder, said patent bearing date July 16, 1891.

48,804.—Saw-mill.—Joseph Fecker, Cavetown, Md.:

I claim, in combination with a saw pitman, the changeable crank pin block and follower, with the keys or wedges, for the purpose of shifting the working part of the saw, and thus causing it to wear away uniformly throughout its length, and avoid the necessity and loss of so much filing, as herein described and represented.

48,805.—Steam Boiler.—Henry Gerner, New York City:

I claim the combination and arrangement of the cylindrical steam reservoir, B, located within the boiler, A, the tube, b, and the education steam pipe, d, substantially in the manner and for the objects specified.

48,806.—Hydro-carbon Blower for Furnace of Steam Boiler, Etc.—Henry Gerner, New York City:

I claim, First, Superinducing the combustion of fuel by introducing directly thereto a hydro-carbonaceous vapor, when the same is produced by forcing steam into and through a body of petroleum or other hydro-carbon liquid, and when said vapor, together with the atmospheric air, is made to constitute the draught medium, in the manner herein described.

Second, The hydro-carbon chamber, E, provided with a steam supply pipe, C, and vapor discharge pipe, D, in combination with the chamber, F, jets, H, H, and air-induction pipe, L, M, constructed and operating substantially as and for the purpose described.

Third, Making the air-induction pipe, L, adjustable, substantially as and for the purpose specified.

48,807.—Stereoscope.—S. D. Goodale, Cincinnati, Ohio:

I claim, First, A continuous scene-carrier, having the series of two-faced wedge formed holders, N, strung upon elastic ribbons, M, M', substantially as set forth.

I claim, Second, A continuous scene-carrier, having the series of two-faced wedge formed blades, N, when combined with the pair of depressed lens holders or eye tubes, O, O', substantially as set forth.

Third, The scene-holder, N, P, formed and operating as described.

Fourth, The combination of the bent elastic pintle, d, with the reflector, B, as and for the purposes set forth.

48,808.—Portable Derrick.—John Grieves, Brooklyn, N. Y.:

I claim the sliding frame, D, D, lifting wheel, R, arbor, H, large wheel, H2, in combination with the arbor, M, pinion, M2, spool, O, lever, S, ratchet, Q, and fall, Q2, in the manner and for the purpose set forth.

48,809.—Well-borer.—John Grieves, Brooklyn, N. Y.:

I claim, First, The cone-shaped cap, P, with the collar, B, for the purpose set forth.

Second, The safety-cup, U, as specified.

48,810.—Car Brake.—Charles H. Gustin, Worcester, Mass.:

I claim, First, The employment of laterally adjustable friction clamps, E, E', which are suspended from the truck frame, in combination with intermediate friction plates, D, which are secured to the axles of the car-wheels, substantially as described.

Second, The construction of the friction clamps, with wings on them, substantially as described.

Third, Suspending the friction clamps by means of hang-ers, d, d', staple guides, f, f, and pins, g, g, substantially as described.

sponges, d, d', with the discs, D, of a dish washing machine, in the manner and for the purposes substantially as herein set forth.

Second, We claim the spring, C, arranged relatively to the wheels, B, D, and suitable means for depressing, D, substantially as and for the purpose described.

48,815.—Churn.—Henry Hutchison, Three Rivers, Mich.:

I claim, First, The combination in a churn of the four-armed crank, A, with four sectional dashers arranged quadrilaterally, substantially as and for the purpose specified.

Second, The combination with the four-armed crank, the pitmen rods and dashers of the stationary guide, E, arranged within the churn substantially as described for the purpose set forth.

48,816.—Lamp.—James Ives, Mount Carmel, Conn.:

I claim, First, A combined hinged shade and chimney base for lamps, substantially as herein described.

Second, The construction of the hinge with a guide and stop, substantially in the manner and for the purpose described.

Third, The combination of a combined shade and chimney base, a lamp or burner cap, and a huge joint, all constructed and operating substantially as described.

Fourth, The combination of the set screw seat ring of a lamp fountain, and the bowl or lamp fountain, substantially as and for the purposes set forth.

48,817.—Cultivator.—C. M. Jenne, Young America, Ill.:

First, I claim the axle, A, arranged or applied to the draught pole, C, substantially as shown, to admit of a forward and backward play thereon, for the purpose set forth.

Second, In combination with the axle, I claim the rods, D, D, attached to the draught pole, C, and passing through the axle, A, with springs, a, on their rear ends, to operate substantially as and for the purpose herein set forth.

Third, The stirrup, H, applied to the draught pole, C, in combination with the bars, I, I, rods, f, links, g, and axle, A, all arranged substantially as and for the purpose specified.

Fourth, The rods, M, M, attached to the plow beams, J, J, and connected by links, N, N, with the adjustable plates, O, O, on the draught pole, C, substantially as and for the purpose set forth.

Fifth, The bar, E, connected by a hinge or joint, b, with the rear of the draught pole, C, in combination with the rod, F, and adjustable plate, G, for the purpose specified.

48,818.—Roofing Bracket.—Charles A. Kirkpatrick, Massachusetts:

I claim a bracket or machine constructed substantially as above described, and for the purpose set forth.

48,819.—Drill.—Loomis G. Marshall, Mokena, Ill.:

I claim the construction and combination of the pivoted drills, having front and back cutting edges, and flat incline bottoms, for chambering and cutting outward and upward, as herein described.

48,820.—Priming Metallic Cartridges.—Edwin Martin, Springfield, Mass.:

I claim inclosing the fulminate of mercury, or other substance to ignite the powder in a cartridge box by its explosion, in glass or other vitreous substance, substantially in the manner and for the substance described.

48,821.—Children's Carriage.—Orville Mather, Newport, Ky.:

First, I claim the mode of supporting the body of children's carriages from points of suspension above the centers of gravity of the same when loaded, substantially as set forth.

Second, In combination with the above mode of hanging the body of children's carriages, I claim the check brace, D, D, or its equivalent, substantially as and for the object stated.

48,822.—Method of Closing Bottles.—John Matthews, Jr., New York City:

First, I claim constructing a bottle stopper with a core of metal, either magnetic or capable of being attracted by a magnet, as and for the purpose specified.

Second, I claim the employment of a magnetic plunger, M, M, or its equivalent, substantially as and for the purpose specified.

Third, I claim the bottle, B, stopper, F, and plunger, M, when operating by magnetic attraction, as described, for the purpose specified.

48,823.—Rock Drill.—John M. May, Janesville, Wis.:

First, I claim apertures or mortises, c and d, in thimble, A, or their equivalents, to receive tenons, a and v, or their equivalent, extending from members, C and D, when used to connect thimble, A, and members, C and D, substantially as and for the purposes described.

Second, Aperture or mortise, e, in member, B, to receive tenons, g and f, or their equivalent, extending from members, C and D, of a drill, when used to connect members, B and D, of a drill, substantially as and for the purposes described.

Third, An angle and bearing at m and at n in members, C and D, either with or without pieces, o and p, to give suitable outward pressure against the inside of thimble, A, to make, when the several parts are put together, a firm, compact-built tool, substantially as described.

Fourth, Combining members, B and C and D, with thimble, A, substantially as and for the purposes described.

Fifth, A general arrangement of members, B and C and D, thimble, A, and band, E, when the whole are constructed and operated substantially as and for the purposes described.

48,824.—Lamp Burner.—Rufus S. Merrill, Boston, Mass.:

I claim, First, The employment of annular concentric collecting chambers at or near the tip of the burner, when the same are made adjustable in relation to the burner, substantially as hereinbefore set forth.

Second, The attachment of the annular collecting chamber or chambers concentrically with the wick tube to an adjustable sliding tube or friction sleeve, whereby the flame of the burner may be regulated without interference with the wick itself.

Third, In combination with the above, I claim the concentric outer jacket, open at the underside so as to allow air entering the same in the manner and for the purpose substantially as set forth.

Fourth, In combination with the above, I claim the perforated disk or flange for the purpose specified.

Fifth, The method described of attaching the outer jacket to the adjustable slide by indentation, substantially as set forth.

48,825.—Stair Rod.—Wm T. Mesereau, Newark, N. J.:

First, I claim continuing the metal in the manufacture of the button so that an ornamental device may be formed upon the same, for the purpose specified.

Second, I claim continuing the metal in the manufacture of the sliding catch so that an ornamental device may be formed upon the same for the purpose specified.

Third, I claim combining with the button and sliding catch, whether the same be ornamented substantially as shown or not ornamented, the stair rod, H, for the purposes specified.

48,826.—Pump.—George E. Mills, New York City:

I claim the mode of attaching guide rods, in m, to the head of the pump cylinder and stuffing box, k, so that they will turn to allow the cross head, l, to be worked by a crank in any position, as set forth.

Second, Marking with lines, substantially as described, the first inclined plane, extending from the base line of the furrow to the first step.

Marking with lines of the angle described, or thereabout, the outer portion of the face of the stone, as described.

48,832.—Marble Polishing Machine.—Edmund S. Nichols (assigner to himself and Francis M. Nichols) Joliet, Ill.:

First, I claim the employment of a reciprocating inclined polishing bed, K, arranged and operating substantially as and for the purposes specified and shown.

Second, I claim the combination with said reciprocating polishing bed, the employment of the antifriction rollers, R, and adjustable bearings, S, arranged as and for the purposes described.

Third, I claim in combination with the sand box, C, the hinged bottom, D, spring, b, and slides, a, all arranged and operating substantially as shown and set forth.

Fourth, I claim the combination and arrangement of the hinged bottom, D, spring, b, chain, c, and arm, E, as and for the purposes described.

Fifth, I claim providing the inclined table, I, with the pivoted adjustable leaf, M, arranged substantially as and for the purposes specified.

Sixth, I claim the employment of a revolving bucket, Q, arranged and operating substantially as and for the purposes shown and described.

Seventh, I claim the combination and arrangement of the reservoir, T, the revolving bucket, Q, inclined table, I, polishing bed, K, receiver, U, and tube or trough, V, operating substantially as and for the purposes described.

48,833.—Houses for Preserving Fruit.—E. F. Olds, New Hudson, Mich.:

First, I claim the safe, B, arranged and constructed in the manner set forth, in combination with the ice house, A, as specified.

Second, I claim the side ice chambers, c, g, and doors, e' b, g, separate, and in combination with gage or perforated slides, p, a, and for the purpose set forth.

Third, I claim one or more central chambers, C, D, with or without the gage or perforated slides in connection with the doors, b, h, substantially as and for the purpose set forth.

48,834.—Rake Attachment to Harvesters.—Wm. B. Parsons, Granger, N. Y.:

I claim the block, S, in combination with the rock shaft, L, operated and operating substantially as described.

Second, The latch, N, in combination with the block, S, substantially as and for the purpose set forth.

48,835.—Well Drill.—Loren G. Peck, Rouseville, Penn.:

First, I claim the hollow stock or socket holder, composed of the parts, A, A, so constructed as to be united or held firmly together at the top, but expanding sufficiently below to receive the boxes, d, d, in combination with the reaming bits, B, B, bands, f, f, and adjustable wedge, G, the whole arranged and operating substantially in the manner and for the purposes set forth.

Second, I also claim the arrangement of the wedge, G, in relation to the points of the bits or reamers, B, B, and stock, A, whereby said reamers are enabled to work around and beyond tools or other impediments which accidentally obstruct the well, substantially as shown and described.

Third, I further claim constructing the bits or reamers, B, B, with equally inclined faces on their adjacent slides within the stock, A, in combination with said stock, and the wedge, G, so arranged that when said faces by approaching become in contact the motion of the wedge, and the expansion of their cutting parts are limited, and the parts are firmly held together, and act as one reamer, substantially as shown.

48,836.—Deck and Side Light for Vessels.—Charles Perley, New York City:

First, I claim the fixed conical ring, a, b, in combination with the conical deck or side light fitted and acting substantially as specified, and in combination therewith I claim the packing groove, 3, for the purposes specified.

Second, In combination with the deck or side light and ring, a, I claim the screws, 3, and groove, 4, as set forth.

Third, I claim retaining the glass in the metallic frame by pins passing into notches in the edges of the glass in combination with a cement surrounding said glass whereby any movement of the glass previous to the hardening of such cement is effectually prevented, as set forth.

48,837.—Washing Machine.—Orrin Reeves, Greenport, N. Y.:

I claim the standard and friction rollers, g, g, in the rubbing board, D, in combination with a tub having ribs on its inner perimeter and radial flutes or ribs on its bottom the rubbing board having a scalloped perimeter and radial ribs on its under side as and for the purposes herein described and represented.

48,838.—Tree Protector.—Asa T. Ring, Newtonville, Mass.:

I claim the openings, f, f, and slides, g, g, in combination with the cases, b, b, the caps, c, c, the semi tubes, d, d, and the two troughs, a, a, the whole being arranged substantially as described.

48,839.—Portable Water Apparatus.—J. F. Rochow, New York City:

I claim the injector, A, applied in combination with the steam pipe, t, and condenser, C, in the manner and for the purpose substantially as herein described.

Second, The arrangement of a double packing at the ends of the condensing tubes with open spaces intervening between said two packings, substantially as and for the purpose set forth.

Third, Constructing the condenser, C, with diminishing compartments substantially as and for the purpose specified.

Fourth, The horizontal partitions between the ends of the condensing tubes in combination with the sheets, a, in the interior of the condenser, constructed and operating substantially as and for the purpose described.

48,840.—Clutch-pulley for Driving Sewing Machines.—Peter Rodier, Springfield, Mass.:

I claim the combination of the pulley, C, of a sewing machine loose on the shaft, D, with the collars, A and B, on the same shaft, and the spring pins, b, b, and corresponding notches, a, a, a, substantially in the manner and for the purpose described.

48,841.—Apparatus for Obtaining Oil from Running Streams.—Thaddeus S. Scovill, Williamsport, Pa.:

I claim the combination of the swinging or movable oil gathering boom, B, oil collecting race, G, with its under gate or gates, a, and chute, c, and the oil reservoir, H, arranged substantially as and for the purpose herein specified.

I also claim in combination with the oil gathering bar, the sunken channel bar, E, arranged and operating substantially as and for the purpose herein set forth.

48,842.—Hinging Coffin Lids.—Jacob C. Seeley, Cambridge, Mass.:

I claim hinging a coffin lid by hinges, the pivots of which are placed in rear of the whole joint between the lid and main cover, substantially as and for the purpose set forth.

48,843.—Machine for Driving Hoops on Casks.—Hiram C. Sherman, Buffalo, N. Y.:

I claim attaching the driving bars, H, H, to the direct acting non-revolving screw shaft, E, by means of the head, K, or its equivalent so that said bars are suspended above and in a position to engage with the hoops on the barrel, L, the whole arranged and operating substantially as and for the purpose set forth.

Second, I also claim pivoting or loosely hanging the bars, H, to the head, K, by means of the joint, b, or its equivalent, so that said bars may gravitate freely, substantially as set forth.

Third, I also claim, in combination with the suspended driving bars, H, the disc, M, with its series of cams, f, f, and springs, d, d, or their equivalent arranged and operating substantially as and for the purposes set forth.

48,844.—Plow Clevis.—Andrew Shogren, Sandwich, Ill.:

I claim providing a clevis with a cast iron lining or jacket, substantially as set forth and specified.

48,845.—Horse Shoe.—Thomas Skelton, Rockford, Ill.:

where the plows are firmly attached to a rigid frame which is itself adjustable upon and in relation to the axle, substantially as set forth.

Second, the combination of the tongue with the main frame by a hinge and lock, substantially as described to render it rigid or flexible at the will of the driver.

Third, The combination of a clevis with the main frame of a gang plow and the tongue whether rigid or flexible, substantially as described to work three or more horses abreast and equalize the draft between them.

Fourth, The attachment of the left supporting wheel of a gang plow to a crank axle to preserve the desired parallelism of the axle to the ground, substantially in the manner set forth.

Fifth, The combination of an adjustable gauge wheel with the rigid main frame of a gang plow, when arranged forward of the plows, substantially as and for the purpose set forth.

Sixth, The combination in a gang plow of a rigid main frame and an adjustable axle with a mechanism for raising and lowering the frame, substantially in the manner described for the purpose set forth.

Seventh, The combination of the main frame, the axle and stand-ards by the draft rod and reach or guides, substantially in the manner described for the purpose set forth.

48,847.—Vessel for Reception and Transportation of Night Soil.—R. A. Smith, Philadelphia, Pa. Antedated July 6, 1865:

I claim the box, G, rollers, f, tight-fitting detachable cover, H, having the tubular projection, b, and its cap, i, the whole being constructed and adapted for the reception and transportation of night soil and garbage, as set forth.

48,848.—Paper-collar Packing Envelope.—G. K. Snow, Watertown, Mass.:

I claim as a new manufacture, and as of my invention, the said envelope, substantially as described and for the purpose specified.

48,849.—Stubble Coulter.—M. A. Spink, DeKalb, N. Y.:

I claim the herein-described coulter, consisting of the shank, A, and blade, B, the same being constructed as and for the purpose set forth.

48,850.—Steam Blower.—J. W. Stevens, South Danvers, Mass.:

I claim combining with the steam blower pipe, b c, and its jet holes a cock, d, in the manner and for the purpose substantially as set forth.

48,851.—Piston for Steam Engine.—Nathan P. Stevens, Boston, Mass.:

I claim arranging the joint of the expansion ring at the lower part of the piston head and on the bottom of the bore of the cylinder, and providing such ring and piston with a means of preventing the ring from revolving in its groove, the whole being substantially as and for the purpose set forth.

48,852.—Carriage and Caster for Sewing Machine.—Nesbitt D. Stoops, Newark, N. J.:

First, I claim the apparatus described for mounting a skeleton-frame sewing machine upon a carriage, substantially in the manner and for the purposes explained.

Second, Constructing a caster so as to lock and unlock, substantially in the manner and for the purpose described.

Third, Socket, J, when used for the mounting of a skeleton-frame sewing machine on a carriage, to prevent undue elevation of the machine.

Fourth, Caster frame, H, so constructed as to support the caster above the top of the platform, and also to prevent undue elevation of the machine, by letting the caster up into the platform.

Fifth, The combination of platform, A, caster, B, pawl, F, socket, J, and caster frame, H, or their equivalents, constructed and operating together substantially as described.

48,853.—Steam Pump.—A. W. Todd, Chicago, Ill.:

I claim the combination and arrangement of the cylinder, K, levers, 44, piston, T, valve rod, F, inlet, J, pipe, L, crosshead, C, rod, H, pipe, P, fulcrum, M, and ropes, I, I, substantially upon the principles and in the manner herein set forth.

48,854.—Table for Invalid.—Stephen Ustick, Philadelphia, Pa.:

I claim, First, The combination of the foot pieces, b, with the legs, a, of the table, C, when constructed, arranged and operating substantially as described.

Second, Combining and arranging the cord, m', and clamps, o o, with the table, C, by means of the uprights, m m, substantially as and for the purpose set forth.

Third, Combining the longitudinal guides or ways, F F, with the table, C, substantially in the manner and for the purposes above described.

Fourth, The combination and arrangement of the box, G, rest, H, pen rack, I, pin cushion, J, clamps, K, and screen, L, with the table, C, by means of the longitudinal guides or ways, F F, substantially in the manner described and for the purposes specified.

Fifth, Combining and arranging the endless apron, P, with the table, C, by means of the frame, O, and guides, F F, substantially as and for the purpose specified.

48,855.—Water Wheel.—Henry Wenger, Farmersville, Pa.:

I claim the arrangement and combination of the water wheel, K, with its buckets m, on its vertical periphery, M, within the vertical casing, A, chutes, a, on top, disk, B, with its valve, b, and cogged valve, b', operated in the manner and for the purpose set forth.

48,856.—Sash Fastener.—Amos Westcott, Syracuse, N. Y.:

I claim, First, The manner of connecting the bolt, D, to the slotted piece, I, Fig. 5, as and for the purpose substantially as above described, in combination with the triangular piece, J, and the shank, M, Fig. 2, of the knob, C, Fig. 1, substantially as above described.

Second, The arrangement consisting of the straight moving slide, K, oscillating device, J, and bolt, D, the said parts operating together substantially in the manner and for the purpose described.

Third, The manner of sustaining and guiding the slotted piece, I, Fig. 2, substantially as above described, in combination with the bolt, D, triangular piece, J, Fig. 2, and knob, C, and plate, B, Fig. 1, substantially as above described.

48,857.—Sawing Machine.—G. Westinghouse, Schenectady, N. Y.:

I claim, First, The combination of the lever, L, and adjustable weight, Z, with the beam, G, for raising, lowering and counterbalancing the saw, as set forth.

Second, The pivoted bar, V, when provided with the projection, W, and connected by means of the bar, X, and lever, Y, to the lever, T, substantially as and for the purpose specified.

Third, The log carrier or log feeder, composed of two heads, U U, made separate, or detached from each other, and placed on the shaft, O, permanently, or so that either or both may be adjusted thereon, for the purpose specified.

48,858.—Lantern.—Wm. Westlake, Chicago, Ill.:

I claim, First, The construction of a lamp pot, e, in connection with the flanges, d and g, substantially as recited, allowing the guard to be attached to the bottom, and the lamp and the bottom to be readily separated from the glass or globe and guard and dome, as herein set forth.

Second, The hole, h, with the sliding door, i, in combination with the recess, j, of the globe, for lighting of the lamp, as herein recited.

48,859.—Railway Frog.—Wm. Wharton, Jr., Philadelphia, Pa.:

I claim a frog, H, having a recess for the reception, and lateral and vertical retention of a continuous rail of the main track, and so constructed and so arranged in respect to a rail of the intersecting track as to afford a medium for permitting the wheels of cars transverse the latter track to pass across the rail of the said main track, all substantially as described.

48,860.—Kerosene Burner.—S. G. Wilnot, Brooklyn, N. Y.:

First, I claim the arms, D3, or their equivalents, on the seamless dome, D, made from the same piece of metal, and serving to unite it with the bottom, A, along short lines, A4, substantially in the manner and with the advantages herein set forth.

Second, I claim bending outward the ears, D2, formed from the metal cut out of the dome itself, substantially as and for the purposes herein set forth.

Third, I claim the wick tube, B B', soldered along the edge, substantially as and for the purposes herein specified.

Fourth, I claim the seamless and legged dome, D D3, as a new article of manufacture, adapted to be cheaply made, by the means set forth, and to be afterwards connected to the parts, A B.

Fifth, The method herein described of manufacturing the seam-

less skeleton dome, D, by forming the same from a blank cut in shape before forming, and afterwards striking or swinging in dies, so as to produce the legs, D3, having between them the openings required for the admission of the air, without further cutting, all substantially in the manner and with the economy of material and of labor herein set forth.

48,861.—Fluid Ejector.—Joseph Wood, Red Bank, N. J.:

I claim the employment of a curved pipe, provided with an aperture, C, or several similar apertures, placed at a point in the pipe where it or they shall be below the surface of the fluid to be elevated, and in advance of the point in the pipe where the steam or air, which is the propelling power, is admitted, in the manner and for the purpose substantially as described.

48,862.—Submarine Steam Gun.—Wm. W. Wood, Philadelphia, Pa., and J. L. Lay, Buffalo, N. Y.:

We claim, First, Projecting submarine shells from vessels by means of a steam cylinder, and piston and piston rod acting against the rear of the shell, substantially as described.

Second, The cylinder, in combination with the tube, F, through which the shells are forced by the piston rod of said cylinder, substantially as specified.

Third, The combination of the tube, F, with the pipe, E, and the ball joint, substantially as set forth.

Fourth, The movable trunk, H, constructed and arranged in respect to the steam cylinder and discharge tube, F, substantially as set forth.

Fifth, The combination of the said movable trunk with the box, G, and its doors, J, substantially as specified.

Sixth, The combination of the pipe, E, and its spherical end, a, the pipe, F, the box, G, its trunk, H, and steam cylinder, K, with the truck, L, and elevating screws, M M.

Seventh, The spool or roller, a, arranged at the end of the external piston rod for receiving the discharging cord.

48,864.—Mortising Machine.—Carl L. Zeidler, Cincinnati, Ohio:

I claim, First, The sheave or wrist, F, pivoted eccentrically upon its driving shaft and employed to give motion to a mortising chisel or analogous tool at the will of the operator.

Second, I further claim the toggle arm, J, and sliding box, I, in combination with a treadle lever or its equivalent and with an eccentric sheave or wrist for throwing the tool into and out of action, substantially as set forth.

48,864.—Machine for Cleaning Boots and Shoes.—T. Cecil Andrews (assignor to himself and Peter Gordon), Jersey City, N. Y.:

I claim the arrangement of the hand lever, G, and treadle, H, upon the same fulcrum, e, in combination with the crank, f, fly wheel shaft, D, and pin wheel, d, pinion, c, and rotary brush shaft, C, substantially as and for the purpose herein specified.

48,865.—Washing Machine.—V. R. David (assignor to himself, H. R. Fowler and N. G. Davidson) Newark, Ill.:

I claim, First, The combination and arrangement of the drive wheel, D, the support or standards, C, the frame, B, and the pinion, H, provided with the hollow journal, when all constructed, and operating substantially as described.

Second, The combination and arrangement of the pinion, H, with the hollow journal the iron head, and the arms, K, when constructed and operating substantially as and for the purposes herein set forth.

48,866.—Water Wheel.—L. S. Fairchild (assignor to himself and G. F. French), Cleveland, Ohio:

I claim the herein described water wheels, consisting of the bed, A, chutes, C C, wheel, H I J, gates, E, connected as described, when the several parts are constructed and arranged as and for the purpose herein set forth.

48,867.—Lady's Hood.—Emma Hill (assignor to Thomas Dolan), Philadelphia, Pa.:

I claim a lady's hood composed of the four pieces, A B B' and C, formed, arranged and stitched together, substantially in the manner described.

48,868.—Machinery for Rolling Tapering Bars or Plates.—Josiah Holmes, Pittsburgh, Pa., assignor to Hussey, Wells & Company:

I claim the use of the plunger, water chamber and valves, constructed and arranged substantially as hereinbefore described, situate in and forming part of the pressure screw of rolling mill housing, for the purpose of rolling tapering metal bars or plates.

48,869.—Machines for Forming Baskets.—Edwin A. Jeffery (assignor to the American Basket Company), New Haven, Conn.:

I claim, First, The combination of a former, B, with a head, H, and folders, a, a, constructed to operate substantially in the manner and for the purpose specified.

Second, Closing or folding the sides of the basket by means of the folders, a, a, substantially as specified.

48,870.—Steam Boiler.—Thomas J. Jones (assignor to himself, George Wettengel and John D. Richards), West Pittsburgh, Pa.:

I claim the combination with a steam boiler of a scraper attached to a rod, inserted through a stuffing box in one end of the boiler, for the purpose of removing the sedimentary or residual deposit from the bottom of the boiler, substantially as and for the purpose hereinbefore described.

Also the shoes in the edge of the scraper, to enable it to pass the overlapping ends of the boiler plates, substantially as hereinbefore set forth.

48,871.—Combined Seeder and Cultivator.—Sebastian Keller, Elizabethtown, Pa., assignor to himself and Jacob L. Good, Lancaster County, Pa.:

First, I claim the construction of the semi-circular crank, U, and crank, e', forming the top of the pulleys shaft, e, in combination with the friction pulley, d, saddle step and spring brace connection, f, arranged and operating substantially in its adjustability in the manner and for the purpose specified.

I claim the five-pointed star crank, V, for operating the valve, I, in combination with the pin or pins, h, on the face of the driving or roller pulley, D, constructed and operating in the manner set forth.

I claim the flat-sided roller pulley, D, supported in the brackets, a, a, for the vibrating hopper frame, B B, in combination with the pivot rod attachment to the cultivator, in the manner and for the purpose specified.

I claim the construction and operations of the valves, 12 and 13, in combination with the connecting rods, R S T, and the double crank, U e', and star crank, V, operated in the manner described.

48,872.—Drill.—Loomis G. Marshall, Mokena, Ill., assignor to himself and F. W. Hughes, Pottsville, Pa.:

First, I claim the arrangement and combination of the devices, D E G J and K, of the machine, as herein described and for the purposes set forth.

Second, I also claim the arrangement and combination of the devices, 2 R T V and W, of the drill, J, when constructed and combined as herein described, and for the purposes set forth.

48,873.—Railway Car.—Benjamin T. Millburn, Wilmington, Del., assignor to himself and Jos. Rigby, Brandywine, Del.:

I claim the combination of the chair pieces, A and B, the stirrup, C, and the rails, D D, constructed and operating substantially as described, for the purpose set forth.

48,874.—Extension Door Knob.—W. T. Munger, Brantford, Conn., assignor to himself and James Graham, New Haven, Conn.:

I claim the combination of the grooved shank, f, with a lip, e, or its equivalent, in the socket of the rose, in the manner and for the purpose described.

48,875.—Sawing Machine.—Martin Newman (assignor to himself and Clark J. Hayes), Unadilla, N. Y.:

I claim, First, Combining with the yielding rolls of a pair or pairs of feed rolls a lifting piece and a lever, so that the operator from his stand may rise up, hold up, or let down said yielding rolls at will, substantially as described.

I also claim, in combination with yielding rolls, hung at both ends, the connecting of said end supports by a rigid roller cap, to prevent one end of said roll from rising or falling independent of its other end, and to make the pressure on the board uniform at both edges, and thus cause it to move in a direct line, substantially as described.

I also claim shifting the movable saw upon its shaft by means of the levers and link connection herein described and represented,

whereby I get a quicker motion, and thus economize time, substantially as described.

48,876.—Mode for Embossing Leather.—Geo. W. Pratt (assignor to himself and William P. Martin, Salem, Mass.:

I claim pebbling or embossing leather or other treated skins by placing the face or grain side in contact with a flat, or nearly flat surface, having the design formed in it, and applying the rolling or rubbing tool under pressure to the flesh side of the skin, substantially as described.

48,877.—Diaphragm Pressure Gage.—Richard C. Robbins (assignor to J. M. and G. W. Keen), New York City:

I claim a diaphragm holder, having a female screw on one part and a male screw on the other part, by which the diaphragm is firmly secured and held in its place, thus dispensing with bolts or screws, and obtaining a more perfect diaphragm, as herein fully described and set forth.

48,878.—Machine for Knitting Shoe Lacings, Etc.—Nathaniel W. Westcott, Providence, R. I., and Henry L. Walcott, Charles River Village, Mass., assignors to James G. Payson, Foxborough, Mass.:

First, We claim the combination of the needle bar, E, carrying one or more needles, with the rest bar, E, constructed, arranged and operating substantially as described.

Second, The looping pin, d, or its equivalent, in combination with the needle, A, and operating substantially as and for the purpose described.

Third, The shear or guard, n, or its equivalent, operating substantially as and for the purpose described.

Fourth, The depresser, h, or its equivalent, in combination with the needle, A, and operating substantially as described, for the purpose specified.

Fifth, The mode of operation described, by which the point of the needle tongue is first positively raised and carried over the loose yarns which are to form the succeeding loop by the interposition of a suitable instrument, and afterward immediately depressed to the requisite extent to permit the loop already formed to be cast off, substantially as described.

48,879.—Sawing Machine.—Chas. P. Wiggins (assignor to Case, Marsh & Wiggins), Indianapolis, Ind.:

I claim the arrangement of the saw guide, J, set screw, L, guide frame, K K, with slotted foot or pivot bar, S S and M, when constructed and operated substantially as set forth.

48,880.—Protection for Pump and Other Oscillating Rods.—Levi Wilson (assignor to J. Nelson Buell), Middletown, Conn. Antedated July 14, 1865:

First, I claim the coaming, E, and top piece, G, so arranged relatively to the reciprocating and vibrating rod, D, as to allow the top piece to cover and inclose the coaming, and to move thereon to accommodate the lateral portion of the rod, substantially as and for the purpose herein set forth.

Second, I claim the central pivots or axis, I, arranged relatively to the coaming, E and G, and rod, D, substantially in the manner and for the purpose herein set forth.

48,881.—Harmonium.—James Gilmour, Glasgow, North Britain:

I claim the arrangement and construction of musical instruments, substantially as hereinbefore described, or any modification thereof.

48,882.—Apparatus for Carbonizing Wood.—Pierre Hugon, Paris, France, assignor to Emil Justh:

I claim First, The method herein described of charring or carbonizing wood, disintegrating rocks, roasting or fusing ores and metals, by direct application in the form of jet of inflammatory gases, generated in and directed by a movable apparatus, substantially in the manner herein shown and set forth.

Second, I claim an apparatus for carbonizing wood, disintegrating rocks, etc., composed of a furnace or fire chamber, movable, upon a stationary frame, both vertically and horizontally, and provided with a nozzle, in combination with a suitable blowing apparatus, substantially as set forth.

Third, In combination with a movable furnace and blowing apparatus, under an arrangement for operation substantially as described, I claim an apparatus for injecting water or steam in the manner described, so as to mix with the air previous to its passage through the furnace, for the purpose set forth.

REISSUES.

2,028.—Amalgamating and Collecting Gold and Silver.—Henry W. Adams, New York City, and W. S. Worthington, Newtown, N. Y. Patented Feb. 16, 1864. Antedated Feb. 12, 1864:

We claim the process of amalgamating the precious metals by bringing their mineral matter in the state of a dust into contact with the vapor of quicksilver during their passage through the heating vessel, substantially in the manner and for the purpose herein set forth.

2,029.—Piston for Steam Engines.—Henry D. Dunbar, Springfield, Mass. Patented Aug. 14, 1860:

First, I claim the solid T shaped ring applied to a piston head, in the manner substantially and for the purpose described.

I also claim, in combination with a solid or uncut ring, the segmental break-joint rings, e i, the latter fitting into the angle of the former, and both breaking joint with each other, and held out against the cylinder by the action of the steam therein, substantially as described.

2,030.—Machine for Cutting Corks.—Peter Holmes, Charlestown, Mass., assignee of J. Power and A. J. Bailey. Patented May 20, 1862:

First, I claim producing a cylindrical or conical cork by two cuts with one and the same knife, by means substantially such as herein described, or by any equivalent means.

Second, The combination of the reciprocating cutter, L, and rotating mandrel, C, when arranged substantially as shown, so that the latter will have a continuous rotary motion imparted to it in one and the same direction by the reciprocating movement of the cutter, for the purpose herein set forth.

Third, The cap, K, of slide, I, knife, L, and shafts, J J, attached in combination with the sliding rack, O, pinion, N N, and pins, h h', arranged substantially as shown, for elevating and depressing the knife, L, for the purpose specified.

2,031.—Constructing Railroad Cars for Transporting Oil and Other Liquids.—Joel F. Keeler, Pittsburgh, Pa. Patented Jan. 10, 1865:

First, I claim constructing railway freight cars (technically called so) with a covered tank or tanks for the transportation of liquids in bulk, when any part of such tank or tanks is placed below the level of the top of the wheels of the car.

Second, Constructing railway truck tanks for transporting liquids in bulk in such a manner, substantially as hereinbefore described, as that the metallic parts of the tank itself shall serve the purposes of a truck frame.

Third, Providing railway truck tanks for transporting liquids in bulk with one or more contracted space or spaces in the upper part of the tank, of less horizontal area than the body of the tank, for the purpose of affording room for the expansion of the liquid, and checking its surging motion, substantially as hereinbefore described.

Fourth, Constructing freight cars with a tank or tanks for transporting liquids in bulk, combined with a box or receptacle for the carriage of dry freight, substantially as hereinbefore described.

Fifth, The mode of ventilating combined railway truck tanks and freight cars by means of air passages, substantially as and for the purposes hereinbefore set forth.

2,032.—Horse Rake.—Ariel B. Sprout, Hughesville, Pa. Patented Jan. 17, 1865:

First, I claim, independently of the shape of the sides, which are, however, in the main of a triangular character (viewed in cross section), unless by the removal of the angles the sides are merged into a curve, a tooth so constructed that on being divided by a longitudinal section which follows the curvature of the tooth at a point midway between the inner and outer lines of said curvature, the greater amount of metal and the widest portion of the tooth shall be on the inner side of said curved section, substantially as above set forth and described.

Second, In combination with a tooth having the above characteristics, I claim a coiled spring by which it is attached to the head, and by means of which its elasticity is increased.

Third, I claim the plates, C C, adapted to be secured in position by the screw, e, substantially as and for the purpose specified.

Fourth, I claim the spool, C c2 c3, constructed and arranged substantially as described, and adapted for the attachment of the spring A', in the manner set forth.

2,033.—Soda Fountain.—Samuel R. Sylvester, Washington, D. C. Patented July 21, 1863:

I claim, First, Producing soda water on draught by means of an apparatus which is so constructed as to give a direct discharge of the alkaline solution from an open vessel, through a pump, into a vessel containing acidulated sirup, substantially as described. Second, Producing a continuous or uninterrupted stream of an alkaline solution from an open vessel into a vessel of acidulated sirup by means of a pump, substantially as described.

DESIGNS.

2,134.—Bust of Lincoln.—Henry Berger, New York City.

2,135.—Paper Collar, Cuff, Etc.—Wm. Boggs, New York City.

2,136.—Carpet.—Elemir J. Neig (assignor to the Lowell Manufacturing Company), Lowell, Mass.

2,137.—Envelope.—Geo. H. Reay, New York City.

2,138.—Sewing Machine.—C. A. Shaw and J. R. Clark, Biddeford, Maine.

2,139.—Medallion of Abraham Lincoln.—Franklin Simmons, Washington, D. C., assignor to Wm. Miller, Providence, R. I.

2,140.—Medallion of Gen. Grant.—Franklin Simmons, Washington, D. C., assignor to Wm. Miller, Providence, R. I.

2,141.—Medallion of Vice-Admiral Farragut.—Franklin Simmons, Washington, D. C., assignor to Wm. Miller, Providence, R. I.

2,142.—Medallion of Maj.-General Hancock.—Franklin Simmons, Washington, D. C., assignor to Wm. Miller, Providence, R. I.

2,143.—Medallion of Maj.-General Wright.—Franklin Simmons, Washington, D. C., assignor to Wm. Miller, Providence, R. I.

2,144.—Medallion of Maj.-General Parke.—Franklin Simmons, Washington, D. C., assignor to Wm. Miller, Providence, R. I.

2,145.—Medallion of Maj.-General Hooker.—Franklin Simmons, Washington, D. C., assignor to Wm. Miller, Providence, R. I.

2,146.—Medallion of William H. Seward.—Franklin Simmons, Washington, D. C., assignor to Wm. Miller, Providence, R. I.

2,147.—Medallion of Chief Justice Chase.—Franklin Simmons, Washington, D. C., assignor to Wm. Miller, Providence, R. I.

2,148.—Picture Frame.—H. Vanderbeck and E. W. Hadden, New York City.



PATENTS

GRANTED

FOR SEVENTEEN YEARS.

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for new inventions in the United States and in all foreign countries during the past seventeen years. Statistics show that nearly ONE-HALF of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after eighteen years' experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from ex-Commissioners of Patents.

Messrs. MUNN & Co.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

CHAS. MASON.

[See Judge Holt's letter on another page.]

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

Messrs. MUNN & Co.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant, Wm. D. Bishop.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

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The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of \$5 accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No. 37 Park Row, New York.

The Patent Laws, enacted by Congress on the 24 of March, 1861 are now in full force and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention; the Government fee for a caveat is \$10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention is susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is out little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row New York.

REJECTED APPLICATIONS.

Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has been very great. The principal portion of their charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject, giving a brief history of the case, inclosing the official letters, &c.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is \$15. Other changes in the fees are also made as follows:—

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

EXTENSION OF PATENTS.

Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort of extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention.

Patents may be extended and preliminary advice obtained, by consulting, or writing to, MUNN & CO., No. 37 Park Row, New York.

FOREIGN PATENTS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery Lane London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. They think they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Pamphlets of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO.'s Agency, the requirements of different Government Patent Offices, &c., may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

UNCLAIMED MODELS.

Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model, is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York.



M. B., Jr., of Mass.—The best mode of dividing water among several owners of power in their due proportions has been very fully considered in your city by the ablest and most intelligent engineers in the country, and you can learn the plan finally decided on by inquiring at the office of the Locks and Canals Co., or probably of the Superintendents of any of the corporations. Will you please give us the information when you get it. The method in use at Woonsocket, we believe, is to measure the flow at the surface over a horizontal dam.

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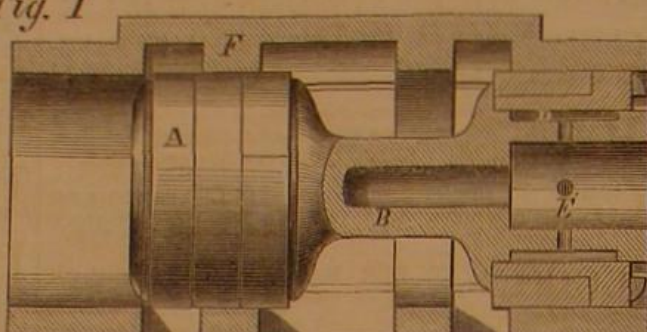
The improvement in this valve relates to the method of constructing it, so that it shall always be steam-tight, and so that the friction of the packing shall be in proportion to the steam pressure.

To accomplish these ends the packing, A, is constructed of several segments or rings, which are fitted to the piston, B, which forms the valve, in a peculiar manner, to be seen by examining Fig. 2. The rings are there shown overlapping each other, as at

Fig. 2



Fig. 1

**IVES'S BALANCED SLIDE VALVE.**

C, so as to form a steam-tight joint. By referring to Fig. 1 a chamber, D, may be observed; this chamber extends entirely around the body of the piston, and steam is admitted to it through the openings, E. It is the pressure of this steam which forces out the rings and keeps them always up to the interior of the cylinder, F, which forms the steam chest. It is easy to see, therefore, that this valve packs itself, and will continue steam-tight for a long time without any adjustment other than that it performs for itself; also that the friction of the valve is always equal to the working pressure. It is easily handled to be reversed, and is a certain method of keeping a piston valve steam tight.

It was patented through the Scientific American Patent Agency, on June 6, 1865, by J. G. Ives, of Springfield, Ill. For further information address him at that place.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

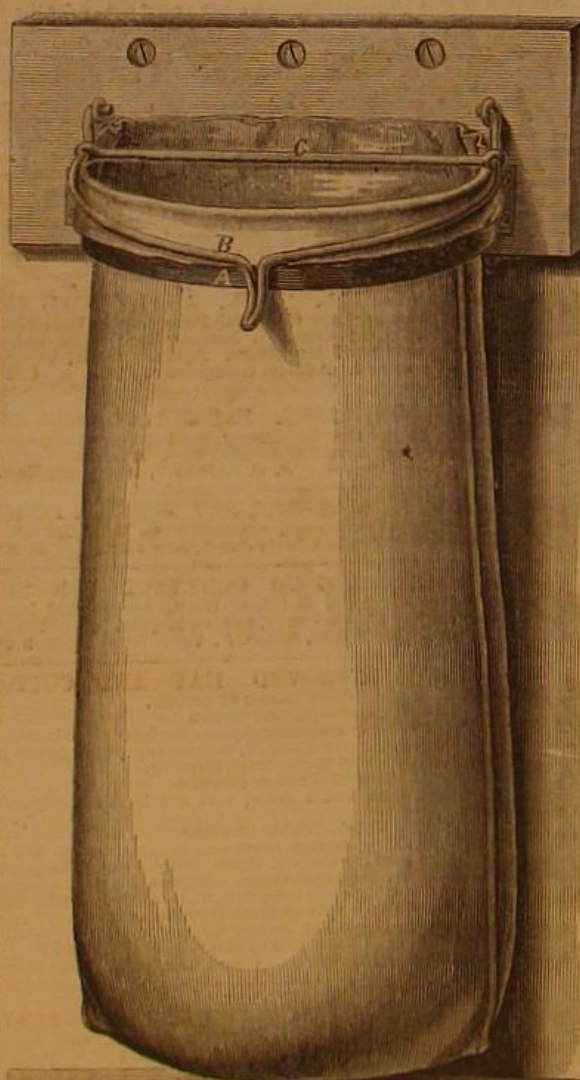
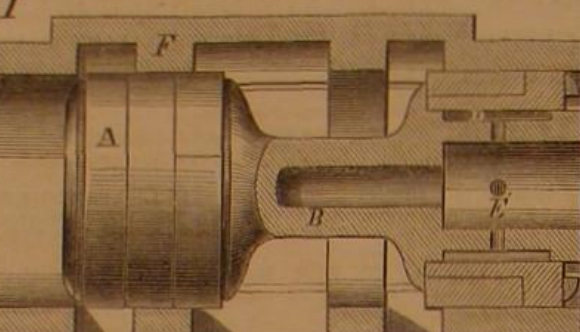
Steam Boiler.—This invention consists in arranging the steam dome or reservoir of a steamboat in the interior of its shell and of the water space, in such a manner that the shell of the boiler can be filled up with water nearly to the top and the fire made to strike the same around its entire circumference; and, furthermore, the steam reservoir of the boiler is surrounded by the heated water and the radiation of heat from the same, and the condensation and loss of steam, consequent upon such radiation, are avoided. Henry Gerner, of 20 Bleecker street, New York, is the inventor.

Hydro-carbon Blower.—This invention consists in the use of a current of hydro-carbon vapors formed by the action of steam, and mixed therewith and with a suitable percentage of atmospheric air in combination with a furnace, in such a manner that an artificial draught is obtained without incurring any loss of heat; and, furthermore, a quantity of inflammable gases are introduced into the furnace, and thereby the heat is increased and the consumption of fuel in furnaces is reduced. Henry Gerner, as above, is also the inventor of this.

Drag or Cross-cut Sawing Machine.—This invention relates to a new and improved sawing machine of that class designed for sawing logs transversely with the grain, and intended chiefly for sawing fire or cord wood. The object is to obtain a device for the purpose specified, which may be attended or manipulated with the greatest facility and admit of having the log fed to the saw at equal distances after each cut to insure the log being sawed into pieces of equal lengths. The invention has, further, for its object, the obtaining of a simple and efficient log-feeding mechanism and a means for regulating the downward pressure of the saw on the log. G. Westinghouse, of Schenectady, N. Y., is the inventor.

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Nothing can be more annoying, in the list of small trials, than filling a bag with one hand and holding it open with the other. Some individuals, with a view to hasten the work, contrive an ingenious and elaborate arrangement of sticks and strings to hold the bag open, but these are so unsuccessful that when the shovel, or measure-full, of grain is partly in, the bag collapses as if on purpose, and the grain flies all over the floor. A simple and cheap device, like the one here illustrated, is of great utility to farmers, or in mills, and will more than pay for itself in a short time.



is not confined to one locality and will sustain the whole weight of a bag of grain with perfect safety. It is also useful for filling bags with fruit or any purpose where sacks are used. We are informed that over 9,000 of them have been sold since the patent was applied for through this office a few weeks ago. The patent is ordered to issue. State and county rights for sale. Address the patentee, J. S. Corbin, Clinton, Iowa.

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Vol. XIII---No. 6.
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NEW YORK, AUGUST 5, 1865.

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reversed, rendering the gun less liable to burst from the explosion of the powder in it; and a much greater degree of hardness is given to the interior surface, rendering the gun less liable to abrasion in the bore by the passage of the projectile along it, and the action of the gasses of the powder upon the metal. It is generally held by the witnesses that no effective gun of large calibre can be made of cast-iron except upon the Rodman principle.



BLACK'S GANG PLOW.

a method for raising and lowering the plow so as to increase or diminish the depth of the furrow at will. This is done as follows:—The plows are set in the beam, A, to which they are securely fastened and braced. The rod, B, serves to regulate the position of the plow share or its relation with the beam, and the nuts on this rod are to raise or lower the point as desired, so as to cause it to work to advantage. The depth of the furrow is regulated by the lever, C. One side of the frame is fastened to an upright arm, D; this arm carries the rear wheel, E, and the axle of the wheels is at one end formed into a jaw, F, which embraces this upright arm, and slides up and down on it, when the lever, C, is worked. This throws the plows in or out, so as to diminish or increase the depth of the furrow. The plows can be raised entirely clear if desired, when proceeding to or from the field, and the width of the furrow can also be regulated by a screw, G, which changes the line of draught from the pole, thereby causing the plows to take a wider or narrower slice.

A patent has been applied for this improvement through the Scientific American Patent Agency by

and third, those made entirely of wrought iron. Of the first class are the guns generally known as the Dahlgren gun and the Rodman gun. Of the second class is the Parrott gun. Of the third class is the Ames gun. There is still another gun, known as the Wiard steel gun, but as it does not come, so far as your committee have been able to learn, under the head of "heavy ordnance," they have not deemed it necessary to devote much attention to it.

THE RODMAN GUN.

The Rodman gun, while having to some extent its peculiarity of form, is principally distinguished by the mode adopted in its manufacture, which is an invention of Major T. J. Rodman. The casting is made around a hollow core, or core-barrel, as it is termed, into which is introduced a stream of cold water, the outside of the casting being kept heated until the cooling from the interior reaches the outer portion of the mass of metal forming the casting. This mode of manufacture, it is claimed, ensures two important advantages over the old method of casting the gun solid and then boring it out. The strain upon the metal produced by cooling in large masses is

THE DAHLGREN GUN.

The Dahlgren gun is the invention of Rear-Admiral John A. Dahlgren, and is distinguished by its exterior form. The plan adopted to avoid the strain consequent upon cooling a solid casting of large size from the outside is to make the castings considerably larger than would otherwise be needed to produce a gun of the required size, anneal it after cooling, and then turn it down to the proper size and form. But the Dahlgren guns of the largest calibre are now being manufactured upon the Rodman principle.

These two guns are the only guns of large calibre, made entirely of cast-iron, which are now used in the service. It will be seen from the testimony that officers of the navy generally prefer the Dahlgren gun for naval service, while officers of the army express a preference for the Rodman gun. Both of these guns would appear, from the testimony, to be the best cast-iron guns now known to any service. They are generally smooth-bore guns, but few, if any, of the larger calibre being rifled.

THE PARROTT GUN.

The rifled gun of large calibre, employed almost

wholly in the army and navy service, is the gun invented by Robert C. Parrott. It is composed of a cast iron cylinder, with a wrought iron jacket or band shrunk upon the breech of the gun, in order to strengthen it about the seat of discharge. The cast iron cylinder of this gun was formerly cast solid, and then bored out; but latterly those of the largest calibre are cast upon the Rodman principle.

The introduction of the turreted iron-clads into our naval service impressed upon the Department the necessity for guns of large calibre. Those vessels carrying but few guns, and being designed to operate against other iron-clads, as well as to resist the effect of opposing batteries, it was considered important to have guns throwing projectiles, shot or shell, of the greatest possible weight, and guns of as large calibre as fifteen inches were designed and constructed principally for use on turreted vessels. The result of the contest between the United States iron-clad Weehawken and the rebel iron-clad Atlanta shows the remarkable effect of heavy projectiles upon iron-clad vessels.

THE BURSTING OF PARROTTS.

The bursting of these guns is generally attributed to the explosion of shells prematurely within the bore of the gun. The opinion of Mr. Parrott in regard to the cause or causes of premature explosion of the shells is as follows:

"It has been a matter of much concern with me, and I would rather not make a gun than have any accident occur. I ascribe the difficulty to the friction of the powder in the shell itself. At first it was natural enough to ascribe the difficulty to bad shells, bad castings, bad fuses, etc.; but, upon full trial, it appears above all question that the difficulty arises from the powder exploding in the shell within the gun by friction caused by the striking of the powder against the inside of the shell. A 300-pounder shell is ten inches in diameter; a round shell of that diameter holds about three pounds of powder. My 300 pounder shell holds about seventeen pounds of powder.

"Now, when you fire a gun and strike the butt of a shell suddenly with the immense force of the charge, there is a reaction of the powder within the shell against the bottom of the shell; and if there is any roughness so as to cause friction at the bottom, the powder will be exploded in the shell while it is within the gun. Thinking that to be the case, I have for a long time been endeavoring to coat the inside of the shell with varnish or licker, and now I am able to do so with entire success. A great many people were skeptical about it, and precautions have not been taken in regard to it as quickly as they might have been. I now melt together rosin, tallow and brown soap, forming a thin liquid mixture, and pour it into my shells and pour it out again, leaving a coating on the inside which covers over the rough iron, and when that is done I find the shells can be fired without premature explosion.

"Some two months ago Captain Temple, one of the officers of this very fleet of Porter's, came to the foundry, and became aware of this fact. He had two one hundred pounders on board his vessel; when he got back he found that his shells had no such coating, and he immediately set to work and lined them with asphaltum, etc. He fired his guns fifty or sixty times each during the engagement, and not a single shell exploded prematurely in his guns; while in some of the other vessel around him shells were exploded prematurely and thrown out of the guns in fragments. That is so stated in a letter of his, which I saw yesterday."

THE AMES GUN.

In view of these considerations, your committee desire to refer, somewhat at length, to a wrought-iron gun, which to them seems to possess those qualities of strength, durability, and safety, which are so very desirable. It is the invention of Horatio Ames.

The mode of manufacturing this gun is described by the board in their report as follows:

"The gun is built up from the cascabel on the end of a long cylindrical port bar. The end of this bar is first enlarged by welding pieces around it. It is then enlarged still further by placing two rings on the end, one over the other, concentrically, and welding them there in succession. Against the end of the cylinder, thus increased to twenty-eight (28) inches in diameter, is welded a circular plate or disk, also

twenty-eight inches in diameter and four inches thick.

"The disk is composed of a centre-piece, ten inches in diameter, surrounded by two concentric rings, one outside of the other, all accurately fitted together by turning. The bottom of the bore terminates against this disk. Upon this disk is welded a ring of twenty-eight inches exterior diameter, four inches interior diameter, and five inches thick, compounded of three concentric rings, accurately fitted together by turning. The inner one is ten inches in exterior diameter, and about six inches in thickness, so that its ends project on either side about half an inch beyond the faces of the other two rings. This is intended to secure a perfect weld next the bore, and force out the slug. Other compound rings, made in the same manner, are welded on one after the other, until the gun is of the required length. In making the compound rings for the small part of the gun, between the trunnions and muzzle, the outer ring is omitted.

"The gun remains in a horizontal position during the process of construction, and is handled by means of the bar projecting from the cascabel. The welding on of the disk and rings is done with a hammer worked horizontally by steam; a hammer working vertically is also used against the sides of the piece. The inner ring of the compound rings is made from a block six inches by ten inches, by boring a hole five inches in diameter through it, and turning off the corners. The fibres and laminae of the metal is at right angles to the axis of the gun. The centre and outer rings are made like a tire by bending the bars and welding the ends together, thus placing the layers of the metal in cylindrical surfaces. The trunnions are attached by being screwed into the sides of the piece three inches."

In regard to the projectiles and charges used, the board report:—

"Considerable delay and many interruptions in the progress of the trials were occasioned by the want of suitable projectiles. Those of the Hotchkiss pattern, which have been officially proscribed for rifles of a large calibre, on account of their excessive strain upon the gun, were almost exclusively used. In weight they varied from 104 to 127 pounds.

"The powder used was what is known as No. 7 experimental powder, giving a pressure of 57,000 pounds per square inch in an eight-inch gun. The charges were varied increasingly from thirteen to thirty pounds, although it was frequently necessary to reduce the higher charges in order to accommodate the projectiles, from which the packing would often strip, or the cap break, even with comparatively low charges."

As the result of the examination, the board report:—

"It is the unanimous opinion of the board that Ames's wrought-iron guns possess, to a degree never before equalled by any cannon of equal weight offered to our service, the essential qualities of great lateral and longitudinal strength, and great powers of endurance under heavy charges; and that they are not liable to burst explosively and without warning, even when fired under very high charges; and that they are well adapted to the wants of the service generally, but especially whenever long ranges and high velocities are required. It is also the unanimous opinion of the board that Ames's seven-inch guns, of which he has now fifteen nearly finished, possess sufficient weight and strength to receive an eight-inch bore, and even greater, although not heavy enough for a ten-inch bore."

And to show more fully their confidence in the strength and durability of the gun they had it tested by firing it seven hundred times. The board—

"Further recommend that the gun which they have tried be rebored to eight inches and rifled, and then submitted to another series of tests similar to these through which it has just passed, to be then cut up for examination."

COST.

In regard to the cost of these several guns, the price of a 100-pounder Parrott gun is \$1,300; a 200-pounder about \$2,000; a 300-pounder from \$4,500 to \$5,000. Of the cast-iron guns, the contract price for the 15-inch gun, as stated by Mr. Fox, is \$7,500; those of smaller calibre in proportion. The Ames gun would cost about a dollar a pound, or about \$12,000 for a 100-pounder; \$17,000 for a 150-pounder, and \$28,000 for a 200-pounder.

LAYING THE ATLANTIC CABLE.

By the time that this notice reaches the public the Great Eastern will probably have begun her eventful voyage. All that the experience of previous attempts could suggest, all that the most earnest and painstaking foresight could anticipate, has been done; everything now rests with the weather. In the four great divisions on which the success of the undertaking may be said to turn—namely, the cable itself, its stowage, the ship, and its engines, nothing apparently has been overlooked.

ELECTRICAL CONDITION OF THE CABLE.

As regards the cable, it still remains in the same perfect state as when it was tested at the works, and, in fact, its whole electrical condition is such as the largest shareholder in the undertaking would desire for it. Its various lengths are now and have been for some days past joined up, and twice every day, morning and evening, messages are sent through. The time which these occupy in transmission shows its condition to be as nearly invariable as possible. Last week experiments were tried with a variety of instruments to ascertain the highest rate of working speed with a low battery power. The best of these instruments was, it is said, one invented by Mr. Varley, with which it was found easy to work through the whole length of two thousand five hundred miles at an average rate of about four words a minute. At this speed the signals were remarkably clear and distinct, and it is still claimed that it is possible to devise instruments which can raise the rate from four words a minute to as high as eight or even ten. This, however, remains to be proved.

FOUR WORDS THE MINIMUM RATE OF TRANSMISSION.

Yet even in the absence of such instruments there can be no doubt but that the gradually improving skill of the signalling clerks, as they become more accustomed to work through the wire, will, with the bettered electrical condition of the cable when at the bottom of the Atlantic, soon make four words a minute the minimum of what can be accomplished by this telegraph. The insulating properties of the gutta percha are always increased by external compression. When sunk in the tremendous depths beneath which the cable is to be submerged it is calculated that the weight of water above it will give a pressure of about two and three-quarter tons to the circular inch. Under this enormous weight the bulk of the insulating core will probably be reduced one-third, and in fact, so compressed on all sides as to most materially improve both "conductivity" and insulation. Such aids to signalling excellence, when coupled with the benefit which the cable is certain to derive from the unvarying temperature at the bottom of the ocean, are likely to do more towards increasing the rate at which messages can be sent than any instrument which has yet been brought forward.

HOW THE PROGRESS OF THE WORK MAY BE KNOWN ON SHORE.

During the time of paying out signals will be sent to Valentia for every fifty miles of the cable sunk, and for every fifty miles the Great Eastern runs. Thus it will be perfectly easy for the public to follow her course on any map, and know precisely by the difference between the distance traversed and the length of the cable sunk the amount of slack that is being paid out. This slack, as it is called, will afford the best index to the state of the weather and the way in which the Great Eastern is doing her work. No less than thirty-three per cent of the entire length of the cable has been allowed for slack, or waste, as we may better call it. If all goes well not more than ten per cent of this will be used; but, on the other hand, with bad weather or irregular going of the Great Eastern, every coil will go over the stern to the very last mile. So far as regards the cable.

STOWAGE OF THE GREAT EASTERN.

As concerns the Great Eastern herself, Captain Anderson and his officers have taken every possible precaution as to her stowage and general equipment. From outside she seems at the first glance to be almost alarmingly deep in the water. It is, however, less her actual depth which creates this unpleasant impression than the appearance which she presents of "sagging" amidships. Of course, this awkward and most unpleasant appearance is merely an optical delusion, no doubt created by her deep trim astern. There is a difference of nearly five feet between her trim fore and aft. Astern she draws thirty-five feet

of water, while under the bows it is only thirty. Levels have been carefully taken to ascertain if any deflection was perceptible under the ponderous weight she bears. No sign of change, however, has been observable. Before any of the cable was coiled on board one thousand four hundred tons of water were pumped into the aftermost compartments of the ship, and one thousand one hundred tons into the compartments most forward. Under these weights at her extremities the *Great Eastern* deflected nearly an inch and a half, recovering herself directly the water was pumped out. This proof of strength is, of course, very satisfactory. It would have been more so, however, if the test strains employed bore a closer relation to the enormous weights which she has now on board. All told, the *Great Eastern* will leave the Thames with rather more than twenty-five thousand tons in her, a burden almost as great as the whole fleet with which Nelson fought the battle of Trafalgar could have carried.

CHANCES OF A ROLL.

All the weights are stowed as high as possible to counteract to the utmost the *Great Eastern's* most unpleasant tendency to roll. It is popularly supposed that this ship is almost immovable in any sea. Against a head wind she is certainly very steady, though she can pitch as well as other vessels, and has, in the Atlantic, aye, and even in the Channel, taken in heavy seas over her bows. Nevertheless, in a beam sea she is particularly "lively," and rolls just in proportion to her size—that is to say she rolls very much indeed. Her motion is easy, slow and deep, occupying about fifteen seconds. To make her do this, however, a beam sea of fifteen seconds interval between the waves is necessary, and such a sea is rare even in the Atlantic. Of course, all her system of stowage proceeds on the theory that high-placed weights will prevent her rolling. The *Agamemnon* was stowed after the same fashion on the occasion of the last Atlantic expedition, and our readers will probably recollect that on that occasion the great line-of-battle ship rolled as if she was never coming up again.

ABOVE DECK.

All the running gear has been removed from the rigging, so as to obviate the possibility of anything falling from aloft into the paying-out machinery. Some of the yards have been lowered, and scarcely a spar has sails. The village of huts and workshops has disappeared from her decks, but their places have been more than occupied by shanty coverings of various kinds, leading troughs, buoy rope wheels, gigantic buoys for floating the cable at various depths from six hundred to three thousand fathoms, and, above all, the whole space of what in other vessels would be the quarterdeck is occupied by the paying-out apparatus. The praise which was at first bestowed upon the simple efficiency of this machinery has been amply vindicated by its every day working. As far as can be known from mere preliminary trials it is absolutely perfect.

ADAPTING THE ENGINES.

Both screw and paddle engines are reported to be in very good condition. Every part of each, of course has been carefully overhauled and examined. From the great depth of the vessel it has been necessary to considerably reduce, or rather reef in, the paddle floats. One-third has been taken off each float, and the two remaining thirds brought as close to the inner ring as possible. On the voyage round to Valentin both screw and paddles will be used, while during the submergence of the cable the *Great Eastern* will depend mainly on her screw. The paddles, however, will be kept under steam, turning easily to save the screw the labor of driving them as well as the ship. This will be the more necessary, as from the position of one of the cable coils over two of the screw boilers it has been found necessary to shut off the latter entirely from steam, thus reducing the power of the screw engines about one-fifth—namely, from 1,500 to 1,200 horse power. Another reason for the paddle engines, being kept going is the assistance they may be required to give in keeping the vessel on her course against side winds.

PREPARING FOR A "KINK."

They will be also used to reverse the ship at once in case of any serious "kink" occurring in the cable tanks. The experience of submarine telegraphy points always to one danger—that of stopping the paying out simultaneously with the stoppage of the

vessel. The very rapid downward course of the wire being suddenly arrested at its point of departure over the paying-out wheel generally causes instant breakage of the rope—an accident which is always as sudden as it is irremediable. In case of any stoppage being necessary, therefore, the *Great Eastern* will be at once reversed, so as to back her slowly over the line where the cable lies until it hangs almost vertically from the stern. During the time the *Great Eastern* has been anchored at the Nore the swell, and especially within the last few days, has often been so great as to prevent the service tugs from Sheerness coming alongside. On some days, indeed, the sea has run very high, yet always without making the slightest impression on the big ship, which, from first to last, has remained as absolutely immovable as if she were aground.

HOW TO SKIN AND STUFF BIRDS.

As many persons have made inquiry for some simple and efficient method of skinning and stuffing birds, we publish herewith a circular on the subject of "Collections of Animals injurious to Agriculture," which has recently been put forth by the State Agricultural Society of California. The first step is skinning, which applies both to birds and animals:—

A great assistance in skinning animals is to suspend the body by a hook, so that both hands are at liberty. For small kinds a common fish-hook will answer, with the barb broken off, and a cord attached a foot or two in length. This may be inserted among the bones near the tail after the skin has been partly detached.

Other implements required are the following:—1. A sharp knife, of almost any shape, but a Surgeon's scalpel without a jointed handle is the best for small kinds, and the common butcher knife, which is of similar shape, for large ones. 2. A strong, sharp-pointed scissors, and for large skins a shears is often useful. 3. Triangular Glover's needles for sewing up skins; two or three sizes. 4. A pair of spring forceps, such as are used by Surgeons, though not essential, are very useful. 5. A tape measure, three to six feet long. 6. A fine saw, or coarse flat file, to notch small bones before breaking them, so as to make them break evenly. Some use sharp-edged nippers for this purpose. Large bones may be broken roughly and the ends smoothed off.

BIRDS.

The ovaries of the female containing minute eggs, or the testicles of the male will be found near the kidneys. When a bird is shot, all large holes must be plugged with cotton or paper, and this also inserted in the mouth and throat, so as to prevent the flow of blood or other fluids. Blood on the feathers may be absorbed by sprinkling with plaster of Paris, ashes, dust or sand, shaking off all that does not stick; then make a cone of paper, large enough to put the bird in, head down, and to twist up the other end over it, taking care not to injure the tail feathers. This will secure smoothness of the feathers when the body stiffens. In cool weather it is best to postpone skinning for twelve to twenty-four hours, in order to allow the blood to coagulate, so that it will not flow so freely, and the fat hardening also gives less trouble. Some use a ring of paper pinned around the body, to obtain its exact girth, so that it can be stuffed out to the same dimensions afterwards.

Before skinning, put fresh plugs in the mouth, nostrils and large shot holes. Take the measurements and notes required. Then make an incision from the breastbone down to the tail, not so deep as to open the intestinal cavity, and carefully separate the skin on each side, plugging or sewing up any holes accidentally cut too deep. If blood or fluids run too freely, absorb them by some dry ashes, plaster or paper, and use these so as to protect the feathers; if necessary keeping the fingers well powdered. Separating the skin from one side, the leg is soon reached; this must be drawn out by the knee-joint as far as it can be, and the tendons cut where they go towards the foot. Break off the bone within the skin, and having freed that leg treat the other in the same way. It is most convenient in small birds to break these bones, and also those of the upper wing-joint, before beginning to skin, thus having the limbs less in the way.

After the legs are freed, cut down to the tail, and

separate from the body, leaving some of the vertebrae attached to support the feathers. Remove the oil-glands above the tail carefully from the skin, then insert the hook in the body and hang it up, head downwards. The skin is then easily peeled off until the wings are reached, when it must be drawn to one side until the broken end of the shoulder bones are reached, which may be slipped through the muscles, and pulled out as far as possible. The muscles must then be cut off and this wing being freed, the same process is used for the other.

The skin then slips off easily as far as the head, and if large must be supported, so that its weight may not stretch the neck. In drawing it over the head be careful not to tear it, and use the fingernails more than the knife. The ear membranes are easily drawn out with it, and on reaching the eyes the attachment of the lids must be carefully separated from the eyeball, cutting so as to injure neither the lids nor the eyeball, as the fluids escaping gives trouble. Then cut off the back part of the skull, remove the brains and the eyes, clean away all remains of muscle, etc., from the skull, and sprinkle or smear the skin with arsenic. Fill the eye-sockets, and other cavities about the head with cotton or other stuffing, and draw the skin back to its original shape. If the neck has dried during the operation, it will need moistening before retraction.

The second joints of the wings now require cleaning from the muscles, etc. This may be done in small birds by carefully drawing the skin down over the bones, loosening it with the finger nails. Large birds, however, need an incision under the wing, reaching the whole length of the joint, which may be sewed up afterwards by a few stitches. Arsenic must be applied freely to all these parts. The wing-bones must now be connected by a string passed through the space between the bones, or a thread sewed through the ligaments so that it cannot slip. Do not draw the wings too close together, but leave as nearly the natural distance between them as is practicable. Cotton or tow may be now wound round the broken ends of the wing and leg-bones, a roll of it inserted in the neck, and enough put in the body to fill it out to its natural shape.

When the legs are tied together no stitches are generally necessary to sew up the cut. If there are large holes in the skin they should be sewed up from the inside before putting in the stuffing. In large birds it is well to sew on wide strips of rag along the inner edges of the cut made in the skin, to protect the feathers during the operation of skinning, removing the rags afterwards. Very badly soiled skins can, however, be cleaned by the Taxidermist, and provided they have not lost any feathers, are still useful. The bill should generally be tied shut by a string passed through the nostrils, and the label may be put there or on the legs. Very long necks are best stuffed by rolling up a long cylinder of paper and passing it down the throat or from the inside. The neck may then be bent down along the side of the body, and the legs bent up so as to make as compact a specimen as possible. Having smoothed down the feathers, the bird must now be pushed carefully inside of a cylinder of stiff paper of the proper size and laid on its back to dry. Hanging it up by the bill or feet stretches it too much. If carefully dried it retains a good shape, and may be freely handled afterwards.

Some birds, especially ducks and woodpeckers, have the neck so slender that the head cannot be drawn through it by skinning in the usual manner. In these an incision must be made on the most injured side, from the ear down far enough to allow the head to be cleaned through it. The body may then be skinned as usual, or the incision may be continued down the neck to the bare space under the wing, and the skin taken off without cutting it elsewhere. To sew this up requires care in order to adjust the feathers nicely, and the stitches must be taken from within outwards.—Some persons skin all birds in this manner, but the feathers are more apt to fall out of those birds that have them loosely attached.

There is much difference in the ease with which a bird may be skinned, according to the relative toughness of skin, and adhesion of feathers. A hummingbird is more easily skinned than a pigeon, and those of the size of a robin take much less time than an eagle. To practise on the best are blackbirds and jays, those not too fat being preferable.

Improved Flour Bolt.

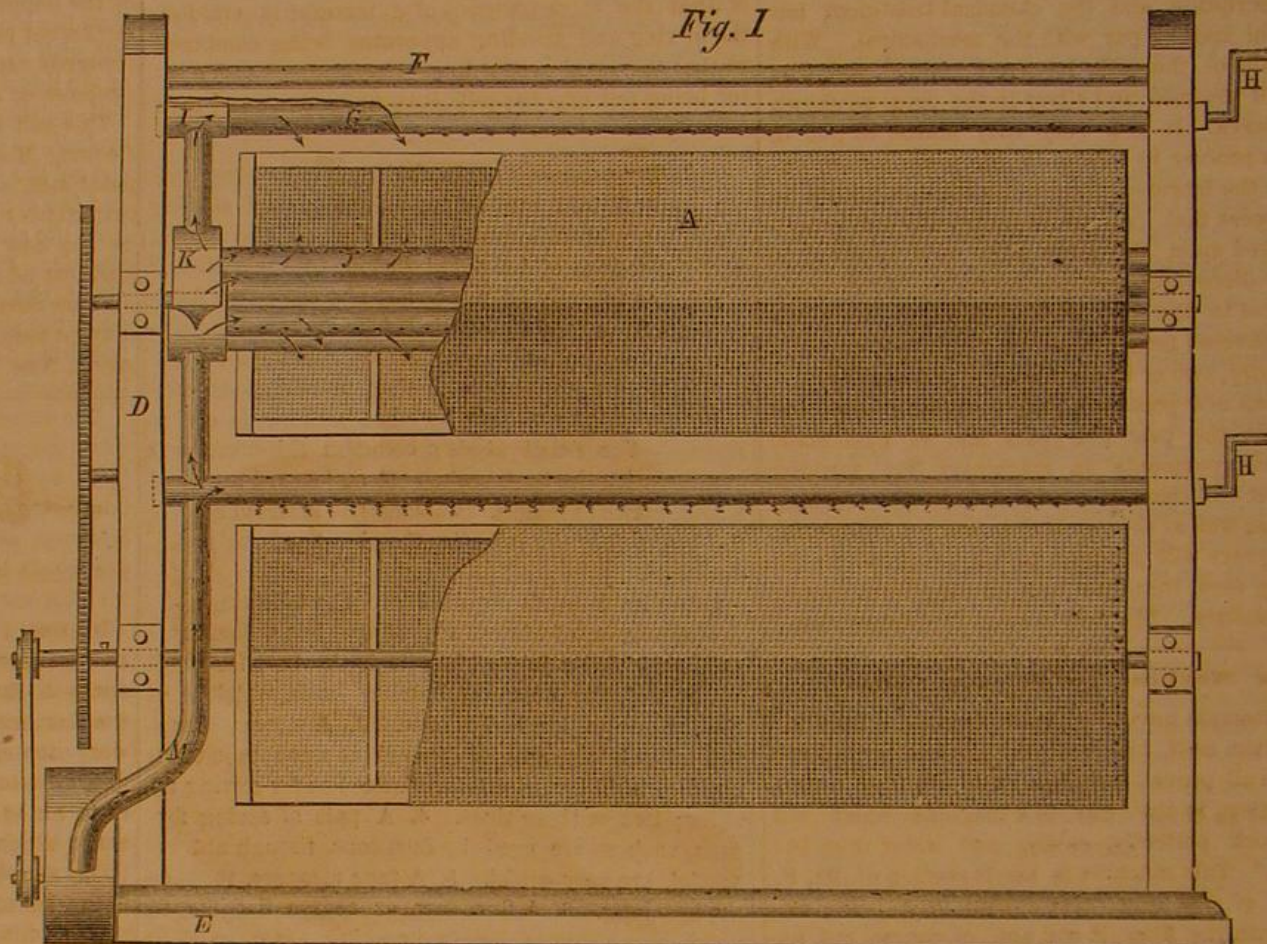
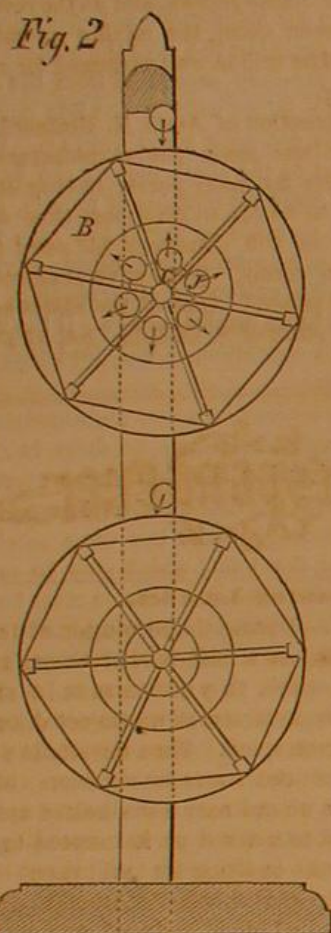
In common flour bolts, or sieves for ridding flour of the bran and husks collected during grinding, much trouble is experienced from the high temperature at which the flour is delivered at the close of the process. In consequence of the heat still remaining in it, when it issues from the "cooler," it is liable to sweat and ferment, ultimately turning sour if packed in barrels in that state. The bolts are also liable to get clogged in from working, and take time to clean so as to make them fit for service again. The inventor of this bolt claims to have remedied the evils mentioned by passing currents of air through the flour in the bolt, and thus lowering its temperature and rendering it capable of being packed almost

ure, according to the requirements of the apparatus, is passed into the air chamber, C, whence it is distributed into the perforated pipes before alluded to. Flour being supplied to the bolt, the same revolving, currents of air will issue from the pipes into the flour and reduce its temperature, at the same time tend to assist the operation of the bolt by forcing the flour through the meshes on all sides. The upper pipe will, at the same time, deliver a current of air downward upon the bolt, clearing the meshes as it rotates from bran or chaff. The current of air from the pipe may be delivered at any angle, as before stated, or it can be shut off altogether by turning the pipe so that its perforations shall be closed.

It is claimed that the quantity of flour bolted in

ever, must not contain any free sulphuric acid; for if only one drop of this acid is added to it the first spectrum reappears. It thus becomes a question whether the change above described does not depend on the formation of a new chemical compound. On adding dichromate of potassium to the indigo instead of sulphate of copper, a much smaller alteration takes place. The red band then remains unchanged, and after adding several drops we observe only a displacement of the limits of the green towards the red end, the maximum displacement amounting to about one-thirtieth of the total breadth of the spectrum.

The solutions examined by the author with respect to alterations of absorption caused by changes of tem-

**MADIGAN'S FLOUR BOLT.**

as soon as it issues from the bolt. This apparatus also saves labor in cleaning the bolt, for air blasts are directed against the cloth, freeing its meshes from any accumulations and facilitating its operation. The details are as follows;—A represents an hexagonal bolt whereon bolting cloth is stretched as usual. The cloth is also secured at the left-hand end of the bolt to the periphery of the head, B, Fig. 2, which is perforated so as to leave an annular space between its inner circumference and the shaft, C. The bolt is held in standards, D, which rise from a floor or platform, E, and are connected at top by a cross-piece, F; beneath this is placed a perforated pipe, G, the right-hand end of which passes through the right hand standard, D, and carries a crank, H, by which the pipe can be turned to cause the air blast to be presented at different angles toward the bolt beneath or turned off altogether. The left-hand end of the pipe fits in a fixed socket, I, secured on the left-hand standard. The bolt shaft is either made hollow, or fitted about its periphery with pipes for the distribution of currents of air within the bolts.

In this engraving we have shown the shaft fitted at different points of the periphery with pipes extending throughout the length and securely fastened in grooves upon the exterior. These pipes are perforated upon the side opposite the inner faces of the bolt. The right hand ends of the pipes are closed, but the left-hand ends are open, and set in and connected with a circular plate, or head, J, which is fitted to the open ends of an air chest, K. This plate is so fitted to the chest as to revolve freely within its open end, and a pipe extends from the upper side of it to the socket above, so as to form a communication with the perforated pipe before-mentioned. An india-rubber tube, M, or a suitable pipe connects the air chest, C, with a fan or blower, or an air pump, for the supply of air.

The operation is as follows:—In the bolting apparatus a stream of cold air under great or less pres-

sure, according to the requirements of the apparatus, is passed into the air chamber, C, whence it is distributed into the perforated pipes before alluded to. Flour being supplied to the bolt, the same revolving, currents of air will issue from the pipes into the flour and reduce its temperature, at the same time tend to assist the operation of the bolt by forcing the flour through the meshes on all sides. The upper pipe will, at the same time, deliver a current of air downward upon the bolt, clearing the meshes as it rotates from bran or chaff. The current of air from the pipe may be delivered at any angle, as before stated, or it can be shut off altogether by turning the pipe so that its perforations shall be closed.

It is claimed that the quantity of flour bolted in

Absorption of Light at Different Temperatures.

The prismatic examination of light which has passed through absorbent media has been continually acquiring greater importance ever since Stokes called attention to its practical utility. In particular it is interesting to examine the alterations in absorption which take place on mixing two absorbing substances which exert no chemical action upon each other, and the alterations caused by changes of temperature.

Professor Melde of Marburg has described the modifications produced in the position of the absorption-bands of a solution of carmine by mixing it with other colored solutions, and was thus the first to call attention to phenomena of this nature. The following observations, on analogous phenomena presented by indigo, had been already made by the author at the date of Professor Melde's communication.

It is well known that indigo gives a spectrum in which a comparatively narrow red band is followed by an absorption-band, of greater or less breadth according to the concentration of the solution, while after this there comes a bright band which attains its maximum of intensity in the blue, and lastly the violet end of the spectrum again suffers absorption. Now if a small quantity of a solution of sulphate of copper is mixed with such a solution of indigo, the red line disappears immediately, and after a short time the second bright band begins to approach the red end of the spectrum, and finally extends in this direction to the extent of about one-eighth of the breadth of the entire spectrum. The indigo solution, how-

ever, must not contain any free sulphuric acid; for if only one drop of this acid is added to it the first spectrum reappears. It thus becomes a question whether the change above described does not depend on the formation of a new chemical compound. On adding dichromate of potassium to the indigo instead of sulphate of copper, a much smaller alteration takes place. The red band then remains unchanged, and after adding several drops we observe only a displacement of the limits of the green towards the red end, the maximum displacement amounting to about one-thirtieth of the total breadth of the spectrum.

The behavior of chloride of cobalt is also interesting. At common temperatures and at the proper degree of concentration this substance shows two luminous bands, one of which is very intense and embraces the whole of the red and yellow, and part of the green; the other, comparatively weak, is situated in the violet. On applying heat, this violet band gradually diminishes in intensity, and two new bands of absorption, of which previously no trace was visible, appear in the red. They increase very rapidly in breadth, especially the less refrangible of the two, as the temperature rises; so that, when the boiling-point is approached, they have completely obliterated the entire bright band in which they appeared, with the exception of a very narrow weak stripe in the extreme red.

In order to explain those phenomena, one might be disposed to assume that the elevation of temperature occasioned chemical changes to take place in the liquids—that, for instance, a few atoms of water were fixed or given off—were it not that, so far as the ob-

servations have yet gone, a sudden alteration of absorbing power never occurs, but the changes take place in a perfectly gradual manner. On the other hand, these phenomena are quite analogous to those observed by Brewster and others in relation to the absorbing powers of certain gases, in which, as the temperature rises, the absorption-bands increase in number and width.—*Philosophical Magazine.*

Chemical and Mechanical Treatment of Ores.

The Philadelphia *Mining News* says:—"The new discoveries of vast deposits of gold and silver on the Pacific coast is calling out the talents of our inventors and chemists. The machinery in use at the mines, for the past one hundred years, has been of the very rudest description, and the chemical treatment has been about upon a par with the mechanical. With such treatment the mills have not yielded over fifty per cent of the gold and silver in the ores, as shown by the assays. It is a very easy matter to put in practice a process by which all the metal can be extracted in the laboratory, but quite another matter to find a process that can be economically and practically worked upon the large scale now required in our newly-discovered mining districts. What would be practical in the city of Philadelphia—could the ores be delivered here—would be very expensive in a new country, two or three thousand miles away.

"Various new processes have been discovered and tried within the past five years, and we have made various improvements in machinery for working quartz, but still there is a wide field for the practical chemists as well as the machinist, and we believe the next five years will produce better practical results in working ores, than has been accomplished during the past century. The field is open for competition."

New Machine for Sowing Cotton.

Many attempts have been made to make a machine to sow cotton seed, but up to the present we believe they have all proved failures. But we now record the invention, in this city, of a machine which will do this work perfectly, easily, and faster than 100 "niggers." This machine is the invention of Mr. F. M. Bacon, of this city. The cotton seed being enveloped with the fiber, it will not, of course, roll together, and flow like other seeds. To meet this difficulty, Mr. Bacon has arranged two hoppers with spikes and followers which work the seed to the center, where it falls through to the ground, leaving it in drills as wheat by the grain drill. This machine makes the furrow, deposits the seed and covers it, while heretofore it has required a man, mule and shovel plow to make the furrows, three or four men to drop the seed by hand, and as many more to cover it with hoes. We believe there is a large fortune in this invention. Mr. Bacon has had constructed a one-third size machine, and tested it practically with cotton seed. Aside from its usefulness, the machine is worth going to see as a specimen of the work of Ripon mechanics. This work was done by Mr. Geo. Richards, and is a splendid job.—*Ripon (Wis.) Commonwealth.*

Oiling Agricultural Machines.

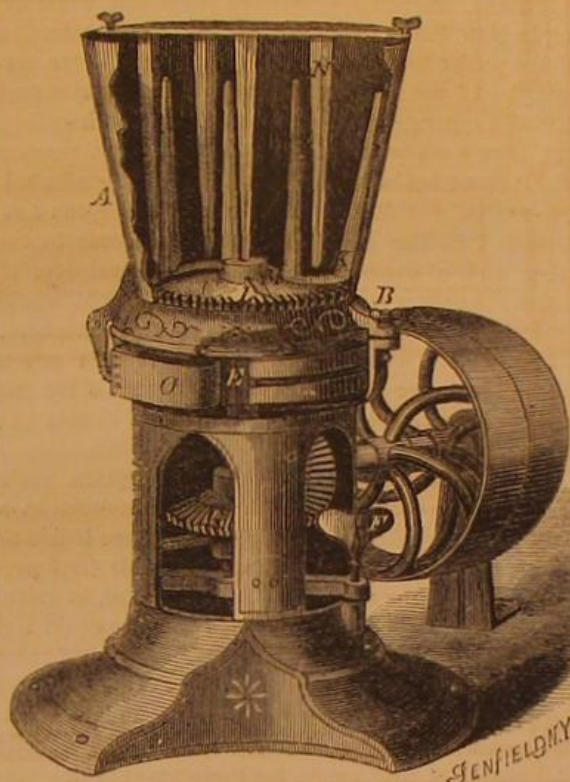
Speaking of oiling reapers, a man said the other day that he oiled his enough, for he did so every day. Yet this man thought his machine wore out very fast. Of course it wore out fast, and the only wonder is that he has a machine left at all from last year. A new machine needs oiling oftener than an old one, but no machine should run more than an hour without oiling the parts doing the most work. The question of what kind of oil to use is an important one. Light oils should be avoided, and those having a heavy body should be invariably used. Undoubtedly castor oil is the best by a great deal, and the only objection to its universal use for reapers is, that it is costly at the present time. But even at the present high price many experienced farmers claim it is the cheapest as well as the best. At any rate farmers should buy castor or heavy machinery oil.—*Ripon Commonwealth.*

[Castor oil is not fit for machinery. Nothing could be worse. All vegetable oils contain a large amount of gluten which makes them dry or gum rapidly, therefore animal fats are better. When nothing else can be had, pure lard will be found excellent for the bearings of machines.—*Eds.*

BRAINARD'S "UNION" PAINT MILL.

Paints in small quantities, and for immediate use, are commonly mixed for grinding by stirring the dry color and oil together in a dipper or other vessel, and then are emptied into the grinding mill and ground through by hand. Where larger quantities are ground for sale or use, the stirring is done by power in a machine called a "mixer," usually consisting of a plain hopper in which revolve a series of knives driven by over-head gearing and an upright shaft; into this machine the oil and color are thrown in certain definite proportions and kept in motion till thoroughly mixed; then, as with smaller quantities, the mass is transferred to the mill.

One peculiarity of the mill we are about to describe, is, that the inconvenience of a transfer is avoided, the mixing and grinding apparatus being combined so that the usual proportions of solid and liquid matter being put into the mill it is first mixed and then



ground, in one continuous operation, and the additional expense of a mixer is saved; the efficiency of the grinding part of the mill is also increased, as the color is kept in motion, and steadily fed to the grinding plates.

There is a difficulty incident to the grinding of stiff colors in ordinary mills, to obviate which there have been many inventions, but none heretofore satisfactory; it is, that the ground paint oozing out at all parts of the circumference of the grinding plates, adheres to both; that adhering to the revolving one, or runner, is removed by the scraper; but it accumulates upon the upper or stationary one, till its weight causes it to drop, or it is thrown off, and deposited about the floor; much paint is thus wasted and much attention is required to prevent the waste of a great deal more.

In the mill of our illustration not a particle of paint is wasted, or drops anywhere but just where it is wanted, and the only attention required is to keep up the supply of material in the hopper. The device for effecting this is quite simple, being merely a hollow ring of iron, forming a close chamber around the junction of the two plates, and open at the point where the scraper, O, rests against them; it is secured to the upper plate, and the lower one revolves within it. Whenever any color leaves the upper plate, it passes no further than the shallow cavity of the ring, from which it goes directly to the outer surface of the runner, and is carried at once to the scraper, and deposited in the receiver; the ring performs two other offices; its flanges fitting closely the two plates, it steadies the runner and prevents any "wobbling," it also keeps from the air the paint that may be upon the outside of the grinding plates when the mill is stopped for the night, thus keeping it from drying.

A is the hopper of the mill, hinged to the base by a pin at the back and secured by a thumb screw, B, at the front; C is the runner, driven by bevel gearing attached to the upright shaft, E, which rests in a step that is raised or lowered by set screws, F, to graduate the fineness of the color to be ground; the upright

shaft, E, is splined and passes freely through the gear wheel, G, which rests upon a cross bearing, H, and is not disturbed in its relation to its fellow by the raising and lowering of the upright shaft. The runner, C, has on its top side a stud, upon which is screwed the mixing frame, K, the outer knife of which revolves close to the inner side of the hopper, preventing any adhesion of paint there; a stationary knife, L, is secured to the hopper and cleans the upper surface of the runner; the two horizontal arms, M, of the mixing frame act in relation to this knife like shears, and effectually crush any lumps that may not have been pulverized by the knives above; to facilitate the breaking up of lumpy colors, a stationary frame, or series of knives, N, is secured to the top of the hopper by the thumb screws, and as the revolving knives pass between them, the mixing operation proceeds rapidly. The mill is well arranged for convenience of cleaning.

This mill is the invention of Amos H. Brainard, of Boston, Mass., who has made the manufacture of paint mill, a speciality for many years; having other inventions to which he wishes to give more time than he can now spare, he will dispose of his paint mill business on favorable terms. [See advertisement in another part of this paper.] One of the above mills may be seen at the store of S. C. Hills, No. 12 Platt street, New York.



Seasoning Lumber.

MESSRS. EDITORS:—During the revolution of 1848, the Hungarians seasoned a million of green-cut gunstocks in four days, thus: they put them in a close chamber, with escape ports, steam was injected for 48 hours among the green wood. Then the stocks were plunged into tanks of iced water for six hours; after which for 36 hours in an ordinary stove-heated apartment, which sufficed to make a perfect seasoning.

This simple process—omitting the ice water—has often been used with equal success in America, chiefly on a limited scale, and often combined with giving bended forms to the wood. Recently the same plan has been tried in Mercer county, Pa., on a large scale and with complete success. The exhaust steam of the engine was used. The green boards became soft and spongy in the process, and the steam completely expelled the sap. The drying and seasoning were rapidly perfected in the same chamber. The whole process occupied four days; and it is to be observed that the boards, as well by their shrinkage as by their kindly working under the plane and saw, gave evidence of the most perfect seasoning. The Chief of Ordnance, under whom the Hungarian gunstocks were seasoned, assures us that he had frequent occasion to notice the stocks in after years; and he can speak with certainty of the perfection of the process.

There is an American patent for using steam of higher temperature in seasoning lumber, by which it is claimed that the steaming and drying are effected by one operation. Super-heated steam it is called; that is, all steam instead of steam and water, which is the cheaper article ordinarily produced in our steam boilers. Probably air, equally heated, would season as well. How far this drying the steam first, instead of drying it out of the lumber afterwards, may prove profitable, experience will tell. The heat expended in each case is probably the same. What we understand is, that there is as yet no exact mechanical means of application, regulated as to secure the precise temperature that will season the lumber and not char it. The process, like all experience with super-heated steam, is one of great delicacy. Yet it may be found practicable to bring it, for this purpose, within the enforcement of exact, yet easy, mechanical and chemical application. Till that time lumbermen have, in the Hungarian process, a certainty of being able to season their green boards without risk and at mere nominal expenditure. ANTHRAX.

Manufacture of Vache Lisse.

MESSRS. EDITORS:—Conformably with your desire I send you the details of the manufacture in France, of the neat leather called *vache lisse*. The skins

with the hair on are always soaked in running water, in water that is neither too hard nor too soft, for if the water be too soft the leather will not have sufficient firmness. After eight days the skins are taken from the water, cleared of the particles of flesh adhering to them, thoroughly rinsed, and piled to drain, after which they are treated with lime. They are first thrown into milk of lime which has already been used, and allowed to remain four or five days, being handled from day to day. They are then put into a new and very strong milk of lime, and kept for ten or twelve days, or long enough to loosen the hair. Each workman now takes his five skins, the number for a day's work, scrapes off the flesh, works them once on the hair side with a stone in the form of a knife, and puts them the same day into the liquor. The tubs which contain the liquor are of oak, round, $4\frac{1}{2}$ feet high and 5 feet in diameter. The skins are put into these tubs in liquor which has already been used, and left for two days, being handled three times each day. They are then taken out, the liquor is cleaned of the old bark and four bushels of new bark is added, with a little water to maintain always the same quantity of liquor. At the end of eight days the bark is changed again, and 6 bushels of new bark is added. At the end of a week the hides are put into the vats, which are 6 feet wide and from 6 to 8 feet deep, with a good bed of bark on the hair side. At the end of four months the bark is changed and this time it is put on the flesh side. At the end of four months thin hides are taken from the tanks, or in less time if found to be thoroughly tanned; but thick hides are returned to the tank with a fresh bed of bark applied to the hair side. After the hides are tanned they are placed lengthwise on a block of wood and split from head to tail. Each half is numbered at the tail, and then two workmen hold it, one by the head and the other by the tail, and with a stick knock off the bark adhering to it. The leather is now mounted to dry, but it is never dried in the sun, as that would turn it red. After moistening, the leather is ready for currying.

Volla, Messieurs, comment que ce cuir est tanné en France. Votre Serviteur. M. A. DURIFT.

[Tanners will observe that our correspondent passes over the process of removing the lime; probably that is the same as usual.—Eds.]

New Electro Motor.

Messrs. Editors:—Some time ago, when electro-magnetism was discussed as a motor the velocity of sound was stated to be 1142 feet per second, light 192,000, electricity 576,000. I would like to know if the above is admitted to be correct; if not what is the fact?

Since Mr. Charles J. Page made his experiments I have been trying to make this great velocity available in producing motion. I think I can now produce ten or twelve times the power that Mr. Page did with the same battery. The counter current is no detriment in this arrangement, and an engine can be worked at fifty revolutions per minute or two hundred, with equal effect.

BALSLEY.

Dayton, Ohio, July 17, 1865.

[The velocity of sound in air at a temperature of 61° F. is 1118.3 feet per second, and it decreases with the temperature, being 1106.091 feet at 50° . The velocity of light is 192,000 per second, and that of electricity is very various, depending on circumstances. By Wheatstone's measurements the velocity of frictional electricity was found to be 288,000 miles per second, that of the voltaic current, when the earth forms part of the circuit, is stated by the engineers of our coast survey at 16,000 miles per second, though it varies considerably with the conditions.]

The objection to electricity as a motive force is its cost. In the battery the power obtained by oxidizing zinc which is worth 13 cents per pound, while in the steam engine it is obtained by oxidizing coal which is worth one-third of a cent per pound.—Eds.]

The Value of Experience.

Messrs. Editors:—At the time I engaged you to prosecute my claim for letters patent a gentleman in this place undertook three cases on his own responsibility, and ridiculed the idea of employing scheming yankee agents, especially without first contracting terms, as in my case, since I was sure to

both fall in getting a patent and be swindled in the bargain; the only safe course being to do one's own business, etc. However, as the case progressed this same individual expressed surprise at the promptness of my agents in doing their duty, and now that the patent is granted on my improvement, I not swindled nor in any way wronged, and his cases having troubled him from the beginning and are now finally rejected, you can console yourselves by being assured that experienced agents are in better demand with him just now. And I write to thank you for the discharge of your duty in my case. I, too, am more than satisfied, and if I had forty—I have two that I want to have you prosecute as soon as convenient—cases you should have the whole of them. I repeat, I am more than satisfied, and thank you for your services.

F. BREWER.

Collinsville, Ill., July 14, 1865.

Pneumatic Railways.

Messrs. Editors:—Some ten years ago, while living in New York, I endeavored to call the attention of the public to this mode of traveling, and for several years I was quite enthusiastic and sanguine that it would supersede the present mode of railroading, but, after a while I saw, or thought I saw, reasons why it could not be generally and extensively adopted. One reason was, that it would have to be one continuous building from one end of the route to the other, and, of course, could only be crossed over or under. Another reason why I was not sure it would work, is, or was, the elasticity of the atmosphere.

Please give us your opinion upon this point. Would the power be as great or effectual if the car was twenty miles from the engine, as if it was but twenty rods?

I suppose a tube six or eight feet square, made true and smooth, of good inch lumber, inclosed in a light frame, would stand sufficient pressure inside to send a car weighing a thousand pounds (and perhaps more) at the rate of one hundred miles, or more, per hour, and I see no reason why this car could not rest and slide upon oiled ways with but little noise or friction. Really, if these things can be done, we shall soon attain the speed of a bullet, and in a similar manner, too. But let us have this subject fully illuminated in your paper, for there may yet be something in it.

HAMILTON ILLINOIS.

Tempering Mill Picks.

Messrs. Editors:—For the information of "N. D.," of Mich., and others, I will give the result of 35 years experience in making mill picks and other similar tools. A great deal depends upon the manufacture of the steel for such tools. For instance: to sharpen a mill pick, heat it evenly to a bright red, no matter how quick, so that it is evenly heated; then do all the hammering on the edge first, so as not to strike it on the edge after it is brought down thin, or the corners will be liable to crack off in hardening. Then, with light blows, reduce it to a proper thickness, hammering on both sides alike, dipping the hammer frequently in water. Do not strike it hard when too cold; file the pick to an edge; then heat evenly, as before, though not quite so hot, and plunge into water, not too cold, for a distance of three-fourths of an inch. Continue to sink the tool gradually for an inch more, or it will be liable to jump off at a line between the hard and soft steel, then let the temper run down until the color begins to change; just enough to toughen but not materially soften the steel; after this cool it off.

If this process answers N. D. as well as it does me I shall be amply rewarded.

I use may old files from the saw-mill for picks, which I find very economical. A. T. P.
Albia, Iowa, July 15, 1865.

Taste in Designing Machinery.

Messrs. Editors:—Almost every product of human hands may be said to consist of two parts, viz., the real and the ornamental or ideal. A machine may perform its work well, quietly and rapidly and yet be uncouthly and ill-proportioned; in other words, a machine may be in its real and essential quality all that could be desired, and yet be unskillfully designed. The outline of its frame work may consist of straight lines, sharp corners, and abrupt terminations, where there should be a symmetrically curved

outline, with weight and strength, varying according to the demands of the work to be done by the machine. Its working part may be too heavy here and too light there for the office for which they were designed.

Not many years ago I saw a steam engine on exhibition in a New York fair, which was entirely covered with carvings, gilding, beadings of every kind; it was made down South—in Montgomery, Ala., I think—and "What a beautiful thing!" was the exclamation of many a passer, but I wondered at the taste, or, rather the want of taste in the designer of such a pile of superfluities.

Some of the forms of architecture to which we still cling with tenacity are deserving of much criticism and modification. But let me say to Young America, be simple, truthful, persistent, bold and original in all your elaborations, then will the work of your head and hands be in keeping with your professions, and in harmony with the progressive democratic-republican idea, and worthy your race and time.

F. G. W.

Worcester, Mass.

Another Cause for Defective Cartridges.

Messrs. Editors:—I notice some letters in your paper of the 8th inst., in regard to the metallic copper cartridge. I will set forth my experience in this matter. I have had one of Ballard's breech-loading rifles for the past two years, and when the mercury stands at 12° to 30° below zero, the tallow on the outside of the cartridge scrapes off when the cartridge is inserted in the gun and rolls up in a ball behind the flange on the back end of the cartridges, forming a cushion between the flange that contains the percussion, and the end of the barrel, so that the blow from the hammer is insufficient to strike off the fulminate through the tallow. I have had five out of six miss fire through this cause, but by warming the cartridge and wiping off all the tallow not one out of a hundred will miss fire.

J. H. TIBBITS.

Shokopee, Minn., July 13, 1865.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Ratchet Lever Press.—This invention relates to a press in which the follower is actuated by two sets of lever pawls and eccentrics, in combination with ratchet wheels and chains (or, instead of the chains, racks and pinions, or worms or worm wheels might be substituted), in such a manner that by the continuous revolution of the driving shaft an intermittent rectilinear motion is imparted to the follower, and the most powerful pressure can be effected. The driving eccentrics are placed at right angles to each other, so that if one of the pawls draws back to take a new tooth the other pushes, and the motion of the follower is made as steady and continuous as possible. Said eccentrics are, however, arranged in such a position that the lower pawls on one end of the press take hold at different times from those on the opposite end, and the follower travels up alternately, first on one end, then on the other, whereby the operation of the press is greatly facilitated, and a much more powerful pressure on the material in the press can be effected than in ordinary presses, where both ends of the follower move simultaneously. The chain wheels are so constructed and arranged in relation to the ratchet wheels and to a hand wheel on each end of the press, that by turning the hand wheels in one direction the chain wheels are tightened and rendered rigid with the ratchet wheels; and, furthermore, the follower can be moved up by hand until the material in the press is compressed to such a state that no more than hand power is requisite to complete the pressing, and when the pressing operation is complete, and the bale tied, the follower can be released by simply turning the handwheels, whereby the chain wheels are rendered loose and allowed to turn back, independent of the other mechanism. The follower is then made to descend instantaneously by its own gravity, and no time is lost in working the press back. Thos. B. Webster, New York City, is the inventor, and has assigned it to himself and Thomas Gannon, of No. 25 Old Slip, N. Y.

Valve.—This invention consists in a flat disk valve,

with two or more passages communicating through the interior of the valve, in combination with a flat seat, furnished with two or more ports, which communicate with the receiving and discharge pipes, and with a center pin passing through a central shell in the valve and seat, and held in place by a spring and nut, in such a manner that when the valve is turned and the ports in the same made to communicate partially or wholly with the ports in the valve seat, a free and unobstructed communication is effected between the pipes, which communicates with the several ports in the seat, and a valve is obtained which is not liable to leak, and to the working parts of which free access can be had with little loss of time. D. D. Allen of South Adams, Mass., is the inventor.

Sewing Machine.—This invention relates to certain improvements in that class of sewing machines which produce what is termed the lock stitch. The loop of the needle thread is caught by the beak of an oscillating bobbin holder, which rests loosely between the jaws of an oscillating shoe, being retained in its position by a hemispherical spring bearing, which drops into a socket in the center of the bobbin, and which is so arranged that the loop of the needle thread will slip through between the same and its socket. After the loop of the needle thread has passed over the bobbin, carrying the lower thread, and the needle has ascended, said loop is turned up and held under the table by a slide actuated by a vibrating arm, in such a manner that the needle, on its subsequent descent will not pass through it, and each stitch is drawn tight by the subsequent action of the beak of the bobbin holder on the next succeeding loop of the needle thread. The feeder is secured to a bar, which has a reciprocating and a rising and falling motion, being subjected to the action of a cam and to that of a spring, the former to raise it up against the action of the presser foot and force it out against the spring, and the latter to cause the feeder to recede, and while retracting it (the feeder) is depressed by the action of the presser foot, so that its teeth will be clear of the material to be sewed. Patented in the United States and in Europe through the Scientific American Patent Agency, by Jacob Zuckermann, of No. 206 William street, New York City.

Double Screw Press.—This invention relates to an improvement in that class of presses in which the power is exerted by a right and left hand screw acting by means of toggle arms on the follower or followers. The box in this improved press is placed in a horizontal position, the right and left hand screw passing through its center in a vertical direction. On each side of the screw is a follower, and two nuts travel up and down on the screw whenever a rotary motion is imparted to the same. Said nuts connect by toggle arms with the follower, and if by turning the screw in the proper direction the nuts are made to close up, the toggle arms exert a progressive power on the follower, and the pressure on both sides of the screw is perfectly balanced, and all the power exerted by the screw and toggle arms is utilized. The bearing of the screw spindle and those of the driving shafts are movable or yielding, so that they are allowed to adjust themselves according to the quantity of material in each press box, and that the screw spindle is not subjected to an unequal strain, which would have a tendency to bend it. The nuts are composed each of two jaws, which are made to open and close by means of eccentrics or crank shafts passing through them, and geared together in such a manner that by turning a hand wheel both jaws open or close simultaneously, and the nut can be made to release or grasp the nut instantaneously. By this arrangement much time is saved in operating the press, since in working the followers back the nuts can be released, and thereby said followers are brought in such a condition that they can be pushed back with little loss of time. Thomas B. Webster, of New York City, is the inventor, and has assigned it to himself and Thomas Gannon, of No. 25 Old Slip, N. Y.

Artificial Leg.—This invention consists in a double butt hinge fastened to two pieces of wood, one of which is inserted in the leg above and the other below the knee joint, and which are shaped in such a manner that the requisite motion is left to the leg backward and forward, and that at both extremities of its motion the hinge and the pieces of wood are brought flat against each other, and a positive stop

is obtained. The invention consists further in an ankle joint, composed of two plates secured to the lower end of the leg, and two brackets fastened in the heel part of the foot, in combination with a pin passing transversely through the plates and brackets in such a manner that a firm, durable and simple joint is obtained, which leaves the foot at liberty to swing up and down as far as may be desirable. The invention consists finally in a tendon, one part of which extends up from the heel to a loop suspended from the blight of a belt, one end of which is secured to an eye-bolt secured to the lower part of the knee joint, and in front of the same, whereas its opposite end extends up over a rod or roller in the upper part of the knee joint, to which it is secured near the bough in such a manner that when the knee joint is straightened out the tendon will have a tendency to prevent the same from bending, and a spontaneous breaking down or involuntary bending of the joint is avoided. Joshua Monroe, of No. 560 Houston street, New York City, is the inventor.

Bracing the Running Gear of Railroad Cars.—The pedestals of railroad cars, in which the bearing of the axles are fitted, have a tendency to be forced out of a perpendicular or vertical position in consequence of the side surging, lurching and concussions to which they are subjected when the cars pass over curves and turnouts. This is more especially the case when axles are used having no collar or shoulder on the outward end of the journal. The forces above referred to, and also the powerful brakes pressing against the wheels at their outer or farther sides have a tendency to disarrange the parallelism of the two axles or their rectangular alignment, in either of which cases the car runs hard and is prone to leave the track. This invention is designed to obviate these difficulties, and it consists in an arrangement of longitudinal stays or connecting rods and diagonal stays applied to the pedestals in such a manner as to effect the desired end. John Stephenson, New York City, is the inventor.

Axle Box.—The object of this invention is to obtain an axle box for car axles which will afford them greater facilities for repairs than usual, and which will promote the durability of the box and of the parts connected therewith. The bearings and journals of railroad carriages are moved more rapidly toward the shoulder in consequence of the presence of some foreign substances entering at the aperture through which the journal passes into the box. Many contrivances have been devised to prevent such entrance, most of which are complicated, requiring attention and adjustment, and resulting in but partial success. This invention, it is believed, is superior, on account of being simple, self-regulating and more efficient. John Stephenson, New York City, is the inventor.

Valve for Gage Cocks, Etc.—The object of this invention is to construct a valve for gage cocks that shall fit closely to its seat, operate easily, and lose none of its qualities by long continued use; and it consists in making the valve in a conical form, and fitting it in a correspondently bevelled seat, and in forming in its base a tunnel-shaped cavity, into and against which the steam or water presses, in such a manner that the steam or water itself causes the valve to fit so closely to its seat that there is no possibility of any escape of either the steam or water, except when the valve is turned for that purpose. E. A. Walker, of Nashville, Tenn., is the inventor.

Machine for Cleaning and Finishing Silk Thread and Other Articles.—The object of this invention is to finish silk thread after it has been spun, and other articles made of silk, such as twist, braid and cord, and also thread cord and other articles made of cotton, linen, worsted or other fibrous materials. It supersedes the process of cleaning such articles by means of knives or sharp-edged bodies, and by means of passing them over a flame, as commonly practised. This invention consists, among other things, of a new process of cleaning such articles by means of frictional contact with metallic or other suitable surfaces. By the method now commonly used silk is cleaned in the raw state and by single threads, and whenever an uneven thread or a knot comes along the cleaner knives will cut the thread in two, and the two ends must then be united again, and since in making sewing silk or twist as many as twelve or fifteen of these threads are twisted together, it follows

that the silk or twist is full of knots and very uneven. But by this new process the silk is wound, doubled and twisted into silk thread or twist while in a raw state, and then dyed and afterward put through the machine described in this patent, which stretches, cleans and finishes it, taking out the kinks and softening it, and also greatly brightening its color. A machine with eight cleaning spindles will do the work of about fifty operatives, and also effect a great saving in silk. Tobias Kohn, Hartford, Conn., is the inventor.

Register.—This invention relates to a new and improved register for denoting the number of revolutions made in a given time by any shuffling of machinery. The invention is more especially designed to be applied to marine engines, in order to show the number of revolutions of the paddle wheels or propeller, but it may be advantageously applied to all machines where a knowledge of the speed of certain driven points is desirable. The object of the invention is to obtain a register which will be compact and operated by a positive mechanism, so that it will perform its work with accuracy, and have its index wheels so arranged that they will be capable of being set to the new mark at the commencement of each operation of a machine. Victor Giroud, New York City, is the inventor.

Drill and Apparatus for Boring Wells.—This invention has for its object the boring of oil and other deep wells, and it embraces several improvements in apparatus for effecting the work. The drill has several cutters, two of them with narrow faces set on opposite sides of the main cutter, and all the cutters are placed at an angle with the axis of the stock, so that they give a forward or angular stroke. The drill stock is provided with vanes, also set angularly for the purpose of giving a partial rotation to the drill by means of the resistance of the fluid and debris of the rock through which the drill descends. The edges of these vanes are armed with surfaces of glass or other suitable material which will resist abrasion and protect the sides of the cutters, so that the drill shall not be worn to a smaller diameter. The head of the drill stock works in a swivel, and is free to rotate and also to move vertically therein, so that the drill receives a downward blow from the swivel after the cutters have reached the bottom of the bore, and also an upward blow when it is being raised for the next stroke. The drill rope is fed out automatically by means of a spiral groove formed in a stationary pin, around which the rope is wound in connection with a friction roller which is placed above the said pin, and the stroke of the drill is effected by means of a drop motion. Caleb Bates, of Kingston, Plymouth County, Mass., is the inventor.

Method of Separating the Products, by Distillation, of Hydro-carbon Oils and Other Substances.—The object of this invention is two-fold—first, to separate the benzole and heavy oils from the illuminating oils while manufacturing the same from petroleum, coal and other substances; and second, to return the heavy oils which are condensed in the first sections or parts of the condenser to the still for redistillation. The first part thereof can be applied with advantage to the distillation of all volatile liquids, as, for instance, to whisky or alcohol, since the water distilled over will be condensed before the spirits, and may be separated by this process with great facility. L. N. Wilcox, Pittsburgh, Pa., is the inventor.

Gas Lighting Device.—This invention relates to a new and useful device for lighting gas, and is more especially designed to be used for lighting street and other out-door lamps, so as to dispense with the use of friction matches, a great number of which are consumed for this purpose on account of failures to ignite, owing to the wind, storms, dampness of the atmosphere, unnecessary waste, etc. The invention consists in inserting an oil or other lamp within a suitable case provided with an opening at such a point and in such relation with the wick tube of the lamp that the device may be applied to the gas burner, and the flame from the lamp ignite the gas issuing therefrom. John G. Harper, New York City, is the inventor.

BEET CULTURE IN FRANCE.—It is said that the beet culture in France now furnishes more than a hundred million pounds of sugar, for human consumption.

Improved Isochronal Chronometer.

This article is furnished by the inventor.

"The manufacturer of the Isochronal Pocket Chronometer, after an experience of over thirty years in practical watchmaking, believes he has constructed a watch which, in excellence of time-keeping and durability, far exceeds any now in market. The combinations introduced in his chronometer are such as to insure perfect time in all climates and occupations. The inventor, through strict adherence to the most approved mechanical principles, has been enabled to avoid all those errors and defects to which other chronometers are more or less liable.

"The inventor of the American pocket chronometer has, during his long experience (more than thirty years), had ample occasion to observe the defects of

all the advantages of both of these, and is entirely free from the defects that they are liable to."

This invention is protected by three patents, dated Feb. 1, 1859; April 5, 1864, and March 7, 1865, all issued through the Scientific American Patent Agency. For further information address the inventor, Charles Fasoldt, 128 State street, Albany, New York.

A New Light.

This journal recently called attention to the strong resemblance of the crystals of sulphate of magnesia and sulphate of zinc, they being so much alike that the eye cannot with certainty distinguish the difference. Unfortunately a proof of this was given in the city about the same time, for a chemist's assistant served a woman with sulphate of zinc for Epsom

MISCELLANEOUS SUMMARY.

GREAT PRIZE IN VOLTAIC ELECTRICITY.—The French Government has just announced the renewal of the grand prize of 50,000 francs to be given, in five years time, to the author of a discovery which shall render the voltaic pile economically applicable as a source of heat, as a means of lighting, or otherwise, in chemistry, mechanics, or medicine. This prize was awarded, in September last, to M. Ruhmkorff, for the well-known apparatus which bears his name. In case no invention deemed worthy of the honor should be brought forward within the time specified, the period may be prolonged for another five years by decree. The prize is, we believe, open to all the world, but it is not so stated.

Fig. 1.



Fig. 3.

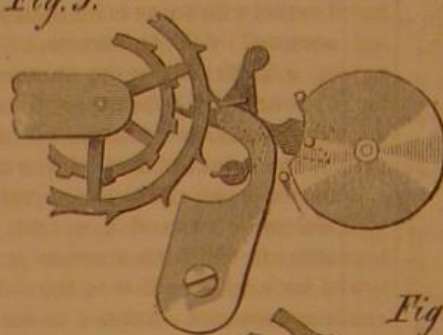
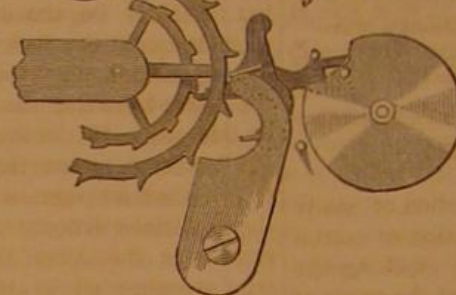


Fig. 4.



Fig. 5.

**FASOLDT'S ISOCHRONAL POCKET CHRONOMETER.**

different escapements; and his aim has been to construct one which should, as far as possible, be free from all the defects heretofore encountered.

"The isochronal escapement works by means of two wheels, and gives the impulse, not by a stroke, as in the detent spring, but equal driving; thereby reducing the friction to the lowest possible point.

"The following is a description of the superiority of my escapement:—Fig. 1 is a top view of the 'movement'; Fig. 2 has a portion removed, and Figs. 3, 4, and 5 show the improvement which constitutes the invention. It is through its construction held by every movement of the balance to unlock, and to

Fig. 2.



add thereto the requisite or necessary impulse. Each impulse imparted will show correctly on the dial and cannot—as in the case with the detent spring-chronometer escapement—escape double or not at all. The counter or outside motion, will have no influence on the time. The escapement cannot get out of order when being cleaned, because it is so constructed that it operates through mechanical action and has no need of springs, like the detent spring escapement. The action of the detents is like the anchor, and the escape is like the detent spring escapement. It has

salts, in consequence of which she was made very ill, but is now slowly recovering. *L'Opinione*, of Turin, announced that Professor Carlevaris de Mondovi had discovered a means of producing light of more actinic power than that given by metallic magnesium, and that the editor of that journal had seen portraits taken by its aid. The inventor—who at first kept his process a secret, although he had made some successful experiments with the new light at the Scientific Institution at Genoa—came last week to Paris, and made his process known at the Academy of Sciences. He said that when magnesium wire was ignited in atmospheric air, or in pure oxygen, the most luminous effects were not manifested till a certain quantity of oxide had been formed, and was raised by the heat produced to an excessively high temperature. The light in this case, as in the combustion of carburetted hydrogen, as in that of hydrogen in contact with platinum, and as in the Drummond arrangement, is derived from the solid particles raised by the flame to a great heat—a heat which dissolves and volatilises platinum, but leaves the oxide of magnesium solid, fixed, and intact. To raise this oxide to the temperature necessary to give the greatest light, it should be presented to the flame in as small a quantity and in as large a volume as possible, which is done by employing a spongy oxide, obtained in the following manner:—A piece of chloride of magnesium is exposed to the flame of the oxyhydrogen blowpipe, in contact with a piece of carbon. The chloride of magnesium is rapidly decomposed, leaving the spongy oxide, which gives the light in question; or by simply replacing the chloride with the carbonate of magnesia of commerce, the same effect can be produced.

COFFINS for preserving the bodies of the dead for an indefinite length of time, by means of ice, are now sold in New York City. The bodies are preserved in a dry and frozen condition so that little change takes place. Persons who desire to be preserved after death should so specify in their wills and bequeath funds to keep up the supply of ice as long as they wish the preservation to be maintained.

From the single county of Bergen, N. J., there were sent to the New York market 4,500,000 baskets of strawberries last season.

PRESERVING GRAPES.—Mr. F. J. BOVING, of Lancaster, Ohio, has been very successful in preserving grapes during the winter, in the following manner:—On a clear bright day he gathers perfectly ripe and sound bunches, and lays them carefully in stone jars holding one or two gallons each. The jars are then set in the ground, in a trench deep enough to allow their tops to be eight or ten inches beneath the surface. Some boards are then laid over the jars, the trench filled up over it. Grapes packed in this way keep perfectly well until the first of March.

THE Beloit (Wisconsin) *Journal* mentions one firm in that town who have, during the present season, built 700 agricultural machines, comprising reapers, mowers and two wheel cultivators. The number of cultivators manufactured by them is 450. The firm has been very successful in selling, the articles manufactured being already disposed of.

STEAM AGAINST MUSCLE.—In a race between a steam wagon and a pedestrian at Poughkeepsie on Friday last, the wagon went a mile in 2.20, beating the man, who was to go a half mile. The man made his mile in 5.20. The wagon also beat a trotting horse, who went his mile in 2.37½.

THE *Dictator*, ocean monitor, arrived at Boston on the 23d inst., on her way to Halifax, and ultimately to Europe. On the trip to Boston she made nine to eleven knots an hour with ease and it is hoped to increase the speed to thirteen knots.

THE *Quinnebaug*, government transport recently destroyed, was an old vessel and one of the first in which twin screw propellers were used. She formerly ran to Norwich.

MESSRS. CROSSE AND BLACKWELL have lately had a large boiler made of aluminum, in which their jams and preserves are boiled. By this means all injury from any contact with copper is avoided, and the aluminum is not attacked by the operation.

A SOLUTION of a pound of copperas in one gallon of hot water, diluted with five or six gallons of cold water, and applied with a watering-pot, has been found fatal to the currant worm.

"JACKSON'S Hominy Mill," illustrated on page 31, of the present volume is very highly spoken of; the inventor's address is Andrew P. Jackson, Memphis, Clark Co., Indiana.

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NEW YORK, SATURDAY, AUGUST 5, 1865.

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THE WANT OF THE DAY.

Since the war has ended the attention of many persons has been drawn to the cultivation of cotton with the laudable design of once more stocking the market and starting factories, so that the needs of the people shall be supplied.

Of course the old time methods of growing this staple are unsuited to the spirit which now directs operations. Listless and slovenly culture is to give way before an energetic, methodical and business-like mode, so that two bolls shall grow where but one did formerly. Machinery in general is wanted, but for one special machine, above all others, there is great need. That is one for picking cotton. At present the yield of cotton per acre is limited by the quantity which can be picked during the season. Planters inform us that one of the greatest obstacles to renewing the cotton supply is the difficulty experienced in harvesting what the land is capable of producing. They further assure us that if a machine could be invented for picking cotton, not only would great good to the community result, but the fortune of the lucky inventor be secured beyond doubt.

Let it not be supposed that we broach this subject with serene self-confidence, as if we had only to will that such a machine should be made, or that the production of it is a simple problem easily solved by a tyro. This is not the case. The task is arduous. There are difficulties in the way but the invention would be a great one and take rank beside that other machine, the gin, which has a world wide celebrity. Let us look at some of the difficulties. Cotton does not all ripen at once. It grows to various heights in the same row. It does not always grow to the same height in the same State, or county, or field, even. It is cultivated in rows five or six feet apart, and the plants are from 30 inches to 60 inches tall.

Now a machine has to be made which will go between the rows, look at the opened bolls, take them and reject the others. And this has to be done with such untailing accuracy that it will be a success, like the mower or reaper. Nice mechanism is, of course, out of place; a costly machine would be a dead failure. It is necessary to have the cotton picker so simple, so reasonable in price and so useful that any person with two hands can use it, or any one that is able to raise five bales of cotton, own one.

Parties who are now engaged in raising cotton are agreed on these points, and think that the machine should pick at least four times as much as a full hand can. By working between sun and sun the latter can gather 400 pounds. We firmly believe that this machine can be produced. If not to-day, in the future, but the sooner the better. The incentives to exertion are great, the obstacles are also great, and

no man should put his hand to this plow if he thinks of looking back.

All the information we can obtain on this subject we shall immediately lay before our readers and we suggest that planters and others interested in such machines should endeavor to aid inventors by forwarding communications containing practical hints relating to it.

THE CHALLENGE TO THE NAVY.

The monotony of midsummer has been broken recently by a revival of the discussion which Mr. E. N. Dickerson and the Navy Department have been carrying on for some years past, greatly to the delight of the friends of both parties, also to the delectations of persons who are fond of comic literature.

The machinery of the *Algonquin*, a double ended naval vessel which was constructed by Dickerson was not accepted by the Government for causes not made public, and Mr. Dickerson thereupon issued a challenge to the Navy Department to try the speed of the *Algonquin* and the economy of her machinery by a race. The conditions of this trial were that each steamer was to have an equal amount of coal weighed into her and run until the same was exhausted; after this the steamer giving out was to be towed back by the other to the starting point. This challenge was not accepted under these conditions, but the Navy Department offer to try the engines of their design at the dock against those of Mr. Dickerson, by testing the amount of power given out for fuel burned, leaving the decision to engineers of note in this city. Mr. Dickerson's reply to this challenge had not been promulgated at the time of our going to press but we presume he will decline it. We hope the test trial will come off, and that neither Mr. Dickerson nor the Navy Department will object to the trial as suggested by the other. Why not test the matter under both conditions?

TOOL BORROWERS.

A tool borrower is a tool breaker. He that knows how to use tools keeps them in order and always has them ready for use. There is nothing more trying to the good workman, when he has just sharpened his tools and put them in their appropriate places, than to have some shiftless comrade catch one of them up, turn the edge, break it, knock the handle off, then put it back slyly in the drawer, or, what is more likely, throw it down where he got through with it.

If it be in a machine shop, there is sure to be some good-for-nothing, who goes prying about his companions' lathes for a sharp side tool with a long point. This he pounces on, runs it under the center and breaks the end off, after which exploit he borrows another of some one else to be served the same way.

All the center drills that can be found in the tool-borrower's possession are broken short off. His center punches are blunt, his files without handles, and the tangs bent. His hammer is loose on the handle, his chisels are a quarter of an inch thick on the end. There is a filthy mess of greasy waste, old washers of different sizes, a lot of old bolts and a piece of yellow soap daubing everything in his drawer. Red-lead litters up one corner, and a reversed oil can, dripping its contents over everything, aptly represents the character of the man and his ideas—all upside down.

It is the same with neighbors in the country or the city. "Lend me your ax?" says one. "Oh, yes," you reply cheerfully, but it is ten chances to one if you ever get it again, or if you do the edge is destroyed, and the helve is half out. If the hammer is loaned it never comes back. The saw wants setting when you go to get it from the man you lent it to, and you find to your sorrow that it was not hard enough to cut nails, as the rounded teeth testify. The worm on the auger is a worm no more, and the lips of the edge will cut nothing. The screw-driver is bent, and the gimblet broken short off, and ruin is over and upon all.

There are some occasions where tool borrowing is pardonable and justifiable, that is when they are returned in as good condition as they were taken away. To those who continually abuse tools they should never be lent, for no man is obliged to suffer loss for the convenience of others. Tools are indispensable to every one not rich enough to hire a workman for every job that has to be driven, and the time, trouble

and annoyance saved by having the tools always at hand and ready for use cannot be lightly estimated.

THE GREAT SCHOOLS OF ENGLAND.

In the year 1861, a Commission was authorized by the British Parliament to make a thorough examination of such of the principal schools of England as are supported mainly by bequests or endowments of property, and the report of the Commission has been largely discussed by the leading English reviews. It seems, from the report, that these great and rich schools are characterized by inefficiency and dishonesty; the revenues being appropriated by the officers for their private use, and the students being left to ignorance and demoralization.

A summary of the facts of this report may be found in a convenient form in a pamphlet of 117 pages just published by Sever & Francis, of Cambridge, Mass. They were embodied in a lecture read before the Society of Arts of the Massachusetts Society of Technology, by W. P. Atkinson.

The results of these rich endowments of schools in England are worthy of examination by our own men of wealth, who are making so many similar endowments.

THE FAIR OF THE AMERICAN INSTITUTE.

We direct attention to the advertisement on another page of the American Institute. This exhibition, it is hoped, will exceed all former ones, and strenuous efforts are being made to render it a complete success. All persons interested in such matters and able to send anything likely to interest the public, should apply for space immediately. Machinery in motion is to be shown, and the committee in this department are determined to make it one of the prominent features.

THE COLOSSUS OF RHODES.—Dr. C. F. Luders, Professor at the Johanneum at Hamburg, has just published a critical historical treatise on the Colossus of Rhodes, about which the most crude ideas and fabulous exaggerations exist in the public mind. According to the researches of Dr. Luders, this monument, one of the seven wonders of the world, is reduced to nothing more than a colossal statue, standing on *terra firma* like the Bavaria at Munich, but near the harbor, and dedicated to Phœbus Apollo. He insists upon it that its standing open legged across the mouth of the harbor, and being used as a lighthouse, is a pure invention, and an emanation of fancy from later writers.—*London Builder*.

ST. CLOUD, MIN., is a great place for lumber, and, of course, for saw mills. A sight of the rafts that go by or stop there would astonish people not used to the rough productions of the forest. Recently the advance of Morrison & Smith's drive of eleven million feet, and a portion of Kean's drive of three millions also passed the town. These are owned in St. Anthony and Minnesota. Toby & Morrisons's drive of over a million and a-half feet will be there soon. The greater portion of these will stop at St. Cloud, and will furnish the mills with work enough for some time.

We learn that at the ironworks of Holmberg & Co., at Lund, a new invention has been applied, by which tubes of iron can be cast by centrifugal force. The machine is of very simple construction; it is composed of a cylinder, which can be opened and closed, and into which molten metal is poured. A rapid rotary motion being imparted to the cylinder, the liquid mass is pressed against the sides, and the result is the formation of a perfectly uniform and straight tube. The machine was invented by a young workman named Auguste Larson, and the first trials proved completely successful.

MISFORTUNES OF TALL PEOPLE.—General Scott says that people think he is proud and pompous simply because he is tall and erect. To a recent caller, who expressed surprise at his affability, he remarked, "Sir, it has been the misfortune of my life to be six feet four inches high and have a straight spine. Had I been round shouldered, or had a hump on my back, it would have relieved the odium in the public eye."



ISSUED FROM THE UNITED STATES PATENT-OFFICE
FOR THE WEEK ENDING JULY 25, 1865.
Reported Officially for the Scientific American.

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

48,883.—Valve.—D. D. Allen, South Adams, Mass.:
I claim the valve, A C, in combination with the spring, b, and tongue, i, and belt, d, substantially as and for the purpose described.

48,844.—Cultivator.—W. D. Ament, Muscatine, Iowa:
I claim the adjustable metallic plate, G, formed or cast in one piece, with the bearings, I, substantially as described.

[This invention relates to an improvement in that class of cultivators which are commonly termed "riding cultivators," and it consists in a novel construction of certain parts whereby several advantages are obtained.]

48,885.—Shingle Machine.—Sherman E. Anthony, Stillwater, N. Y.:
I claim the circular saws, C C, when arranged and operating as described, in combination with the endless toothed chains, for the purposes substantially as set forth.

[This invention relates to a new and improved sawing machine of that class in which circular saws are employed for sawing the shingles from the bolt.]

48,886.—Apparatus for Compressing Air.—Wm. Arthur, Brooklyn, N. Y.:
I claim the combination of the air pump employed to compress air with a series of air vessels by means of pipes and stop cocks connecting the air pump and air vessels, substantially as hereinbefore set forth, in such manner that the air which has been compressed into one air vessel may be used to supply the air pump when compressing the air to a greater extent in another air vessel, substantially as herein set forth.

I also claim the combination of the said apparatus with a water force pump to increase the pressure of the air in the last vessel, substantially as herein set forth.
I also claim the conical construction of the vessel of the series into which the air is ultimately compressed, when such vessel is combined with a water force pump, substantially as set forth.

48,887.—Amalgamator.—John B. Atwater, Chicago, Ill.:
I claim, First, The application of oscillating plates, or their equivalents, to the circumference of a cylinder which is arranged to rotate within a vessel, A, substantially as described.
Second, So applying movable plates to a rotating cylinder, or its equivalent, which is arranged within a vessel adapted for containing melted lead or mercury, that said plates will operate automatically for receiving and discharging the quartz, substantially as described.

48,888.—Lady's Work Stand.—John B. Atwater, Chicago, Ill.:
I claim providing a table with one or more trays, or their equivalents, which can be elevated above the top of the table or depressed beneath said top, substantially as described.

48,889.—Device for Operating Window Sash.—James R. Baker, Kendallville, Ind.:
I claim the employment of one or more vertically adjustable spur wheels applied to a window frame, in combination with toothed racks applied to the sashes, said parts being so arranged that the sashes can be connected together and made to counterbalance each other, or the lower sash operated independently of the other, at pleasure, substantially as described.

48,890.—Grain Separator.—H. A. Barnard, Moline, Ill.:
I claim, First, The arrangement of a suction fan, B, between the air trunk, F, and the screen and shaking shoe, and in relation to the inlet and exit passages thereof, so that two separations of the grain from its impurities shall take place, while the grain has one continuous path through the machine, substantially as herein described and represented.

I also claim the combined use of an open cam or eccentric, and a coiled spring, for giving a light but rapid shake motion to the sieves, substantially as herein described and represented.
I also claim making the pipe or trunk which carries the feeding spout, d, adjustable, so that it may be turned in either direction to facilitate the "spouting" or feeding-in of the grain to be cleaned and separated, substantially as described.

48,891.—Vessel for Holding Petroleum.—J. W. Barnum and Peter M. McNoah, Detroit, Mich.:
I claim the employment of use of sheet-iron, coated wholly or in part with lead, for making vessels for holding petroleum or other volatile liquids.

[This invention has for its object the construction of a metallic vessel or cask for containing petroleum and other volatile oils and substances, which will not injure the quality of the substance placed therein nor be liable to leakage and wastage.]

48,892.—Drill for Boring Wells.—Caleb Bates, Kingston, Mass.:
I claim, First, In drills for boring oil and other wells, protecting their sides from abrasion, by means of a vitreous or equivalent surface placed in the ends of the arms or vanes on the drill stock, or elsewhere on the stock, substantially as above described.
Second, I also claim the use of leading cutters, S, for splitting the rock, in combination with the wide-cutting surface, R R, substantially as described.

Third, I also claim setting the cutters of the drill at an angle with the axis of the drill stock, substantially as and for the purpose described.
Fourth, In combination with a drill, adapted to operate as described, I claim the swivel, M, constructed and applied in the manner and for the purposes specified.

Fifth, I also claim feeding the rope of the drill automatically, by means substantially as above described.

48,893.—Washing Machine.—Isaac A. Beals, Middleboro, Mass.:
I claim the combination and arrangement of the two reciprocating and connected dashers, C D, and the upright grid, B, applied to the tank.
Also the combination of the same, and mechanism, as described, for operating the two dashers.

48,894.—Washing Machine.—William Beaton, Grinnell, Iowa:
I claim the combination of the reciprocating rubber, B, presser bar, C, springs, D, pitman, E, crank shaft, F G, gearing, H I L M, shafts, J N, spring, Q, and escapement, R S T, all constructed, arranged and operating as and for the purposes specified.

[This invention consists in applying the power of a spring or weight to a reciprocating rubber of a clothes-washing machine, in such a

manner that the clothes may be washed without the employment of manual labor.]

48,895.—Axle for Vehicles.—Wheeler Beers, Bridgeport, Conn.:
I claim the application of the springs to an axle, in connection with the tube or flange, the circumferential projection in the interior of the box, and the nut on the outer end of the axle, substantially as and for the purpose set forth.

[This invention relates to a new and useful improvement in axles for vehicles, whereby a certain degree of longitudinal play is allowed the box of the hub on the axle, and a corresponding degree of lateral play allowed the wheel, whereby the latter will be protected from undue strains, and also from lateral jars or concussions, and much wear and tear prevented, and also the body of the vehicle prevented from being racked.]

48,896.—Stills for Distilling Petroleum.—John Bibby and Allen Lapham, Brooklyn, N. Y.:
We claim, First, The elevated exit chamber, C, in combination with the chimney or flue, B, which passes through the center of the still, substantially as and for the purpose herein set forth.

Second, The perforated cone or dome-shaped plates, E, and gutters, F F, applied in combination with each other within a still, substantially as and for the purpose herein specified.

48,897.—Spring Gaiter.—F. M. Blodgett, Boston, Mass.:
I claim the mode herein described of applying the staples of gaiter fastenings to the flaps of the gaiters.

48,898.—Apparatus for Preserving Food for Transportation.—Maurice Brune, New York City:
I claim the combination and arrangement of the several parts, substantially as and for the purposes described.

48,899.—Car Platform Stake-holder.—C. H. Bryan, Racine, Wis.:
First, I claim the combination of the stake, A, provided with the hole, a, with the bolt, D, and nut, E, arranged and operating substantially as and for the purposes specified.

Second, I claim in combination with the above the employment of the jaws, c, arranged and operating as shown and described.
Third, I claim the combination of the skate, A, socket, B, jaw, C, bolt, D, and nut, E, arranged and operating substantially as and for the purpose specified and shown.

48,900.—Grain Binder.—W. W. Burson, Rockford, Ill.:
First, I claim the arrangement of the jointed arm, A, with the groove, O, to hold the band material perpendicular and out of the way of the gavel, substantially as described and for the purposes set forth.

Second, The combination and arrangement of lever, T, with cam groove, P, and spool, R, substantially as described and for the purpose set forth.

Third, The combination of lever, U, cam collar, S, and pitman, W, with tightening cord, J, substantially as described and operating for the purpose set forth.

Fourth, The combination of the hook, a, with shaft, D, and groove, E, constructed substantially as described and operating for the purpose set forth.

Fifth, The combination of hook, a and b, constructed and operating substantially as described.

Sixth, The combination of hook, c, provided with the cutting point, d, with the receptacle plate, m, having the cutting edge, b, operating substantially as described and for the purpose set forth.

Seventh, The combination and arrangement of the delaying point, h, and recess of receptacle plate, m, with hooks, a and b, operating for the purpose set forth.

Eighth, The projecting blocks, f and p, on alternate sides of the opening in the platform, M, operating for the purpose set forth.

Ninth, The combination of latch, n, lever, o, and forearm, A, constructed substantially as described and operating for the purpose set forth.

48,901.—Balanced Slide Valve.—A. S. Cameron, New York City:
I claim, First, The combination of the diaphragm, C, and rollers, D, and valve, B, constructed and operating substantially as and for the purpose set forth.

Second, The arrangement of cogs or their equivalents at the ends of the rollers and corresponding toothed racks on the backs of the slide valve, substantially as and for the purposes described.

48,902.—Valve for Steam Engine.—J. Wesley Carhart, Cohoes, N. Y.:
I claim, First, The lip or projection, e, extending from the small end of the valve, as and for the purposes set forth.
Second, The recess, f, located at the head, b, of the valve, and communicating with the steam space of the valve through suitable channels substantially as and for the purpose described.

Third, The chamber, h, located in the socket, A, above the thick end of the valve, substantially as and for the purpose specified.

Fourth, The unequal thickness of the abutments on the steam and exhaust side whereby to give lead to the exhaust.

Fifth, The recess or recesses, k, in the socket, in combination with the valve, substantially as and for the purpose described.

48,903.—Glass Furnace.—John Carroll, Longacoming, N. Y.:
I claim the combination and arrangement described of the three fire chambers, H H and G, in respect to the two benches, B B, and side walls, D D, of the furnace for the purpose specified.

48,904.—Valve Gear for Oscillating Engines.—Henry T. Carter, Portland, Me.:
I claim the arrangement of the stationary slotted link, b, projecting laterally from the standard, c, arm, J, valve stem, I, and oscillating cylinder, A, all as and for the purposes specified.

48,905.—Animal Trap.—William F. Caswell, Raynham, Mass.:
I claim the spring jaw-setting mechanism, as constructed with the wheel, t, and the rail or projection, m, combined and arranged with the tripper, D, the latch, e, and the bait trigger applied together as set forth.

48,906.—Insulator for Telegraph Wires.—Lewis A. Cauvet, New York City:
I claim constructing glass insulators for telegraph wires with an internal screw thread and securing them thereby to the bearings, bars or pins of telegraph posts, substantially as above set forth.

[This invention consists in constructing glass insulators for use in telegraph poles in such a way as that they can be secured to the poles in any position without the use of metallic or other attachments.]

48,907.—Flooring or Dust Rack for Carpets.—George J. Colby, Waterbury, Vt.:
I claim a portable flooring, A, to be laid under carpets the same being made of beveled slats secured together in sections with suitable openings to allow the dirt and dust to pass through, as herein specified.

48,908.—Window Shutter.—George J. Colby, Waterbury, Vt.:
I claim a curved, corrugated spring acting on the edge of a slat to hold the section of movable slats in any desirable position, as set forth.

48,909.—Knot Latch.—George J. Colby, Waterbury, Vt.:
I claim the knob shaft and cam in combination with the convex plates on both sides of the door so constructed as to form the lever and fulcrum to operate the latch or bolt, as herein described.

48,910.—Clothes Dryer.—Sylvanus Cole, Pawtucket, R. I.:
I claim the combination with the leather or other suitable flexible bands, b, by which the cross rods of the swinging clothes frames are hung upon their common center post or standard of the intermediate collar plates, m, made of metal or other suitable material, arranged together substantially as and for the purposes specified.

[This invention relates to a clothes horse in which a series of vertical hanging frames are hinged to and revolve upon a common center post or standard and consists in a novel and peculiar manner of bringing the same thereto, whereby a substantial and durable clothes-horse is produced, and one which in case of breakage

of any portion of it, can be easily and readily repaired without necessarily detaching all the parts composing the horse, from each other.]

48,911.—Bag Holder.—J. S. Corbin, Ann Arbor, Mich.:
I claim the combination with the fixed band, a, of the swinging frame, f, when the latter is provided with the bent spring or arm, n, and arranged to operate in the manner described.

[For an illustration and description of this invention see SCIENTIFIC AMERICAN, No. 5, current volume.]

48,912.—Machine for Cleaning Flower Pots.—S. W. Curtis, Stoughton, Mass.:
I claim the mechanism for grasping and holding the pot, the same consisting of the movable jaws, d d, their slide bar, B, the levers, e e, the toggles, g g, the lever, f, the rack, h, as specified.

I also claim the combination of the water tank or tub, A, with the apparatus for holding the pot and with that for cleaning it, as described.

I also claim the combination of the slider, p, its clamp, g, with the slider, o, the brush lever, r, and its pressure spring, t, and the cammed lever, 4, the whole being arranged and so as to operate together, substantially as specified.

I also claim the combination of the longitudinal adjusting carriage, D, and its clamping devices, k k l m, with the spindles, C.

I also claim the combination of the conical holder, b, and the spring, c, with the spindle, C, and the holding jaws, d d, and the brush, s, and the mechanism for revolving the brush, as specified.

48,913.—Manufacture of Friction Matches.—Gideon G. Dennis, Dover, N. H.:
I claim arming or applying the igniting materials or composition to each or both ends of the match stocks or splints, so as to make each splint or stick some far time lightings instead of one.

I also claim making matches by cutting or sawing into each end of a block, card or sheet of match material, so as to leave the splint jointed at the middle, substantially as described, and then applying the igniting material or composition to both ends of the stocks or splints so made or formed.

48,914.—Rock Drill.—J. C. Dickey, Saratoga Springs, N. Y.:
I claim the combination of the drill, A, with the reamer, C, substantially as described and set forth.

48,915.—Machine for Rolling Irregular Forms.—James Dodge, Waterford, N. Y.:
I claim the mechanism for driving the said pattern or cam rollers or segment with a positive motion, that is, by gear for starting the patterns or cams, by the introduction of the article to be shaped and for stopping the movement by the action of the machine itself, all substantially in the manner as herein described.

48,916.—Flour Sifter.—John Earnshaw, Lowell, Mass.:
I claim the combination of a sifting device with a flour or meal scoop, substantially as set forth.

[This invention consists in the employment, in a scoop, having a portion of its rear part made of wire gauze, of a roller having wings arranged on its surface and parallel with its length, for forcing, by rubbing or scraping, the meal or flour through the meshes of the sieve.]

48,917.—Spinning Machine.—Wm. Eberhard, Sigourney, Iowa:
I claim in combination with the feeding head and the drawing rollers, the spindles and spire, arranged and operated as set forth.

48,918.—Annealing and Polishing Sheet Iron.—J. W. Ellis, Pittsburgh, Pa.:
I claim annealing and polishing sheets of iron by placing them in a tight cast-iron box or muffle, with scales or oxide of iron, animal charcoal, coke, lime, or other decarbonizing and cutting agents, and imparting sufficient motion to the box or muffle while in the furnace to agitate the sheets of iron to such an extent as will polish them by the attrition of the annealing and cutting agencies during the operation of heating and cooling, whereby they are given the peculiar mottled and polished appearance of Russian sheet iron.

48,919.—Safe Lock.—John Farrell, New York City:
I claim combining the bolt or bolts, by which the door is secured, with the bolt of the lock by a mechanism, substantially as described, operated by the lock bolt to lock the door bolt or bolts, and which, when violence is applied to the lock, will permit the lock bolt to separate from it without unlocking the door bolt or bolts, as set forth.

48,920.—Road Scraper.—Edward A. Field, of Sidney, Maine:
I claim the combination and arrangement of the levers, l l, in or on the said levers and the wheels, t t, with the road scraper composed of the sled and the scraping bar or their equivalents, substantially as described.

48,921.—Steam Whistle.—Abraham Fitts, Worcester, Mass.:
I claim, first, The combination of two bells with an intermediate chamber, having an annular passage opposite the edge of each of the bells, substantially as and for the purpose set forth.

Second, Combining in a whistle operated by steam or compressed air, two bells tuned so as to produce musical chords, substantially as herein described, for the purpose of increasing the intensity of the sound.

[This whistle is operated by steam or hot air, and is composed of two bells with an intermediate chamber having an annular steam or air passage opposite the edge of each of the bells in such a manner that, by admitting steam or compressed air to said chamber, both bells are sounded simultaneously, and a sound of increased intensity is produced. In order to increase the intensity of the sound still further, and render the whistle particularly fit for a signal gong, the two bells are so tuned as to produce musical chords.]

48,922.—Bag Fastener.—Addison C. Fletcher, New York City:
I claim the fastening for bags and sacks, constructed as herein described, and operating in the manner substantially as herein set forth.

48,923.—Cooking Stove.—D. P. Foster, Shelburne Falls, Mass.:
I claim, first, The fire-box or grate, A, provided with the holes, e e e, or their equivalents, in combination with the slotted frames, B, constructed and arranged to operate substantially as and for the purpose herein set forth.

Second, I claim the movable stand composed of the end pieces, B B, united by the bar, J, in combination with shaft, F, pinion, E, ratchet, H, and pawl, I, for the purpose of supporting and adjusting the grate, A, as and for the purpose described.

48,924.—Hoop Skirt.—Henry Frendenburg, New York City:
I claim the spiral wire in combination with the tubular web, substantially as and for the purpose described.

48,925.—Shutter Lock.—Samuel S. Garver, Hamilton, Ohio:
I claim the door or shutter lock herein described, consisting of the case, A, rack bolt, B, pinion or segment, C, projection, e, notch, f, and friction spring, D, all constructed and arranged substantially as and for the purpose specified.

[This invention consists in the use of a rack bolt and a pinion or part pinion, arranged and applied in a very convenient and economical manner.]

48,926.—Railroad Car Rail Coupling.—Henry A. Gilman, Buffalo, N. Y.:
I claim the combination of the base plate, A, and clamping bar, C, and tightening wedges, D, or equivalents thereof, for the purposes and substantially as described.

48,927.—Register for Counting Revolutions.—Victor Giroud, New York City:
I claim the arrangement and combination of the ratchets, b, pawls, l, toothed wheels, a d, notched wheels, c, and the single toothed disks, e, applied respectively to the heads or collars, E, wheels, F G, and shaft, I, to operate in the manner substantially as and for the purpose specified.

48,928.—Gage for Setting the Pitch to Wagon Axles.—John Gorton, Providence, R. I.:

I claim the adjustable gage, described as figure 2, or its equivalent, in combination with the machine described as figure 1, or its equivalent, the whole substantially as described, for the purposes as set forth.

48,929.—Roller Skate.—W. P. Gregg, Boston, Mass.:

I claim a roller skate constructed with a stock having a small supporting roller under each end and a large driving roller on each side, substantially as described.

48,930.—Amalgamator.—Ira T. Halstead, Fredonia, N. Y.:

I claim a concave disk, provided with openings at the sides and in its center, in combination with a muller revolving in a tub with a flat or concave bottom, substantially in the manner and for the purpose set forth.

[This invention consists in the employment of a concave disk provided with openings at the sides and in its center, in combination with a muller revolving in a tub with a flat or concave bottom, in such a manner that the quartz or other material which is to be acted upon by the muller, and which, in consequence of the centrifugal force has a tendency to accumulate near the inner periphery of the tub, is caused to rise through the openings on the circumference of the disk, and to descend over its concave side to the center, where it passes back into the tub.]

48,931.—Boot-blackening Case.—F. G. Harding, Boston, Mass.:

I claim the combination of the chair, a, hinged seat, b, and foot rest, g, arranged as herein specified, for the reception and use of boot blackening appliances.

[For an illustration and description of this invention, see SCIENTIFIC AMERICAN, No. 12, Vol. XII.]

48,932.—Gas-lighting Device.—John G. Harper, New York City:

I claim a case or jacket provided with a lamp for burning oil or other suitable material, and having an opening or aperture made in it, in such a relative position with the wick tube of the lamp, as to admit of the case or jacket being applied to a gas burner to ignite the gas issuing therefrom, substantially as set forth.

48,933.—Wringing Machine.—M. Harris and R. G. Bush, Jamestown, N. Y.:

We claim the arrangement of rubber rollers upon shafts which have their ends extended and constructed so that handles can be applied to each or both when said rollers and shafts are used in a frame, for the purpose of wringing clothing, as is herein fully set forth.

48,934.—Apparatus for Washing Tumblers.—Barney Hart, Washington, D. C.:

I claim the arrangement and combination of the apparatus with the water pipes and grating above, by which a continual jet of water is projected into each tumbler or glass so as to cleanse and rinse the glass completely, as herein described.

48,935.—Construction of Flat-bottomed Boats.—Herman Haupt, Cambridge, Mass., and J. Y. Smith, Alexandria, Va.:

We claim the construction of boats or barges, substantially in the manner and for the purposes herein set forth.

48,936.—Cigarette Paper.—F. X. Hazman and L. L. Arnold, New York City:

First, We claim the manufacture of cigarette paper coated on one side with an adhesive substance, dried, and whether the same is applied to the whole surface or to the margin only.

Second, The manufacture of cigarette paper coated on one side with a substance which, when dried, shall shrink so as to give the paper a tendency to curl.

Third, The employment of the ingredients compounded in the proportions and manner herein described, for a mucilage or paper coating, for the purpose set forth.

48,937.—Trunk Caster.—William O. Headley, Newark, N. J.:

I claim a combined bracket and caster for trunks, when the former is cast with an exterior projection or projections, e, and with lugs or projections, d, at the inner surface of one of its arms, a, by the side of the opening, b, which receives the caster or roller, B, and on lugs or projections the axis of the caster or roller is fitted, substantially as described.

[This invention consists in combining, in a novel way, a trunk caster and a bracket, so that the device may be cheaply manufactured and be very strong and durable, and serve as an efficient protection for the angles of the trunk, and at the same time admit of the trunk being readily moved or rolled about.]

48,938.—Rotary Pump.—Geo. W. Heald and L. D. Clisco, Baldwinville, N. Y.:

We claim the construction of the piston, B, consisting of the rim, b, and hollow arms, c, c, arranged and operating substantially as and for the purpose herein set forth.

48,939.—Table or Desk.—William Hemmer, Newark, N. J.:

First, I claim connecting the boards, D C and B, together, as described and for the purpose specified.

Second, The arms or frames, E F, connected to the board, C, substantially in the manner and for the purposes herein specified.

Third, The frame or rest, a, in combination with the frame, E, substantially as described.

Fourth, The thumb screws or screw rods, b and d, in combination with the frames, E and F, substantially as described.

Fifth, The combination and arrangement of all the parts, substantially as herein shown and described.

[The object of this invention is to construct a table whose top can be raised at various angles and heights, so as to provide a desk, on which to write or draw, that will suit different persons either sitting or standing; and it consists in the use of a number of supporting frames or legs, so arranged that each will give to the top of the table a different height and inclination.]

48,940.—Rudder.—Jonas Higbee, Northport, N. Y.:

I claim the applying of rudders to vessels either at the bow or stern, or at both said places, in the manner substantially as shown, so that the rudders will be capable of being reversed, turned outward from the recess or openings, a, when necessary, as when used as a stern rudder, or turned inward so as to fit in said openings when used as a bow rudder, as set forth.

[This invention relates to a new and improved rudder which may be used either at the bow or stern of a vessel, and is so arranged or applied that it will be capable of being reversed and used as a stern rudder, and when not reversed used as a bow rudder.]

48,941.—Apparatus for Cooling Liquids.—Peter and Frederick Hinkels, New York City:

We claim the mode of refrigerating beer and other beverages herein fully described and for the purpose set forth.

48,942.—Watch.—Samuel Hittel, Detroit, Mich.:

First, I claim the curve spring, d, in combination with the movable stud, a, and hair spring, b, constructed and operating substantially as and for the purpose specified.

Second, The curve spring, k, in combination with the regulator, J, spring, b, and balance, h, constructed and operating substantially as and for the purpose specified.

[This invention consists in the use of a movable hairspring stud in combination with the hairspring of a watch, in such a manner that the watchmaker is enabled to get a correct beat in a short time and with little trouble. In connection with the movable hairspring stud an undulating spring is used for the purpose of overcoming the effect of the atmosphere on the hairspring and of keeping the watch in

beat. The invention consists, finally, in an undulating spring attached to the regulator in such a manner that the effect of the atmosphere on the balance is overcome, said regulator being connected directly to the hairspring.]

48,943.—Boot Heel.—Samuel Hodgins, St. Louis, Mo.:

I claim the adjustable plates, B and C, in combination with the heel of a boot or shoe, arranged to operate in the manner and for the purpose herein specified.

[The object of this invention is to obviate the running down of the heel of a boot or shoe, caused by the wearing away of one part sooner than the other; and it consists in the employment in the heel of a boot or shoe of a metallic plate extending, either wholly or in part, down to the treading surface of the heel, said plate being bent round so as to correspond with the shape of the heel; and the said plate having its inner or upper end beveled in such a manner that a correspondingly beveled plate, arranged over the same, in the heel of the boot, may be caused to force it out by means of a set screw or any other suitable device, and which may be retained in position when out, by a similar device.]

48,944.—Horse Rake.—J. Hollingsworth, Chicago, Ill.:

First, I claim a scroll rake tooth constructed with the transverse eye, c, arranged relatively thereto, substantially as herein described and represented, for the purpose set forth.

Second, The arrangement of the scroll teeth upon a continuous head or bar, E, which is hung to the axle-tree, A, in such a manner that they enter grooves in the head, E, so as to be stayed laterally and pass under the head, E, and at the same time are susceptible of being removed and replaced independently of one another, substantially as herein described and shown.

Third, The arrangement of the foot and hand lever, G G, adjustable goose-neck brackets, a, a, oscillating head, E, and axle-tree, A, in the manner and for the purpose described.

Fourth, The arrangement of the rod, J, forked lever, I, spring, s, pulley, k, chain or cord, l, goose-neck brackets, a, a, head, E, and foot and hand levers, G G, substantially in the manner and for the purpose described.

Fifth, The arrangement of the hand and foot lever directly on the rake head, E, which is hung in goose-neck brackets, a, a, substantially in the manner described.

Sixth, The combination of the goose-neck brackets, a, a, slide rod, J, and rake head, E, in the manner and for the purpose described.

48,945.—Piston Packing.—J. W. Holloway, Akron, Ohio:

I claim the beveled rings, b, b, and circular springs, c, c, in combination with the solid ring, D D, when arranged and operating substantially as and in the manner described.

48,946.—Machine for Trimming Hedges.—W. C. Hooker, Abington, Ill.:

I claim a machine for trimming hedges, constructed substantially as herein shown and described.

[The object of this invention is to provide a machine whereby hedges or hedge fence may be trimmed easily and rapidly and accurately, the several stalks being cut at the same height which is quite essential when a neat and even line of hedge is desired; and the invention consists in constructing a suitable frame, intended to stand over or straddle the hedge, and in arranging on said frame a cutter on one side and a block against which to cut on the other, both having a wringing motion and capable of being moved forward and backward the length of the frame as occasion may require during the operation.]

48,947.—Lawn Mowing Machine.—James A. and Henry A. House, Bridgeport, Conn.:

We claim the combination of the finger beam frame, vibrating cutter, cam gear and breast piece, arranged and operating substantially in the manner described for the purpose set forth.

48,948.—Cleaning Tubes in Boilers.—Joseph Jacob Illingworth, Brooklyn, N. Y.:

I claim the nozzle, E b, and flexible pipe, D, applied substantially as herein described, for cleaning flues or tubes of steam boilers.

[This invention consists in cleaning the flues and tubes of steam-boilers by means of a jet or current of steam directed through said tubes.]

48,949.—Broadcast Seeding Machine.—E. S. Jewett, Lima, Mich.:

I claim the adjustable sleeve, E, in combination with the seed slides, D, revolving cylinders, A, and hand lever, F, constructed and operating in the manner and for the purpose substantially as herein shown and described.

48,950.—Skate.—E. Johnson, Jr., Cleveland, Ohio:

I claim the standards, A A' a', plates, C G, springs, F f, flanges or guides, h h, and shank, e, when the several parts are arranged as herein described, and operating as specified.

48,951.—Road Scraper.—Wm. W. Johnson, Harrison, Maine:

I claim the combination and arrangement of the vibratory scraping board with the axle and its wheels, the tapered tongue, and the mechanism for regulating the inclination of the scraping board, as specified.

I also claim the combination of the side wings or plate, c c, with the vibratory scraping board applied to and arranged with an axle to its wheels and tongue, as specified.

I also claim the combination of the stop, g, and the bar, d, with the tapered tongue, and the vibratory scraping board applied to an axle and wheels, and having a mechanism, as described, or equivalent, for varying the inclination of the board, as set forth.

48,952.—Stove-pipe Damper.—Chas. Nathan, Hardin, Iowa:

I claim the revolving disks, B B, arranged to operate in connection with the central portion or frame, A, of a damper for stoves and other heaters, substantially as herein specified.

[This invention consists in the employment or use of two revolving disks, one arranged on each side of the central portion or frame proper of a damper for stoves and other heaters, and in such relation thereto that the escape of the heated air and other products of combustion may be controlled as desired.]

48,953.—Paper Knife-handle.—Edward Kelsey, Center Brook, Conn.:

I claim the combination with a dowel pin, inserted within and across the joint of the contiguous ends of the handle and the knife-blade shank of the inclined grooves or channels, substantially as herein described and for the purpose specified.

[This invention relates to a new mode of securing the handles to the blades of paper knives, whereby a more secure and permanent joint is made than by the method hitherto practised.]

48,954.—Mode of Receiving and Delivering Mails and Packages on Railroad Cars.—W. J. Ketcham, Washington, D. C.:

I claim receiving and delivering upon lines of railroad communication mails and packages, by means of devices connected to the railway car, and operated at the several points of delivery, in the manner herein described.

48,955.—Machine for Pressing Tobacco.—J. D. King, Cincinnati, Ohio:

I claim the employment or use of a series of rollers, K, placed loosely on a shaft, I, provided with adjustable bearings, in combination with a reciprocating bed, G, provided with a series of removable boxes or troughs, G, corresponding in width to the rollers, substantially as and for the purpose set forth.

[This invention relates to a new and improved machine for pressing tobacco into plugs, and it consists in the employment or use of a series of pressure rollers, in connection with a reciprocating bed, provided with molds having false or supplemental bottoms, whereby the desired work is done very expeditiously and in a perfect manner.]

48,956.—Paddle Wheel.—C. A. Kirkpatrick, Somerville, Mass.:

I claim the combination of the movable slats with the cam slot, when arranged and operating as and for the purpose specified. Second, The adjustable gates, applied in combination with the cam slot and movable slats, in the manner and for the purpose described. Third, The combination of the double ratchet, double cam and movable gates, all constructed, arranged and operating as herein described, to constitute an automatic reversing gear.

[This invention relates to a paddle wheel, the buckets of which are made each of a series of movable shutters or slats, similar to an ordinary window blind, in such a manner that the said slats can be turned edgewise as they descend in and rise out of the water, and to close up while passing through the water in a position to offer a very extended working surface to the water.]

48,957.—Horse Chain.—Homer W. Knowlton, Saratoga Springs, N. Y.:

I claim constructing the T ends of horse and other chains, with a joint in their shanks, to operate substantially as and for the purpose herein set forth.

[This invention relates to a new and useful improvement in the T-end of a horse chain, which is fitted in a ring of the latter in order to attach the chain of a heater to a post or other fixture, or which is fitted in the ring of a bit, in order to attach the horse to the post.]

48,958.—Device for Finishing Threads.—Tobias Kohn, Hartford, Conn.:

First, The described concave-faced rollers, on which to wrap the threads to be finished by the longitudinal motion of the carriage on which the rollers are mounted.

Second, Placing the alternate rollers on axis at or nearly at right angles to each other, so as to partially counteract the tendency of the thread to transverse lengthwise of the rollers.

48,959.—Cultivator.—Frederick C. Leffler, Highland Township, Iowa:

I claim the draught bars, L, attached to the rear bar, E, by pivots, c, and uprights, f, and secured to the upright bars, A, by a rod, G, substantially as and for the purpose set forth.

[This invention relates to a new and improved cultivator, designed to be drawn by two horses, and for the cultivation of those crops which are grown in hills or drills.]

48,960.—Sash Fastener.—George Liming, Roxbury, Mass.:

I claim the improved sash fastener, with the cam and spur, formed, and operating as described.

48,961.—Sap Spout.—Archibald Leitch, Ryegate, Vt.:

I claim a sap spout, made of an outer wooden tube, inclosing a metallic tube, substantially as and for the purpose above described.

[This invention consists in a novel construction of spout for collecting saccharine sap from maple and other trees, being a combination of metal and wood, for the purpose of securing the advantages of both those materials, without causing injury to the trees by bringing metallic surfaces in contact with them.]

48,962.—Button-hole Cutter.—F. C. Leypoldt, Philadelphia, Pa.:

I claim the described improvement in instrument for cutting button holes, consisting in the use of the self-adjusting block, B, when the same is constructed in relation to the knife, C, substantially as and for the purpose herein set forth.

48,963.—Tweezer.—D. S. Loy, Graceham, Md.:

I claim the blast plate, C, having a deflected slit opening, and capable, by change of position, of directing the blast in the direction required, as described and represented.

48,964.—Skiving and Splitting Machine.—W. S. Marsh, Indianapolis, Ind.:

I claim the inclined slide plate, D, the adjustable roller, L, placed over the knife, with its boxes, K K, and rods, P P, the springs, J J, all in connection with the knife, B.

I also claim the check rib, O, and set screw, H, all arranged and operating substantially as and for the purpose set forth.

48,965.—Meat Chopper.—John Massey, New York City:

I claim the combination of the horizontally reciprocating platform, f, f, and driving device, consisting of the shaft, q, cog-wheel, p, pins, a, and groove, m, with the knives, n' n', jointed connecting rods, g' h', and crank shaft, b', arranged to operate in the manner and for the purposes specified.

[This invention consists in the use of a horizontal reciprocating traveling platform or box, in which the meat or other material to be chopped is placed in combination with any suitable cutters, so arranged that as the meat box is moved forward and backward they shall be made to cut or chop the material therein.]

48,966.—Cartridge Retractor for Breech-loading Fire-arm.—Edward Maynard, Washington, D. C.:

I claim the combination of a retracting slide, B, with the barrel, A, and curved link, C, of my improved breech-loading fire-arm, substantially in the manner and for the purpose herein set forth.

48,967.—Apparatus for Burning Petroleum.—E. McKinney, Middletown, Pa.:

I claim the method herein described of generating heat and light from the combustion of petroleum or other hydro-carbon, crude or refined, by introducing it through pipes controlled by stop-cocks passing through any proper refrigerating medium, to keep said pipes cool, and prevent the transmission of the generated heat to the reservoir of oil into the place or places of combustion, and there mixing it with a refractory material pulverized, so that the pipes are protected from the fire, the oil being supplied in such quantity as merely to saturate the mass of material with which it is mixed, and being drawn to its surface by capillary attraction, substantially as above set forth.

[This invention consists in a new method of generating heat by the burning of petroleum, and it is applicable to domestic and culinary purposes, to producing steam in boilers, and generally to every use where heat is required.]

48,968.—Carpet Stretcher.—H. A. Mead, Cuba, N. Y.:

I claim the combination of the hand lever, b, and foot plate, n, constructed, arranged and operating together, substantially in the manner described and for the purpose specified.

[This invention relates to a carpet stretcher, made and constructed in such a manner as to obviate the many objections to those now in common use.]

48,969.—Governor Valve for Steam Engine.—Samuel Mills, Bergen, N. J.:

I claim the cylindrical valve tube, B, sliding over the cup, C, they both having a series of openings through on all of the sides, so as to form an equilibrium governor valve for steam engines, as herein described.

48,970.—Preparing Sponge for Stuffing Padding, Etc.—A. T. Moith, Fishkill Landing, N. Y.:

I claim the method herein described of preparing sponge, for the purposes set forth.

48,971.—Machine for Boarding Leather.—W. H. Moore, Salem, Mass.:

I claim the combination and arrangement of the table, A, the presser-board, C, the endless apron, H, and its operative rollers, the whole being applied together in manner and for the purpose as specified.

And in combination with the table, A, the presser, C, the endless apron, H, and its carrying and operating rollers, I claim the open chamber or box, B, for the purpose specified.

I also claim the combination of the elevating spring, L, or its equivalent, and the stirrup, N, with the presser, C, the table, A, the endless apron and its operative rollers, the whole being substantially as specified.

48,972.—Method of Protecting Caps of Oil Cans.—E. A. More, St. Louis, Mo.:

I claim a protection for the nozzles of oil cans, consisting of a metallic cap, A, closely fitting the nozzle and cork, one side of the cap being hinged, so it may be slid laterally upon the cork. The cap, being hinged, is open, so it may be slid laterally upon the cork. The cap, being hinged, is open, so it may be slid laterally upon the cork. The cap, being hinged, is open, so it may be slid laterally upon the cork.

48,973.—Composition for Castings.—George Nimmo, Jersey City, N. J.:

I claim the compound metal formed in the manner specified.

48,974.—Adjustable Tweezer.—Butler G. Noble, New York City:

I claim the method of regulating the quantity of air relative to steam by adjusting the steam jet or tweezer within the opening for the air, substantially as and for the purposes specified.

48,975.—Row Lock.—Joseph W. Norcross, Middletown, Conn.:

First, I claim placing the fulcrum on which the row lock swivels outside the center of its horns and above the gunwale, substantially in the manner and for the purpose set forth.

Second, The hook, c, and staple, d, in combination with the flanged plate, E, and with the bracket supporting the stanchion or fulcrum of the row lock, or any other equivalent fastening, substantially as and for the purpose specified.

Third, The flange, e, with the open slot, f, in combination with the row lock, C, constructed and operating substantially as and for the purpose set forth.

[The object of this invention is three-fold:—First, to construct a row lock which will operate without or with but little noise, and so that the oar may be temporarily left in the same without danger of unshipping, thereby giving an opportunity to the person rowing to relieve himself by wiping the sweat from his brow, or in some other way; second, to make the row lock so that the oar might swing parallel to the boat or "trail;" third, to arrange it so that the same can be readily unshipped and taken home to prevent it from being stolen.]

48,976.—Railway.—Pelatiah Osgood, Waterville, Me.:

I claim the use of the movable or swinging rail operated with regard to the track, c, e, by means of the arms, p, p', drum, h, bands, l, lever handle, f, and connecting bars, e, e', substantially as described.

48,977.—Flood Gate.—Andrew Ralston, Carlisle, Pa.:

First, I claim the combination of the float, F, and arms, E, E', and upright gate, A, in the manner and for the purpose within described.

Second, The movable block, G, when combined with float, F, and hook, H, in a flood gate, constructed in the manner and for the purpose herein described.

48,978.—Mode of Switching Street Cars.—John S. Reid, Muncie, Ind.:

First, I claim shifting or switching cars from one track to another by pressure upon the outside of the rail or track, substantially as herein specified.

Second, I claim the employment of the adjustable wheels, C, C', provided with exterior flanges, arranged and operating substantially as and for the purposes shown and set forth.

Third, I claim the combination of said wheels, C, C', the shaft, D, and springs, d, d', arranged and operating as and for the purposes described.

Fourth, I claim the combination of the wheels, C, C', axle, D, springs, d, d', lever, E, and arm, F, arranged and operating substantially as shown and described.

48,979.—Dough Kneader.—Francis C. Ring, Portland, Me.:

I claim the employment and use of revolving kneader, B, with troughs, in combination with springs, D, and spring fastenings, d, and d', substantially as and for the purpose set forth.

48,980.—Lock.—Fred. Rudolph, New York City:

I claim a lock with a cylindrical case, B, containing a bolt, D, and one or more tumblers, E, to be operated by a key, K, which can be introduced from either side, substantially as and for the purpose set forth.

Also, the latch, F, in combination with bolt, D, and tubular or cylindrical case, B, constructed and operating substantially as and for the purpose described.

[This invention relates to a lock in which the bolt, with one or more tumblers, and also the latch, is inclosed in a cylindrical case, which can be inserted in a door by boring in a hole large enough to take said case, and thereby the time requisite to make a mortise for the reception of the lock is saved. The latch is so arranged that it operates in a slot in the head of the bolt, or it may be made to work side by side with said bolt, the latch being made to work by a handle, and the bolt by a key, in the usual manner.]

48,981.—Apple Corer and Slicer.—Samuel Saucerman, Freeport, Ill.:

I claim the pointed plunger, C, in combination with the pointed tubular corer, A, slicing knives, B, and top plate, D, constructed and operating as and for the purpose set forth.

[The object of this invention is a simple, cheap and effective device, by which apples, after the same have been pared, can be cored and quartered by one operation, and with little loss of time.]

48,982.—Evaporator.—Thomas and James M. Scantlin, Evansville, Ind.:

First, We claim the constructing of the furnace, A, of semi-cylindrical taper form, substantially as and for the purpose set forth.

Second, Having the evaporating pan, E, constructed in sections, or formed of a series of pans, b, constructed, connected together and secured between the wooden sides, c, c', in the manner substantially as and for the purpose specified.

Third, The passages, e, e', made or placed in the wooden sides, c, c', and arranged with screens, gates, h, substantially as set forth.

[This invention relates to a new and improved evaporating pan for evaporating sorghum and other saccharine juices. The invention consists in a novel construction of the furnace and pan, whereby it is believed that several advantages are obtained over devices for a similar purpose.]

48,983.—Oil Well Pump.—Henry Searl, Rochester, N. Y.:

I claim the arrangement of the pipes, G and H, with the valve, K, and the seal bag, F, or other suitable packing, substantially as herein described, not claiming separately either the seal bag, the valve or the pipes, as I am aware that they are in common use for many purposes.

48,984.—Jack for Shaft Coupling.—A. J. Settle, Schorharle, N. Y.:

I claim a tool composed of two jaws, A, B, formed and connected substantially as herein described and for the purpose set forth.

[This invention consists in a tool composed of two arms or jaws and a handle. One of the jaws is intended to catch the clip of a shaft coupling behind the axle, and the other jaw is to bear on the eye of the joint in such a manner that by the combined action of said jaws the eye can be forced in between the jaws of the clip against the elasticity of the india-rubber or other packing applied to prevent the rattling of the joint, and thereby the operation of introducing the eye-bolt is materially facilitated.]

48,985.—Bread Cutter.—S. D. Simmons, San Francisco, Cal.:

I claim the bread cutter described, the same consisting in attaching and arranging upon a suitable shaft a series of knife blades, of any desired number and size, and at proper distances apart, said shaft being provided with a suitable handle, and arranged and operating with regard to the fixed platform used for receiving the bread to be cut substantially in the manner as hereinabove set forth.

[For an illustration and description of this invention, see No. 4 of current volume.]

48,986.—Turbine Fan Blower.—Marvin Smith, New Haven, Conn.:

I claim the combination of the annular disks or casings, B, B', with the vanes or blades, b, b', and c, when the whole is constructed, arranged and fitted to operate with the parts C and D, substantially as herein described.

48,987.—Churn.—Henry Soggs, Columbus, Pa.:

First, I claim a recess, N, made in the churn cover, having air holes, N', in combination with the hollow cap, C, for the purpose of an improved vent, substantially as described.

Second, The combination and arrangement of the revolving disk, B, including the crank pinion, C, and common churn placed thereon, and bottom stand, A, including the cog rim, a', with the connecting rods, I, and cross head, H, for the purpose of operating a common dash churn, substantially as set forth.

48,988.—Harvester.—Edwin F. Page, Brooklyn, N. Y.:

First, I claim the combination and arrangement of the arms, M, M', of the cradle shaft or handle with the studs, J, J', on the stationary shaft, I, whereby the cradle is made to stand upright while cutting the grain, and to tilt forward and deliver the cut grain, as set forth.

Second, The combination and arrangement of the shaft, H, head, I, studs, J, J', sleeve, F, and case, G, or their equivalents, for the purpose of carrying and operating the cradle, T, substantially as set forth.

Third, The jointed platform, C, in combination with the jointed shaft, e, substantially as set forth, for the purpose described.

48,989.—Stand for Lady's Cloak.—Joseph R. Palmenberry, New York City:

I claim the construction and arrangement of a revolving frame, F, on an upright stand or rod, B, in the manner and for the purpose substantially as described.

48,990.—Evaporator.—Isaac H. Palmer, Lodi, Wis.:

I claim a revolving skimmer for removing the scum from the surface of the liquid.

The combination of the skimmer with the belt or endless chain and the rollers, G, D, E.

The skimmer with its central divisional groove, H, in combination with the pan divisions, B, or wires, upon which it transverses.

The screw in the said divisional groove by which the depth of the skimming is regulated.

The cleaner is so placed as to wipe out the contents of the skimmer in the manner described.

The hook in combination with the chain and skimmer for retaining the latter in an operative position when required.

I claim the skimmer divided or otherwise hinged in a carriage or holder attached to the endless carrier belt or chain.

48,991.—Combined Corn Planter and Cultivator.—Jeremiah Palmer, Oriskany, N. Y.:

First, I claim the movement of the feed bars, G, G', in the hoppers by means of three outwardly projecting cogs, k, k', k'', on the main wheel, the three tooth cog wheel, J, notched lever, I, and one tooth cog wheel, the whole combined and operating substantially in the manner and for the purpose herein set forth.

Second, The lever, I, in combination with the three tooth cog wheel, J, for breaking the revolution of the wheels or stopping the operation of the feed bars, substantially in the manner and for the purpose herein set forth.

Third, The tongue, L, and lever, M, in combination with the bracket plate, o, joint, o', fulcrum, S, and guide, N, when constructed and operating as and for the purpose herein set forth.

Fourth, The vertical hand screw, K, cross plate, n, bearing plates, a'', in combination with the axle, B, open slotted guides, n, n', for the depression or elevation of the wheels, substantially in the manner and for the purpose herein set forth.

Fifth, The notched sliding frame, o', and guide, N, in combination with the axle, B, and foot lever, M, substantially in the manner and for the purpose herein set forth.

48,992.—Manufacture of Hard Rubber or Vulcanite.—Dubois D. Parmelee (assignor to Chas. S. Richards) New York City:

I claim the method herein described of producing hard rubber or hard and flexible rubber or hard flexible and elastic rubber by subjecting native rubber first to the vulcanizing process, according to the invention patented to Charles Goodyear deceased, on the 15th day of June, 1844, and by their immersing the vulcanized rubber thus obtained in chloride of sulphur dissolved in bi-sulphide of carbon or other fit solvent of caoutchouc, substantially as set forth.

48,993.—Manufacture of Hard Rubber.—Dubois D. Parmelee (assignor to Charles S. Richards) New York City:

First, I claim the production of a hard or hard and flexible and elastic compound by the process herein described the same consisting substantially in first converting india-rubber or like gums into a soft, flexible and elastic product resembling soft, vulcanized rubber by immersion of rubber in a solution of proto-chloride of sulphur and bi-sulphide of carbon in the manner described and in converting the soft, flexible and elastic product into a hard and flexible or hard flexible and elastic product by immersing the product of the first immersion in a solution of proto-chloride of sulphur and bi-sulphide of carbon, substantially as herein set forth.

Second, As a new product or substance I claim a hard or hard and flexible or hard, flexible and elastic compound composed of india-rubber or other similar gum which has been subjected to two or more immersions in solutions of proto-chloride of sulphur and bi-sulphide of carbon, substantially as herein described.

Third, As a new manufacture or substance, I claim colored hard or colored hard and flexible or elastic compound, composed of rubber having incorporated with it colored pigments as described and subjected to successive immersions in solutions, substantially as set forth.

48,994.—Device for Oil Wells.—George T. Parry, Philadelphia, Pa.:

I claim the arrangement of the heater, B, with the induction and ejection pipes, C, C', and the oil well tube, A, substantially as described.

48,995.—Faucet.—Geo. G. Percival, Brooklyn, N. Y.:

I claim the combination with a faucet of the split ring, f, arm, d, and screw pin, p, substantially as shown and described.

[This invention consists in a novel construction and arrangement of a faucet whereby the distance to which it opens can be regulated at pleasure so as to allow a greater or lesser quantity of liquid to pass through it, when the cock is turned in one direction, while by reversing the movement the cock can be opened to its full extent.]

48,996.—Tumblers, Pitchers, Etc.—Geo. G. Percival, Brooklyn, N. Y.:

I claim as a new article of manufacture the attachment of a rim made of india-rubber or any of its elastic compounds to and upon the bottom edges of tumblers, glasses, pitchers and other articles of crockery or glass ware, substantially as and for the purposes specified.

[This invention consists in attaching to tumblers, glasses, pitchers and other similar articles made of crockery or glass, and so as to extend around the lower edge thereof a rim of india-rubber or of any of its elastic compounds for the purpose of preventing them from being broken if too carelessly or heavily placed upon the table, etc., as well as also to prevent them from scratching, marring or in any other manner defacing the surface of the same.]

48,997.—Ox Yoke.—Wm. Perrin, Andover, Mass.:

I claim an adjustable ring carrier applied to an ox yoke when the said ring carrier is adjusted by means of a screw or screws, arranged substantially as herein specified and for the purpose set forth.

48,998.—Forge Tweezer.—Ralph Platt, Florence, Ind.:

I claim so constructing the tweezer that the longitudinal axis of the elongated orifice may be rotated in either direction as and for the purpose specified.

48,999.—Ore Crusher.—J. V. Pomeroy, Utica, N. Y.:

I claim, First, The hopper, G, perforated circumferentially or on its sides and applied to an ore crusher for the purpose of separating the finer quartz from the coarser, during the crushing process, substantially as herein described.

Second, The jacket, H, in combination with the screen, J, and crusher, D, C, substantially as and for the purpose described.

Third, The combination of the diffusing screen, J, and crusher, C, D, substantially as and for the purpose described.

Fourth, Screening pulverized ore upon two or more surfaces, one

of which concentrates while the other diffuses the ore during the crushing process, substantially as herein described.

49,000.—Guide to Key-holes.—W. R. Pomeroy, Millersburg, Ohio:

I claim the flange, F, or other similar device when arranged and applied in the manner and for the purpose described.

49,001.—Cooking Range.—Moses Pond, Boston, Mass.:

I claim the combination and arrangement of the flues and connecting passages thereof about each of the ovens the same consisting of the flue, G, the passage, g, the flues, H, H', the passages, h, h', the flue, I, the diving flue, K, and the passage, l, the whole being to cause the smoke and heat to pass in contact with the oven in the manner as described.

Second, I also claim the improved arrangement of each of the steam escape openings, b, and its discharge flue, o, with the boiler chamber, F, and the oven and its flues.

Third, I also claim the damper, q, adjustable on its rod, substantially as described, in combination with the shoulder, y, or its equivalent, on such rod, the whole being arranged so as to operate in manner and for the purpose as specified.

Fourth, I also claim the arrangement of the closets, D, D', the fireplace, the flue, C, the flue, X, the ovens, E, E', and the recess or chamber, F.

Fifth, I also claim the arrangement of the movable mantel, v, with the ovens, E, E', and the boiler chamber, F, the same being as and for the purpose set forth.

Sixth, I also claim the above described mode of making each of the extensions, w, of the side plates, w, of the boiler chamber, viz. in sections or parts, a, a', hinged together and hinged to the front part of the range, for the purpose described.

49,001.—Manufacture of Friction Matches.—Van Rensselaer Powell, Troy, N. Y.:

I claim the manner of "coating" and "capping" friction matches with the ignitable compound while said matches are still in the form of "strips," substantially in the manner herein described, whereby a material saving in the quantity required of said compound is effected, as set forth.

I also claim the manner of separating said match strips from each other, and dividing the same into loose matches, by the means substantially as herein specified, whereby a saving in labor is gained.

And, lastly, I claim the combined use of the within described improved modes of manufacturing friction matches, as constituting an improved manner of manufacturing the same, substantially as herein described.

49,003.—Sheep Rack.—A. D. Stansbury, Cross Creek Township, West Va.:

I claim, First, A combined sheep rack and trough, so constructed and arranged that its racks can be thrown down, as represented in Fig. 4, and also raised and brought together and fastened, as represented in Fig. 3, substantially as and for the purpose set forth.

Second, So constructing and pivoting the bottom of a combined sheep rack and trough that it will open and close, substantially as described.

Third, The combination of the hinged racks, which adjoin when closed, with the fastening boards, D, substantially as described.

49,004.—Running Gear of Railroad Cars.—John Stephenson, New York City:

I claim, First, The longitudinal stays or connecting rods, B, when attached to the upper sides or above the feet of the pedestals, and secured in position by the pintle bolts, a, substantially as and for the purpose set forth.

Second, The diagonal stays, C, applied or attached to the pedestal and the frame work of the truck or car, substantially as and for the purpose specified.

Third, The combination of the longitudinal stays or connecting rods, B, and diagonal stays, C, applied in the manner substantially as and for the purpose set forth.

49,005.—Axle Box.—John Stephenson, New York City:

I claim, First, The combination of the yielding or self-adjusting collar, B, with the chamber, A, at the rear of the axle box and the axle, C, the collar being fitted on and controlled by the axle, and all arranged substantially as and for the purpose set forth.

Second, The method of confining the bearing in the box in order to provide for the facility of its extraction, as set forth.

49,006.—Unloading Attachment for Wagons.—James H. Stevens, East Durham, N. Y.:

I claim, First, The rails, j, j', either with or without a bottom, i, for the body, A, for the purpose of serving as a support for the apron, B, and still admit of a free movement of the latter, substantially as and for the purpose specified.

Second, The flexible apron, B, in combination with the two shafts, C, D, all arranged and applied to the wagon body, to operate substantially as and for the purpose set forth.

Third, The rollers, I, J, arranged in relation with the flexible apron, B, and used in connection with the shafts, C, D, for the purpose specified.

Fourth, The supplemental roller, K, either with or without the straps, L, arranged substantially as and for the purpose set forth.

[This invention relates to a new and improved unloading attachment for wagons. The object of the invention is to obtain a device for the purpose specified which will admit of being applied to any ordinary wagon body in use, capable of being constructed at a very moderate expense, and operated with the greatest facility.]

49,007.—Clothes Bracket.—James Stimpson, Baldwinville, Mass.:

I claim the folding and removable frame, B, c, supported by lugs, g, g', from the brackets, A, A', as and for the purpose described.

[This invention consists in a suitable bracket to be attached to the side of a room, or in any other proper place, having folding or swinging arms connected together by cross rods, which form a frame on which to hang the clothes, the said frame being provided with a series of rods suitably connected together and attached to the bracket, whereby the surface on which to hang the clothes or other articles is considerably increased.]

49,008.—Cultivator.—Garland B. St. John, Kalamazoo, Mich.:

I claim the two plow beams, A, A', connected together as shown, in connection with the handles, G, G', pivoted to the beams, and having the wheels, I, attached to them, and the segment racks, J, and catches, K, all arranged substantially as and for the purpose herein set forth.

[This invention consists in combining and arranging two plow beams with wheels and levers, arranged in such a manner as to operate very efficiently.]

49,009.—Crucible for Metallic Baths.—Benj. S. Stokes, Manchester, N. H.:

I claim the construction, substantially as herein described, of a crucible of two parts, a and b, with space, c, between a and b, filled with sand, or its equivalent, for the uses and purposes herein set forth.

49,010.—Gas Burner Chimney.—James Stratton, Brooklyn, N. Y.:

I claim a glass chimney for gas burners composed of an upper part, f, of oval or elliptical form in its transverse or horizontal section, and of equal diameter throughout, and a lower conical or flaring part, g, also of oval or elliptical form in its transverse section, and applied to the burner so as to have a relative position with the flame or jet, substantially as and for the purpose specified.

[This invention consists in having a glass chimney constructed or made in such a form and applied to the burner in such a manner as to cause the flame or jet to burn steadily, or without that flickering which invariably attends the flat flames or jets produced by the ordinary "bat-wing" or "fish-tail" burners, and which is very detrimental to the eyes.]

49,011.—Board Measure.—G. S. Tiffany, Palmyra, Mich.:

I claim, First, Making one or more series of perforations in concentric circles in the transverse wheel, c, each of which acts in the capacity of a bevel wheel, or placing a wheel upon the same shaft equivalent to said perforations, in combination with the pinion, F, screw, D, index and scale, when the same are arranged to operate substantially as and for the purpose herein set forth.

Second, The combination of thumb-piece, L, strap, n, nut, m, and

point, o, when the same are arranged to operate as and for the purpose herein specified.

49,012.—Manufacture of Sugar from Corn.—Henry A. Tilden, New Lebanon, N. Y.:

I claim treating the entire grain of maize and other cereals so as to produce sirup, substantially as herein described.

49,013.—Filter.—H. A. Tilden, New Lebanon, N. Y.:

First, I claim a series of filtering vessels, each formed substantially as specified, and connected from the upper part of one to the lower part of the next, for effecting successive filtrations or displacements, as set forth.

Second, I claim a series of filtering vessels, in which the adjacent vessels are connected, in the manner specified, so that one of them can be excluded from the filtering operation, for the purposes specified.

49,014.—Mode of Sharpening Saws.—J. F. Tudor, Philadelphia, Pa.:

I claim the combination of the devices, constructed and arranged substantially as herein described, for sharpening the teeth of saws.

49,015.—Medicine for Horse.—Vivian Vance, Havana, N. Y.:

I claim the above-described remedy, prepared and compounded in the manner and for the purpose substantially as described.

49,016.—Gage Cock, Etc.—E. A. Walker, Nashville, Tenn.:

I claim the conical valve, D, constructed and operating substantially as herein specified.

49,017.—Staging for Building Purposes.—E. D. Walker, Millbury, Mass.:

I claim a mode of construction of the staging with its straddle pieces, brackets, standards, etc., as within described.

49,018.—Machine for Cutting Paper.—Chas. Wells and Henry Barth, Cincinnati, Ohio:

I claim giving an oscillating motion to the knife, C, during the process of cutting, by bringing its ends down one end at a time, alternately, whether the same is combined with the sliding motion as given by the link or not, or whether the motion is given by cams or any other equivalent means, substantially as herein described, so that the knife descends one end at a time in the direction of its cutting edge, for the purpose set forth.

[An engraving and description of this invention was published on page 367, Vol. XII, SCIENTIFIC AMERICAN.]

49,019.—Batter Cup or Dish.—Benj. Wieland, Orangeville, N. Y.:

I claim the arrangement, in connection with the cup or vessel, A, having an inclined bottom, a, of the spout, B, valve, C, spring, E, lever, F, and rod, H, constructed and operated substantially in the manner and for the purposes herein specified.

[This invention consists in providing a cup or dish with a valve, having a spring connected with it, and also a rod and lever, whereby the contents of the cup or dish may be allowed to discharge itself at the will of the operator or holder of the cup or dish, and without admitting of any waste or dripping of the contents. The invention is more especially designed for patting batter on griddles in baking cakes, but is applicable to other purposes, such as molasses cups, beer mugs, etc.]

49,020.—Method of Separating the Products of Distillation of Hydro-carbon Oils and other substances.—L. N. Wilcox, Pittsburgh, Pa.:

I claim separating benzole from illuminating oils in distilling hydro-carbon oils and other substances, by means of separate pipes, D, arranged with traps, C, leading off from different parts of the condenser, substantially as and for the purpose above described.

49,021.—Hay-spreading Machine.—Charles Willard, Newtown, Pa.:

I claim the application to the cranks, F, of the springs, I, and slides, C, fitted in slots or openings, b, in the forkbars, D, to operate in the manner substantially as and for the purpose set forth.

[This invention relates to a new and improved machine for spreading or loading hay, and it consists in a novel connection of the cranks of the machine to the fork bars of the same, whereby the forks are allowed to come in contact with obstructions, and pass over the same without being liable to be broken or injured.]

49,022.—Railway Journal Box.—R. C. Wright, Meadville, Pa.:

I claim, First, The application to railway axle journal boxes of a cover or cap, arranged with a spring, in the manner shown, or in a y equivalent way, to operate as set forth.

Second, The opening, b, in the upper part of the cover or cap, A, the rod or belt, B, and the spring, C, arranged substantially as and for the purpose specified.

Third, The lip, a, having an inclined inner surface, in combination with the lower beveled surface, a', of the cover or cap, A, and a spring, C, for the purpose specified.

[The nature of this invention consists in providing the opening at the outer end of a railway-axle journal box with a cover or cap, that may be readily opened for the purpose of inspecting the contents of the box, and adjusting and removing the same, and at the same time preventing the admission of dust, dirt, and other foreign substances into the box.]

49,023.—Sewing Machine.—Jacob Zuckerman, New York City:

I claim, First, The oscillating shoe, m, applied in combination with the bobbin holder, m', bobbin, q, and an eye-pointed needle, n, substantially as and for the purpose set forth.

Second, The use of a spring bearing, r', in combination with the oscillating shoe, m, bobbin holder, m', and bobbin, q, constructed and operating substantially as and for the purpose described.

Third, The reciprocating slide, u, in combination with the cam, t, and spring, v, substantially as herein described, for the purpose of switching off the old loop before the next succeeding descent of the needle.

49,024.—Harvesting Machine.—Wm. F. Cochrane (assignor to himself, B. H. Warder, and J. C. Child), Springfield, Ohio:

I claim, First, Folding the cutting apparatus upon the main frame, and between the driving wheels, by the use of a single joint, substantially as described.

Second, Connecting the finger beam and main frame by an extension bar bent at an acute angle and journaled in the frame, substantially in the manner described, for the purposes set forth.

Third, The combination of the main frame and cutting apparatus with oblique gearing and a single joint, substantially as described, for the purpose of folding the cutting apparatus on the frame between the driving wheels without deranging the gearing.

Fourth, The combination of the inverted bevel gear, D, with the counter shaft, when arranged and operating as described.

Fifth, The combination of the counter shaft and crank shaft, when arranged and operating as described.

Sixth, The combination of the extension arm brace, K, and countershaft, when arranged and operating as described.

49,025.—Wringing Machine.—John O. Couch, Middletown, Conn., assignor to Metropolitan Washing Machine Company, Middlefield, Conn.:

First, I claim the combination of the single bell-cranked piece, X, carrying rigid studs, x y, with the single straight link, Y, and with the supporting arm, A', arranged on a clothes-wringing machine, so as to secure firmness and economy, substantially in the manner herein set forth.

Second, I claim the arrangement of the pinching nut, F, stationary screw, f, within the framing, A, of a wringing machine, substantially as and for the purposes herein set forth.

Third, I claim the rack, I, and pinion, H, in combination with the duplex lever or bail, J, and suitable confining means, K A', substantially as and for the purposes herein set forth.

Fourth, I claim, in combination with a roller wringer, the use of the bent wire or rod, M, so mounted and arranged as to perform the

double function of a guide and a clearer, substantially as herein set forth.

Fifth, I claim, in combination with a clothes wringer, the adjustable castings, G, carrying the slides, I I, to pinch the tub or vessel, and adapted to be twisted and set in various positions, substantially as and for the purpose herein set forth.

Sixth, I claim the soft-bearing pieces, Q, in combination with the slides, I, and the adjustable castings, G, of a clothes-wringing machine, substantially as herein set forth.

49,026.—Apparatus for Discharging the Cargo of a Sunken Vessel.—Peter E. Falcon, Cohasset, Mass., assignor to himself and Geo. W. Fuller, Chelsea, Mass.:

I claim the combination and arrangement of the ropes, s h and m, with the tub, b, the eye, o, and blocks, r and l, or their equivalents, the whole being applied to a submerged vessel and a lighter or its equivalent as explained so as to enable the tub to be drawn through the hold of the vessel and out of the same and to the surface of the water and afterward be drawn back again into the hole and through the same, substantially as specified.

And I also claim the combination of one or more bars, p q, with the said ropes, h and m, the tub, k, the eye, o, and the back draft rope, s, such bar or bars being applied to the submerged vessel in manner and to support the eye, of one or more blocks, substantially as specified.

And I also claim the tub made and provided with the guide rods, x x, as represented in Fig. 2, and as above described.

49,027.—Shirt Bosom.—E. F. French (assignor to himself and E. C. Terrill) New York City:

I claim an "open front" shirt bosom secured together by means of one or more pockets formed along and upon the inner edge of one of the parts, and a corresponding number of interlocking lapels or flap pieces of suitable length and width on the other and overlapping part, substantially in the manner described and for the purpose specified.

[This invention relates to the mode of securing shirt bosom fronts together when worn, and consists in so forming its two flaps or sides that they can be fastened together without the use of studs, buttons, or other devices hitherto generally employed therefor, the advantages of which are manifest.]

49,028.—Horse Shoe.—John Haseltine (assignor to himself and James M. Williams) Warren, N. H.:

I claim the employment or use of india-rubber, either pure or combined with other substances, fitted between the shoe and the hoof or foot of the animal and provided with a ridge or roll at its inner edge or arranged in any equivalent way for the purpose of preventing the admission of snow between the shoe and hoof and at the same time preventing jars or concussions being transmitted to the hoof or foot, substantially as set forth.

[This invention consists in applying shoes to the hoofs or feet of horses with india-rubber, either pure or combined with other substances, interposed between the shoe and the hoof or foot in such a manner that the hoof or foot is relieved from all jars or concussions and the feet prevented from "balling" with snow in winter.]

49,029.—Heat Controller Attachment.—Marcus F. Hitchcock (assignor to himself and James M. Ross) Springfield, Mass. Antedated July 19, 1865:

I claim the combination and arrangement of the drum, A, and pipes, D E and F, and damper, H, as applied in the manner and for the purposes substantially as herein described.

49,030.—Roller for Clothes Wringers.—John F. Holt, Providence, R. I., assignor to Woonsocket Rubber Co.:

I claim, First, The spiral grooved mandrel, constructed substantially as described, for the purpose specified.

Second, The binding of the preliminary sheet or thickness of vulcanizable material on the mandrel, substantially in the manner and for the purpose described.

Third, I claim an elastic roll, for the purpose specified, constructed substantially in the manner described.

49,031.—Cloth Guide for Sewing Machines.—Arthur Huston, Bristol, Me., assignor to Shaw & Clark, Biddeford, Me.:

First, I claim a sewing machine gage in which the pad or upper plate, B, is arranged and used substantially in the manner and for the purposes shown and specified.

Second, I claim constructing the pad, B, substantially in the form described and shown in Fig. 1, for the purposes specified, when such pad is arranged and used in the manner herein set forth.

49,032.—Ore Crusher.—Simon Ingersoll (assignor to himself and George H. Keith), Stamford, Conn.:

In combination with the movable jaw, d, I claim the cam, h, and the hangers, h' h'', whereby the said jaw is made to operate in the manner herein specified.

[This invention relates to an arrangement of the movable jaw of ore-crushing machines, whereby not only can a strong and powerful crushing pressure be brought to bear against the ore in the machine, but there is no possibility of the ore being blocked therein, the advantage and importance of which are manifest.]

49,033.—Steam Pressure Gage.—James D. Ingram, New York City, assignor to George M. Rice, George S. Barton and James A. Fales, Worcester, Mass.:

I claim the combination of the hollow cylindrical or other suitable shaped plug, o, with its guiding tube, f, arranged together and having steam inlet and outlet ports, substantially as and for the purposes described.

49,034.—Rock Drill.—Charles W. Johnson, Waterbury, Conn., assignor to Hiram Dalley and S. Atwater:

In combination with the drill, B, I claim the enlargement, C, extending eccentrically from the drill and shaft, and carrying one or more cutters.

In combination with the enlargement, C, extending eccentrically from the drill shaft, I also claim beveling or slanting up the top of the enlargement, C, so that it will enter the lower end of the tube freely.

49,035.—Wood-turning Lathe.—Harvey Locke (assignor to John J. McNutt), Boston, Mass.:

I claim, First, The combination of the stationary bevel gear, W, rotating pinion, X, hollow spindle, V, pinions, Z and A', links, C' C', and feed wheels, D' D', substantially as and for the purpose described.

Second, The adjustable clamp, K', and spring clamp, E', substantially as set forth, and for the purpose described.

Third, The adjustable clamps, M' and N', arranged substantially as and for the purpose described.

Fourth, So arranging the feed rolls, D' D', as to bear on each side of the corner of the square stock to be cut, substantially as and for the purpose described.

Fifth, Confining the cutters, d, to the wheels, O, by means of a dovetail and a clamp and screw inside of the circle described by the edge of the cutters, substantially as described.

49,036.—Binder Guide for Sewing Machines.—Clark Marsh (assignor to The Wheeler & Wilson Manufacturing Company), Bridgeport, Conn.:

I claim, First, The combination in a binder guide of the following instrumentalities, viz., the stock, tongue and guide, substantially as set forth.

Second, The combination in a binder guide of the following instrumentalities, viz., the stock, tongue, guide and adjusting screw, to vary the relative positions of the tongue and lips of the guide, to admit binding of various widths, substantially as set forth.

Third, The combination in a binder guide of the following instrumentalities, viz., the stock, tongue, guide and adjusting screw, to vary the relative positions of the tongue and guiding lips in the vicinity of the point where the sewing is effected, substantially as set forth.

Fourth, The combination in a binder guide of the following instrumentalities, viz., the stock, tongue, guide and lip, to flatten the folded binding, substantially as set forth.

46,037.—Carpenter's Rule.—Benjamin G. Martin, Philadelphia, Pa., assignor to himself, Thomas M. Davis, Lloyd H. Walton and Watson Sanford:

I claim, First, The swinging arm, C, in combination with a pocket

rule, A B, the same being arranged to operate together substantially as described, for the purposes specified.

Second, I also claim the index, D, and pointer, d', in combination with a pocket rule, A B, the same being arranged to operate together substantially as described, for the purposes specified.

49,038.—Artificial Leg.—Joshua Monroe (assignor to himself and Jetur Gardiner), New York City:

I claim, First, The double butt hinge, D, in combination with the blocks, E F, having planes, a a' b b', and with the two parts of an artificial leg above and below the knee joint, constructed and operating substantially as and for the purpose set forth.

Second, The tendon, I, composed of two parts, I J, which are connected to each other by a loop, k, and to the various parts of the artificial leg, viz., the heel, the block, E, below and the block, F, above the knee joint, substantially in the manner and for the purpose described.

49,039.—Shirt Collar and Bosom.—Celius E. Richards, North Attleboro, Mass., assignor to Vernon A. Messenger, Boston, Mass., and Virgin J. Messenger, Canton, Mass.:

I claim the construction of the collar, viz., its inner fold, a, of a less width than that of the outer fold, b, and with a back button trole fly, c, to extend, from such fold, a, as specified.

I also claim the construction of the bosom, viz., with the wings, d d, separated from the collar by the spaces, c c, and to extend from the bosom and go underneath the collar while in use, the whole being substantially as specified.

49,040.—Manufacture of Tin-lined Lead Pipe.—W. A. Shaw (assignor to himself, Gardner Willard, Lewis Colwell and Joseph Colwell), New York City:

I claim the method herein specified of chilling the cast metal in the cylinder of a hydraulic pipe press, by a core, cooled as set forth, immediately before it is employed in said cylinder, as specified.

49,041.—Furnace Door.—N. L. Sibley, Weston, Mass., and Benj. Shiverick, Waltham, Mass. Antedated June 7, 1865:

We claim the application of one, two or more plates of metal or other material, arranged so far from the door and from each other by suitable means as to form proper and sufficient space for the free circulation of air between the door and the plate, and between the several plates, substantially as described, for the purpose set forth.

We also claim connecting the applied plates to the door by means of bolts, studs or flanges, either with or without the use of the strips of soapstone fire-brick, plaster or other slow conductors of heat.

We claim a door provided with an air space between the door and the water box, arranged outside of the door, substantially as described.

49,042.—Machine for Grinding Files.—I. H. Spencer (assignor to himself and Andrew R. Slade), Pawtucket, R. I.:

I claim, First, The within-described method of grinding files, by placing them on a carriage moving on a curved bed, and exposing them to the action of one or more cutters, substantially in the manner and for the purpose herein set forth.

Second, The sliding clamp, F, in combination with a toothed segment, m, hand lever, H, and hinged dog, p, constructed and operating substantially as and for the purpose described.

Third, The combination of the cutters, T J, with the carriage, B, and curved bed, A, constructed and operating as and for the purpose specified.

49,043.—Wringing Machine.—James N. Pease, Panama, N. Y., assignor to the Metropolitan Washing Machine Co., Middlefield, Conn.:

First, I claim the cranks, B' C', and B2 C2, and rods, D' E', and D2 F2, with suitable guides for the reciprocating ends of the connections, all arranged for joint operation, so as to transmit the motion of one roll to the other, substantially as and for the purposes herein specified.

Second, I claim the gear, K, and rack, L, or their equivalents, in combination with the hand lever, M*, and with the movable roll, C, adapted to be operated by the weight of itself and of the hand, substantially as herein specified.

Third, I claim the hand lever, M*, operating to depress one end of the lever, I, in combination with the adjusting screw nut, J, or its equivalent, adapted to press upon and form a movable fulcrum at the opposite end, substantially as herein specified.

Fourth, I claim the sliding and swinging shield piece, P, mounted and arranged substantially as and for the purpose herein set forth.

49,044.—Apparatus for Feeding Thrashing Machine.—Elijah Valentine and Moses T. Ridout (assignors to themselves and Wm. Beck), Milwaukee, Wis.:

We claim combining with each other and with a hopper, S, and feeding box, H, attached to a thrashing machine, suitable revolving knives, e e, for cutting the bands, confining sheaves of grain, and revolving beaters or paddles, k k and m, to sift and spread out the same when said knives and beaters are secured to and operate upon separate shafts, substantially in the manner herein set forth.

49,045.—Machine for Making Metallic Tubes or Spouts.—Elijah Valentine and Moses T. Ridout (assignors to themselves and Wm. Beck), Milwaukee, Wis.:

We claim the use and arrangement of two or more stationary rollers, E E, in combination with a detachable forming roller, F, partially inclosed thereby, when all of said rollers have a tapering form and are made to revolve in unison with each other, substantially in the manner and for the purpose herein set forth.

In combination with a detachable forming roller or mandrel, F, and stationary auxiliary rollers, E E, we claim the pressure arms, M and N, arranged and operating substantially as and for the purpose herein set forth.

We claim, also, the spring-actuated rod, G, so combined with the supporting block, D, and the pressure arm, N, as to form an adjustable journal box for the free end of the detachable mandrel, F, substantially in the manner herein set forth.

49,046.—Press.—T. B. Webster (assignor to himself and Thomas Gannon), New York City:

I claim, First, The arrangement of the eccentrics, N N', on the driving shafts, P, in combination with the lever pawls, t t', ratchet wheels, r r', and with the cams, wheels and chains, or their equivalents, constructed and operating substantially as and for the purpose set forth.

Second, Placing the two sets of eccentrics, N N', at the opposite ends of the shaft, P, at right angles to each other, substantially as described, so as to impart to the follower an alternate rising motion.

Third, The hand wheels, H, applied in combination with the axles, p, ratchet wheels, r r', and chain wheels, n, substantially as and for the purpose specified.

49,047.—Screw Press.—Thomas B. Webster (assignor to himself and Thomas Gannon) New York City:

First, I claim a press provided with a right and left hand screw spindle, E, I claim the gear wheels, F G, and cranks, I I, or their equivalents in combination with heads, e, detachable nuts, J J, toggle arms, K K, and followers, C C, situated on opposite sides of the spindle, all as herein shown and described.

Second, Making the boxes which form the bearings for the screw spindle and for the driving shafts yielding, substantially as and for the purpose set forth.

Third, The eccentric shafts, d d, geared together by cog wheels, f f, and operated by a hand wheel, g, or its equivalent, in combination with the jaws, u b, spindle, E, and followers, C C, constructed and operating substantially as and for the purpose specified.

49,048.—Machine for Pressing Hats and Bonnets.—Hiram E. West, Attleborough, Mass., assignor to Oliver Carpenter & Co., New York City:

I claim drawing the block, C, and mould, B, together by means of levers substantially as described.

49,049.—Apparatus for Embossing Bonnets and Hats.—Hiram E. West, Attleborough, Mass., assignor to Erastus P. Carpenter, Foxborough, Mass.:

I claim an improvement in the manufacture of bonnets, hats, caps, etc., the removable die for embossing, substantially as set forth.

49,050.—Manufacture of Steel.—Solon W. Young (assignor to himself and Charles T. Place) Providence, R. I.:

I claim the within described process for manufacturing steel composed of three manipulations, substantially as set forth.

[This invention relates to a process which is divided in three differ

ent manipulations whereby steel can be made by mixing cast iron and wrought iron together.

49,051.—Manufacture of Iron and Steel.—Henry Bessemer, London, England. Patented in England March 15, 1856:

I claim, First, Forcing currents of air or steam through and in contact with molten iron, without the use of tuggers or nozzles, substantially in the manner shown.

Second, A converting vessel divided into two chambers so that air or steam forced upon the surface of the metal in one chamber may pass into the metal in the other chamber under or through the partition between the two chambers.

Third, The projections, N and P, either separately or in combination, in chambers or vessels for converting molten iron for the purpose of more thoroughly diffusing the currents of air or steam through said molten iron.

Fourth, The perforated screen, K, either by itself or in combination with either or both of the projections, N and P, in chambers or vessels for converting molten iron, for the purpose of more thoroughly diffusing the currents of air or steam through said molten iron.

Fifth, A mold, provided with a runner or runners, lined with loam or other suitable non-conducting material, substantially as and for the purposes described.

Sixth, A mold from which the atmosphere may be exhausted or partially exhausted, substantially as and for the purpose set forth.

49,052.—Manufacture of Iron and Steel.—Henry Bessemer, London, Eng. Patented in England May 31, 1856:

I claim, First, The use of the double chambers, substantially as described, for treating iron or alloys or fluxes, for the purposes specified.

Second, Heating or melting pig iron or other metals in a reverberatory furnace, or other suitable vessel, by the heat given off when streams or jets of air or steam are forced through fluid crude iron in the process of converting such fluid crude iron into malleable iron or steel, substantially as described.

Third, Alloying iron or steel with other metals by mixing such other metals with the iron or steel during the process of converting said iron or steel from crude iron by currents of air or steam.

Fourth, Blowing powdered metals or oxides of metals or alloys or fluxes into molten iron by means of the currents of air or steam used to decarbonize the said molten iron, substantially in the manner described.

49,053.—Manufacture of Iron and Steel.—Henry Bessemer, London, Eng. Patented in England Jan. 21, 1865:

I claim, First, Rolling sheets, plates, bars and other forms from fluid malleable iron or steel, by running or pouring said fluid metal between the rolls, substantially as described.

Second, The blocks, r, and springs, g, for the purpose of removing water from the surface of the rolls.

Third, The scrapers, w, for the purpose of removing the plate or bar of rolled metal from the rolls in case of adhesion thereto.

Fourth, Holding the rolls in close contact with each other previous to pouring in the molten metal, substantially as and for the purposes described.

Fifth, Rolling fluid metal by means of rolls, cooled by passing water through suitable passages formed in the said rolls, substantially as described.

49,054.—Power of Manufacturing Axles, etc., from Iron or Steel.—Henry Bessemer, London, England. Patented in England March 16, 1859:

I claim, first, The manufacture of locomotive and other crank axles, from a plain slab or rolled or hammered ingot of cast malleable iron, cast steel, or cast semi-steel, by sawing or otherwise cutting away so h parts of the mass as will leave a piece of metal having the general form or configuration of the intended crank axle.

Second, I claim, in the manufacture of locomotive and other crank axles made of cast malleable iron or cast steel, or cast semi-steel, the twisting of the axles so as to alter the angle of the different throws from the common plane in which they are formed into any desired angle or relative position to each other.

49,055.—Machinery for the Manufacture of Iron and Steel.—Henry Bessemer, London, England. Patented in England, March 1, 1860:

I claim, first, A converting vessel capable of rotary motion upon its own axis, in combination with a rack and pinion or any equivalent mechanism operated by hydrostatic pressure in a cylinder for the purpose of giving to such a vessel a rotary or semi-rotary movement.

Second, A converting vessel combined with a twee box so constructed as to constitute a chamber for receiving air for decarbonizing crude liquid metals and distributing such air to the tweers.

Third, A twee box so constructed as to constitute a chamber for receiving air for decarbonizing crude liquid metal and distributing such air to the tweers when the bottom of said twee box is made of a piece or pieces suitable to be easily removed, as and for the purposes set forth.

Fourth, The combination of the ladle with the crane arm, or its equivalent, so that the ladle shall be held in a fixed position relatively to the crane arm, but shall be capable of being tipped when desired, substantially as and for the purposes specified.

Fifth, The combination of a ladle capable of being held in a fixed position relatively to the crane arm or its equivalent, substantially as described, with any suitable means of lowering the ladle, as and for the purposes specified.

Sixth, The employment, in the manufacture of malleable iron or steel, of casting ladles, having two or more valvular openings in their bottoms.

Seventh, The method of filling several molds at one time from a basin or vessel having several outlets such basin or vessel being supplied with fluid malleable iron or steel during such casting process, substantially as described.

Eighth, The method herein described of forming tweers by pressure from dry or nearly dry materials.

49,056.—Apparatus for Receiving and Delivering Mail Bags to and from Railroad Trains and Stations.—Andre Chavaune, Paris, France:

First, I claim the open case, A, applied to a railroad car and operating in combination with the mail bag or package, C, substantially as and for the purpose described.

Second, The movable screen, e, in the interior of the open case, A, to operate in combination with the mail bag or package, C, substantially as and for the purpose described.

[The object of this invention is an apparatus by means of which a mail bag or other package carried on a railroad train, can be deposited at any station, and, at the same time, a bag or package from the station delivered to the train while moving at full speed.]

49,057.—Breech-loading Fire-arm.—M. L. M. Descontures, Paris, France:

First, I claim the employment in or application to fire-arms of an oscillating breech, operating substantially as hereinbefore described.

Second, The application of the oscillating breech described to double-barreled fire-arms, in such manner that either one of the two cocks or hammers may act either on the needle striker or exploding rod of its own barrel or on that of the other barrel, so that the arm may be discharged with one barrel charged and the other barrel open, as well as when both are charged.

Third, The arrangement relatively to each other and method of fitting together the barrel, breech and butt, whereby simplicity of construction is combined with strength, durability and perfect security.

49,058.—Machinery for Hammering Metals.—John Ramsbottom, Cleve, England:

First, I claim the improvements in and applicable to duplex or compound steam hammer, as described and shown in sheets 1, 2 and 3 of the accompanying drawings.

Second, I claim in supporting the hammer blocks on sectors, as shown and described in reference to fig. 9.

Third, The improved apparatus described and shown in sheets 4 and 5, for supporting and holding ingots and other pieces of metal during the operation of hammering.

And, lastly, The apparatus described in reference to fig. 23, for traversing the track with the ingot or other articles to and fro during the operation of hammering.

49,059.—Weighing Attachment for Pen Holders or Pencils.—D. A. B. Savy, Paris, France, assignor to E. T. Vanderbergh, Toulon, France:

I claim a weighing attachment, constructed substantially as de-

scribed, and applied to a pen holder or pencil, for the purposes set forth.

[This invention consists in the application to a pen holder or pencil, of a clasp capable of holding a letter or other article to be weighed, in combination with one or more notches cut or otherwise produced in the surface of the holder or of the pencil, in such a position and in such a manner that, by placing the pencil or pen holder on the edge of a knife or other similar implement, the weight of a letter or other article secured in the clasp can be readily determined in an expeditious and easy manner.]

48,060.—Boring Machine.—John Vandyke, Grimsby, Canada West:

I claim the combination of the movable frame, B, which carries the shaft or stock of a boring tool with a fixed frame, B', on which it works up and down by means of elevating screws, H H, substantially as and for the purpose above described.

Second, I also claim the combination of the elevating screws and the adjusting screws, J K K, with the movable frame, B, substantially as and for the purpose above described.

Third, I also claim the feeding slide, I, in combination with the shaft, C, of the boring tool, and the slide bar, O, of the movable frame, for the purpose of feeding the tool to the work, substantially as above described.

This machine is intended for boring wood, and is especially adapted for use in making carriage wheels with either screw or hollow augers, saving much labor and making what was formerly the most difficult part of wheel-making, when carried on by hand, to be now accomplished with ease and in a comparatively perfect manner.]

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THE EIGHTEENTH ANNUAL EXHIBITION OF THE Maryland Institute of Baltimore, for the Mechanic Arts, will commence on Monday Evening, the 24 of October, and continue to Monday Evening, the 30th of October, 1865. The hall will be open for the reception of goods on Monday, the 25th of September. Goods for Competition and Premium must be deposited before Thursday Night, the 28th of September. Circulars, embracing details, may be had of the Actuary at the Institute. Communications addressed to the undersigned, or Joseph Gibson, Actuary, will be promptly attended to. W. W. MAUGHLIN, Chairman Committee on Exhibition. 3 3m

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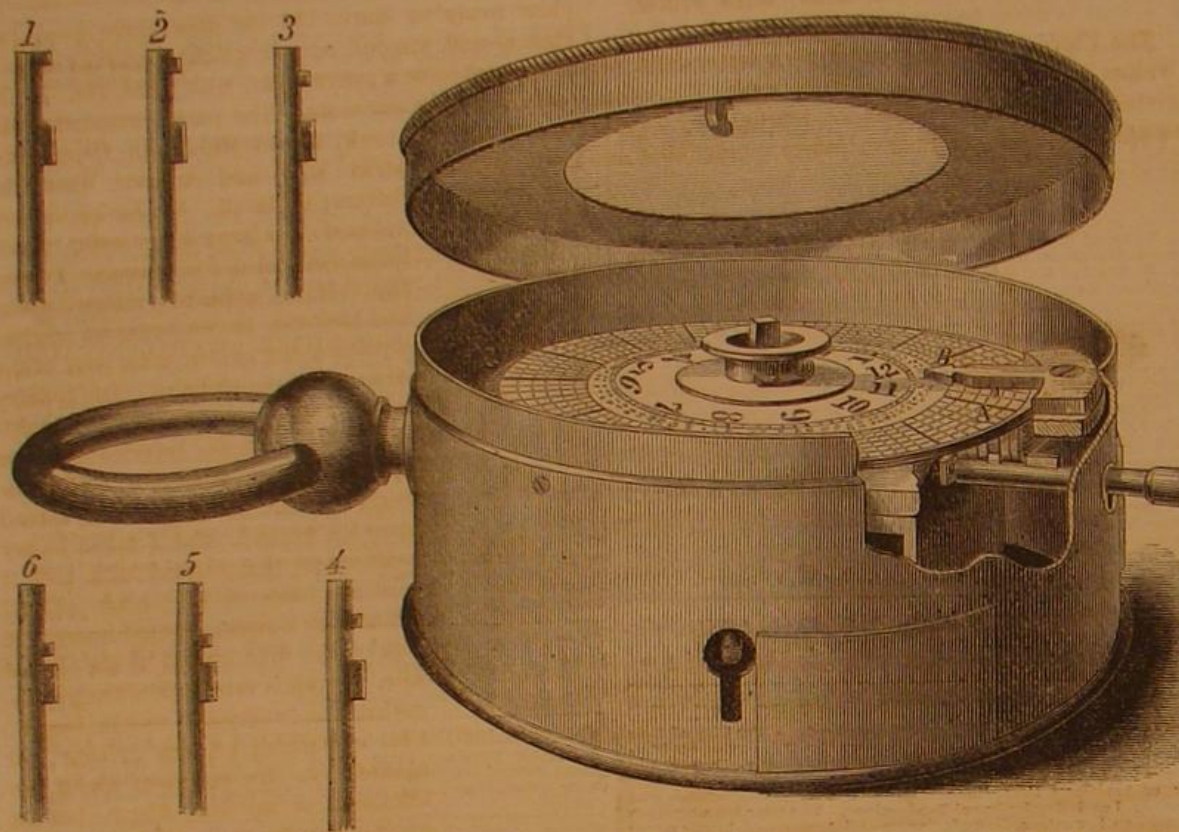
To hire one watchman to look after the other would not be a very wise proceeding, for by collusion they might set at naught all such precautions. Recourse is therefore had to machinery. Silent, insensate wheels

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We now learn through the *New York Times* that the Morris and Essex Railroad Company have ordered their engine-drivers to suspend the amusement of trying speed with the New Jersey Central engines on

**BUERK'S WATCHMAN'S TIME-DETECTOR.**

and springs. By the judicious combination of these, tales can be told, which results in the dismissal of the untrustworthy servant, or his retention and reward if found worthy. "Watch Clocks," as these machines are called, are common, and the principal feature of novelty, is a system of steel pins fitting in holes in a plate rotated by the clock-works. At a certain minute, every half hour, the watchman comes to the counting room, or other post where the clock is set, and pulls a wire. This wire connects with mechanism, and the act causes a pin to be driven in a hole, and so on every thirty minutes through the night. Thus in the morning, when the superintendent comes, he unlocks the clock and sees at a glance if the watchman has done his duty, for if a pin is missing it shows that the man was not at his post at that time.

In the engraving published herewith we present a view of a time-detector which has this advantage over the clock—it is carried by the watchman into every room he may visit, and shows exactly at what time he was at certain places if he does his duty. This obviates the necessity of going long distances to drive a pin, and is an advantage to the watchman who desires to be faithful, but through having to go so far sometimes arrives too late. Besides it is less expensive to employers and is perfectly reliable.

The broken out portion of the watch shows the mechanism which operates the pin which pricks the paper, for the time is indicated in this way instead of driving a pin in a hole as usual. At A, there are a number of sliding bars which connect with the pricking point, so that by turning around the key the ward in it strikes a certain bar and penetrates the dial paper, B. As this can only be done at a certain time, it follows that a perfect record will be kept of each operation. The small figures are views of different keys, there being several of them. Two patents have been granted on this invention through the Scientific American Patent Agency, viz. on Jan. 1, 1861, and June 6, 1865. For further information address the inventor, J. E. Buerk, Box 1,057, Boston, Mass.

the meadow between the Hackensack and the Passaic rivers. It is now ordered, by both companies, that the train nearest to the 1,500-foot signal posts, as they approach either river, shall push ahead, and the one in the rear shall follow at such rate as to avoid even the appearance of racing. The railroads have done a simple act of justice to themselves and the public. It is well.

A Disease Among the Silk Worms.

The *London Pall Mall Gazette* says: "The silk-breeders of France are, we are told, in a position of the greatest distress. A strange disease, which has re-appeared among the worms from time to time—notably in 1688 and 1710—has, since 1860, recommenced its ravages, till the price of seed has risen ten fold, and the demand for mulberry leaves has so fallen off that the planters threaten to cut down the trees and use the lands for some more profitable cultivation. The disease shows itself, according to a petition analyzed in the *China Telegraph*, just as the worm is about to cocoon, so that the breeder has the trouble of rearing for nothing, and has, to purchase seed, as it were, in the dark.

Repeated experiments seem to prove that the only seed which can be trusted is from Japan, and the breeders therefore, pray the State to aid them by bringing home their supplies in men-of-war. It seems probable that this request will be granted, and also that the evil which has spread through all silk growing countries, except Japan, is not temporary, but may last as long as the potato rot and the odium. The real obstacles to silk-growing seems to be the slow growth of the mulberry. The worms will live and work in most countries, but they want mulberry leaves, and nobody is willing to plant orchards which will not begin to bear for five-and-twenty years. It would be no matter of surprise if silk in the next generation became as costly as under the Roman empire, and a silk dress as complete a test of wealth as it was two hundred years ago.

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THE ANNUAL
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Vol. XIII--No. 7.
(NEW SERIES.)

NEW YORK, AUGUST 12, 1865.

\$3 PER ANNUM
IN ADVANCE.

Improved Radial Drill Press.

There is no more indispensable machine in metal-working establishments than a good drill press; and a great deal of ingenuity can be shown in planning them so as to obtain the greatest possible efficiency for the least weight of metal and cost. The kind of work that has to be done under a drill press varies greatly even in shops where one article is manufactured; as, for instance, turbine wheels. One branch demanding long drills to reach past shoulders on the job, which prevent the spindle from being run down, and another requiring the table to be turned out of the way entirely so that the work may set on the floor, or still other jobs running from small holes to large ones. For these reasons it is desirable to have the machine well arranged to accommodate all classes, and we believe the necessary ends are combined in this one.

In detail it comprises a base, A—to be set in the floor, on a foundation of brick work—an upright column, B, and a radiating arm, C, fitted to a neck at the top of the column, and traversing freely in all directions. In this slides the head carrying the drill spindle, which is moved backward and upward by a rack (not shown in the engraving), with pinion and hand wheels, D, one of which is on each side of the machine. The power is derived from a countershaft overhead, a belt from which drives the horizontal shaft, E, passing through a bearing in the side of the column. From this the motion is communicated by two pairs of miter wheels and an upright shaft in the center of the column, to the shaft, F, passing through a sleeve or barrel running in bearings on top of the arm, and provided with a feather, to allow it to slide freely with the motion of the head. The drill spindle is driven by a pair of bevel wheels in the usual manner, and the head in which it runs, with the frame-work carrying the feed wheels and screw, slides within the arm, which is open from end to end and planed up on the bearing surfaces.

It will be seen that the arm or swing is allowed to traverse freely in all directions—the only interference being from the driving belt—and that there is secured besides a longitudinal motion of the drill within the arm. A large number of holes may thus be drilled in succession in the same surface, without moving the work; an advantage which will commend itself to machinists. It is especially useful in fitting up such work as steam cylinders, heads, and steam chests, which, by its means, can be drilled at one sitting instead of many, and has been approved and adopted, particularly in railroad and locomotive shops. The machine is provided with a horizontal table with screw and nut, for small work.

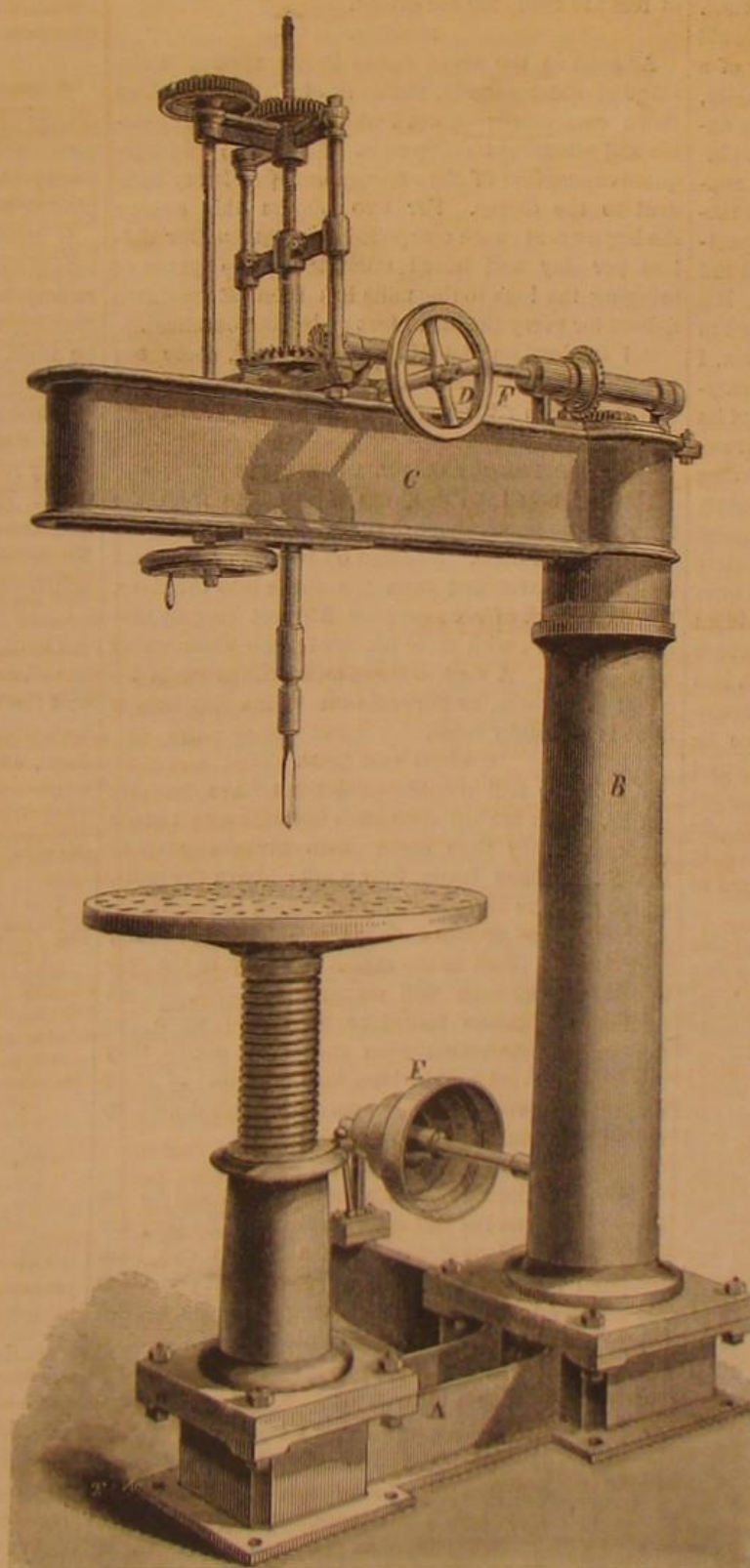
Manufactured by Robt. H. Barr & Co., machinists, Wilmington, Del., to whom all communications should be addressed.

The steamship *Glasgow*, of the Inman line, was recently burned at sea. No lives were lost.

THE STORY OF THE MAN WHO FLEW.

The Chicago *Tribune* contains a letter from one Walter V. Collins, written at Minneapolis, Minnesota, giving an account of a modern Icarus, who flew by means of bladders, copper cylinders, parachutes, and

him ready to start. At the door there stood two teams and wagons, one of which contained what I supposed to be a canvas tent, with poles, etc. In the other we took our seats. The party consisted of Mr. Smith and his clerk, James McLennan, Capt. Cobb and myself, Patrick Riley and Andrew Ward, the drivers; six in all. Mr. Smith was enveloped in a large linen duster, which quite concealed his person. During the ride he appeared rather serious and taciturn. In two hours we reached a point about twelve miles west of the city, and there stopped. The country was a rolling prairie, wholly uncultivated, and with no traveled road for several miles on either side. The canvas, etc., was taken out and spread upon the ground, and I found to my amazement that instead of a tent it was an immense kite, made of sail cloth, with a strong jointed frame. It was of the kind known as the 'house kite,' hexagon form, and when put together was twenty-five feet in length, thus containing an area of over 500 square feet. Its cord was about the thickness of my little finger, but of great strength, having been manufactured to order. The tail of the kite was merely a light rope ladder. Mr. Smith now threw off his linen duster, and I could scarcely avoid laughing at his extraordinary appearance. Beneath his arm pits, and extending around his body, there was a copper cylinder, a foot wide from top to bottom, and about two feet in diameter. His ordinary clothing had been replaced by a tight-fitting suit of ribbed cloth, made apparently all in one piece. Attached to his arms and body were a pair of webbed wings of strong material with a light framework of steel. When at rest, these wings (if I may so call them) hung loosely about him like a closed umbrella, but when his arms were raised they became extended and gave him an odd resemblance to the 'Green Monster' in the pantomime. Scores of ordinary bladders were fastened to the suit above-mentioned, and equally in every part. Some were placed close to the body, and others depended at various lengths, from one to three feet. From the mouth of each a hollow, flexible tube communicated with the cylinder. These, it extended, would consequently form a net-work of air tubes. I made these observations hastily, for Mr. Smith at once placed himself upon the rope ladder and requested that the kite, which had been set up on a slight elevation, should be raised. The Captain and myself called out together



BARR & CO'S RADIAL DRILL PRESS.

kites with rope ladder tails. We print the portion of this letter which describes Mr. Smith, the flying man, and his apparatus, merely remarking with all deference to the names of the respectable citizens appended as witnesses to the feat, that the narrative has a very aerial sound.

"This morning at 11 o'clock, the hour appointed, we were promptly at Mr. Smith's store, and found

that he had forgotten his parachute; but he replied impatiently that he did not need it. We declared, however, that we would not permit so foolhardy an experiment unless this precaution were taken, and after a little parley he consented. A steady breeze was now blowing from the southeast. Riley and Ward took their place in the wagon beside the coil of rope; McLennan acted as driver while

Capt. Cobb and I remained on the ground as spectators. The horses were started into a gallop, and the kite rose, slowly and heavily, but steadily upwards. I glanced at my watch; it was twenty minutes past two o'clock. The kite continued to rise, with a slight swaying motion, higher and higher. It seemed as though the daring aeronaut must become sick and dizzy at his lofty height. Suddenly I was startled by an exclamation from my companion, and noticed a dark object falling from the kite and fluttering slowly downwards. It was the parachute which Smith had thrown away! The persons in the wagon, which was now half a mile distant, did not seem to notice this occurrence. Obviously Smith's situation, if his invention should fail, had become one of appalling danger; since it is almost impossible to bring a kite to the ground without a violent and jerking lateral motion. It seemed equally perilous to stop or to proceed. Trembling with anxiety, we watched with straining eyes his fast-receding form. I had an excellent field glass, which gave me a perfect view of his every motion. And now we noted that both the bladders and the wings had begun to expand. Higher he rose, but we could detect in his attitude no sign of doubt or trepidation. The bladders soon became distended so as to almost hide the man from view. He had now reached an elevation, as near as I could judge, of 1,200 to 1,500 feet, or about a quarter of a mile. He now detached his arms from the ladder, his feet remaining upon it, and waved the wings upward and downward, as if to try them. For an instant he stood thus, and then, relinquishing all support, he sprang off into the empty air! For a moment my heart stood still. I held my breath, expecting to see him dashed to the earth. But he did not fall; he did not even seem to tend downwards. His wings played with great swiftness, and he floated in a horizontal position, with apparent ease. Again, I glanced at my watch. The hand pointed to twenty-seven minutes before three. The kite, deprived of its ballast, had sunk to the ground. Watching narrowly, it was evident that Mr. Smith was slowly moving forward. It appeared to me that the bladder slightly contracted and expanded alternately, as one's chest does in breathing. Of this I could not feel absolutely certain, since the appearance may have resulted from their fluttering motion; yet, the Captain's opinion coincided with my own. After a few minutes (which seemed like hours), we perceived that Mr. Smith had begun to descend. Very gradually this was accomplished, and exactly at a quarter before three he touched the ground. We ran toward him, and found that he was considerably exhausted. He responded cheerily, however, to our hearty congratulations. As the wagon had already returned, it did not take long to stow away the kite, etc., and we then returned to the city.

"I have thus given a plain and exact account of this most extraordinary occurrence. I will not offer any speculation, concerning the nature of Mr. Smith's invention, and in fact do not consider myself at liberty to do so. But, I am greatly mistaken if the name of David K. Smith is not soon familiar to the public as one of its greatest benefactors. Any one can satisfy himself as to his character and standing in this community, by inquiring of Hon. C. E. Vanderburgh, Judge of the District Court, or of almost any citizen of Minneapolis. Any person wishing to inquire further is at liberty to call upon me at my office, No. 26 Larmon Block; or a letter will reach me through the Chicago P. O., Box 6,026.

"WALTER V. COLLINS."

THE WATER POWER OF MINNESOTA.

The St. Paul Weekly Press has a long article upon the flourishing condition of manufactures in Minnesota, and gives some interesting statistics of the value of some branches of trade there carried on. We copy:—

THE WATER POWER.

In order to turn this vast power to practical use the St. Anthony Water Power Company was organized in 1855. This company is now composed principally of Eastern capitalists. In 1856, the Minneapolis Mill Company was organized. In 1857 and 1858 the company proceeded to build a dam twenty feet high, running from the shore out into the river four hundred feet, thence up the river twelve hundred

feet. Five hundred feet of the twelve hundred is a dry dam, the same height as the portion running out from shore, and the remainder is lower, allowing the water to pour over it. Besides this dam the company built a canal at the shore end, one hundred and fifty feet long, which largely increases the opportunity for erecting manufacturing establishments. Mills situated on the dam pay for the use of the water alone, while the owners of those on the canal buy the ground and lease the water power. One of the saw mills pays \$1,200; four pay \$900, and one \$600 per annum for the use of water. Next season the company intend to extend the canal five hundred feet beyond its present limit.

THE LUMBER TRADE.

The most important branch of trade is in lumber, a business in which an immense capital is already employed, and which, owing to the great demand for the article, is being rapidly increased.

WHERE THE LOGS COME FROM.

Ninety miles above the falls, on Rum river, and one hundred and fifty above on the Upper Mississippi, are the pineries, which afford an almost inexhaustible supply of logs. Here, in the winter, large gangs of men ply the ax vigorously, and by spring millions of feet are ready for the drives.

DRIVING.

As soon as the river opens in the spring, if the stage of water permits, the work of driving the logs down commences—a work which is far from agreeable and oftentimes dangerous. Few have any adequate conception of the expense and perplexity incident to the drives. For two months this season the log owners were compelled to pay men four dollars per day and board them, and the expense of bringing the logs to the mills has been at least two dollars for every thousand feet of lumber obtained.

All the logs on the Upper Mississippi, some ten million feet, have been brought down, but in the drives on Rum river there are still twenty-five million feet.

THE MINNEAPOLIS SAW-MILLS.

Having noted the progress of the logs from the forest to the boom above the city, we next turn our attention to the mills. Situated on the dam heretofore mentioned, extending from the shore into the river, stands a block of six saw-mills, 360 feet long by seventy feet wide, with three Ls, 32x40, the whole under a single roof. A visit to these mills will prove of interest to any one, as the scale on which business is done is unusually large.

SORTING THE LOGS.

All of the mill owners or lessees have peculiar marks, which are cut upon each log with an ax in the pineries. They then come down promiscuously to the St. Anthony boom, fully a mile above the mills, where they are sorted—those belonging to the Minneapolis mills being driven into the Minneapolis boom, and floated down to the mills. Directly in the rear of the building each mill owner has a pond, defined by floating timbers lashed together, and when the logs reach these ponds from the boom above they are again sorted and driven into the pond of their respective owners, from whence they are drawn up the slip by machinery into the mill.

A BUSY SCENE.

Entering the mills, the visitor cannot fail to be struck with the life and activity visible. As they are only separated by frame-work, a person can look through the whole length and see a great collection of men and machinery, all moving with the utmost regularity. It is, emphatically, the hive of industry, and the indolent man would blush to find himself a spectator of such a scene.

THE SAWS AND THEIR USES.

The greater portion of the work is done by gangs of saws, which, with a single run, will convert any but the largest logs into boards. A gang consists of from twenty to twenty-two saws, according to the size needed for the logs; and of the gangs there are two kinds, the *live* and the *pony* gang. The *live* gang is used principally for flooring, fencing and inch boards, and is rarely adjusted to make lumber of a different thickness.

The largest logs are taken to the double circular saw, one saw being located just above the other, in order to complete the work if the log is too large for the lower one, and in this way anything short of California trees will meet their doom in short order.

These saws are used in making timber, dimension stuff, etc., and also in preparing the log for the pony gang, either by slabbing it or cutting it into bolts. The *pony* gang differs from the *live* gang in that it is used to saw lumber of nearly every kind and thickness, the number of saws being frequently increased or decreased according to the thickness desired.

In connection with the gangs are three other saws (circular), one edger and two trimmers. As soon as the gang has passed through a log, the boards go to the edging table, where the edges are smoothed and they are made of the same width, from whence they pass to the trimming table, where each end is sawed off at the same time, making them exactly the same length.

POWER AND CAPACITY.

It requires 40-horse power to run a gang of saws and 10-horse power to drive the edger and trimmers which go with it. The length of time required to run the gang through a log varies of course with the size; but eight minutes is ample time to transform a two-foot log into boards, and in fifteen minutes after a log comes up the slip in the rear of the mill it passes out to the sluice in front, finished lumber, and glides away to the raft. In ten hours a gang of saws can turn out about twenty thousand feet, and the double circulars from ten to twelve thousand.

NUMBER OF SAWS, ETC.

Number of gangs (22 saws in each), 9; number double circular saws, 6; number shingle machines, 6; number lath do., 6. Cost of six mills, \$143,000; capacity six mills (24 hours), 430,000 feet; men employed, 300.

If these mills are run night and day, they can manufacture nearly half a million feet of lumber every twenty-four hours. Some of the mills are already running both night and day, all of them probably will be soon.

WHERE THE LUMBER GOES TO.

Three rafts have been sent from Minneapolis and two from St. Anthony this season; and five more are nearly ready. Some of these rafts go as far as Memphis. Three million feet have been sent to St. Louis, and taken thence by steamer to New Orleans. In Minneapolis, all the dealers have large yards in which there are immense stacks of lumber.

THE PRODUCT OF THE SEASON.

Though compelled to commence late in the season, the Minneapolis mills have sawed twelve million feet, and the St. Anthony mills six millions. It is estimated that on the Minneapolis side, thirty-eight millions, and on the St. Anthony side, nineteen millions more will be sawed before the close of the season. This will make the entire product of this season, seventy-five million feet.

PRICE OF LUMBER.

The following is the present price list of lumber at the mills:—

Common lumber and fencing per M.	\$16 00
1st Siding	22 00
2d Siding	20 00
No. 1 Shingles	2 50
X Shingles	4 00
XX Shingles	5 00
Flooring, dressed	30 00
Flooring, rough	28 00
Dimension Stuff	16 to 20 00
No. 1 clear	30 to 35 00
No. 2 clear	20 to 25 00
No. 1 Pickets	20 50
No. 2 Pickets	15 00
Laths	2 75

This shows a large reduction, as for the past two years common lumber has been \$22 per thousand, and superior lumber correspondingly high.

WHAT KEEPS UP THE PRICE.

Those who anticipate any material reduction in the price of lumber this season will undoubtedly be disappointed. The great demand, a wide market and high price of labor, all tend to render it impossible to supply it at a lower figure. Having been without logs for two years, the home stock of lumber became so reduced that the demand in our own State is immense; and add to this the close of the war, which makes a market extending from the Falls of St. Anthony to the Gulf, and the result may be imagined. The expenses are also enormous. During the winter, the men received from \$40 to \$50 a month and board, for working in the pineries; and for driving the logs, owners are, and have been, paying four dollars per day. Where driving formerly cost fifty cents per thousand, it now costs two dollars. Wages at the mills at the present time, range from two to four

dollars per day. From these figures (which do not include the original cost of the logs) some idea of the expenses of the business can be derived.

THE NAVAL CONTROVERSY.

In the last number of the SCIENTIFIC AMERICAN we made brief allusion to the fact that the war of words between the Navy Department and Mr. E. N. Dickerson, of this city, had resulted in a challenge, and stated that Mr. Dickerson had not accepted the same at the time of publication. He has since consented to a trial of his engines against those designed by the Navy, but protesting that the results will prove nothing. We find the following letter in the daily Times. It appears to be semi-official, and contains a clear statement of what the Department expect to do. When the trial takes place, we shall give all the facts in the case.

WASHINGTON, Aug. 1, 1865.

Several letters have recently been published on the subject of the machinery of the United States steamer *Algonquin*, written by E. N. Dickerson, Esq., of New York. Since he has thus brought the matter before the public, the following facts, from official sources, may be of sufficient general interest to warrant their publication:—

Mr. Paul S. Forbes, a wealthy merchant, and a patron of Dickerson, sought and obtained from the Navy Department, in March, 1863, a contract to construct the engines and boilers of a double-ender, according to Dickerson's patent, to compete with similar machinery designed by Mr. Isherwood, the Chief of the Bureau of Steam Engineering in that Department. The prize was to be the same, and the contract contains the following guarantees, namely:—

It is further agreed, and mutually understood, that the variations from the specifications [of Mr. Isherwood's machinery] hereunto attached, and forming part of this contract, are to be in the dimensions and arrangement of the cylinder, and such parts as are thereby affected; in the design of the valve-gear; and in the design and arrangement of the boilers; and also in the surface condenser.

These changes are not to increase the weights of machinery, nor the space occupied by it, nor to decrease the weight of coal carried in the bunkers within the limits allowed for the engineer department, with the machinery described in the attached specifications.

And it is also agreed and mutually understood that, if, on the completion of the machinery and a careful trial thereof by such persons as may be directed by the Secretary of the Navy, it shall be found by them that its performance, either in amount of power developed, or in the cost, pro rata, of that power in coal, is less than those of the machinery described in the attached specification, they, the said parties of the first part, will remove it, and replace it at their own cost, with the machinery described in the attached specifications.

These terms show that the contract requires simply this: The department to ascertain by usual tests—first, the maximum power the two competing systems can be made to develop; second, the cost of the power, pro rata, in coal. The usual tests are the measurement of the power developed by means of the well-known "indicator," employed the world over for this purpose, and the weighing of the coal. The division of the first into the number of pounds of the latter consumed per hour, is the solution of the problem. This, the department has ordered to be done by a board composed of persons than whom none are supposed to be more competent. The machinery of the *Winooska* was selected to compete against that of the *Algonquin* simply because the *Winooska* was the most convenient vessel of her class at command.

The trials are to be made at the wharf with the paddle surface sufficiently reduced in diameter to enable the engines to work off all the steam that can be obtained from their boilers, and are to be continued 96 consecutive hours to give a reliable mean, which cannot be obtained from short trials. The powers developed are to be measured by the "indicator," the coal is to be taken from the same pile and carefully weighed as it is used, but before being carried on board, so that the draught of water and dip of wheels of both vessels will remain constant, and be the same throughout the trials.

The test is not of the speeds of the two vessels, for they are duplicates, and are to have duplicate wheels by the express terms of the contract and specifications. The test is simply whether the boilers, condenser, and valve-gear of the *Algonquin* are equal to, better or worse, than those of the *Winooska*, and the trial, as directed by the department, will not only conclusively show these facts, but how much better

or worse. By making them at the wharf they can be continued longer, be made in a really philosophic manner with strict accuracy, and be witnessed by all who may feel interested in them, which could not be the case were they made in the river or at sea.

The Navy Department has not accepted a challenge from Mr. Dickerson; it has no correspondence with him and has nothing whatever to do with him, but is simply carrying out the provisions of the contract with Mr. Forbes, to determine whether the engine shall be accepted and paid for, or whether it shall be removed from the vessel. The contract does not provide for a trial of speed at sea. The vessels being the same, the result arrived at in the proposed trial will, however, unerringly determine which is the fastest vessel. The Navy Department will not be swerved from its duty to the contractor, or led into any controversy with Mr. Dickerson by any public statement of the latter.

JUSTITIA.

Train Oils.

The different oils that go under the one name of train oil, may be classified as follows:—A. That which is made from fish. This is made from the lard of the great marine animals, such as whales, sea-dogs, seals, etc., and sometimes even made from herrings. The quality will vary according to the peculiarity of the animal it is made from. The oil mostly in use, and known under the name of "Southern Sea Train Oil," is made from seal. The quality will also vary according to the preparation. B. Whale oil. This is of a brown color, is quite transparent, and when boiled with rarified sulphate acid, will throw out brown flakes. The liquid is not very thick and does not smell as bad as the following oils, which are obtained by fermenting the lard. C. Sea-calf's oil. This oil is of a pale brown color, much thinner than the former, is transparent, and when boiled with sulphate acid, will gradually settle to the bottom. D. Dog-fish oil. This is of a dark brown color, is much thicker than both the former, but its smell is unbearable. E. Herring's oil. The herrings are boiled in water and constantly stirred; when they are thoroughly cooked cold water is poured in; this brings up the oil to the top, it is then taken out and filtered and put into casks. Sweden is almost the only place where this oil is produced. F. Cod oil. This is made from the liver of the codfish, and is mostly manufactured in Helgoland and in Bergen. There are two kinds of it, one is white, the other brown. The white is obtained by melting the fat, not on fire, but merely by exposing it to the sun. It has the appearance of poppy oil, pale and yellow. It has a sweet taste, but when mixed with reagent, tastes somewhat acid. It dissolves in spirits of wine, and is much used in medicine.

The second sort is extracted by boiling the liver; its color is brown, and the fluid thick, and has a very offensive smell, and a cutting, bitter taste, but is easier dissolved in spirits of wine than the former. When boiled in water it throws out flakes, and more so when mixed with sulphate acid. The flakes, when dissolved in turpentine, or spirits of wine, show that gall fat is mixed with it. Its specific weight is 92. G. Dolphin oil. This is produced by melting the fat of the dolphin in hot water of 60°. Its color is pale yellow, has the smell of sardines, but, when exposed to the light and fresh air, it loses the offensive odor, and changes the color, first becoming brown and then almost colorless. This train oil is dissolved by adding five parts of boiling spirits of wine.—*German Courier*.

Raising the "Congress" Frigate.

An attempt to raise the wreck of the frigate *Congress*, sunk by the *Merrimac* in Hampton Roads, has been partially successful. On the portion of the wreck which was recovered are two rusty guns, covered with oysters and barnacles. The woodwork is, of course, rotten and worthless, but the great amount of metal in and about the wreck will be quite valuable. Several pieces of coin have been found on the deck, which are prized highly by the finders, and will be treasured as relics of peculiar value. Several naval buttons were picked up, and at once fastened to watch guards. Among other things, one of the spectators found a complete set of artificial teeth. No human remains have as yet been recovered.

Magnesium Light for Telegraphs.

On Tuesday last some experiments with the magnesium light were made on board the *Great Eastern*, off Shoeburyness, by Capt. F. J. Bolton, of the 12th regiment. The night was windy, but signals were transmitted to and received from the shore at Shoeburyness, a distance of about six miles. This system of telegraphing, in which an alphabet on the Morse principle is used, bids fair to become universal, the Board of Trade being about to introduce it into the commercial code of signals. It is the opinion of Capt. Bolton, that the magnesium will be cheaper than the oxy-calcium light, and equally powerful in its effects. On Tuesday night the light on shore was the oxy-calcium, while on board the *Great Eastern* the lime light was used. The lamp in the latter case not being so constructed as to keep out the wind effectually, there was some difficulty at first in getting a steady light, a delay which Shoeburyness noticed by signalling "Look sharp, look sharp; fire away!" An animated conversation between the ship and shore then took place, Shoeburyness finishing with "Good night, good night—our light nearly gone." The magnesium light has never been used by the Government for this purpose before Tuesday last, whereas the oxy-calcium light has been on trial for three years, so any conclusions as to the comparative merits of the two would be premature.—*London Examiner*, July 14.

The Speed of the Pen.

A rapid penman can write thirty words in a minute. To do this he must draw his quill through the space of one rod—sixteen and one-half feet. In forty minutes his pen travels a furlong; and in five and one-third hours one mile.

We make, on an average, sixteen curves or turns of the pen in writing each word. Writing thirty words in a minute, we must make four hundred and eighty-eight to each second; in an hour, twenty-eight thousand eight hundred; in a day of only five hours, one hundred and forty-four thousand; in a year of three hundred days, forty-three million two hundred thousand.

The man who made one million strokes with a pen in a month was not at all remarkable. Many men make four millions.

Here we have in the aggregate a mark three hundred miles long, to be traced on paper by each writer in a year.

In making each letter of the ordinary alphabet, we must make from three to seven strokes of the pen—on an average of three and a half to four.—*Com. College Monthly*.

MARKET FOR THE MONTH.

	Price June 28.	Price Aug 2
Coal (Anth.) 2,000 lb. \$ 8 50 @ 10 00		\$8 50
Coffee (Java) 24 @ 25		25 @ 28
Copper (Am. Ingot) 29 @ 30		30 @ 31
Cotton (middling) 50		48
Flour (State) 55 20 @ 6 15		\$6 00 @ 7 00
Wheat 1 70 @ 2 15		1 85 @ 2 30
Hay 100 lb. 1 00		1 00
Hemp (Am. drs'd) 260 00 @ 270 00		255 00 @ 265 00
Hides (city slaughter) 7 1/2 @ 9		9 @ 10
India-rubber 47 @ 70		48 @ 70
Lead (Am.) 9 75 @ 10 00		9 00 @ 9 62 1/2
Nails 100 lb. 5 00 @ 5 25		6 50
Petroleum (crude) 35 1/2 @ 32 1/2		33
Beef (mess) 10 00 @ 16 00		10 00 @ 14 50
Saltpeter 24		24
Steel (Am. cast) 13 @ 22		13 @ 22
Sugar (brown) 9 1/2 @ 15 1/2		8 @ 16 1/2
Wool (American Saxony fleece)		
75 @ 77		75 @ 77
Zinc 12 @ 12 1/2		12 1/2 @ 13 1/2
Gold 1 39		1 45 1/2
Interest (loans on call) 4 @ 5		7

OUR MERCANTILE MARINE.—It has been definitely ascertained that more than six hundred sea-going vessels belonging to citizens of this country have been sold during the war to British subjects. Those sold to citizens of other countries will probably bring up the total to a thousand vessels that were four years ago carrying the stars and stripes and are now sailing under foreign colors. The capacity of the vessels transferred is estimated at five hundred thousand tons.

HEAVY ENGINE.—The Taunton (Mass.) *Gazette* says one of the largest locomotives ever manufactured in that place was sent from the Taunton Locomotive Manufacturing Co. It weighs 34 tons, and is destined to the New Jersey Central Railroad.

Improved Brick Machine.

The appended article is furnished by the inventor. "The material advantages of this machine consists in the use of the lever principle, by means of which the power required to work the machine is considerably reduced, while the pressure is vastly increased. Thus clay may be worked with less moisture than otherwise, and the bricks still be perfectly smooth, square and solid. In this way they are handled with greater ease, are less liable to injury, while the process of drying is shortened, and damage from rains thereby avoided. It is claimed by the manufacturers that the machine may be made to produce fifty thousand bricks per day—the rate of production in no wise interferes with the quality; a fair day's work, they state, is from thirty to thirty-five thousand. To make this last-named amount, one strong horse, two men to produce the clay, one man to sand the molds, one man to strike, two men to remove the bricks and one man to dump, are required.

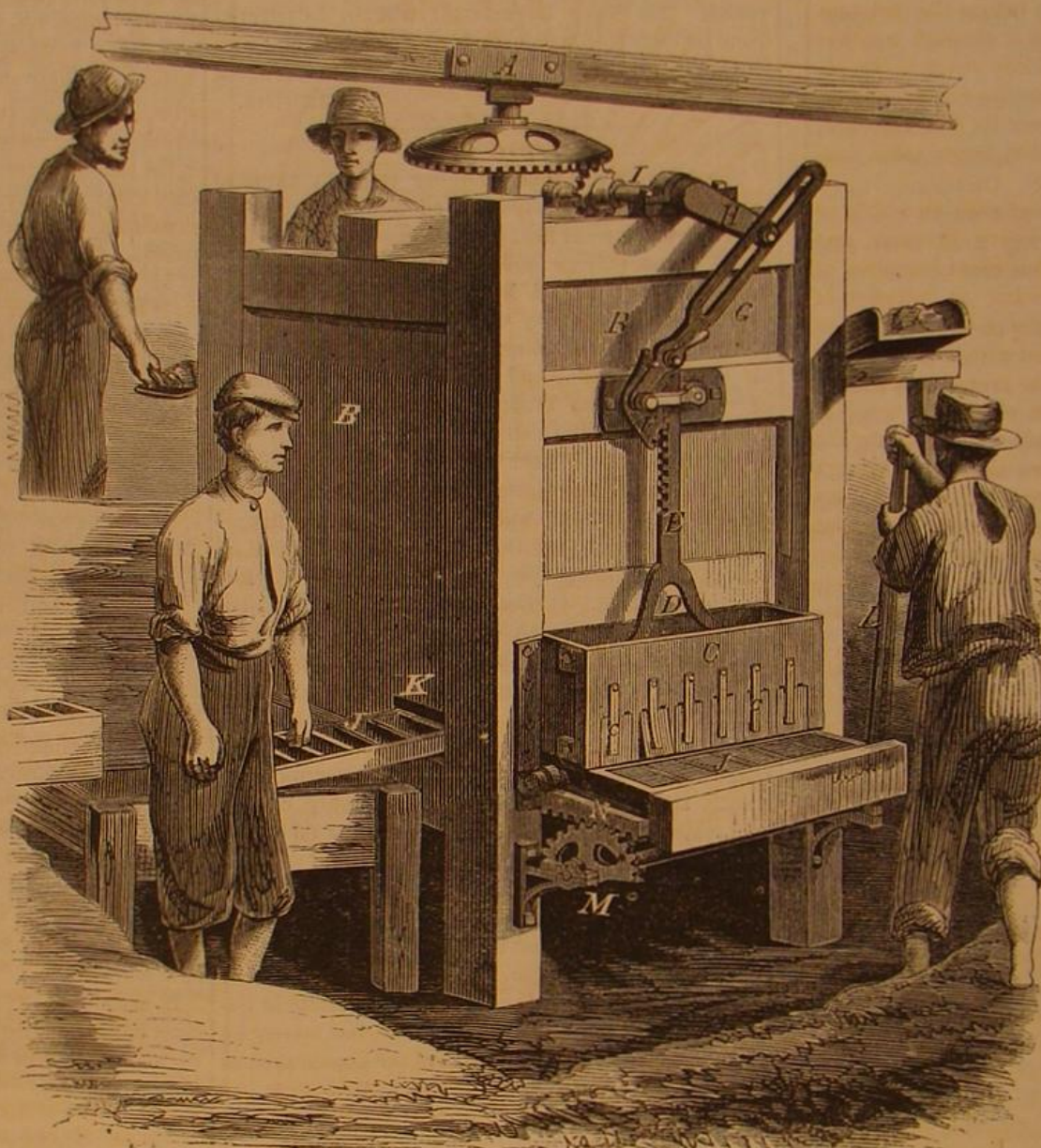
"The body or box, B B, has inside of it a vertical shaft, H, which is turned by a horse attached to the sweep, A. On this shaft are knives to break up and mix the clay; also three forcing knives, six inches wide at the bottom, to push the clay into the molding box, C. In the molding box is a platen, D, worked by a rack, E, and toothed arc, F, which receive motion through a slotted arm, G, from a crank, H, on the horizontal shaft, I, which shaft is turned by the vertical shaft by means of bevel gearing, and makes about three turns to one turn of the vertical shaft. The molds, J J, are pushed in through the side, K, and are brought forward under the molding box by drawing forward the rack, N, by means of the toothed arc, M, on a shaft which is worked by the hand lever, L. When steam or water power is to be used, the inventor proposes, instead of the hand lever, to substitute gearing, by means of which the machine will bring forward the molds. As soon as the mold is brought under the molding box, the platen is forced down and presses the clay into the mold. During the downward movement of the platen, the slotted arm, G, gives such advantage of leverage to the crank, that the pressure is very strong; and during the upward movement of the crank the leverage is short, and the lift is quick. As soon as the platen is lifted, the mold is brought further forward into the fountain, J, in front of the molding box. During this forward movement of the molds, the bottom of the front of the molding box shoves off the clay level with the top of the mold, and thus forms the upper surfaces of the bricks. Lest stones or other foul substances in the clay, should be caught between the edge of the mold, and the edge of the molding box front, and cause breakage, there is a slide the under side of which is beveled so as to rise if any hard substance is forced against it. There is a slide or cam on the slotted lever, which regulates the press from one to six inches, and a nut with a handle to it, as shown in the engraving."

It was patented through the Scientific American Patent Agency, on the 27th June, 1865, by Henry Martin, and assigned to Bradford & Renick, 71 Broadway, New York, of whom further information may be obtained.

THE London *Athenaeum* defines the meaning of the title F. R. S., as a man who Fairly Represents Science.

Hold on to the Running Board.

As the express train from Toronto was approaching Cornwall station, recently, the brakes were whistled down, the train backed up, and disappeared around the curve. After a delay of about ten minutes it came forward to the station. It was ascertained that the fireman had been out on the engine putting tallow in one of the cups. The train was running at full speed, and reaching the curve about a mile and a half west of the station unobserved by the fireman, the engine of course swerved as directed by the curve, causing the unfortunate man to fly off at a tangent. Singularly enough the result was not at all serious, for on the train return-



MARTIN'S "CHAMPION" BRICK MACHINE.

ing to pick him up, he was found "marching on" to meet it.—*Cornwall (C. W.) Freeholder.*

A Choice Bit.

It seems there are some novelties recently discovered in the steam engine not generally known. We find the following lucid and astounding description in the *New York Herald*. It is about a new steam fire engine built at Manchester, N. H.:

"It is the most powerful machine ever in use in this city, and considering the apparent scanty area of its motive power, it is in our view a marvel of beauty, symmetry and power. The boiler is only thirty-six inches in diameter and sixty-five inches in length, containing the almost incredible number of three hundred and thirteen copper tubes, twenty-four inches long and an inch and a quarter in diameter, thereby exposing a surface to caloric operation capable of generating a pressure of steam for instant work in about nine minutes. The pumps are two in number, of double action, and the steam cylinders, eight inches in diameter and twelve inches stroke, all working on the same piston rods, and all the fittings secured with the most durable mechanical skill, by which the harmony of motion at full work is as true to time as the most accomplished composer in the science of music could render his creations captivating in the highest degree. The materials used in the construction of this model of beauty in the steam engine are each and all of the choicest articles in their respective kind, such as the best boiler plate iron

cased in wood and overlaid with Russia iron, hooped with bands of brass, a brass dome and funnel casing with india-rubber valves and polished mountings of turned brass and copper where such things are used. The various and numerous range of apparatus not actually in action with the machine itself when at work, are curious and pleasing in an eminent degree from their positive utility, such as the signal lantern, the wheels and brakes, the driver's seat and lamps, oil cans for the journals, self-supplied; signal whistle, a jackscrew, a coal bucket, capable of containing as much fuel as would work the engine for two hours at the highest pressure; a complete set of nozzles, of every bore and dimension, to provide against

accident in the event of the one at work becoming deranged or disabled, and a hose one thousand feet long of the best tanned bullock hide, riveted in copper and capable of throwing, with great force, two, three or four jets of water at a time, a distance of upwards of two hundred and sixty feet from the nozzle. The second test was by taking the supply from an inexhaustable quantity in the river, and this being accomplished on the hydrant principle and from suction the results were most gratifying in every respect. It may now be averred with the utmost confidence, and without the remotest apprehension that anything rational can be said to the contrary that in this one production of scientific and mechanical skill the city of New York is in possession of the most powerful, the most complete, and for all the purposes for which it was designed and constructed in practical utilitarian and instant operation, a fire engine which stands as a model upon which all the world beside can fashion machines of kindred tendency, but the doubt is, can the combined skill of the whole world produce a better or suggest an improvement in the design and execution of the Metropolitan Fire engine of New York

[We should say, no!—Eds.]

STATISTICS.—A curious calculation has been made lately by a savant, well known in Paris for his peculiar antipathy to the fly. He collected three thousand flies in a room measuring two cubic meters; on the floor he spread a pounded loaf of sugar. At the end of four days he went in to investigate the result of his experiment. There remained a teaspoonful of sugar. This statistician therefore calculates that, sugar being at the rate of thirteen cents a pound, a fly costs the country twenty cents from its birth to its demise.

[That is, if fed on loaf sugar.—Eds.]

NEW COMBUSTIBLE.—I see the mention of a new combustible, invented by a gentleman who very appropriately bears the name of Stoker. It appears to be very pure charcoal, finely ground and made into a paste with starch. The paste is molded into cakes or balls of different sizes, and then dried. When perfectly dry these may be lighted with a lucifer match, and will continue to burn steadily, like German tinder, without giving flame or smoke. The combustible is intended for heating urns, chafettes, etc.—*Paris Correspondent of Chemical News.*

A MODEL miniature locomotive, made of gold and silver, with a ruby for a head-light, and costing \$4,000, is on exhibition at Taunton, Mass. Its wheels are driven by clock-work.

How Paper Collars are Made.

We find the following in an exchange:—"At the end of the first room are piles of pure white paper, awaiting their turn to be guillotined in a machine furnished with twenty-two shear blades, which cut the paper into the requisite strips for the collar, on precisely the same principle as a gigantic pair of scissors, thus leaving no rough edge. The product of two paper mills is consumed in this factory, and at the rate of a ton to a ton and a half per day; the average production being about one hundred thousand collars per day, which find a ready sale, despite the numerous imitations with which the market is flooded. From the hands of the attendant who turns out the pure, even strips of paper, they pass into the hands of another fair executioner, who brings the incipient collar nearer its birth by passing it through another pair of knives, by which it acquires shape in an instant. Still another machine marches relentlessly up and down, and as the collar leaves its iron embrace, the three button holes are visible, large, clean cut, firm holding and easily handled.

"The collar is now placed between two dies or clamps, passed under a quick, heavy pressure, and emerges again stamped with that close imitation of stitching which renders it so perfect an imitation of its linen brother that the difference can hardly be distinguished; it is stamped also with the size and corporate mark. Next comes the crimping machine, which draws the curved line on which the shape of the collar turns, and which by allowing space for the cravat insures a smooth fit. They then pass through the nimble hands of a damsel, who with deft fingers flying with lightning-like rapidity, turns the collar over as no machine has yet been able to do; from these hands it passes to the molding machine, where it is bent round into perfect shape and finished as a perfect collar.

"This process is an important one, requires skill in the operator, and strength in the paper, which must be of the best to resist the immense strain required to mold the collar into perfect shape.

"The collar is now, as it were, born shapely, trim and elegant, and ready to adorn the neck of the most fastidious, having passed through seven distinct processes in its manufacture. It is once more taken in hand by women and packed into boxes by the hundred, or in the well-known little round boxes of ten each, which are so convenient to toss into a valise when off for a week in the country or elsewhere. For the item of boxes the company expend over \$60,000 per annum. The first machine turned out the collar entire, performing the whole work at once, but slowly and imperfectly; but the genius of the inventor, quickened by the rapidly increasing demand for the article, added improvement after improvement, by one machine after another, until the manufactory is now capable of turning out five millions of collars per month.

"The American Molded Collar Company employ in this manufactory seventy neatly-dressed, intelligent looking American women, most of whom are young. These women earn a dollar per day, and their work is clean, healthy and not very laborious. Mr. Gray, who first commenced to manufacture in the spring of 1863, has now eight patents on collars and machine, having previously secured them in Europe; three of the directors of the Company went there this summer with skilled mechanics and American machinery, to take measures to establish the manufacture in England, France and Belgium, where they will probably soon attain that popularity which the American molded collar has achieved in this country."

VALUE OF CITY PROPERTY.—The lot on the corner of Broadway and Ann street, in this city, made vacant by the burning of Barnum's Museum, was bought by Mr. James Gordon Bennett, who proposes to erect thereon a fire-proof building for the *Herald*. The lot is 55 feet by 100 feet, and \$450,000 was paid for it, and \$200,000 besides to Mr. Barnum for his unexpired lease of it. Non-residents can thus get an idea of the value of some city lots.

The Great Britain, a broad-gauge English locomotive, with 18-inch cylinders and 24 inch stroke, has worked up to 1000-horse power. So says the *London Engineer*.

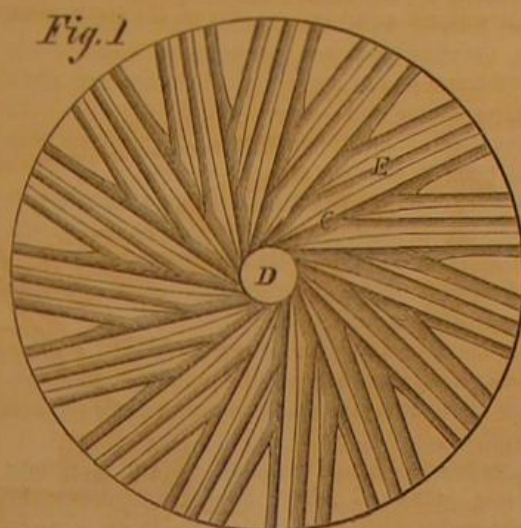
WING'S MILLSTONE DRESS.

These engravings represent a new method for dressing millstones, for which it is claimed that unusually good results are obtained. The appended description is furnished by the inventor:—

"Fig. 1 is a plain view of a runner stone inverted, having my improved dress.

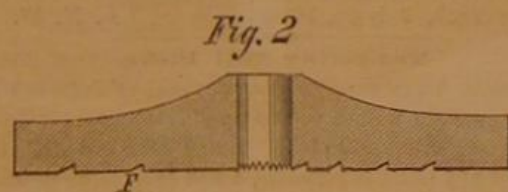
"Fig. 2 is a vertical section of the same, showing the form of the furrows.

"Fig. 3 is a vertical section of a portion of a pair of millstones, dressed in the usual manner, showing the feed opening, or bosom, *a*.



"My improvement has a two-fold object, viz.: to effect the grinding as near to the eye as possible, thereby saving the power required for driving the stone, and by so doing to carry off the flour in the furrows and prevent its keeping between the lands of the stone as it approaches the periphery, whereby overgrinding is produced from greater friction, and retention of the flour between the parts of the stone that revolve the most rapidly.

"In the ordinary mode of dressing millstones for grinding wheat flour the lands run of equal width, and form parallel lines from the periphery to the eye, leaving the furrows of equal width and parallel with the lands. I take from the lands, or surface of the stone, and widen the furrows as they approach the center.



"The furrows, in my method, consists of two series—the leading furrows, *C*, which diverge tangentially from the eye, *D*, outward to the periphery, diminishing slightly in width—and parallel with each of these are two or more auxiliary furrows, *E*, which fill the angular space between the leading furrows, and which are rendered shorter by their intersection with the next contiguous furrow. The bottoms of both incline, as at *F*, Fig. 2; the lands between extend to the eye, thereby carrying the plane of the stone fully up to the eye. At this point the furrows are made deep enough for the grain to enter, whereas some millers reduce this surface around the eye for a short distance below the common plane of the lands.

"This opening or hollow is called the bosom, and its object is to facilitate the entrance of the grain between the stones. By my plan of dressing, however, this is rendered wholly unnecessary, and its evils obviated.

"To grind flour properly the kernels should not be pulverized between the lands, but between the sloping and inclined sides of the furrows, which prevents the flour from being spoiled while grinding, and this is accomplished by the method of dress which is here shown, the object being to make the lands act as guides at the eye, to direct the grain into the furrows.

"A further advantage is that it can be used in any stone where there are straight furrows without dress-

ing any more of the lands away than my furrows require. When introduced it does not require one-half the labor to keep the stone in order that the common dress does, and it is also an improvement in grinding damp grain of any kind."

The inventor will sell rights of mills, towns, counties or States on reasonable terms. Patented on March 21, 1865, through the Scientific American Patent Agency. For further information address Abram Wing, Mayville, N. Y.

Alloys.

Every thoughtful metal worker, who has his hands too full of his daily employment to spend much time in experimenting on the properties of the metals he uses, must have often wondered how it came to pass that with all our boasted knowledge of chemical and metallurgical subjects, we have as yet only succeeded in inventing some half-dozen useful alloys. Brass, pewter, gun-metal, German silver, and type metal are really all the alloys that we can name as entering into the manufacture of the more common articles of trade in this country. The causes of this apathy in experimenting on the properties of mixed metals are manifold. The practical metal-worker of the present day is generally ignorant of the chemistry of the metals he uses; and even if he were well informed, he would be too busy fighting the great battle of competition to set himself the extra task of experimenting upon alloys. But metal workers will turn round very naturally and ask how it is that practical chemists, whose business is to make experiments, do not investigate the capabilities of metallic mixtures more frequently than is at present the case. We fear very much that the only answer to be given to this is that scientific chemists of all countries have, almost without exception, been bitten with a mania for nearly exclusively pursuing their researches and expending their talents upon organic compounds.

This department of scientific chemistry is so vast and so fruitful in results that it is quite a rarity to see an article in a scientific journal upon a metal or metallic compounds. Even those chemists who have not wholly given up the study of inorganic compounds seem to apply themselves to analytical observations or to the investigation of the rarer metals. As an example of the want of knowledge of the capabilities of alloys, we may instance the discovery lately made by M. Pelouze, of the French mint, that the best metal with which to alloy silver is zinc, and not copper, as we have always believed. Now, considering that silver has been known from the remotest ages, and zinc, at any rate, since the birth of modern chemistry, it seems singularly strange that no one ever thought of trying the effects of these two metals on one another until now. To take the case of iron, a merely cursory examination of the second volume of Percy's "Metallurgy" will show that some of the very simplest questions relating to this most common and important metal remain as yet unanswered. Such an apparently vital matter as the formation of steel is a bone of contention at nearly every meeting of the French Academy of Sciences, one party persisting in declaring that no steel can be made without the intervention of both nitrogen and carbon, while the other side as manfully contend that nitrogen has nothing to do with cementation, carbon being the only element concerned in the process. This example shows that not only does the action of one metal upon another, in a state of combination, require patient study, but also the effect of the addition of varying proportions of the metalloids, such as carbon, phosphorus, silicon, sulphur, etc., to different metals, remains still to be discovered.—*Chemist and Druggist*.

Packing Pistons.

Before a vertical engine piston is packed it should be wedged into the exact center of the cylinder by driving blocks on four sides, and verifying the work by exact measurements with a stick that must both "touch and go" on the rod. The packing will then hold the piston true, and the engine will work far better than where the piston is packed by a guess.

It is said that in and around London, at the present time, no less than about 150 miles of railway are in course of construction, involving an outlay of thirty millions sterling at the ordinary rate of calculation.



R. H., of N. Y.—We notice your letter in relation to the article on the slide valve, and the criticisms thereon. Also your inclosed tracing. You are correct in one point, which is, that in the first diagram the eccentric is on the upper side, when in order to turn the crank as the arrow points it should be on the lower. This is not a material difference, as the main object was to show the position of the eccentric with relation to the crank. In the second diagram the same position is shown, as we well know, and is there pointed out as an error purposely. The tracing of the valve and eccentric sent is a fancy sketch, which shows nothing except that the parts in question, as you have drawn them, are wrong, and would never work. If you will take the trouble to go on board a steamer you can satisfy yourself by observation of the correctness of our article.

B. C., of Del.—There are only two kinds of primers used in artillery service—friction and percussion. A percussion primer is a quill full of fine powder, capped by a percussion wafer made of mealed powder and fulminate of mercury. A friction primer is a tube full of powder, with a spur on top full of a composition that explodes by friction, and is set off by a wire pulled through it by a lanyard or rope.

J. A. J., of Ill.—In summer the sun rises north of east and sets north of west. For his yearly track through the heavens see a celestial globe.

T. M., of Conn.—A correspondent puts the following query:—"Suppose the piston in the middle of the cylinder, is there any more steam room on one side than the other? I should say not." You would be in error, then, for the capacity of the upper side, supposing the engine to be vertical is less than the lower by the diameter and length of the piston rod in it.

C. H. B., of Mass.—Windows are crystallized, or made to imitate ground glass, by dissolving epsom salts in hot beer or a weak solution of gum arabic. You can make any pattern or border you please, by cutting out a design on a sheet of pasteboard, and rubbing the design with a damp cloth.

L. W., of N. Y.—One kind of toilet rouge for the complexion is made by powdering isinglass, or "mica," and coloring the same with carmine.

B. P., of Ill.—Rupert's drops are simply melted glass dropped into water. They form a bulb like a pear, with a stem. The thick end may be struck with a hammer without injury, but if you break the tail the whole affair will explode.

J. R., of N. J.—The density of steam depends upon the pressure, and if the steam is saturated—not superheated—the pressure bears a constant relation to the temperature. On page No. 48 of our last volume you will find a table of densities of saturated steam at various temperatures, from 136° to 238°. At 136.77° a pound of steam fills a space of 132.6 cubic feet; at 242.90°, a space of 15.11 feet; at 238.25°, a space of 7.202 feet.

J. D. H., of Ill.—Find illustration of apparatus for distilling spirits of turpentine from wood on page 24, Vol. XI. It was invented by Seth L. Cole, Burlington, Vt.

D. L., of Pa.—Several different machines for mining coal have been described in the English papers, but we do not know that any of them has been practically successful. They were all designed for bituminous coal.

A. P., of N. Y.—You ask us to tell you all about making rods to find mines in the earth. We do so with pleasure; they are all humbug.

Q. B. S. M., of Md.—Any good treatise on geometry will give you the information about the cycloid.

A. A., of N. Y.—It is quite common for different persons to have the same ideas. Your experience on this point will probably prove valuable to you.

D. W., of Ill.—Your specimens are common quartz, of no value whatever.

G. W. J., of Me.—A Blanchard lathe will make your toy boat complete, from stem to stern, out of a single block. Of the value of such a trade you must be the judge.

R. G. N., of Wis.—You can determine the altitude of the sun on land by means of a quadrant and an artificial horizon. For the arrangement of the latter, consult a book on navigation.

C. B., of Mass.—For Patent Report apply to your M. C. Patentees are not entitled to copies. You may get one as a favor.

A. A. H., of Me.—There is no cement in the world that will line a revolver cylinder, that is worn out, so as to make it useful again.

W. E. C., of Conn.—We have no means of judging positively what amount of fuel you will save by a heater, but the economy will be great—certainly 10 per cent. You can inject hot water to your boilers with a common pump, provided the same is so arranged that the feed water flows into it. Take a piece of square rubber, a quarter of an inch less than your stuffing box, wind this with cotton yarn—lamp wick—until the gasket so made fits the stuffing box; cut it in lengths, so that it will meet at the ends, and pack the valve stem with it. A piece of lead pipe, with a piece of hemp gasket run through it, is a good thing to put in the bottom of the piston-rod stuffing box. The pipe must be hammered square first. Put a common hemp gasket over it.

C. C. B., of Pa.—An idea is not patentable unless it takes some palpable form, as in a machine, a design or a new process. Your project for operating balloons by ropes—hauling them down when they reach a certain altitude—has been practiced many times.

W. E. S., of Ind.—To make matches consult Vol. XII., where you will find a variety of recipes for the purpose. We are called upon sometimes to publish the same recipe an unreasonable number of times.



Queries on Belts Answered.

MESSRS. EDITORS:—I have read with much interest the various articles relative to belts. I have known of power being let by the inch of belt running 800 feet per minute, which is a poor way of letting power for the landlord. I have charge of an engine that runs 40-horse power. It has worked as high as 65-horse power, by the rule of 33,000 pounds one foot high per minute with the same width belt, viz., 16 inches. It runs 1,600 feet per minute, which would make 32-horse power according to theory, but practice shows double this power.

I submit the following answers to questions concerning belts in your last issue:—

In my experience I have found that a double belt would do the work with ease that a single one of the same width could not do. Mr. Arnold's plan of running two single belts, one over the other, is new to me, but there is reason in it.

Belts that are soft on one side get crooked, so that in running they go nearly off the pulley, when the resistance of the machine that is driven causes the belt to slip off.

I never knew of a belt that did not run on a tight and loose pulley to twist. Some machinists make the tight pulley a little larger than the loose, so as to have a tight belt. Such a pulley is almost sure to twist the belt, especially if there is a space between the two, and the shipper is very near the pulley.

Opinion is pretty equally divided on which side out the belt should be run. A belt will drive more on the hair side. I think it will wear longer on the flesh side, as the quality grows better as it wears from the flesh to the outside.

Nothing in my experience is so good for belts as neat's foot oil, and but little of that.

A straight-faced pulley is much better than a crowned one. A crowned pulley keeps an unequal tension on the middle and edges of the belt. Crowned pulleys are only useful, in my opinion, to unskillful millwrights.

Lacings crossed on the inside are more liable to cut on each other by the pressure on the pulley.

New York, July 20, 1865. A. M. W.

Tempering Mill Picks.

MESSRS. EDITORS:—In your journal of July 8th a correspondent wishes you to publish what you know about tempering mill picks. As he does not wish to pay for any one's experience, I will give mine gratis. A mill pick should be of the first quality of cast-steel, and should not be overheated; heat of a charcoal fire is better than stone coal. If you use stone coal burn out the sulphur before heating the pick. Heat the point and mass of the pick a straw color; sharpen and refine by dipping your hammer into water, and hammer until nearly cold; heat repeatedly if necessary; sharpen both ends before tempering. To temper, heat very slowly and uniformly; heat to a light cherry red or dark straw; temper in a solution, say, to two gallons of clean water add half pound of alum, one ounce of saltpeter dissolved; then add as much clean salt as will dissolve; dip the point in the mixture as far up as you wish to temper; move it around until sufficiently cool, then rub the point briskly in the scales on the anvil block, then plunge the pick in cool water before the temper runs down. If properly done you will have as good a pick as you wish for.

A MILLER OF THIRTY YEARS' EXPERIENCE.
Wiscay, Alleghany Co., N. Y.

The Main Spring Question.

MESSRS. EDITORS:—On page 36, present volume, in the article on "Main Springs," etc., it appears to me that your correspondent is increasing, rather than diminishing, the liability of the main springs to break. If the spring is thicker in the center, or raised, as he says, having to bend around the arbor and itself, it would have the tendency to fray itself to pieces by the center being the larger and the sides the smaller arc of a circle. The same may be said of the flat spring; that the outside of a spring is a larger arc of a circle than the inner, by the difference

of the thickness of the spring, but in the proposed spring it is increased by the difference in addition to the thickness by the height that the center is raised. The proper spring would be stronger, but would, I think, possess this additional cause of self-destruction. My observation is that the changes of the wind have more to do with breaking main springs than any thing else; let the wind suddenly change from north or northwest to east or southeast and I expect and usually find a harvest of watches with broken main springs, those that have been in ten, fifteen, or twenty years, equally as well as those that have been in only as many days. And it does not make any difference, either, that the watch was in the pocket or hung up at the time of the change of wind. Another cause of broken main springs is, the sultry weather of dog days, in August, when nearly one-half of our work is to repair watches with the spring broken.

I do not know what connection there is between a change of wind and a main spring, but my own observation and that of other watchmakers of large experience confirm the above remarks. The breaking of the main spring is the lesser evil, the breaking of the center pinion, which so frequently follows that of the spring, is the greater; if by some means that could be prevented it would be of more benefit.

A friend has suggested another source of the breaking of springs—thunder storms, when it is not unusual to have a number break, hanging on the board.

FRANCIS STOWELL.

A Problem of Raising Weights.

MESSRS. EDITORS:—Can you tell me what will be the constant strain on a rope raising a weight of 3,000 pounds, ten feet per second, perpendicularly?

Also, what is the percentage of loss of power in the crank, in changing the reciprocating motion of a piston to the rotary motion of a shaft?

What authority can you name to me which treats of these subjects plainly and simply?

C. H. R.

New York, July 16, 1865.

[The strain on the rope is increased beyond that of the weight only while the velocity of the weight is increasing; after a velocity of 10 feet per second has been imparted to the weight then to maintain this requires only the strain of 3,000 pounds. The increased strain, while the velocity is being given, depends on the rapidity with which the velocity is imparted. To impart a velocity of 32 feet in the course of one second requires an additional strain just equal to that required to sustain the weight. You will find this problem fully discussed in "Bartlett's Mechanics."

The loss of power in changing reciprocating into rotary motion by the crank results only from the increased friction; the amount of the friction depends of course upon the material of which the bearings are made, the perfection of the workmanship and the quality of the lubricator. The best treatise on friction is to be found in "Morin's Mechanics."—Eds.

Noise an Indication of Rain.

MESSRS. EDITORS:—Will you explain through your paper why sound travels better just before a storm? People living ten or fifteen miles from a railroad on distinctly hearing the cars, exclaim, "It's going to rain."

I. T. E.

Grand Rapids, Mich., July 15, 1865.

[The distance at which sounds can be heard depends much on the state of the atmosphere; but if you live north or west from a railroad, you would hear the cars more distinctly when the wind was from the south or east, and that wind would be likely to bring rain.—Eds.]

The Crank and Eccentric.

MESSRS. EDITORS:—I have repeatedly seen statements in your paper to the effect that the crank and eccentric were always at right angles to each other, or near it. This is not so; in some cases the crank is with the eccentric, as in a beam engine for instance. I think this statement should be corrected in your next issue.

G. W. R.

Mystic Bridge, Conn.

[We do not remember to have stated that the eccentric was always at right angles with the crank, because we know better; if we did it was an error. We have said, however, that in most cases the eccen-

tric was at right angles with the crank, as it is. Individuals can set their doubts at rest on this point by looking at any locomotive, horizontal or vertical engine. The illustration of the beam engine is not a happy one, for with a long toe cut-off the lead, or what amounts to it, the travel of the toe before it touches the lifter is so great that the throw of the eccentric is nearly with the crank; but for this lead the steam eccentric would be where the exhaust eccentric on the other shaft opposite it is nearly at right angles with the crank.

We also said in the article on "How to set a Slide Valve," that levers made no difference in the relative positions of the crank and eccentric. This assertion has been criticised by correspondents, but, unless our eyes deceive us, it is quite correct, for we have taken pains since writing that article to examine working drawings of oscillating engines with poppet valves, side-lever engines, steerable engines, locomotives and table engines, and we find that, with but one exception, where the valve is worked by a rack and pinion, the diagrams published are correct as regards the relative position of the crank and eccentric.—Eds.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Machine for Refitting Stop Valves.—The valves of that class commonly known under the term of "globe valves," are usually made with conical valves secured to a screw spindle and fitting into a conical seat. If a valve of this class becomes leaky, the only way to refit the same, heretofore, has been by regrinding, or, if that operation was insufficient or too slow, by unscrewing the stop valve from its connecting pipes and sending it to the shop, where it would be refitted in the turning lathe or with the proper tools. Either of these operations causes much loss of time and money. A simple and effective device, by which the operation of refitting said stop valves could be carried out in a short time, and without disconnecting the valves from the pipes, has been a desideratum which will be hailed with delight by everybody who is troubled with leaky valves. The device which forms the subject matter of the present invention, and which is intended to fill the want above pointed out, consists of two parts—one for refitting the valves and the other for refitting the seats. The former consists of a conical concave mill made in the precise form which the valve is to have, and provided with a yielding internal center, in combination with suitable bearings, two for said concave mill and one or more for an adjustable center, in such a manner that by removing the valve from the seat and placing it between the adjustable and the yielding center it is at once in the proper position to be acted upon by the concave mill, and a few revolutions of said concave mill, imparted to it by an ordinary ratchet brace, or any other suitable means, produce the desired effect on the valve and bring it in the requisite shape to fit into its seat. The part for refitting the seats consists of a conical mill or reamer with a cylindrical stem, to be used in combination with a guide, which is made to take the place of the stuffing box and nut through which the valve spindle passes, in such a manner that by removing said box with the valve and valve spindle, and inserting therefor the conical mill and its guide, a few revolutions given to said mill will bring the seat in the proper shape, the whole operation being performed without removing the stop valve from its connecting pipes. The inventor of the above device is Samuel Wing, of Monson, Mass. Geo. R. Topliff, of 60 Pine street, New York (joint assignee), may be addressed for further information.

Adding Machine.—This invention consists in the employment of a revolving disk, marked on its rim with a series of figures, commencing at 1 and ending at 100, or any other figure, and provided with cavities to receive a pin, by means of which said disk can be rotated, and with a helical or cam groove in its face, to operate in combination with a stationary abutment, and with a hinged index and stationary dial, marked with figures from 1 to 100 near its circumference, and with other figures, from 1 to 16, more or less, on the sides of a segmental slot in

which the index plays, in such a manner that by inserting a pin in one of the cavities opposite to any desirable figure on the circumference of the dial the revolving disk can be turned on its axis for a distance equivalent to the figure which was opposite the respective cavity, and, at the same time, the index moves in the cam groove, and the figure in question is registered; and, by repeating the operation with the same or other figures, such figures are added up and the sum registered on the dial and disk. T. T. Strode, of Mortonville, Pa., is the inventor.

Safety Valve for Steam Boilers.—This invention consists in operating two or more valves on the same lever, said valves being held closed by the action of a weight or spring, in such a manner that when the pressure of the steam rises beyond the desired point the several valves open simultaneously, and the combined areas of the openings thereby obtained for the escape of the steam is greater than that of a safety valve of the ordinary construction; the invention consists, also, in an adjustable fulcrum, applied in combination with the lever, from which two or more valves are operated, and with a weight or spring holding said valves closed against the action of the steam in such a manner that the time when the steam blows off is regulated by shifting the fulcrum instead of by a change in the power exerted by the spring or weight to hold the valves in their seats. S. G. Barker, of Dunmore, Pa., is the inventor.

Calendar Clock.—This invention consists in a reciprocating or oscillating slide, marked with the names of the months, commencing with March and ending with February, and provided with openings opposite to said names, and with a projection which bears on a wheel, the face of which is marked with figures, from 1 to 31, to indicate the days of the months, and which is provided with eleven concentric grooves and oblique channels leading from the periphery of the wheel to the first groove, from the first groove to the second, and so forth, in such a manner that whenever the projection of the movable slide comes opposite to one of these channels said slide drops or moves and a new name of a month is brought in view, and opposite to the figures on the rim of the month wheel. The time when the slide changes from one groove to the other is determined by the position of the communicating channels, which corresponds to the number of days of the different months. T. T. Strode, of Mortonville, Pa., is the inventor.

Machine for Rounding and Polishing Balls, Etc.—This invention consists of a machine composed of four, more or less, longitudinally sliding rotary mandrels, radiating from a common center, and provided with chucks at their inner ends, in combination with suitable mechanism to force these chucks alternately up against the ball to be turned or ground, and with a milling tool or grinding wheel, in such a manner that two of the chucks will clamp the ball at a time, and the ball is thereby turned in either direction, while the grinding wheel or milling tool is held in contact with the surface of the ball by means of one or more screws or by an adjustable weight. The force with which the grinding wheel or tool is forced against the surface of the ball can thus be regulated at pleasure. The position of the revolving chucks, and the time when the same grasp the ball, are governed by a double cam and by weights or springs, and said chucks are so shaped that they grasp the general surface of the ball, and that cavities and projections occurring on the surface of said ball will not be able to disturb the correct central position of the same. John L. Knowlton, of Philadelphia, Pa., is the inventor.

Padlock.—This invention relates to a padlock of that class in which the shackle engages or locks itself when forced down into the lock. The invention consists in a novel means for throwing the shackle out of the lock when liberated from a catch and bolt which holds or locks it, and for retaining or holding the catch and bolt, when the shackle is out from the lock, in proper position to receive the shackle when the latter is pressed or forced into the lock. The invention further consists in a novel arrangement of the means aforesaid with the catch, which operates in connection with the bolt for locking or securing the shackle. H. Jackson, of New York City, is the inventor.

Lock.—This invention relates to a lock for pianofortes, sewing-machine cases, and articles generally

having hinged lids. The invention consists in the employment of two bolts of segment form, provided with shanks and connected with a tumbler in such a manner that the bolts will, as the tumbler is operated through the medium of a key, work in the path of a circle in and out from the lock case, in order to lock or unlock the article to which the lock is applied. E. L. Gaylord, of Terryville, Conn., is the inventor.

Drills for Oil and Other Wells.—This invention consists in making a drill, for boring wells, of fast and movable cutters combined together in one stock, in such a way that the movable cutter will be the leading cutter, and, after it has made its stroke, will receive a blow on its end from the descent of the fast cutters, thereby driving it past them into the rock. Elias Baker, of Pittsburgh, Pa., is the inventor.

Method of Cutting-out Buttons from Ivory, Bone, Etc.—This invention consists in a novel method of cutting buttons from ivory, bone, vegetable ivory, wood and other substances. In the art to which this invention belongs, as now conducted, buttons are cut out of plates or disks of the material used, by placing the disks in a lathe and bringing up against them, on each side, cutters of the proper shape, which cut out and separate the buttons from the said material. That portion of the material which is left after the separation of the button was accounted as waste. This is especially true of the manufacture of vegetable ivory into buttons. This substance comes in pieces of small diameter, not great enough to furnish the ordinary-sized buttons for coats and other articles of apparel, and yet so much larger than one button as to leave a great part of the material unused. The object is to utilize this waste portion of the material, which is accomplished by cutting out therefrom one or more rings at the same operation which produces the button. Charles H. Bassett, of Birmingham, Conn., is the inventor. Assigned to The Birmingham Button Company, of same place. New York office, No. 102 Duane street.

A Fire-arms Commission.

Mr. Erskine S. Allin, master armorer at the armory in Springfield, has been commissioned by the War Department to visit the various arsenals in England, France and Switzerland, and to be present at trials of breech-loading fire-arms soon to take place in England and Switzerland. Here he will visit Ghent, Antwerp, Brussels and Liege, the town where the famous Belgian rifles are made, next Paris and other cities in France, and finally Switzerland. The rifle trial in the latter country will begin September 2d, probably at Geneva, and will be open to competitors from all over the world, a prize of \$5,000 being offered for the best breech-loader, besides the sum which the Swiss government will pay for the patent right of the gun. Mr. Allin will return to London so as to be present at a government trial of breech-loading rifles in that city, September 30th. On his return, about three months hence, he will make a report to the Department of the result of his observations. Our Government could not well have selected a more suitable agent than Mr. Allin for this purpose, as he is admirably qualified for it by his long connection with the armory in its practical workings, and his well-known mechanical ability. D. De Gouthal, teacher of languages, and for some time a clerk at the armory, will accompany Mr. Allin as interpreter.—*Springfield (Mass.) Republican*.

An Oil Well Destroyed.

Well No. 19, United States Farm, on Pit Hole Creek, was destroyed by fire about seven o'clock P. M. on the 3d inst. The well was finished that day, and was flowing about two hundred barrels, and no tanks being up the oil was allowed to flow on the ground. Some twenty persons were standing in and around the derrick, some of whom it is feared were unable to escape, for the ground for forty feet around was one sheet of flame in a moment. Three men are known to be seriously burned, and only saved their lives by jumping into the creek. The well is still flowing and burning.

The Pittsfield (Mass.) *Eagle* says the work on the east end of the Hoosac tunnel is progressing at the rate of sixteen feet a day into the solid rock of the mountain.

Improved Barrel Roller.

This engraving illustrates an improved apparatus for rolling barrels, and its form and application can be seen at a glance.

It may be described as a pair of tongs with disks, A, revolving loosely on the outer ends, the disks of such size as to easily enter within the chine of the barrel. The tongs are so made that the barrel may turn without rubbing when the disks are not exactly in center. The opening between the handles is such that the natural fall of the arms, in pushing or pulling, will press the disks against the barrel head, so that the heavier the load is the more securely will it be held. In using this tool, it is not necessary to insert the disks within the chine, but if they are run up along side, so as to be nearly inserted, and then pressed together, at the same time pushing or pulling, one half revolution of the barrel will throw them into place. When on the barrel the tongs and barrel form a combination similar to a common wheelbarrow, but the device is much more easily handled than a wheelbarrow carrying the same load.

Any person who has ever rolled a heavy barrel, especially down hill where the strength is used to retard, instead of to hasten it, will see at once how readily one barrel can be guided, held back, or pushed forward by the aid of this machine. Many severe injuries have been caused by the carelessness, and sometimes by unavoidable accident, of persons rolling heavy casks down declivities, where it is necessary for them to stoop over in very uncomfortable positions, and use heavy leather gloves to retard the speed of the barrels. In such cases, a tool of this kind would be much more efficient, for the user could bring his whole strength into action, instead of a part of it only, as in the former case. The heaviest casks, requiring the services of several men, can be handled with ease by this machine by attaching a rope to the handles so that a number of men can take hold. In such a case as rolling down a wharf and then up a gang plank, when the cask reaches and rests at the lowest point, the apparatus can be just turned over and the same men that let it down can pull it up again. In short, there is no case of barrel-rolling in which it is not superior to hand labor. This apparatus was patented April 25, 1865, through the Scientific American Patent Agency, by Henry W. Stephenson of Cincinnati, Ohio, who holds it for sale, in whole or part, to suit applicants. Any person desiring information will address him as above.

LITTLE'S FRUIT GATHERER.

The device illustrated by this engraving is for gathering apples, peaches, pears and other fruit, which generally hang so high as to make it necessary to climb the tree or use some device by which the fruit may be reached from the ground.

No better description of this fruit gatherer can be given than to call it a semicircular rake; A being the teeth thereof, and B the head in which they are inserted. An extensible rod, C, which can be made longer or shorter, to which this rake is attached, enables it to be raised to the highest part of any fruit tree. The fruit is detached from the tree by a raking motion, in clusters or singly, and when severed falls into a long pouch, D, from one of the pockets of which it can be received into the hand. When the rod, C, is extended, the lower pocket, E, is used, but when the fruit is gathered close at hand, the pouch is shortened, so to speak, by a cord, G, which is tied tightly around it between the two pockets. To preserve the length to which the rod, C, is adjusted, a set screw, H, is employed, and I, is an adjustable slide to which the lower end of the pouch is attached. Sometimes, owing to the position

of the fruit and other circumstances, the knife, J, which encircles the teeth, constitutes an important accessory to the latter in severing or breaking the stems of the fruit; and for the same purpose the knives, K, may be called into requisition. The upper end of the pouch, E, is held open to receive the fruit, by the metallic strip or retainer, L.

Owing to the simplicity of the device it can be constructed with little difficulty, and manufactured at little expense.

**STEPHENSON'S BARREL ROLLER.**

A patent for the invention was granted March 21, 1865, to James A. Little, of Danville, Hendricks County, Indiana.



ty, Indiana; by addressing him, any desired information can be had.

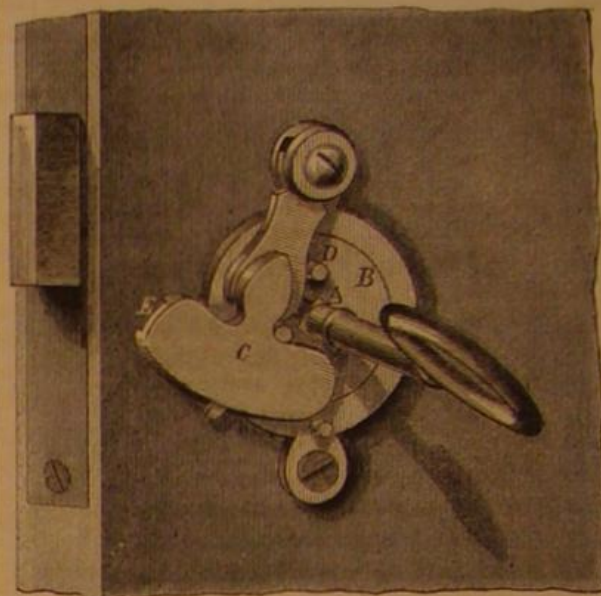
A FINE piece of carpeting, measuring 14 feet by 20, the first of the kind manufactured in Austria, has just been placed in the Museum at Vienna. It presents a map of the railways of Central Europe, and was produced at Prague.

DESAUSSES'S LOCK PROTECTOR.

Travelers sojourning in hotels have awakened in the morning to the unpleasant consciousness of the fact that their pockets had been rifled in the night; and this in spite of the lock on the door. Skillful thieves take advantage of the small end of the key which protrudes through the hole, and by using a peculiar pair of nippers, grip the end so that they are able to turn the key and enter the room; when the key is not in the lock the latter is picked with a skeleton key.

It is to foil burglars who use forceps that this device has been invented.

It consists in forming the key with a square shank,



as at A, and in a plate, B, which fits this shank. This plate works in a recess so that it turns easily in any direction when the door is to be locked, but is held fast by the hasp, C, when the same is vertical, or in such position that the pins, D, fall into a groove, E, in the hasp. When this occurs the key can not be turned from the outside by any contrivance whatever. Thus there is a double lock on the apartment; the door is locked by a key and the key itself is locked.

This device can be applied to the cheapest, as well as to the most costly lock, and can be constructed of four pieces of cast iron, or made ornamental if desired. A patent is now pending through the Scientific American Patent Agency, by J. H. Desausse. For further information address A. B. Justice, No. 14 North Fifth street, Philadelphia, who has the patent for sale.

A LUXURIOUS CHAIR.

We have had a very curious chair in our office for some days past, and it is one of the most comfortable and unique things of the kind we have seen. The seat is composed of sections of india-rubber tubes strung on fancy-colored cords; the back also is so made, and the sensation experienced is delightful. The greatest benefit, however, is derived from the elasticity of the rubber. This gives an easy, springing support to the person, impossible to describe, but not at all difficult to endure. The chair is lighter than those made with springs, is much cooler in summer, and seems in all respects a desirable and useful novelty. It is a fact that all men are not built on the same model, but with this piece of furniture it matters little how fearfully and wonderfully they are made, for this elastic seat supports every part of the person that touches it at once, and does not rest one set of muscles at the expense of another set.

There are also couches, lounges and other articles made on this principle, and for the reasons above set forth they must prove exceedingly comfortable. These articles of furniture are made by the patentee, Mr. Hector Hyves, No. 45 Mercer street, New York.

SOME of the Hartford capitalists have brought out the Weed Sewing Machine Company, of Nashua, N. H., and have formed a new joint stock company with a capital of \$200,000 for the manufacture of the machine at Hartford.

MR. HOLLOWAY'S successor to the office of Commissioner of Patents has not yet been announced. There are rival claimants.

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CAST STEEL FOR BOILERS.

A most intelligent and energetic mechanic, Mr. S. H. Roper, of Boston, Mass., has been for some time engaged in making steam carriages for experimental purposes, with a view to obtain the greatest efficiency for the least weight, and to render the steam carriage an independent, convenient and useful motive power. In these efforts he has been highly successful, and although he regards the carriage more as a plaything than for its general utility, he has pursued the subject thoroughly, and decided some questions which are interesting to the mechanical community. These relate chiefly to a reduction of weight for steam engines and boilers of a given power. This steam carriage weighs but 450 pounds in complete running order, with water for eight miles. The cylinders are double, direct-acting, $3\frac{3}{4}$ inches bore and 10 inches stroke.

The boiler is the most remarkable detail, and is a novelty worth seeing. The shell is 30 inches long and 15 inches diameter. It is a vertical, tubular boiler with an internal fire-box, and the tubes are 10 inches long by $\frac{1}{8}$ th diameter. The shell, as well as the tubes, is made of steel, and it is in the employment of this material that Mr. Roper has been able to reduce the weight, and not only maintain but increase the evaporative efficiency of his boiler. The shell is $\frac{1}{16}$ th of an inch thick, while the tubes are only $\frac{1}{32}$ th. With this boiler steam has been raised in eight or ten minutes, and it is capable of bearing a pressure of 90 pounds per square inch with entire safety. It supplies all the steam necessary for the two cylinders, and propels the carriage eight or nine miles an hour without any difficulty.

In this machine we have one of the most novel steam boilers ever made. And it is a matter for earnest consideration whether, in the employment of cast steel for steam boilers, we may not only greatly increase the strength and reduce the weight, but also add to the economy of the apparatus, by facilitating the transmission of heat. To use a homely illustration, a thin tea kettle boils more quickly than a thick one; and, for the same reason, steam boilers with unnecessarily heavy flues, flue sheets, fire-box walls and furnace crowns, transmit less heat than lighter ones. The only danger to be apprehended in departing from the established time-honored rules and precedents in this case, is in weakening the structure. An example of what a thin iron flue is capable of sustaining, was shown in Lee & Larned's steam fire-engine *Niagara*. This steamer had a large vertical boiler, the tubes in which were but $\frac{1}{32}$ th of an inch in thickness and $1\frac{1}{2}$ inches diameter, by some

four feet long. We have repeatedly seen 240 pounds to the square inch on this boiler, or others with tubes no larger or thicker. Some of the tubes were occasionally collapsed so flat, however, that neither steam nor water could pass through them. These were drawn iron tubes; but if steel had been employed they would not have failed, because the latter metal has a higher tensile strength.

Another lesson on the value of good workmanship is given by Roper's boiler. To bear the pressure required of them, the tubes must necessarily be small in diameter. They were, therefore, all drilled and turned, and were thus homogeneous throughout. Such a method of making a steam boiler is, of course, expensive; but if the evaporative efficiency is increased thereby, as it is, it is only a question of first cost, for the money returns in the future by the fuel saved.

The rapidity with which heat is transferred from one substance to another is directly in proportion to the difference of temperature between them.

The conducting power of steel is lower than that of iron; the former being, according to experiment made by Weideman and Franz, 224; while steel is but 218. But this difference is so small as to be of no moment, and is wholly nullified when the tensional strength of the two metals is considered; for, by taking advantage of the superior virtue of steel we can make a structure much lighter of it, for a given strength. Moreover, in a cast-steel boiler, the rapidity with which heat would be transmitted through the thin walls would be less likely to burn the exposed parts—the tube, sheet and fire-box crown—than in the comparatively slow action of thick iron plates.

Very many persons confound strength with weight, and suppose that, because a number of pounds of material are added to a certain part, a corresponding increase of strength is obtained. Nowhere do we find this more prominently illustrated than in steam boilers; too often the essential points of safety are neglected, while those which bear no strain are heavy in the extreme.

It is, therefore, with a view to promote the efficiency of steam apparatus and economy in its use that we suggest further experiments in this direction. Cast steel of fine texture, well riveted and annealed very low, would seem, from the experiment of Roper, capable of sustaining great pressure. We doubt if a boiler 30×15 inches was ever made which furnished so much steam, or was capable of evaporating so much water in proportion to its size, as this one. If, by a corresponding increase in the thickness of the plates and the external dimensions, boilers can be built of proportionate strength, a great economy of space would result in sea-going ships.

THE ART OF ADVERTISING.

The art of advertising consists chiefly in putting business before the world in such a manner that it will be novel and attractive. This seems a truism, but there are very few persons who are capable of understanding it. The large fortunes accumulated by individuals in a few months for the sale of simple articles to be found on every corner, prove there is some virtue in advertising, for these same people have covered dead walls, pavements, and every spot, remote or near, that the eye of man would be likely to fall on, with announcements of their glue, etc.

We have recently received through the politeness of a large manufacturing concern in England forty illustrated catalogues of different firms in Great Britain who are engaged in the manufacture of agricultural implements and other machinery, from a round pig's trough to a huge steam plow. These catalogues, collected for us at considerable trouble, are valuable additions to our library, and we intend to have them bound for reference. In looking over them we have been much impressed with the great variety and the ingenuity of the tools and machinery adapted to the agriculture of Great Britain. Several of the firms manufacture steam-cultivating machinery, and devote considerable attention to a discussion of its economic advantages.

On receipt of the catalogues mentioned we immediately wrote to all the parties here we could think of, requesting them to send us their trade circulars, which, on coming to hand, were carefully examined. It was with much regret that we found the American catalogues were far inferior in point of mechanical

execution to those received from abroad. The English trade circulars are printed on clear white paper, with new type, excellent cuts—mostly wood, but often steel and lithographs—and they appear to so much better advantage than our own that we confess we blushed for our business men.

Eyes are precious, and it is more than a catalogue is worth to pore over it and scrutinize a cut with a magnifying glass in order to make out what it means.

Besides this, some of our trade circulars are of little value, or considered so by the publishers of them, for when one asks what a certain machine in one of them is, he is often told, "Oh, we don't build them like that now." Of what use is it to publish a cut of it, then?

We recently saw a work of art in the shape of a trade circular, issued by some French drug house. The book was a large octavo, and was certainly fit for any center table. The drugs were shown in their cases; the effect of the glass was beautifully given; the crystals were clearly shown; the powders were properly represented, and the natural colors of the several articles were all given with such accuracy and artistic effect that a chemist would have recognized any kind at a glance. A work of this description is a study, and costs immensely, but who shall say that it does not pay? The gentlemen of the firm where we examined the circular told us they were frequently ordering quantities of goods suggested by an examination of its pages.

Some of our lithographed cards of tobacco, of hair oils, of stove polish, and similar things, are exceedingly beautiful, as are also the cards of our large shipping houses, announcing the sailing of vessels. Bankers frequently issue cards of the finest bristol board, whereon their business is displayed in gold and colors. It is not from a lack of taste among us that we have such poor trade circulars in general, but rather from a want of appreciation of the advantages likely to spring from them. A good circular attracts every one, while a poor one is sure to repulse the most determined purchaser.

We shall be pleased to receive duplicates of all the trade catalogues which contain illustrations. We are frequently importuned to say where such and such a machine can be had, and the catalogue will prove useful to us for reference.

INDISPENSABLE TOOLS.

We always take pleasure in calling the attention of our readers to any improvement in machines or tools which are useful and necessary to economize time and labor. We have lately seen a scroll chuck, manufactured by Mr. A. F. Cushman, of Hartford, Conn., which is a most valuable tool. By the aid of it any piece of work can be held true in the center by simply screwing up one disk. This chuck has been used for a long time through the country, and it is not as a novelty, but as a standard article, that we call attention to it.

By an ingenious modification of the same principle, Mr. Cushman has constructed a neat little drill chuck, which has capacity for a wide range, from $\frac{3}{16}$ th to $\frac{3}{4}$ th of an inch, and yet is compact and handsomely finished. We trust these goods will be widely adopted by mechanics, for they are all they are represented to be.

Examiner-in-Chief.

It is reported that Hon. Elisha Foote, of Saratoga, N. Y., has been appointed by the President an Examiner-in-Chief in the Patent Office, in place of Mr. Coombs, resigned. We have known Judge Foote for many years, and can speak in unqualified terms of his character and qualifications. For many years he has been employed as senior counsel for Burden, of Troy, in his famous spike suit against Corning, Winslow & Co.

AFTER two years of labor on the new defensive works near old Fort Hale, New Haven harbor, water has been let into the moat. The water gates are constructed in the solid rock, through which a distance of twenty feet has been blasted for the admission of the water.

W. C. DODGE, Esq., of Washington, D. C., wishes to correspond with parties who are prepared to make a steam carriage for common roads.



ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING AUGUST 1, 1865.

Reported Officially for the Scientific American.

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

49,061.—Shoe Fastening.—John Adams, Kokomo, Ind.:

I claim the entire fastening, composed of two sections, one section having two plates, three tangs and a shaft (with three notches), the other section having two plates, a pin and lever and three tangs; all of which, as made and combined, I claim as my invention, to be used in place of buckle, eyelets, laces, etc., on shoes and harness.

49,062.—Egg Boiler.—Frederick Ashley, New York City: I claim as a new article of manufacture an egg boiler having a suitable indicating glass, arranged and operating substantially as and for the purpose specified.

[This invention relates to a novel and very useful egg boiler, by which the expiration of the time usually allowed for boiling eggs is plainly indicated, the advantages of which are obvious.]

49,063.—Steam Pump.—J. B. Atwater, Chicago, Ill.:

I claim the combination and arrangement of the chambers, a b, valves, c d, pipes, d e g, and cocks, g g', constructed and operating substantially as described.

49,064.—Lamp.—Lewis J. Atwood, Waterbury, Conn.:

In a lamp burner with the chimney holder projecting beyond the perforated burner shell, I claim the chimney holder to the shell by a hinge whose center is at or near the edge of the shell, so that the side of said shell shall form a stop to the chimney holder when the chimney is turned back, as specified.

49,065.—Oil Well Drill.—Elias Baker, Pittsburgh, Pa.:

I claim, First, A drill for boring oil or other deep wells constructed of a plurality of flat or chisel-shaped cutters, one or more of which are movable up and down past the other cutters or cutting faces of the drill, substantially as and for the purpose above described.

Second, I also claim so constructing a drill, having both fixed and movable cutting faces, as that the head of the main drill stock shall on its descent deliver a blow on the stocks of the movable cutters, substantially as and for the purpose above described.

Third, I also claim forming a reamer on the end of one or both of the stocks, B B', of the drill, substantially as above described.

49,066.—Paint Composition.—James Ball and John Parker Ford, Zanesville, Ohio:

We claim the addition of litharge, red lead, borax and sugar of lead to coal tar, thereby giving body and drying qualities to the composition, and making a durable covering to a roof or other wood work to which it may be applied.

49,067.—Sheep Chair.—Orlando Barker and George E. Blakelee, Huntington, Ohio:

We claim the above described sheep chair, constructed as and for the purposes herein set forth.

49,068.—Safety Valve for Steam Generators.—S. G. Barker, Dunmore, Pa.:

I claim, First, The application of two or more valves, b b, in combination with one and the same lever, E, and with a spring or weight, substantially as and for the purpose set forth.

Second, The adjustable fulcrum, F, in combination with the lever, E, valves, b b', and spring or weight, constructed and operating substantially as and for the purpose described.

49,069.—Manufacture of Paper Stock.—Henry Betts, Norwalk, Conn.:

I claim the application of the fibers of the stalks and also of the roots of the plant known as sedge to the manufacture of paper, whether the same be used separately or in combination with other ingredients, substantially as herein set forth.

49,070.—Rotary Engine.—Dana Bickford, Boston, Mass.:

I claim the combination of the brace, g, and its receiving and stopping passage, h, with each piston, D, arranged in and so as to operate with a cylinder, B, cam, C, and a case, A, substantially as specified.

I also claim the combination and arrangement of the passage, l, in the head or side plate of the case, A, with the cylinder, B, and its pistons, D D, arranged within the said case, as and for the purpose specified.

I also claim the arrangement of the annular packing recess, c, in the head or plate, b, and with respect to the cylinder, B, as specified.

49,071.—Animal Poke.—Abner W. Bishop, York, Ohio:

I claim the application of the spring, E, to upper side of lever, which, by reason of the combustion of the yoke, G, and bolts, D and C, and lever, B, the pins, F F', protrude and withdraw, as the nature of the case requires.

49,072.—Mucilage and Marking Brush.—Edward H. Boswell, Philadelphia, Pa.:

I claim a rubber or other elastic band applied to the brush and cover of a mucilage, marking or other bottle, for the purposes herein specified.

[This invention consists in the use of an elastic band applied to the stem of the brush and to the cover of a mucilage, marking or other bottle, for the purpose of always keeping the brush elevated above the contents of the bottle, except when forced down for the purpose of taking up some of the fluid for use.]

49,073.—Conical Turning Gage.—Milton Bowker, Fitchburg, Mass.:

I claim a combination composed of the self-adjusting bar, D, the pinion and arbor, G, the friction roller, G, the scroll spring, F, the check pin, H, the hand, E, and the dial plate, B, the whole being arranged substantially in the manner and for the purpose herein described and set forth.

49,074.—Helices for Magnets.—Leverett Bradley, New York City:

I claim a helix composed of two or more connected spires or tiers of uncovered wire, with sufficient space between the several turns of the wire to perfectly separate them from each other, and with the different tiers of wires forming the helix also separated (except at the ends) by the interposition of some non-conductor of electricity.

49,075.—Cultivator.—James Brewer, Albany, Ill.:

First, I claim the combination of the corn guards, K, the stirrups and the swiveling standards, S, with the frame, when arranged and operating as described.

Second, The combination of the swiveling front plows and the frame, with the adjustable sliding collars, the drag chains, the lifting chains, the tension screws and the tilting lever, when constructed, arranged and operating as described.

Third, The combination of the plow standards and frame with the adjusting bracket, O, and swiveling or crank hinge, P, when constructed, arranged and operating as described, for the purpose of

varying the angle of the plow to the furrow, while allowing the plows both vertical and lateral play, as set forth.

Fourth, The combination of the triangular frame, the adjustable driver's seat, the lifting lever, the outer plows, the adjustable inner plows, the shields, the stirrups and the lifting chains, when arranged and operating substantially in the manner and for the purpose described.

49,076.—Shoe.—David Brown and Wm. S. Wooton, Kokomo, Ind.:

We claim the combination of the slit, f, at the back of the boot, the double wings or gores, l, attached at the respective sides of the said slit, and the flap, o, attached at the top of the counter, and the outer edges of the gores, l, passing completely around the boot top and fastening above the instep in front, all as herein represented and described.

[This invention relates to a very important improvement in boots or shoes, which enables them to be put on and taken off of the feet with great facility and ease, while, at the same time, there are no apertures in the upper through which moisture can reach the feet.]

49,077.—Reaping Machine.—J. O. Brown, A. Ingham and F. L. Lomont, Massillon, Ohio:

We claim, First, The link, b, and standard, F, in combination with the strip, a, and platform, H, hinged together, substantially as and for the purpose set forth.

Second, We claim the arms, c c', pivoted or hinged to the shoes, in combination with the platform, H, substantially as and for the purpose set forth.

49,078.—Fare Box.—A. H. Bugher, Cincinnati, Ohio:

I claim the checking and registering device, composed of the slot, D, resilient tongue, N, and bell, O, when arranged and constructed as herein described.

49,079.—Fare Box.—A. H. Bugher, Cincinnati, Ohio:

I claim providing the back of check boxes with a concavity, E, as and for the purpose herein set forth.

49,080.—Fare Box.—A. H. Bugher, Cincinnati, Ohio:

I claim in locks a key-hole guard or scutcheon, J, provided with a flaring stud or button, M, adapted to operate in connection with the curb, L, for the reception of a wax seal, arranged as herein set forth.

49,081.—Fetter for Animals.—M. F. Burlingame, Willett, N. Y.:

I claim, in combination with the hinged ring, A, the cap, C, and its spring, the whole constructed and operated substantially as and for the purposes set forth.

49,082.—Car Brake.—Wm. L. Burt, Boston, Mass.:

I claim the combination and arrangement of the rods, G H, with the brake heads, the lever, b', and the windlass mechanisms for operating such lever.

I also claim the arrangement and combination of the adjusting screws and nuts, b c, with the lever, F, and the rods, G H, applied to the brake heads, as specified.

49,083.—Horse Hay Fork.—J. R. Cadwell, Dexter, Mich.:

First, Constructing the fork with a head, A, and tines, a, and with an upper grasping tine or tines, C', substantially as and for the purpose set forth.

Second, Making the handle, C C', of a hay fork, which is constructed with a head, A, and tines, a, to serve the two-fold purpose of a handle and of a grasping tine, substantially as described.

Third, Extending a combined handle and tine, C C', from a pivot on the inner or front side of the head, A, of a fork, substantially in the manner and for the purpose described.

Fourth, The combination of the tines, a, head, A, pivot, e, combined handle and tine, C C', and pivoted loop, D, substantially in the manner and for the purpose described.

Fifth, The combined handle and tine, C C', formed substantially as represented in Fig. 4, in combination with the fork, A, a, substantially as set forth.

Sixth, The combination with a fork, constructed with a head, A, and tines, a, of one or more upper grasping tines, C, and a locking and tripping device, substantially as and for the purpose set forth.

Seventh, So constructing or applying one or more grasping tines or teeth to a fork that the ends of said grasping teeth swing down below and in front of the tines, a, of the fork and thus serve the two-fold purpose of confining the hay upon the tines, a, and of a guard for protecting the tines, a, substantially as set forth.

49,084.—Hand Stamp.—Dexter H. Chamberlain, Roxbury, Mass.:

I claim supporting the arm, C, which carries the type block, in such manner as to allow of its adjustment, substantially as and for the purpose set forth.

I also claim supporting the type block by a pin, t, passing into or projecting from it, substantially as described.

I also claim the slotted bearings, z, through which the inking ribbon, e, is slipped upon the rods, d, substantially in the manner and for the purpose set forth.

49,085.—Door Bolt.—Chas. Chevallier, Brooklyn, N. Y.:

I claim a bolt, the shank of which forms a toothed rack, and which operates in combination with a folding lever, C, spring catch, D, and button, E, substantially as and for the purpose set forth.

[This invention consists in a bolt provided with a toothed rack, which gears in a toothed segment at the end of a folding lever, in combination with a spring catch, in such a manner that when the tooth is pushed out the folding lever lays flush with the front plate of the case which contains the bolt, and is locked by a spring catch, thereby keeping the bolt firmly in position, and preventing it from dropping down spontaneously, or from being pushed down or raised by unauthorized persons; and when it is desired to withdraw the bolt from its socket the spring catch can be made to release the folding lever by pressing a button in the front plate, and said folding lever forms a convenient handle, by which the bolt can be withdrawn from its socket with considerable force.]

49,086.—Railroad Car Spring.—Wm. F. Converse, Harrison, Ohio:

I claim the collet, G, in the described combination, with a centrally clamped disc spring.

49,087.—Gang Plow.—C. W. Corr, Carlinville, Ill.:

I claim the crank axle, C, provided with the hole, or its equivalent, as shown and described.

Second, I claim receiving the plows by means of the clip, b, and brace, f, substantially as shown and described.

Third, I claim the combination of the plow standards, a, stirrups, d, and lever, N, all arranged to operate as and for the purpose set forth.

Fourth, I claim attaching the independent crank axle, C, one above and one below the main frame, as shown and described.

Fifth, I claim the stirrup or guide, V, in combination with the bolt p, and stud, p', for the purpose of adjusting the tongue laterally, and, at the same time permit it to have a vertical movement, as and for the purpose set forth.

Sixth, I claim the foot lever, W, arranged to operate in connection with the tongue and main frame, with its front end working in the slotted bolt, X, as and for the purpose set forth.

Seventh, I claim the slotted bolt, X', in combination with the slotted wedge, x, for the purpose of adjusting the parts, as shown and described.

49,088.—Cider Mill.—J. A. Crevier and F. H. Kerney, Cincinnati, Ohio:

We claim the employment in a crushing and expressing mill of a cylindrical concave, D, revolving in partial contact with a smaller and interior cylinder or roller, F, in the manner and for the objects substantially as set forth.

49,089.—Lamp Chimney.—Wm. H. Culp, Hammondsville, Ohio:

First, I claim the glass shade, A, metallic chimney, B, metallic rim, C, and guards, D, the whole being constructed, arranged and operating as described.

Second, The metallic rim, C, constructed, arranged and operating substantially as described.

49,090.—Carriage Jack.—G. L. Cummings, New York City. Antedated July 26, 1865:

First, I claim the combination of the frame, A, B, elbow lever, D, friction roller, e, and sliding bar, C, all constructed, arranged and employed in the particular manner herein described, so that the

short arm of the lever can be thrown into or beyond a vertical position, and thus sustain the weight without fastening the hand lever. Second, The combination of the adjustable rest, E, and vertically moving slide, C, when constructed and arranged to operate as herein specified.

49,091.—Shuttle Driver for Sewing Machine.—Volney Cutter, Cincinnati, Ohio:

I claim the spring, d, and its central bearing pin, in combination with the pivots, c, horns or tappets, a a, and pins, e e, as described, and for the purpose explained.

[This invention consists in the employment or use of yielding horns or tappets in shuttle drivers of sewing machines, in such a manner that the shuttle, instead of striking against a solid body at either end of its stroke, comes in contact with said yielding horns or tappets, and injury to the shuttle driver is avoided.]

49,092.—Shuttle for Sewing Machine, Etc.—Volney Cutter, Cincinnati, Ohio:

I claim the combination and arrangement of the spiral springs with the bearings of the bobbin journal, for the purpose of producing the requisite friction, to prevent the thread from being paid out faster than it is needed, as specified.

[This invention consists in providing spring bearings for both journals of the bobbin of a shuttle, and it is designed chiefly for use in sewing machines.]

49,093.—Ink Stand.—Samuel Darling, Bangor Maine:

I claim the combination of the concave socket, a, and the friction spring, C, with the ink fountain, A, and its stand, B, such ink fountain being capable of being revolved within the said socket, as and for the purpose hereinbefore explained.

I also claim the combination of the niche, f, the fountain, A, the stand, B, and the spring, C, whereby the spring is made to answer the two-fold purpose of a cover to the ink and a means of holding the fountain in its seat, under circumstances as above specified.

I also claim the combination of the groove, n, and the studs, o p, or their mechanical equivalents, with the pressure spring, C, and the fountain, A, so applied to the stand as to be capable of being revolved therein, substantially as specified.

I also claim the arrangement of the ventilating stopper, k, and the vent hole, i, for its reception with the ink, f, and the fountain, A, the whole being substantially as set forth.

49,094.—Vise.—H. B. Dart, Westfield, Mass.:

I claim a vise, provided with the usual parallel jaws, and with the oblique-faced or V-recessed jaws, combined and arranged substantially as set forth.

[This invention consists in combining with an ordinary vise, having parallel jaws, for grasping plane surfaces, a pair of jaws, having faces provided with V-shaped recesses or notches to grasp cylindrical articles, such as tubing, rods, etc., by which two implements are contained in one and the value of the ordinary vise greatly augmented.]

49,095.—Reciprocating Propeller.—Moses Depuy, Pittsburgh, Pa.:

I claim the employment and use of a swinging propeller, attached to and operating directly on a line, or nearly so, with the piston of the engine, without the intervention of a crank, combined with a sliding frame working in an overhang attached to the outside of a vessel, when constructed, arranged and operating substantially in the manner and for the purpose herein set forth.

49,096.—Harness Motion for Power Loom.—C. Duckworth, Mount Carmel, Conn.:

First, I claim the employment of a loose cross arm, c', upon the rock shaft, c2, in combination with the knives, a, and fixed cross arm, c, substantially as described.

Second, The double-acting pitman rods, F F', the former being connected to the rock shaft, c2, and the latter being connected to the loose arm, c', substantially as described.

Third, The slotted adjustable guide, a3, in combination with the projection, a2, on the knife, a', substantially as described.

Fourth, The specified construction, arrangement and combination of the closers, b b', and knives, a a', when the latter are operated as described, for the purpose set forth.

49,097.—Hydraulic Jack.—Richard Dudgeon, New York City:

First, I claim the arrangement and construction of the cistern pump chamber and ram cylinder, in the manner herein described and for the purposes set forth.

Second, I claim the relative arrangement of the pump chamber cistern, and upper aperture of the cistern, whereby the pump chamber, although situated within the cistern and made in one piece with it, may nevertheless be bored out and have its plunger applied and removed as set forth.

Third, I claim the combination and arrangement of the rod with the plunger for tripping the valve, substantially as described.

Fourth, I claim the arrangement of the pump cylinder within the cistern and between two apertures closed by bonnets as described, so that the eduction valve may be applied and removed from the underside of the cistern and the pump plunger may be applied and removed from the upper side of the cistern, as set forth.

49,098.—Refrigerator or House for Preserving Animal and Vegetable Substances.—J. Hyde Fisher, Chicago, Ill.:

I claim the spaces, a a, at the sides of the flooring, D, between the upper and lower compartments, B C, of the house in combination with the aprons, H H, flue, F, and ventilator, G, all arranged substantially as and for the purpose set forth.

I also claim the inclosed water-proof flooring, D, provided with side strips, a, and a spout, E, for the purpose specified.

49,099.—Diagrams for Testing the Value of Mutilated Currency Notes.—Leander Fox, New York City:

I claim the transparent diagrams lined and spaced as herein described, and for the purposes set forth.

49,100.—Lock for Piano.—E. L. Gaylord, Terryville, Conn.:

I claim the two segment bolts arranged so as to work from a common center and operated through the medium of the tumbler connected with them, substantially in the manner as and for the purpose herein set forth.

49,101.—Lock.—Charles T. Gibson, Baltimore, Md.:

I claim, First, A lock which is provided with a movable sealing bar, C, and tongue, S, adapted for securing a hasp, or its equivalent, upon the frame of the lock outside of the case thereof, substantially as described.

Second, The swinging bar, C, in combination with a tongue, S, and extension, B2, of the lock case substantially as described.

Third, Constructing the laterally swinging bar, C, with a tongue, d', on its free end, in combination with a spring bolt, e, substantially as described.

Fourth, Applying the tongue, S, which receives the hasp, D, to the extension, B2, of the lock frame, in combination with a bar, C, and latch or bolt, e, substantially as described.

49,102.—Feathering Paddle Wheel.—Albert Gilman, Charlestown, Mass.:

I claim the stationary guide or track, c c, fastened to the side of the vessel for the purposes set forth, substantially as described.

In combination with the rocking or rotating paddles, provided with arms, a, rigidly fastened to the paddle axles, b, I claim the fixed or stationary ring guide or track, c c, in which the pins or pivots of the arms travel to govern the position of the paddles.

49,103.—Stirrup.—John S. Gould, Allegheny, Pa.:

I claim the combination of the roller, A, with the joints, B, constructed, arranged and operating substantially as herein described, and for the purpose set forth.

49,104.—Cotton Chopper, Cultivator and Drill.—Joel A. Hall, Keokuk, Iowa:

I claim, First, In connection with a frame, A, the adjustable handles, B C, arranged and operated as above described and for the purpose set forth.

Second, The clamp frame, f, hoe, g, and adjusting segment, g, combined as above described.

Third, The combination of the plow-share, or point, v, guide blade, w, and pivoted wings, x x', substantially as and for the purpose set forth.

Fourth, The plow-share, v, cutting blades, x and x', adjusting rod, y y' and y'', arranged as above described and for the purpose set forth.

Fifth, The arrangement of the hopper, r, distributing spout, S, with the cultivator, in the manner and for the purpose described.

49,105.—Brick Mold.—James A. Hamer, Reading, and Thomas Lippincott, Philadelphia, Pa.:

I claim the combination and arrangement of the levers, J J, and the rods, H H and I I, with the side pieces, B B, and end pieces, C C, of the combined mold for the expansion and contraction of the said pieces, B B, and partitions, D D and D' D', substantially in the manner and for the purposes above set forth.

Second, Combining the rods, K, with the end pieces, C, and side pieces, B, for opening and closing the said end pieces, substantially as described and for the purpose specified.

Third, The combination of the lock strips, M, with the side pieces, B B, and partitions, D D, substantially in the manner and for the purpose above described.

Fourth, The combination of the levers, J J, with the lock strips, M, by means of the cams, n, sliding pieces, O P, and bell cranks, a, substantially as described and for the purpose specified.

49,106.—Process for Disintegrating Vegetable Fibers.—Charles Heaton, New York City:

I claim the process herein described of treating vegetable fiber, by subjecting it for a short time to a high degree of heat without the presence of alkali, and afterward immersing it in an alkaline solution at a lower temperature.

[The object of this invention is to separate gummy, silicious and other surrounding matter from vegetable fiber in a simple and expeditious way, part of the means used for this purpose being mechanical and part chemical, in conjunction with heat.]

49,107.—Railway Chair.—John L. Hills, New York City. Antedated July 21, 1865:

I claim, in combination with the wrought iron chairs, C a b, the brace bar, E, extending from chair to chair, and held in notches between the abutting ends of the rails, as herein shown and described.

49,108.—Tempering Steel Springs.—William Hughes, Bloomington, Ill.:

First, I claim the within described process of hardening cast-steel springs, by first coating them with soap, or its equivalent, before heating, and cooling them off, as before described.

Second, The hydrated solution above set forth, and composed of the ingredients herein specified, for the purpose of hardening springs of either cast or spring steel.

49,109.—Wood-bending Machine.—Philip Hurm, Hamilton, Ohio:

I claim the former, A, stirrups, E, key, F, shear bars, D I, bolt, J, pins, G, and wedges, O, arranged and operating together substantially as described.

49,110.—Trace Trimmer.—William L. Hutchinson, Burlington, Iowa:

I claim a device for trimming traces and other straps, constructed and operating substantially as herein shown and described.

[The object of this improvement is to facilitate the trimming or dressing of leather traces and other straps, and for harness and other purposes. The invention consists in the combination of two springs—namely, a lateral and a vertical self-adjusting spring—with an adjustable cutter or knife, the construction being such that on simply drawing the trace or strap between the springs it will be very smoothly and rapidly trimmed upon its edges.]

49,111.—Cultivator.—Hanford Ingraham, Naples, N. Y.:

I claim the transverse beams, A and B, and center forward beam, a, in connection with the knee braces, C, as constructed and arranged substantially in the manner and for the purpose set forth.

49,112.—Light Wagon.—H. L. Isham, Plattsburg, N. Y.:

First, I claim the securing of the ends of the leaves, a, of the springs to the bolster and axle, in the manner substantially as herein set forth.

Second, In combination with the leaves, a, secured as hereinbefore specified, I further claim the safety straps, G, attached to the bolster by dovetail plates, d', and grooves, c', in the manner described.

49,113.—Padlock.—H. Jackson, New York City:

I claim the sliding frame, C, provided with the bolt, D, and lever, E, with the spring, F, bearing against the latter, the lever being notched at its upper edge to catch against the projection, e, at the upper part of the case, substantially as and for the purpose set forth.

I further claim the pivoted catch, G, connected with the frame, C, as shown, to operate simultaneously therewith, for the purpose specified.

49,114.—Water Wheel.—Andrew Jamison, Taylorstown, Pa.:

I claim constructing the buckets of an overshot water wheel in two parts, F F', the former, F, being so arranged as to contain or hold the water so that it can act upon the wheel by gravity, while the latter, F', are provided with openings, c, and so arranged as to admit of the water acting upon or against them by impact, and then allowing it to pass into the inner parts, F, of the buckets below, substantially as described.

[This invention relates to a new and useful improvement in overshot water wheels, and it consists in constructing the buckets in such a manner that they will receive the force of the water, and the wheel be driven by the impact as well as by the gravity of the water.]

49,115.—Blacking-box Holder.—Charles E. L. Jelliffe, Williamsburgh, N. Y.:

I claim a blacking box having a handle or holder attached thereto, substantially in the manner described and for the purpose specified.

[This invention relates to a novel and very useful device for a holder for boot-black boxes, the object of which is to prevent the hands from becoming soiled when the blacking is used.]

49,116.—Valve Cock.—Nathaniel Jenkins, Boston, Mass.:

I claim the employment of an adjustable stop or regulator, N, or its equivalent, in combination with the follower of a valve cock, substantially as set forth and for the purpose set forth.

49,117.—Grain Drill.—David J. Jones, Sudbury, Pa.:

First, I claim the slides, M, with their openings, y y, adjustable plates, N, combined with the hoppers, I, and operated substantially as and for the purpose specified.

Second, The crank axle, E', levers, P, slides, M, combined and operating substantially as described.

Third, The levers, F, with the pins, m, and the slides, M, with the notches, x, constructed and operating in combination with the levers, K, substantially as and for the purpose set forth.

Fourth, The drums, I, with their cords, b and d, operating in combination with the drill feet, G, and beveling plates, J, substantially as specified.

Fifth, I claim operation for depositing grain, seeds, etc., in the ground, in such quantities and at such intervals as may be desirable.

Sixth, The drill foot, G, hung to the frame, and combined with the cord, t, as and for the purpose specified.

49,118.—Boot and Shoe.—Isaiah T. Jones, Sandwich, Mass.:

I claim beveling under the inner surface of the part, B, so as to aid in retreating the filling, D, and to allow the pegs or equivalent fastenings, E, to be placed very near the edge, in combination with the thin lugs or parts, B', extending inward from B, under the filling piece, D, substantially as and for the purpose herein set forth.

49,119.—Machine for Making Paper Board.—John F. Jones, Rochester, N. Y.:

First, I claim the combination of an open wire mesh or perforated cylinder, B, wire apron, E, and pressure rollers, D D', for forming paper board in a continuous or indefinite length, substantially as set forth.

Second, In paper-making machines, the combination of the suction box or boxes composed of the rollers, I I and K, operating substantially in the manner and for the purpose herein set forth.

49,120.—Sofa Bedstead.—Francis Keller, New York City:

I claim the combination of the back, C, seat, a, flaps, E, hooks, e, hinges, C b f, when constructed and arranged as and for the purposes herein specified.

[This invention relates to an improved sofa bedstead, and it consists in a peculiar construction of the same, or in an improved arrangement of its parts, whereby a better bed is obtained than usual in such devices, and a more convenient and desirable article of the kind obtained.]

49,121.—Corn Planter.—Philip H. Kimball, Prophets-town, Ill.:

First, I claim the peculiarly shaped runners or shoes, L L, constructed and arranged specifically as described, for opening a furrow and covering the seed therein, substantially as herein set forth.

Second, I claim so combining the runners, L L, of my machine with the weighted levers, N N, connected to the framework thereof, as that each runner and coverer may, under an adjustable degree of pressure, act and operate independently of the other, substantially in the manner and for the purpose herein set forth.

I claim, in combination with the seed slide, N, of my improved corn planter, the pinions, h h, operating against the edge thereof, substantially as and for the purpose herein set forth.

Fourth, I claim, in combination with the pivoted roller scrapers, A, and the platform and driver's seat of my improved corn-planting machine, as described, the foot lever, R, for the purpose of operating said scrapers, substantially in the manner herein set forth.

49,122.—Machine for Rounding and Polishing Balls.—John Loper Knowlton, Philadelphia, Pa.:

First, I claim the method herein described of imparting to the ball while being ground or turned, an intermittent rotary motion in two or more directions by means of four (more or less) longitudinally sliding rotary mandrils, D D', radiating from a common center and provided with chucks at their inner ends, or any other equivalent means, constructed and operating substantially as and for the purpose set forth.

Second, The combination of four (more or less) chucks, E E', made to grasp the work at stated intervals with a grinding wheel or milling tool, applied and operating substantially as and for the purpose described.

Third, The combination of the segmental rack, C, pinion, d, shaft, e, and weighted lever, f, g, arranged and operating in connection with the pivoted frame, G, and polishing wheel, F, in the manner described, to regulate the pressure of the said wheel against the ball to be polished.

Fourth, The cams, o, p, and toes, s, t, in combination with the carriages, C C', chucks, E E', and weighted levers, s s', or their equivalent, constructed and operating substantially as and for the purpose described.

49,123.—Drill for Well Boring.—O. B. Latham, Seneca Falls, N. Y.:

I claim the adjustable reamer, C, in two sections, the screw, e, plates, c, the key and gibs, in combination with the drill and shank, arranged and operating conjointly, substantially as and for the purpose set forth.

49,124.—Journal Box.—Henry A. Lee, Worcester, Mass.:

I claim the application to journal boxes of the set screws, D, within one of the shells or halves of which the journal box is composed, substantially in the manner and for the purposes specified.

49,125.—Steam Boiler.—David Lister, Carbondale, Pa.:

I claim a pipe, B, arranged near to the bottom or to that surface of a steam boiler from which the sediment is to be removed and perforated with a number of holes, a, in the manner and for the purpose substantially as herein shown and described.

49,126.—Revolving Car.—Daniel Lott, Lottsville, Pa.:

I claim the rolling receptacle, A, mounted by a horizontal shaft, B, upon wheels, C, which run freely upon the said shaft, and drawn by means of a frame in which the ends of the said shaft are journaled.

49,127.—Musical Instrument.—Thomas Loud, Philadelphia, Pa.:

I claim the use of a rail placed in front of the key board of a reed organ, melodeon or other musical instrument and connected with the device or devices usually employed therein for covering the chamber containing the reeds or other devices used for producing musical sounds, arranged and operating substantially as herein described and for the purposes specified.

[This invention relates to the mode of opening and closing the swells of melodeons, reed organs, etc., and consists in a simple and novel arrangement of parts whereby it can be accomplished while the feet are employed in working the bellows, and without removing the hands from the keys, the importance and advantage of which are self-evident to all performers on such instruments.]

49,128.—Screw Wrench.—Horace W. Love, Brooklyn, N. Y.:

I claim a single diagonal adjustable screw wrench, constructed and capable of operating substantially as described.

49,129.—Drill.—John M. May, Janesville, Wis.:

First, I claim bevelling the bit or cutting edge of a drill all on one side or chiefly on one side to give the drill a slightly rotating motion in a horizontal direction at each blow of the drill, substantially as described.

Second, A swivel formed of parts, E E and G, when used to allow a drill or a punch drill to revolve in the path of a horizontal direction, substantially as described.

Third, Using a spring guide to catch pieces of rock, and other substances that fall into a drilled well and obstruct the operation of a drill, substantially as and for the purposes described.

Fourth, Screw or strainer when used in a pump drill, substantially as and for the purposes described.

49,130.—Breech-loading Fire-arm.—Edward Maynard, Washington, D. C.:

First, I claim the formation of an outlet, in or through the cone seat or recoil block of breech-loading fire-arms to permit the free escape of gases leaking from the cartridge or gun barrel at the explosion of the charge therein, substantially in the manner herein set forth.

Second, The use and combination of a central recoil rod, B, with a movable cone seat, A, and the loading aperture of a breech-loading gun, substantially in the manner and for the purpose herein set forth.

49,131.—Manufacture of Felted Fabrics.—Edwin D. McCracken, New York City:

I claim the use of the fiber of cane or reed, in combination with wool or fur, or with both wool and fur, in the manufacture of felted goods, substantially as herein described.

49,132.—Surgeon's Operating Table.—Thomas McIlroy, New York City:

First, I claim the table hinged to and supported upon the frame, A, and provided with a hinged portion, B', and hinged leg extensions, E E', each section, to wit: B B' E and E', being provided with devices for vertical adjustment, substantially as described.

Second, I claim the latterly adjustable leg extension, by means of the pivot joint, F, to support the leg in its laterally deflected position.

In combination with the table, B, I claim the hinged back support, I, J, with its device for vertical adjustment, substantially as described.

49,133.—Machine for Cutting Screws.—John A. Merri-man, Chicago, Ill.:

First, I claim closing dies by the use of the lateral sliding bearings, K, acting directly upon the dies by means of inclined, operating substantially as and for the purposes herein specified.

Second, The sliding bearings, K, the levers, I, and the dies, g, all arranged and operating substantially as and for the purposes herein set forth.

Third, The latch or strap, p, in combination with the sliding bearings, k, and the dies, g, substantially as herein shown and described, for the purpose set forth.

49,134.—Mode of Hoisting and Lowering Window Sash.—John M. Merryman and Kilby Ferguson, Indianapolis, Ind.:

First, In combination with the upper and lower moveable sash of a window, a cord winlass and pulleys, or equivalent devices, so that the said sash may be raised or lowered at pleasure, and perfectly balanced, when the winlass is fixed within the window casing.

Second, The combination of a cord winlass and pulley, with the upper and lower sash of a window, or equivalent devices, so that the

said sash may be raised or lowered at pleasure, and perfectly balanced when the winlass is attached to the lower sash.

Third, In combination with a hoisting and lowering device applied to one edge of a window sash, the friction roller, M M', applied diagonally opposite corners of said sash for the purpose set forth.

Fourth, In combination with the winlass, A, for raising and lowering window sash and the ratchet and pawl, B R, the friction brake, D, substantially as described.

Fifth, The lock, P, or its equivalent, in combination with the ratchet and pawl of the winlass, A, for the purpose of facilitating the working of the upper sash, and for locking the window with the said upper sash at any desired point of elevation.

49,135.—Washing Machine.—John H. Monsees, Smith City, Mo.:

I claim the particular combination and arrangement herein described, of the tub, A, oblique plunger, C, oscillating arms, B, supporting bars, d, lever frame, D, inclined abutment, e', and guard boards, D' D'', as and for the purposes herein specified.

[This invention relates to a new improved clothes washing machine, of that class in which a swinging plunger is used, and the clothes subjected to a pressure or squeezing action. The object of the invention is to obtain a washing machine of the class specified, which will be simple in construction, and possess advantages over others of the same class, as hereinafter referred to.]

49,136.—Summer Stove.—Francis Morandi, Boston, Mass.:

I claim, First, In portable summer stoves or furnaces, arranging a perforated cover, K, upon the smoke pipe so as to enable one to discharge the smoke into, and use the stove with a kitchen stove or range, without requiring any change in the latter, substantially as described.

Second, I also claim fixing a platform or heating surface, H, upon the horizontal part of the smoke pipe, substantially as and for the purpose described.

Third, I also claim the combination of a summer stove or furnace with a platform or heating surface, H, on the pipe, substantially as described.

[The object of this invention is to provide a portable, convenient and economical summer stove, for domestic and other uses. It consists in a fire chamber or furnace, which can be connected either with another stove, so as to discharge the products of combustion into its flues, or else with a chimney or other flue; the fire chamber being provided with a boiler hole, and the discharge pipe being made to support a hot air or combustion chamber whose top forms a heating surface on which vessels may be set, as upon any other heating surface.]

49,137.—Car Spring.—Wm. Neubauer, Philadelphia, Pa.:

I claim constructing a spring when made of plates, or sheets of metal, with the resilient parts, on angles from the central position of the spring plates, which compose the combined spring, and decreasing the length of the said resilient parts of each plate, in order, from the outer plates, for the purpose of increasing the strength of the spring and imparting increased elasticity to the same, substantially as described.

I also claim varying the angles of the resilient parts of the spring in such a manner that there shall be spaces, b, extending over the whole surface of the spring plates, between their points of contact, substantially as represented, for the purpose of giving increased elasticity to the spring, substantially as above described.

49,138.—Churn.—Abel Newbrough, Madisonville, Ky.:

I claim the frame, F, pulleys, P P', belt, D, the crank, B, and staff, A, and adjustment as shown at b, the several parts being constructed and arranged in relation to the churn, C, as and for the purpose specified.

49,139.—Lathe for Turning Heads of Nails, Tacks, Etc.—Wm. H. Nichols and Horatio H. Abbe, Chatham, Conn.:

I claim, First, The employment or use of the cap, J, attached to the arm, K, arranged substantially as shown, in such relation with the mandrel, C, to admit of the head being readily adjusted on the mandrel as set forth.

Second, The combination of the cap, J, milling tool, T, cutter, Q, and thimble, H, all arranged and combined with a mandrel, C, to form a new and improved lathe, for the purpose specified.

[This invention relates, first, to a new and improved means for chucking the heads to be turned and ornamented; second, to a milling tool for milling the head; third, to a cutter for turning the head, and fourth, to a thimble for discharging the finished head from the mandrel; all being constructed and arranged in such a manner that the device may be operated with the greatest facility by children equally as well as by adults.]

49,140.—Molding Crucible.—George Nimmo, Jersey City, N. J.:

I claim, First, Manufacturing crucibles in a plaster mold, in the manner and for the purpose specified.

Second, I claim lever I, and rib, n, applied in the manner specified, to form the interior of a crucible contained within a revolving mold, as set forth.

Third, I claim the combination of the revolving chuck, c, plaster mold, d, lever, I, and rib, n, as and for the purposes specified.

Fourth, I claim mounting the lever, I, and rib, n, in the frame, g, in the manner specified, in combination with the counterpoise, k, fulcrum, o, and stop, p, for determining the size of the interior of the crucible, as specified.

49,141.—Manufacture of Crucibles.—Geo. Nimmo, Jersey City, N. J.:

I claim a crucible or pot of plumbago, with a lining or coating of clay, or of clay and sand, or similar material, for the purposes and as specified.

49,142.—Pipe Coupling.—James Old, Pittsburgh, Pa.:

I claim the mode of connecting tubes, or pipes of wrought iron or other metal (when so thin as not to admit of cutting screw threads sufficiently coarse to be easily united), by means of the use of a screw coupling, the male and female parts of which are united to the opposite ends of the pipe or tubing, by a very fine screw in the pipe or tube and coupling, and soldered around the pipe or tube and coupling, substantially as hereinbefore described.

49,143.—Breeching Strap Fastening.—A. W. Olds, Green Oak, Mich.:

I claim securing the breeching straps to shafts of carriages by means of a hook in one end of which the strap is looped, in combination with a fixed pin or staple of the shaft on which the hook is hung, arranged together and operating substantially in the manner described and for the purpose specified.

I also claim in combination with the above, the use of a spring, substantially as and for the purpose specified.

49,144.—Bottle Stopper.—Robert T. Osgood, Orland, Maine.

I claim a concave cap covering the whole upper portion of a common cork stopper with a pointed spiral wire attached to, and within the cavity of said cap firmly, for the purpose of passing down into, but not through said cork, to aid in extracting it, and to prevent the breaking of the same, as are herein substantially set forth.

49,145.—Stand for Ladies' Figure.—Joseph R. Palmenberg, New York City:

I claim the arrangement and construction of a stand for ladies' figures, and similar articles, made in parts in the manner described and for the purpose substantially as set forth.

49,146.—Preserving Wood, Etc.—George Palmer, Littlestown, Pa.:

I claim, First, The apparatus and mode of applying the same for heating the inner and outer surface of timber, sufficiently to open the pores of the wood, and extract the sap and gaseous matter, as herein described for the purposes specified.

Second, I claim opening the pores of timber, by applying heat, in the manner herein described, so that oily, resinous, or bituminous substances will penetrate the wood to its fullest capacity.

49,147.—Composition for Frames, Bottles, Etc.—John T. Peet, Cincinnati, Ohio:

I claim the use of asphaltum, or rosin, with any suitable powder, to the end and for the purposes substantially as set forth.

49,148.—Lubricator.—Theodore G. Pelton, Lyons, Iowa, and James Brewer, Albany, Ill.:

We claim, First, Making the valve stem for oil cups in two parts, when constructed, arranged, and operating substantially in the manner described.

Second, In combination with the valve stem, constructed substantially as described, the spiral spring, L, and collar or pin, P, as and for the purpose set forth.

Third, In combination with the stem, constructed substantially as described, the grooves, m, as and for the purpose specified.

49,149.—Lock for Piano.—A. F. Pfeiffer, Newark, N. J.:

I claim a lock provided with a supplemental bolt, E, pivoted to a sliding bolt, B, and arranged to operate in connection therewith in the manner substantially as described.

[This invention relates to a new and improved lock for desks, pianos, chests, the cases of sewing machines, etc., and it consists in the employment or use of a bolt pivoted to a sliding bolt, and arranged in such a manner as to turn over and catch into the plate which is attached to the lid or cover of the article to which the lock is applied, and at the same time be capable of turning back so as to pass out of the plate when the lock is unlocked.]

49,150.—Cotton Seed Planter.—Brown Platt, Pana, Ill., and Norman Platt, St. Louis, Mo.:

We claim, First, The shaft, M, armed with the pins, W, or their equivalent, revolving in the box, L, during the process of planting, in combination with the belt, D, armed with the pins, x, or their equivalent, and the roller, I, all acting for the purpose of stirring up the mass of seed contained in the box, L, and preventing the same from remaining or becoming a compact mass.

Second, We claim conveying the seed out of the box or reservoir upon a belt studded with metallic pins, or their equivalent.

Third, We claim the armed wheel, N, revolving immediately in front of the belt as it turns over the pulley, J, to pull the seed off of it.

Fourth, We claim the roller, I, attached to the box in the upper part of the orifice through which the belt passes through its front end, to prevent seed clogging at that point.

49,151.—Apparatus for Mashing, Boiling and Fermenting Grain.—E. F. Prentiss and R. A. Robertson, Philadelphia, Pa.:

We claim, First, The combination of the perforated malt supply pipe, a, the surrounding casing, b, and the double-rotating mixer, c, for mashing the malt, the whole arranged and operating substantially as shown and described.

Second, The combination of the adjustable pipe, d2, with the pipe, d, leading to the center of the bottom of the mash tub, and the distributor, d', for the double purpose of admitting water to said tub when necessary, and for drawing off the wort therefrom.

Third, The sparger, e, perforated as described and for the purpose specified.

Fourth, The combination and arrangement of the cistern, B, pipe, f, column, g, and the perforated false bottom, i, in the manner and for the purpose substantially as described.

Fifth, The employment of the conical perforated false bottom, i', and chimney, j, arranged and constructed substantially in the manner and for the purpose described.

Sixth, The combination of the boiler, B, pipe, f, and column, g, the latter having pipes, k and k', for the entrance and exit of steam or heated water, or cold water, for alternately heating and cooling the contents of B, the whole constructed, arranged and operating in the manner and for the purpose substantially as shown and described.

Seventh, The combination of the solid wooden float, O, with the return pipe, r, these parts being constructed, arranged and operating substantially as shown and described.

Eighth, The employment of the cooling and heating vessel, D, in connection with the mercury cup, n2, the inverted cup, n3, and the system of levers, the several parts being constructed as shown, and the whole arranged and operating substantially in the manner and for the purpose described.

Ninth, The combination and arrangement of the mash tub, A, boiling and cooling cistern, B, and fermenting tun, C, in the manner described, for the purpose of mashing, boiling, cooling and fermenting malt liquors.

49,152.—Composition for Lining Petroleum Barrels.—Robert Price, Jersey City, N. J.:

I claim the preparation of barrels or other vessels for containing and transporting petroleum oil or similar substances, substantially as described and for the purposes set forth.

49,153.—Coal Stove.—D. S. Quimby, Brooklyn, N. Y.:

I claim the arrangement of the hot-air flue, o, p, and box, q, in combination with the heater, a, and flues, i k l, as specified.

I also claim the register, r, fitted as specified, in combination with the hot-air box, q, and pipe, p, for the purposes specified.

49,154.—Watch Regulator.—George P. Reed, Roxbury, Mass.:

I claim the application of the curved spring, c, and its adjusting screw, f, to the pointer, b, in combination with the application of the hair-spring pins or studs to the said spring, c, the whole being substantially as and for the purpose explained.

49,155.—Watch Escapement.—Geo. P. Reed, Roxbury, Mass.:

I claim the combination of the movable detent, e, and the spring, L, and stop, p, with the lever, D, carrying a fixed detent, o, and arranged in manner and so as to operate with the scape wheel and the impulse pallet of the balance wheel, substantially as specified.

49,156.—Manufacture of Axes.—Henry C. Reynolds, Manchester, N. H.:

I claim reducing the edge of the ax to the form desired when it is finished for use, and refining the steel at the same heat; the steel is welded to the ax, by means of dies, a and b, constructed and operated substantially as herein described.

49,157.—Azimuth Compass.—E. S. Ritchie, Brookline, Mass.:

I claim the combination of the light-converging cylindrical-segmental lens, E, or its equivalent, with the limb or annulus, A, or its equivalents, and its sights, to be used on a magnetic compass, in manner substantially as specified.

I also claim the combination of the adjustable screen or shutter, M, or its equivalent, with the light-converging lens, E, combined with the fore sight of the annulus, A, or its equivalent, and for use substantially as hereinbefore specified.

I also claim the combination of the reflector, F, and the light-converging lens, E, or its equivalent, with the annulus, A, or its equivalent, and its fore sight, or fore and back sights, to be employed on a compass, in manner substantially as hereinbefore explained.

I also claim the combination of the indicators, g g, with the auxiliary sight, s, and the annulus, A, or its equivalent, its fore sight or fore and back sights, and the light-converging lens, F, the same being as specified.

I also claim the combination of the indicators, g g, with the two lenses, e f, or the same, and the auxiliary sight, s, and with the annulus, A, or its equivalent, its fore sight, or fore and back sights, and the light-converging lens, E, the same being as specified.

I also claim the combination of the indicators, g g, with the two lenses, e f, the prism, H, and the annulus, A, or its equivalent, its fore sight, or fore and back sights, and the light-converging lens, E, the same being as specified.

I also claim the combination of the index mark, h, or its equivalent, with the light-converging lens, E, the annulus, A, and the fore sight, C, or the equivalent thereof, the whole being arranged substantially in manner and for the purpose specified.

49,158.—Machine for Upsetting, Cutting and Punching Iron.—J. J. Rose, Elmwood, Ill.:

I claim combining in a complete and portable machine a device for shearing metal, a device for punching metal, and a device for upsetting tires, the several devices being constructed and arranged substantially as described.

[This invention consists in a novel arrangement of levers with clamps, a punch and a cutting device, whereby tires for wheels may be shrunk, and iron cut and punched, the whole forming a compact and portable machine convenient for a smith shop.]

49,159.—Sash Fastener.—A. H. Rowe, Hartford, Conn.:

I claim the revolving slotted cam, C, in combination with the case, A, and spring bolt, B, constructed and operating substantially as and for the purpose set forth.

[This invention consists in a revolving slotted cam, arranged in a circular case, in combination with a radially-sliding spring bolt, in

such a manner that when the device is applied to a sash by turning the cam in one direction, the spring bolt is drawn in and the sash unfastened, allowing it to move up or down, and by releasing the cam the bolt is allowed to drop into suitable sockets made in the side of the window frame, at suitable intervals, and in this position it is locked by the cam, and the possibility of a spontaneous unfastening of the sash is avoided.]

49,160.—Photographic Lens.—Joseph Schnitzer, New York City:

I claim, First, A lens, A, constructed of a triplet front lens, B, and doublet back lens, C, substantially as herein set forth.

Second, The correcting lenses, h i, and the disk, F, or its equivalent, applied in combination with a lens, A, substantially as and for the purpose specified.

Third, The disk, F, or its equivalent, furnished with one or more correcting lenses, h i, in combination with the diaphragm, G, and lens, A, constructed and operating substantially as and for the purpose described.

[The object of this invention is a photographic lens, which combines with a short focus an angle of eighty degrees, more or less, and which is so arranged that its focus can be adjusted, and that the same instrument can be used for pictures of different size.]

49,161.—Cutter for Wood-turning Lathe.—James Shannon, Cohoes, N. Y. Antedated July 30, 1865:

I claim the construction of a cutting tool, by the combination of a gouge or gouges, G, with a toothed cutter, B, formed as described, and attached to a revolving disc, substantially as set forth in the within specification.

49,162.—Railway Frog.—Theodore Sharts, Albany, N. Y.:

I claim the employment or use of a movable or detachable tongue, applied to a frog, in the manner substantially as and for the purpose herein set forth.

[This invention relates to a new and improved frog for single-track railroads, and it has for its object the dispensing with the ordinary switch, and, consequently, with a switchman.]

49,163.—Key-bolt Connection of Car Trucks.—J. J. Sherman, Albany, N. Y.:

I claim, First, The elastic key-bolt connection for railway carriages, when arranged and applied to operate against lateral or other horizontal impulse, substantially as described.

Second, Surrounding the pivot or key-bolt connections with india-rubber or other elastic substance, confined within metallic cups or boxes, in such manner as to admit of a horizontal motion of said key-bolt, but no vertical motion, substantially as described.

49,164.—Horse Rake.—S. M. Sherman, Fort Dodge, Iowa:

I claim the combination of the S-formed wooden teeth, E, bars, e e, arms, f f, link, F, and lever, G, all as specified.

[This invention consists in constructing the teeth of the rake of wood, bent or curved in S-form, and arranged or applied in such a manner as to form a cheap and durable horse rake, and which will operate perfectly, and be capable of being manipulated with the greatest facility.]

49,165.—Coal Stove.—James Spear, Philadelphia, Pa.:

I claim the damper, C, with a hole in the center, or its equivalent, placed inside a stove, having direct draft, and arranged and operated in the manner and for the purpose herein set forth.

49,166.—Ditching Machine.—Nathan Starbuck, Wilmington, Ohio:

I claim the wheel, E, provided with flanges, c, projecting beyond the rim, a, in combination with the plow, F, and scraper, I, substantially as and for the purpose specified.

I also claim the inclined planes, L L, attached to the scraper bar, H, when used in combination with the wheel, E, plow, F, and scraper, I, for the purpose set forth.

I further claim placing the wheel, plow and scraper within a frame, C, placed or arranged within a frame, A, substantially as and for the purpose specified.

[This invention relates to a new and improved machine for excavating ditches, and it consists in the employment or use of a wheel provided with flanges for cutting the sides of the ditch, a plow for raising the earth between the cuts made by the wheel, and a scraper and inclined planes for taking the earth from the wheel and discharging it to the sides of the ditch.]

49,167.—Window Glass.—Thomas D. Stetson, New York City:

I claim as a new article of manufacture double or duplex glass tightly joined at or near the edges and adapted to serve in the manner herein set forth.

49,168.—Adding Machine.—T. T. Strode, Mortonville, Pa.:

I claim the revolving disk, A, marked with figures on its circumference and provided with a cam groove, c, and with cavities, p, in combination with the slotted dial, C, and index, D, constructed and operating substantially as and for the purpose set forth.

49,169.—Calendar Clock.—T. T. Strode, Mortonville, Pa.:

I claim the slide, B, marked with the names of the months and provided with openings, h, to operate in combination with the wheel, A, marked with figures from 1 to 31, and provided with concentric grooves, e, substantially in the manner and for the purpose herein set forth.

49,170.—Closing Hand-hole Plates in Steam Boilers.—Joseph R. Taylor and Horace A. Towne, Centralia, Ill.:

We claim the plug, B, inserted in the boiler plate, in combination with the cap, C, and clamp, D, substantially in the manner and for the purpose herein shown and described.

[This invention consists in the use, for closing hand holes in steam boilers, of a plug secured permanently in the boilers and bored out to give access to the interior of the same, in combination with a cap fitting on the surface of the plug with V or bell joint, and held down by a movable screw clamp, in such a manner that by taking or receiving said screw clamps the cap can be removed, and when the cap is replaced, a tight joint can be produced without the use of india-rubber or other costly packing.]

49,171.—Method of Preventing the Breaking of Glass by Exposure to Heat.—Eli Thayer, Worcester, Mass.:

I claim the non-conducting lining when applied to the surface of glass exposed to fire or to a high heat, substantially as set forth.

49,172.—Steam Generator.—Eli Thayer, Worcester, Mass.:

First, I claim the tubular supporters of grates, substantially as set forth.

Second, In combination with their supporters, I claim the extension or continuation of the pipe or pipes into the combustion chamber, substantially as set forth.

Third, The combination of these supporters with the screen grates or bars, resting upon them, and also with the sediment extractor.

49,173.—Sled Brake.—Levi H. Thomas, Waterbury, Vt.:

First, I claim the vibrating self-adjusting bar, attached to the sliding frame, the same being connected with the levers and so operating the grong or dogs that they will adjust themselves to the density of the substance they come in contact with.

Second, I claim placing the pins, f f, in such a position with the movable hooks, e e, as to always insure their taking hold to break the force of the load when pressing forward.

49,174.—Steel Trap.—Levi H. Thomas, M. D., Waterbury, Vt.:

I claim the jointed pan so constructed and arranged as to embrace both ends of the jaws, and hold them closed.

Second, I claim holding the trap set, the pan forming the catches under the angles of the jaws.

Third, I claim placing springs within the circumference of the jaws acting directly upon the pan, whereby they hold the trap either set or sprung.

Fourth, I claim the mode of constructing animal traps, whereby the pan forms the levers for setting.

Fifth, I claim the jointed double pan, in combination with the spring and jaws, the same being constructed and operating in the manner herein described for the purposes specified.

49,175.—Manufacture of Wrought Iron.—Robert Thomas and Giles Edwards, Columbiana, Ala.:

We claim extracting wrought iron direct from its ore or from the oxide of iron, by subjecting a layer of pulverized ore, which is mixed with carbonaceous matter, to the action of heat and balling the metal as rapidly as it is set free from the surface of said layer, substantially as described.

Second, Conducting the within-described process, substantially as described, upon an inclined or porous surface, substantially as set forth.

49,176.—Egg Beater.—Howard Tilden, Boston, Mass.:

I claim a case or box provided with a rotating wheel midway between the ends, with floats arranged diagonally to its axis, substantially as described, so that the wheel will be turned by the contents of the box as it flows from end to end, when the box is shaken.

49,177.—Drill for Wells.—J. H. S. Tuck, Cambridge, Ohio:

I claim locking drills for boring oil or other wells to their rods or shafts, substantially as and for the purpose above described.

49,178.—Cutting and Grasping Shears.—Samuel W. Valentine, Boston, Mass.:

I claim a cutting and grasping shears having a yielding hold fast, for the purpose substantially as set forth.

49,179.—Burning Hydro-carbon Oils.—Delevan D. Van Norman, Lester B. Brown and Enoch R. Morrison, Petroleum Centre, Pa.:

First, We claim placing in the furnace or fire box of a steam boiler a retort for generating gas from petroleum or other hydro-carbon liquids, the retort being surrounded by a steam chamber, from which superheated steam may be used with a small portion of carburated hydrogen gas for fuel.

Second, We claim placing a copper or other metal coil of pipe in the bottom of the retort, through which superheated steam is admitted, to hasten and evolve the gas from hydro-carbon liquids.

Third, We claim one or more pipes leading from near the top of the retort down under the bottom of the same, for the purpose of intensifying the heat in the retort, and thereby dispensing with fire in the pan after the steam in the boiler is at working pressure.

Fourth, We claim the smoke jacket surrounding the retort and steam chamber, in combination with the fire pan, whereby the smoke of the burning liquid is brought in contact with gas and steam, and is entirely consumed.

Fifth, We claim the float valve placed in the retort for controlling the supply of petroleum or other liquids for generating gas, in the manner herein set forth.

Sixth, We claim the manner of separating the water from the crude oil, by pressing a coil of steam pipe through the tank, as described.

Seventh, We claim the perforated coil or curcular, q, in the top pipe of the retort, for the purpose of letting a small portion of steam into the top of the gas-generating retort, G', to commingle with the gas as it escapes for ignition.

Eighth, We claim the arrangement of iron or other suitable metallic pipes for superheating steam in the furnace of a steam boiler, as herein described, in combination with the gas-generating retort.

Ninth, We claim the construction and arrangement of the steam-pressure governor valve, in combination with the spring balance, as and for the purposes set forth.

49,180.—Dogs for Lathes.—Wm. Vine, Norwalk, Conn.:

First, I claim the arrangement of the two adjustable plates, A and B, in the manner and for the purpose substantially as herein described.

Second, The arrangement of the corrugated faces, or their equivalent, substantially as set forth.

49,181.—Cutting Soles of Boots and Shoes.—J. H. Walker, Worcester, Mass.:

First, I claim cutting and beveling the rear end of tap soles at one and the same operation, substantially as set forth.

Second, I claim the use and employment of the double curved knife, with an irregular edge, b c, substantially as and for the purposes set forth.

49,182.—Picker Staff Connection in Looms.—Warner Welland, Deakam, Mass.:

I claim the arrangement, substantially as described, of the picker staff and the socket, the bearings and the pin of its carrier.

49,183.—Harvester.—Thomas Welch, Churchville, N. Y.:

First, I claim the combination and arrangement of the box, D, constructed, as shown and described, with the crank pin, C, socket, d, wheel, or its equivalent, and driving shaft, A, of reapers and mowers, for the purposes specified.

Second, The joints, I and J, constructed and arranged as shown and described, in combination with the crank box, D, and cutter bar, F, for the purpose set forth.

49,184.—Reaping and Mowing Machine.—Thos. Welch, Churchville, N. Y.:

I claim the arrangement of the ratchet, R, fixed, D, the ground wheels, B, in combination with the adjustable spring pawls, P, rigidly attached to the main axle, A, substantially as and for the purposes described.

Second, The primary pawl bar, C, rigidly attached to the main axle, A, in combination with the adjustable or sliding auxiliary bar, C', the independent spring pawls, p, and steady pin, g, constructed, arranged and operating in the manner and for the purposes shown and described.

Third, I claim the employment or use of the circular stock, J, and its slide, S, the latter having a ratchet edge, and both being arranged and operating in the manner shown and for the purposes specified.

Fourth, The roller, T, in combination with the circular slide, S, as shown, and for the purposes set forth.

Fifth, In combination with the stock, J, and brace, L, the brace bar, M, arranged in the manner and for the purposes set forth.

Sixth, The lever, t, and ratchet wheel, w, constructed and arranged as shown, in combination with the circular ratchet slide, S, and locking latch, r.

49,185.—Crank Pin Boxes.—Thomas Welch, Churchville, N. Y.:

First, I claim the combination and arrangement in harvesters of the set screw, S, and boxes, B and D, with the head, A, the bearing face between the latter and box, D, being made convex, substantially in the manner and for the purposes set forth.

Second, In combination with the crank head or box, A, of harvesters, the chambered cap, C, constructed, arranged and operating substantially in the manner and for the purposes shown and described.

49,186.—Harvesting Machine.—Milton A. Wheaton, Suisun City, Cal.:

First, I claim, in combination with the cam teeth, B, the employment or use of the friction rollers, D D', and the jointed vibrating rods, E E', or their equivalents, for the purpose specified and set forth.

Second, I claim the employment or use of the collars, H H, or their equivalent, with the depression and projection, substantially as and for the purpose specified.

49,187.—Stamping and Crushing Mill.—J. D. Whelpley and J. J. Storer, Boston, Mass.:

We claim, in combination with the radial arms, or disks, of a grinding, crushing or pulverizing mill, the employment of a plate, paddle, or beater, A, constructed of chilled cast iron, incorporated in casting, with wrought iron or other suitable malleable metal, substantially as set forth and for the purposes described.

49,188.—Gas Regulator.—Joseph S. Wood, Philadelphia, Pa.:

First, I claim passing the gas through the valve, H, by means of the openings, h h', substantially as described.

Second, I claim the valve, H, in combination with the stop, K, substantially as described.

Third, I claim the combination of valve, H, stop, K, and set screw, m, substantially as described.

49,189.—Bed Bottom.—William Workman and C. F. Swain, Ripon, Wis.:

thereto, or the slats themselves, to the rods or projections, c, in such a manner as to keep said slats extended, and employed in combination therewith the springs, a, a, and cross pieces, A, A, substantially as and for the purpose herein set forth.

49,190.—Straw Cutter.—George T. Wright, Cincinnati, Ohio:

I claim the arrangement of the ratchet wheel, O, pawl, P, in combination with the slotted arm, R, and perforated disc, S, for graduating the rotation of the feed rollers, K, in the manner described.

49,191.—Machine for Cutting Rings from Ivory.—Chas. H. Bassett (assignor to The Birmingham Button Company), Birmingham, Conn.:

I claim forming rings from any material out of which buttons or other circular articles are cut, by cutting them from that portion of the material which is exterior to the button, and at the same operation with the cutting of the button, by the means substantially as described.

49,192.—Process of Varnishing and Polishing Wood.—George Bricker, Sr., Newville, Pa., assignor to himself and George B. Hammer, Harrisburg, Pa.:

I claim the process herein described of varnishing and polishing wood, substantially as set forth.

49,193.—Beater Press.—L. C. Field (assignor to himself, J. P. Frost and W. S. Bellows), Galesburg, Ill.:

I claim, First, The two levers, F, F, employed in combination with the rope, H, beater, D, and notches, g and r, in the manner and for the purpose set forth.

I also claim the standard, n, n, on the beater, D, when used in combination with the levers, F, F, and rope, H, for the purpose specified.

I also claim the windlass, E, composed of two drums, d, h, when used in combination with the eccentric, j, to operate either the levers or beaters, at the will of the attendant, as described.

I also claim the ways or track, i, at the bottom of the press box and arranged substantially as shown for the discharge of the bale from the press box.

49,194.—Reaping Machine.—Henry Fisher (assignor to C. Aultman & Co.), Canton, Ohio:

I claim swinging and dumping table, G, operated automatically, such as herein described and represented.

I also claim in combination with a swinging and dumping table, the hinged section, d, at its front edge, as and for the purpose substantially as herein described.

I also claim in combination with a swinging and dumping or dropping table, a shield, or holder, operating in connection therewith, as and for the purpose described.

49,195.—Starting Cars.—A. F. French (assignor to himself and Ed. Chas. Terrill), Franklin, Vt.:

I claim the lever, F, pawl, c, in combination with the ratchet wheel, d, draught pole, D, and with the axle or wheel of a street car or other vehicle, constructed and operating substantially as and for the purpose set forth.

[This invention consists in the application of a lever pawl and ratchet, in combination with the draught rod or draught chair, and with the axle of a stretcher or other vehicle, in such a manner that in starting the car the strain exerted by the draught animal or animals is increased by the purchase of the lever, and the operation of starting the car or other vehicle is rendered comparatively easy, and can be effected with much less exertion for the draught animal or animals than by the ordinary arrangement.]

49,196.—Steering Apparatus.—Nathan Richardson (assignor to himself and Eli F. Stacy), Gloucester, Mass.:

I claim in a steering apparatus made with a worm gear on the rudder head, and operated by means of worms or endless screws meshing therein, the arrangement of said screws outside of the periphery of said gear and substantially in the plane, as and for the purpose specified.

I also arranging the endless screws with reference to the gear on the rudder head, so that by forcing the screws toward the center of the rudder head it will be prevented from lateral motions.

49,197.—Life Boat.—A. L. Shears, Flint, Mich., assignor to himself and H. T. Woodman, Dubuque, Iowa.

I claim the general arrangement of the boat herein described of the air chambers or spaces for storage of provisions, etc., water, scuppers and thwarts susceptible of being raised or lowered at pleasure for communication with the air chambers of the boat, arranged together and operating substantially in the manner and for the purpose specified.

[This invention relates to some important improvements in life boats, whereby their efficiency is much increased, and the safety of its passengers more insured than with such boats as heretofore constructed.]

49,198.—Salve.—Wm. Slape, Salem, N. J., assignor to himself and H. S. Marsh, Philadelphia, Pa.:

I claim a salve composed of the within-named ingredients, composed substantially, as set forth.

49,199.—Steam Boiler.—Wm. Mont Storm (assignor to himself and R. Charlton Mitchell), New York City:

First, I claim the relative arrangement of the parts of my steam boiler, substantially as follows: viz: In a cylindrical horizontal shell, the arrangement of two independent furnaces, located at its middle, with grate bars running transversely to its length, said furnaces being separated by a water space or "leg," and their products of combustion respectively, passing right and left through flues (preferably small tubes), to chambers, i, i, and thence through some proper conduit to their final exit, all substantially as described.

Second, I claim in conjunction with the other general arrangement of the parts of this boiler, the application of a series of auxiliary draft-heating tubes running the entire length of the horizontal shell, from its end to its furnaces respectively, in the manner and for the reason given.

Third, I claim the hollow head or "tonpion," with its conduits for circulation, substantially in the manner and for the purpose described.

Fourth, I claim the application of the sleeve, m, m, through the steam drum and chimney, for the objects described.

49,200.—Flour Sifter.—George W. Tileston (assignor to Asa Wilmet) New Haven, Conn.:

I claim as a new article of manufacture, a flour or meal sifter, consisting of a curvilinear vibrating sieve, and a crushing or pulverizing roller, when the whole is constructed and fitted to produce the result, substantially as herein described.

49,201.—Composition for Paint.—James C. Wendrem, Albany, N. Y., assignor to Wheeler, Mellick & Co., Albany, N. Y., and Edward Wackerhagen, Greenville, N. Y.:

I claim the composition specified for mixing with pigments to form a paint.

49,202.—Barrel for Holding Petroleum.—George W. Williamson, Gouldsborough, Pa., assignor to himself and D. W. Lee, Wilkesbarre, Pa.:

I claim, First, Filling the space between double barrels, designed to contain petroleum or other volatile fluids, with a solution composed of water, chalk or its equivalent, substantially as described.

Second, With a solution composed of water and chalk or other mineral equivalents.

Third, With a solution composed of water and glue or other glutinous equivalent.

49,203.—Machine for Refitting Stop Valves.—Samuel Wing, Monson, Mass., assignor to himself and George R. Topliff, Brooklyn, N. Y.:

I claim, First, The concave mill, B, provided with an internal yielding center, c, and arranged in suitable bearings, a, in combination with the adjustable center, C, constructed and operating substantially as and for the purpose set forth.

Second, The guide, E, and conical mill, D, applied in combination with each other, substantially as and for the purpose described.

49,204.—Cultivator and Planter.—E. M. Wright (assignor to himself and A. C. Diboll) Wilmington, Ohio:

I claim, First, The construction and arrangement of the under

cultivator frames, composed respectively of long central beams, D, D, fixed but adjustable in position and of short side pieces or beams, E, E, hinged and movable or adjustable to and from the said central beams, substantially as and for the purposes herein specified.

Second, I also claim the governing wheel, o, arranged and operating substantially as and for the purpose herein specified.

Third, I also claim the combination of the governing wheel, o, and the side pieces or beams, E, E, of the under frames, through the means of the levers, Q, Q, connecting bars, p, p, rods or bars, P, P, all substantially as herein described.

Fourth, I also claim operating the seed-dropping wheels, U, U, by the governing wheel, O, under the control of the driver, by means of the lever-armed rock shaft, S, and flexible connecting rods, s, s, and t, t, or their equivalents, substantially as herein specified.

Fifth, I also claim the projecting ledge, v, in the spiral seed separator, substantially as and for the purpose herein set forth.

Sixth, I also claim the friction plate, r, between the brush, w, and its fastening wedge, for the purpose specified.

Seventh, I also claim the construction of the drill teeth or shovels, with sockets or mortises fitting over their standards, for the purpose specified.

49,205.—Machine for Hulling Grain.—Christophe Ours Bulot (assignor to Bulot & Company), Santa Rosa de los Andes, Chili:

I claim the decorticating apparatus herein described, the same consisting of the grinding disks, G, L, feeding screw, E, fans, M, P, and air pipes or conductors, N, O, arranged to operate in the manner described.

[This invention consists in subjecting the corn or other grain to be decorticated to the influence of moisture for a few minutes previous to exposing the same to the decorticating apparatus, which is composed of two pairs of wooden grinding disks; the grinding surface of the first being covered over with wire gauze, and the other with leather or other flexible material, and those of the second pair being covered with leather or other flexible material only, in combination with suitable conduits and fanblowers.]

49,206.—Suspended.

49,207.—Lock for Satchel.—Bernard Steinmetz, Paris, France:

I claim the arrangement of a spring lever, D, in combination with a tumbling bolt, V, acted upon by a spring, s, and operated by means of a key, when combined with the jaw frames of a carpet bag, satchel, etc., and operating in the manner and for the purpose substantially as described and set forth.

49,208.—Wrench.—James White, Cleveland, Ohio:

I claim the stop, L, operating as described, in combination with the disk, F, and adjustable jaws of the wrench, whereby they can be used at any desirable angle, and in either way, without removing the wrench from the nut, as specified.

REISSUES.

2,040.—Box for Hats and Bonnets.—Oliver A. Dalley, Washington, D. C. Patented March 14, 1865:

I claim a hat box made of paper, cloth, leather, or the equivalent thereof, with respect to lightness, and strengthened by the use of ribs, substantially as described.

2,041.—Seed Coverer for Grain Drills.—John S. Gage, Dowagiac, Mich. Patented Aug. 26, 1862:

I claim, First, The seed coverer as herein described, constructed with two concave or converging arched palms, a, a, which are shaped on their rear and bottom edges as represented, and are connected by an intermediate portion, c, so as to have a space, b, between them, the said coverer being made of one piece of metal only, and adapted to be applied to the nearly horizontal arms, A, A, of the seeding machines, so as to operate upon the sides and top of the ridge or row, as herein specified.

Second, Providing the coverer with a lug, c, adapted to receive a weight, substantially as described.

2,042.—Tackle Hook.—Joseph W. Norcross, Middletown, Conn.:

I claim the strap or brace, B, which forms the upper section of the lower eye of the hook, A, and is made to swivel on the neck of said hook, and connected to its points, substantially in the manner and for the purposes set forth.

2,043.—Lighting Arrestor for Telegraphs.—George A. Stearns, Rochester, N. Y. Patented June 21, 1864:

I claim the protection of electric telegraph lines from the disturbing influences of atmospheric electricity by means of a small, fine guard-wire, inserted in the main or line circuit thereof, in such a manner as to complete said circuit, when such guard wire is used in combination with a metallic surface or with a series of metallic points, connected with the earth and placed in close proximity to the line at or in advance of said guard wire, all substantially in the manner herein set forth.

I also claim establishing communication between the main or line circuit of an electric telegraph and the earth, for the discharge of atmospheric electricity from the line by the use of charcoal, powdered glass, powdered amber, sulphur or other equivalent substances brought into contact with said line and connected with the ground, substantially in the manner herein set forth.

2,044.—Machine for Sheetting Plug Tobacco.—W. J. Van Horn and Wm. Alexander, Louisiana, Mo. Patented December 27, 1859:

First, We claim the combination and arrangement of the two belts, C and G, or their equivalents, with a cylinder, B, and a series of pressing rollers, F, arranged and operating substantially as and for the purposes herein specified and shown.

Second, We claim in combination with said cylinder, pressing rollers and belts C, G, the employment of the feeding table, J, all arranged and operating substantially as shown and described.

Third, We claim the employment of the rollers, L, L, provided with the circular knives, a, and the corresponding channels or grooves, substantially as and for the purposes delineated and described.

Fourth, We claim the employment of the rollers, M, M, provided with the longitudinal cutters, N, arranged and operating as and for the purposes set forth.

Fifth, We claim the combination and arrangement of the two pairs of rollers, L and M, provided respectively with the cutters, a and N, arranged and operating substantially as and for the purposes herein set forth and shown.

Sixth, We claim in combination and arrangement of the cylinder, B, rollers, F, table, J, belts, C, G, cutting rollers, L and M, constructed and operating substantially as and for the purposes herein specified and described.

2,045.—Sawing Machine.—A. E. and J. V. Warner, Norwalk, Ohio. Patented May 30, 1865:

We claim the above-described arrangement of operating a circular saw, in combination with a cross-cut saw, or separately, substantially as and for the purposes set forth.

2,046.—Skeleton Skirt.—S. H. Doughty, Clinton Township, N. J., assignee by mesne assignments of Jas. Draper. Patented Oct. 4, 1859. Reissued Dec. 27, 1859:

I claim the new manufacture of skeleton skirt, substantially as described, consisting of a series of tapes woven in the direction of their length, in alternate sections, as single and as double tapes, with the hoops inserted in the loops formed by wearing the tapes as double tapes, and there secured to prevent the tapes from sliding laterally on the hoops.

JULY 25.

2,034.—Turndown enameled Paper Collar.—James H. Hoffman, New York City. Patented Jan. 24, 1855:

I claim the new article of manufacture consisting of a turndown or folded enameled paper collar, substantially as described.

2,035.—Carpet Bag Frame.—Samuel Lagowitz, New York City. Patented July 7, 1863:

I claim the cover, B, made of elastic wood and attached to one end of the jaws, A, by stays or brackets, all as herein shown and described.

2,036.—House for Preserving Fruit, Etc.—Benjamin M. Nyce, Cleveland, Ohio. Patented November 2, 1858. Reissued October 23, 1860; again May 16, 1865:

I claim the insulated and cooled preserving chamber, J, provided

with absorbents of moisture, substantially as set forth, either with or without the agitator, K.

2,037.—Preserving Fruit and other Perishable Substances.—Benjamin M. Nyce, Cleveland, Ohio. Patented November 2, 1858. Reissued October 23, 1860; again May 16, 1865:

I claim the method of preserving fruit in a chamber whose walls, doors and floors are practically air tight, and so proof against the ingress of heat and moisture, as to maintain by the aid of ice, on a metal floor above a uniform temperature of from 34° to 37° F. throughout the year, and by the use of absorbents within said chamber producing any desired degree of dryness.

2,038.—Preserving Fruit and Other Perishable Substances.—Benjamin M. Nyce, Cleveland, Ohio. Patented November 2, 1858. Reissued October 23, 1860; again May 16, 1865:

I claim the above described outside air tight casings of walls, when used in combination with a chamber chilled by ice on a metallic floor, on its upper part, with absorbents of moisture, within said chamber.

2,039.—Steam Engine Governor.—Thomas Silver, New York City. Patented April 26, 1859:

I claim the combination of a spring with a momentum wheel, and adjustable speed limiting vanes, the whole constructed with the combination of the peculiarly adjusted sectors, pinion and links, as fully described and set forth.

DESIGNS.

2,149.—Bass Relief for Bust of Abraham Lincoln.—Elizabeth V. Bunting, Philadelphia, Pa.

2,150.—Stove.—Gardner Chilson, Boston, Mass.

2,151.—Trade Mark.—D. L. Gold and J. B. Adams, Springfield, Ill.

2,152.—Carpet Pattern.—E. J. Ney (assignor to the Lowell Manufacturing Co.), Lowell, Mass.

2,153.—Plate of a Cook Stove.—Garrettson Smith and Henry Brown, Philadelphia, Pa., assignors to Marshbank & McConkey, Lancaster, Pa.

2,154, 2,155.—Stove Base.—N. S. Vedder (assignor to Cox, Church & Co.), Troy, N. Y. Two Patents.

2,156.—Cook Stove.—N. S. Vedder (assignor to Cox, Church & Co.), Troy, N. Y.

2,157.—Top of a Stove.—N. S. Vedder (assignor to Cox, Church & Co.), Troy, N. Y.

2,158.—Cook Stove.—Russell Wheeler and S. A. Bailey, Utica, N. Y.



PATENTS

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[See Judge Holt's letter on another page.]

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March, 1893. 2 2m3t

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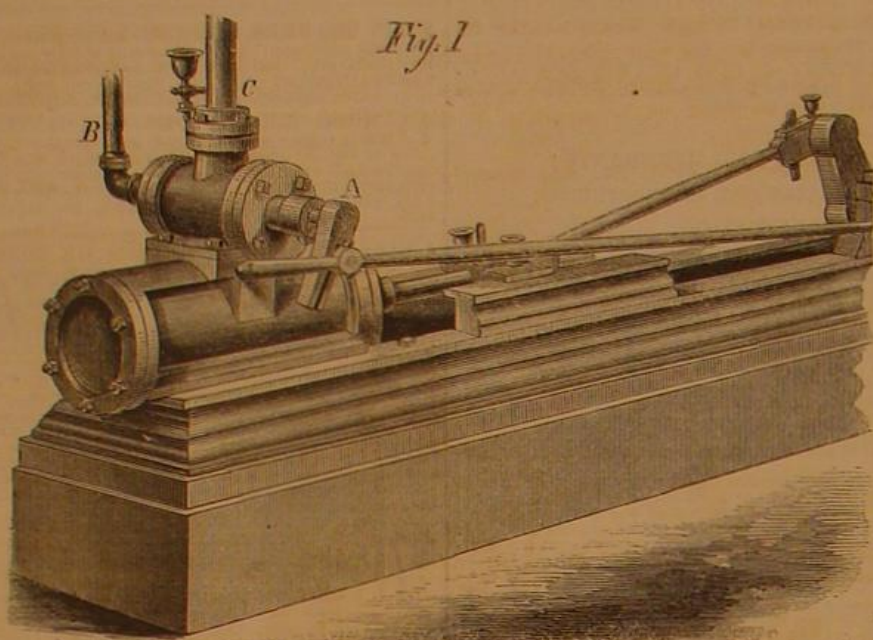
Oscillating Steam Valve.

The object of this valve is to overcome the resistance and loss of power in the use of common valves, more particularly the slide valve. It is plain that by overcoming this resistance, there will be just so much power added to the engine for practical purposes. The chief difficulty has been to balance the valve properly, without making it too complicated or expensive. It is claimed that this has never been so successfully accomplished as in the valve herewith illustrated.

This valve may be perfectly balanced; is about as simple in its construction as an ordinary steam cock, and is claimed to be much cheaper to construct than any other valve known. In addition to these several advantages, it will out-wear any other, since the

ance made for expansion of the valve, to prevent it sticking, as it would be liable to do with a set-screw.

Fig. 3 shows the upper, or exhaust side of the valve, and the recess, I, for the purpose of counterbalancing the upward pressure of the valve. There are small openings admitting the steam from the inside of the valve to these recesses. If the sum of the area of both these recesses exactly corresponds to the area of the main opening in the underside of the valve, it is evident that the valve will be balanced. It is found on actual experiment that the valve works as easy under pressure, the surfaces being exactly right, as it does without any pressure. The valve on a six-horse power engine, at work under sixty-five pounds of steam, was worked with the thumb and finger.

**CARHART'S OSCILLATING STEAM VALVE.**

working parts are not subject to heavy pressure. It may be applied to engines of any ordinary device, without alteration in the valve motion, link, or any part of the engine proper.

Fig. 1 represents an engine with the valve attached. This engine formerly had on a slide valve. No alteration has been made in the cylinder or valve seat. There are flanges cast on the under side of the valve socket, whereby it is bolted to the old valve seat. The arm, A, attached to the valve stem takes the eccentric rod by which the valve is worked. The position of the pin in which the rod hooks may be varied by means of a slot in the arm, thus varying the oscillation of the valve. B is the steam, and C is the exhaust pipe.

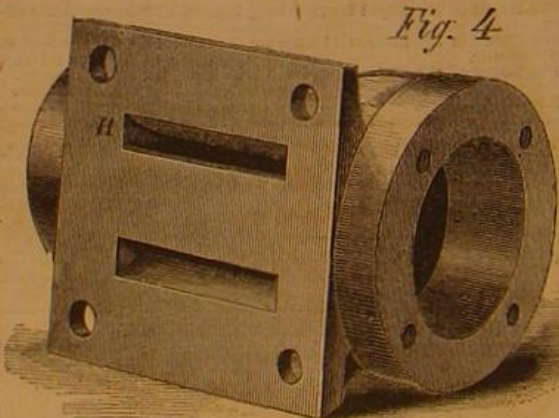


Fig. 2 represents the valve isolated, chiefly to show the opening, D, which communicates alternately with corresponding openings in the valve-chest, leading to the opposite ends of the cylinder. Steam is admitted at E; the valve being cast hollow communicates alternately with the opposite ends of the cylinder through D, and exhausts over the valve, at F.

The valve is made tapering, so as to wear to a fit. It is held in place by steam pressure, and is without a set-screw; there is not a screw or bolt exposed to the action of the steam. The steam passes through the small opening at G, into a thin chamber at the head of the valve, made by a washer being slipped on to the stem. The area of this end being greater than that of the opposite end, the pressure is just enough greater to hold the valve in its place. The washer not fitting steam-tight, there is allow-

Fig. 1

Fig. 4 shows the under side of the valve chest, the flanges with bolt holes, and more particularly the openings, H H, which communicate with openings leading to opposite ends of the cylinder.



Patented through the Scientific American Patent Agency July 25, 1865.

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For further information, address the inventor, Rev. J. Carhart, D.D., Troy, N. Y., or Geo. Gould, President Oscillating Steam Valve Company, at the same place.

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A neat arrangement for sprinkling salt on food has been shown us. It is merely an ordinary cruet with a perforated top, but inside there is a wooden post set fast, having a number of small arms radiating from it. This arrangement divides the mass of the salt so that it falls freely through the holes in the top. The cruet looks very curious with this attachment in it, and is a novelty. We are assured by the patentee that the article is a success, and that he is selling quantities of them. Mr. C. P. Crossman, of West Warren, Mass., is the inventor.

MODELS.—We are almost daily receiving models which have neither name nor post-office address upon them. One such model has been in our office upwards of six months, and we have no trace of its origin. We hope all who send models to us will be particular to put their names and post-office addresses upon them.

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Vol. XIII—No. 8.
(NEW SERIES.)

NEW YORK, AUGUST 19, 1865.

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IN ADVANCE.

Improved Steam Carriage.

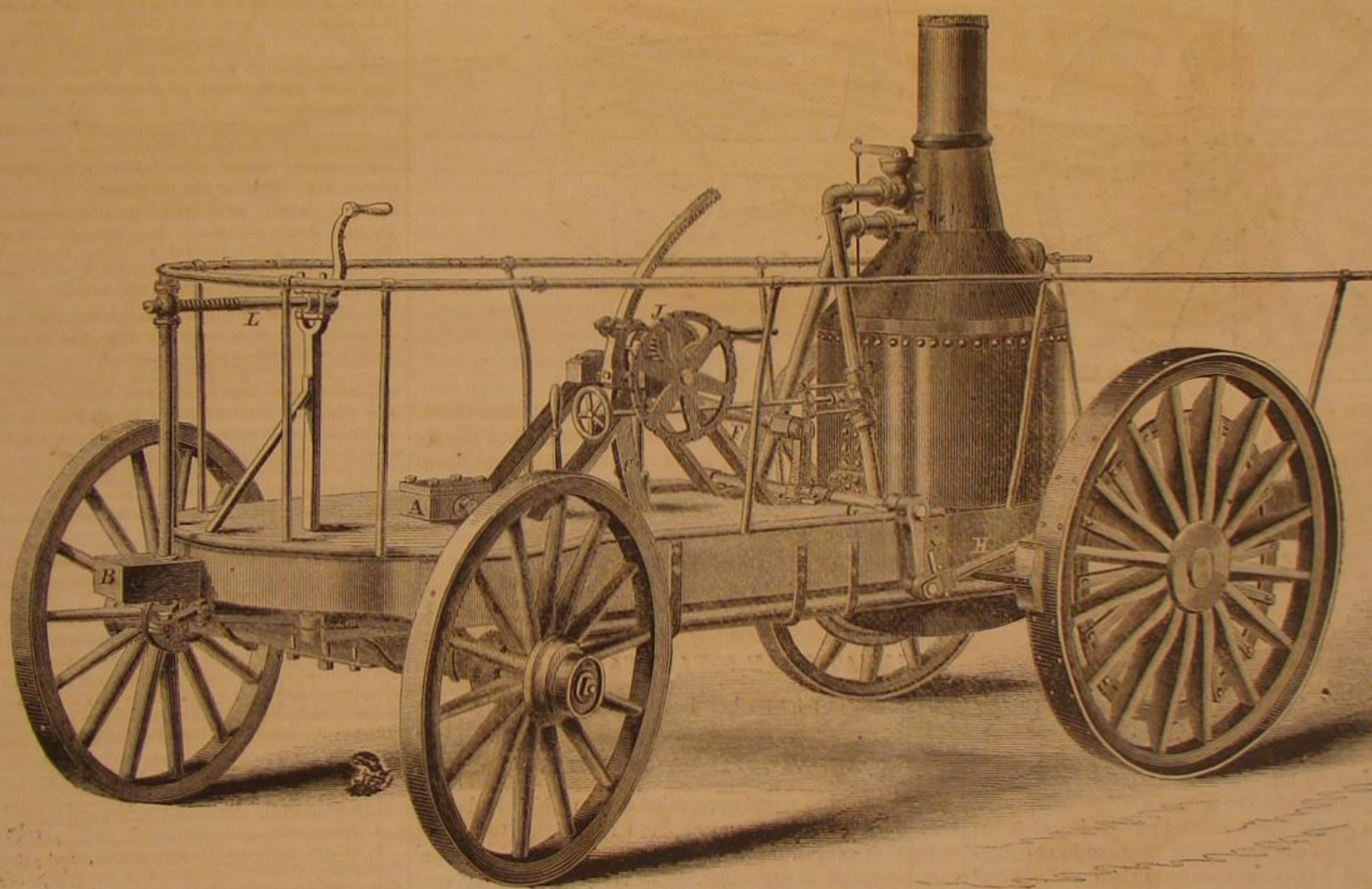
The ingenuity of inventors and engineers has, for many years, been directed to perfecting the steam carriage so as to adapt it for traffic on common roads, and thus open another field for usefulness to the steam engine. In years gone by steam carriages

lately built a steam carriage which weighs but 450 pounds. These are not the only ones ever constructed here; we might mention many ambitious attempts which failed, but we think further mention of them unnecessary at this time.

Mr. Perry Dickson, of Erie, Pa., has recently in-

vented a steam carriage which weighs but 450 pounds. These are not the only ones ever constructed here; we might mention many ambitious attempts which failed, but we think further mention of them unnecessary at this time.

Mr. Dickson has shown a good deal of ingenuity and originality in his ideas and in putting them in practical form; following is a description of this machine.



DICKSON'S STEAM CARRIAGE.

ran on common roads in England, and some were in operation for months, carrying passengers between different points with regularity. From various causes, the chief one being unpopularity, they were discontinued, and we believe there are none now at work in the United Kingdom except traction engines for hauling heavy timbers in shipyards, or carrying loads on highways for short distances. In France, we learn by recent foreign advices, that a line of steam carriages has been established between two provincial towns, but no particulars are given of the engines or their details.

In this country the steam carriage has been the subject of much thought, and many valuable improvements have been made in it. Among the later machines may be classed the self-propelling steam fire engines of Lee & Larned, and Latta, of Cincinnati. One of Lee & Larned's engines is occasionally in use as a steam fire engine in this city; several of them were built years ago, but the *John Storm* is the only one now in existence; the others were torn to pieces after short service. Mr. Richard Dudgeon, of 24 Columbia street, New York, an accomplished machinist, built a steam carriage which ran publicly in this city on several occasions. It was destroyed by fire in the Crystal Palace. Mr. S. H. Roper, of Boston, has

vented a steam carriage for common roads that can also be instantly converted into a stationary engine without disconnecting any part whatever. We give very full illustrations of it, both in perspective and in detail.

The perspective view represents a machine which was constructed the past winter and is now in successful operation. In Fig. 1 the details are shown. The distinguishing feature of this engine is the arrangement for graduating the power of the engine to the work to be done, so that heavy grades, or stiff miry ground, can be ascended or run over with ease. The arrangement of the machine to effect this is shown in Fig. 1, and consists in applying the power of the engine nearer to or further from the axle, and in this way exerting greater force upon the wheels when unusual obstacles oppose them. This alteration can be made at any time while the engine is in operation. There is another novelty in the way the power is transmitted to the driving wheels. This consists in a toggle-joint movement, so arranged that one arm bites on the inner face of a metallic wheel bolted to the driver—thus dispensing with a crank and allowing the engine to work freely in all positions or inequalities of the ground; it also allows the side levers to make a short or long stroke.

The piston rod connects to a quadrant, C, which has centers or bearings at D, so that when the engine is in motion the quadrant will have a rocking movement to and fro. On this quadrant there is a sliding head, E, to which the connecting rod, F, is jointed. This latter rod gives motion to a transverse rock shaft, from which the main rods, H, run to the driving wheels, as before explained.

The connecting rod, F, is jointed, and has a forked end, which enables it to embrace the link, and the sliding head is furnished with a rack, I, through which the head is raised up or lowered down on the quadrant; suitable means are provided to retain the sliding head, E, in its working position wherever it may be placed. Fig. 4 is a front view of the quadrant, showing the method by which it is operated; that is, through the wheels, J. There is a small fly-wheel, K, attached to the frame, which serves to steady the motion of the engine and operate the valves thereof; it is also a driving pulley to run any kind of machinery independent of the carriage, if it is ever needed. By these arrangements—that is, the sliding link for regulating the amount of power to be transmitted to the driving wheels, and the substitution of the toggle-jointed arm acting on the driving wheels for the crank motion, it is possible to use one cylinder in-

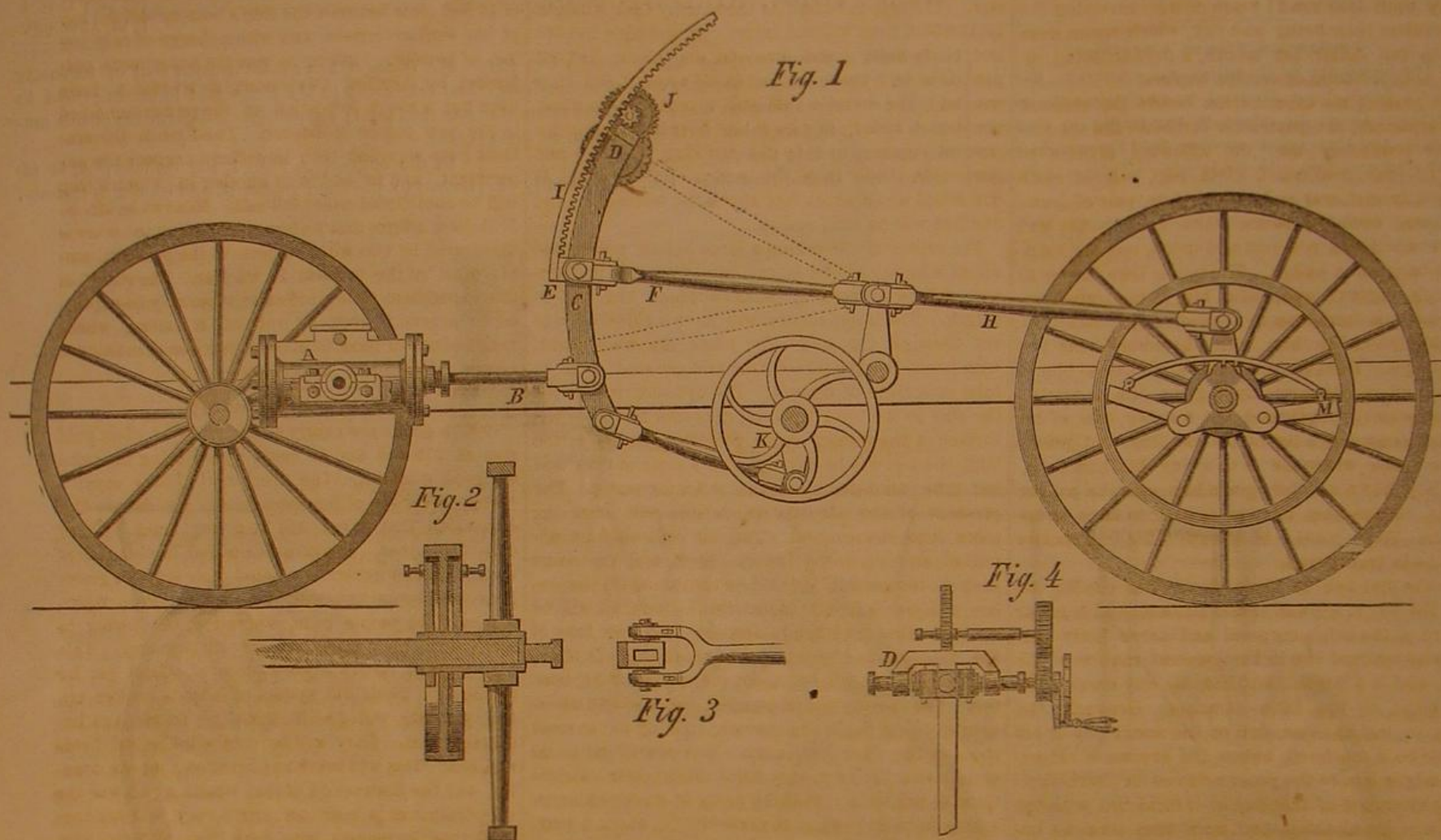
stead of two, thus simplifying the apparatus, reducing the weight, and enabling the machine to be started at any time, for there are no dead centers to overcome, and the motion is easy and continuous. The machine is capable of going in any direction, either backward or forward, by throwing either set of the toggle-jointed arms, M, in or out, and it is steered in front by gear, L, there placed. When the sliding head is moved up until it is in line with the rock shaft it is then at the point of no motion, but the engine yet runs while the carriage stands still. In this way the power may be used for driving pumps or other machinery of any kind whatsoever, and this without disconnecting any rod.

tion of time. In different places I work it with a short stroke, and then it runs and continues to run with perfect safety, whereas, if it were the *John Storms*, or an engine that had to make a full stroke or nothing, then I must let on steam until it started. As soon as it started it would have too much steam on and would go smash into some catastrophe before it could be stopped. The rotary motion of the driving wheels is perfect, and there is no need of two engines for such a purpose. I can get more accommodation out of one simple lever than there would be in all the cog wheels that an English traction engine would be able to haul."

This carriage was patented November 25, 1862, by

practice and school ship for naval apprentices, under the command of Lieutenant-Commander R. B. Lowry, U. S. N., who was specially selected by the Navy Department for the very important and arduous duty of organizing and establishing on a firm basis the nucleus from which the future rank and file of the navy were to emanate, and in such a form as not only to be reliable at all times, but of a character which would place our vessels upon an equality, if not make them superior, to those of any naval power.

Owing to the want of proper attention on the part of some recruiting officers, and the desire of many parents to place their boys in the service, either in hopes of receiving part of their pay or for the pur-



ELEVATION OF STEAM CARRIAGE.

The inventor has some ideas of his own on this subject which we take pleasure in printing as he has written them. He says:—

"Suppose my machine in the same depot with the *John Storms*, when the fire-bell rings and 'Barnum's' is on fire. So soon as I get five lbs. of steam I can start and run slowly; by the time I get opposite your office [twenty rods from the depot.—Eds.] I have ten lbs. of steam, and have turned my hand crank and increased the speed two to one. As soon as the steam is high enough for more speed I keep turning the crank and lengthening the stroke, and thus get to the fire as early as any horse-drawn engine. And further, I can get there and have hose all attached by the time my steam is sufficient to throw water, and I have spent no time connecting or disconnecting anything except the hose.

"Let us go back and look after the *John Storms*, which has had to stay at the depot until it is smoking hot; it must have a pressure of steam sufficient to go a whole length stroke, or none, before it can start, and, after it gets to the fire, it must be taken apart and put together again to make a stationary engine of it, during which time poor 'Barnum' might get badly burned.

"Some people propose to build three engines to accomplish the object of one fire engine; to do this the engines would weigh twelve tons. Such an engine would destroy so much pavement that if there was a fire the people in the neighborhood would keep still about it, for fear the engine would come.

"My engine is eight horse power, weighing fifty-three hundred—which is some ten hundred more than is necessary, it being the first one ever made on my plans. I have ascended grades of one foot in four, and find that climbing steep grades is only a ques-

Perry Dickson; for further information address him at Erie, Pa.

OUR NAVAL APPRENTICE SYSTEM.

The need of a naval apprentice system which had been once tried in our service and tailed, owing to a variety of causes, made itself apparent at the commencement of the rebellion. The scarcity of naval seamen, men who were conversant with the routine and duties of men-of-war, gave the department much anxiety and caused considerable delay in fitting out vessels for the pressing and important demands of that time. It had been supposed that the fishermen, to whom the Government has been paying large bounties for many years, would come forward in the event of war and pay back these munificent gifts which they had been receiving. In this the department were disappointed.

The navies of other powers have their apprentice and training schools, and England especially is noted for her wisdom and foresight in the education of boys for service on board war vessels. In this country the system has at times been ridiculed, although some of our best naval officers have approved the plan, while others have objected to it mainly on the ground that at its organization they would be subjected to the arduous work of bringing it to perfection, forgetting that in these apprentices who, having once become thoroughly instructed in seamanship and naval gunnery, would in the course of a few years become the bone and sinew of our naval strength and pride.

Our apprentice system was formally inaugurated by an act of Congress dated March 2, 1837, but after many disappointments it was abandoned in 1843, and was not revived until 1864. In May of last year the *Sabine* was ordered to be put in commission as a

pose of ridding themselves of troublesome, incorrigible or refractory sons, a large number of worthless, and, in some instances, vicious boys were sent on board. Many persons seemed to think that this was a school of reform for bad boys, and availed themselves of the privilege of confining their wicked offspring in a man-of-war at the expense of the Government. Nothing could have been more foreign to the plan of the Navy Department than the enlistment of such a class of boys, and upon the proper representations the naval rendezvous ceased to take any more boys, and the enlistment was only consummated on board the school ship.

The mistake of careless enlistments was speedily rectified. Under the present system of careful scrutiny and care which is exercised in the preliminary examination, it is almost impossible for any bad boy to obtain admittance into this interesting and promising body of embryo naval seamen. The greatest care is taken in the selection of boys. They must be 14 and not over 18 years of age. At 14 they must measure not less than four feet eight inches in height and 27 inches around the chest, and at 15 years the height must be four feet ten inches and 29 inches around the chest. Each candidate must be able to read, write and spell, be free from physical disabilities, well grown, healthy, active, and exhibit an aptitude for the ocean and the duties of sea life.

To guard against bad characters, the candidate must be of good moral standing, not an indentured apprentice, must never have been charged or convicted of crime. He must be a willing applicant, and must have the written consent of his parent or guardian. Parents can rest assured that applicants will be compelled to undergo a thorough examination as to their moral and physical qualifications. It

is determined by the department to have none but good and promising boys enter this school; those who will be a credit to the country and will not contaminate the boys who are now on board. Sickly and effeminate boys will not be taken; the Government cannot afford to keep a naval hospital nursery school for invalid boys, any more than to provide a juvenile house of reformation for boys with sea going proclivities. Therefore the public are to understand that any attempt to foist upon the service sickly boys, with a view to improve their health, or refractory boys to establish their future morals, will be met at this school with a firm refusal, and that time and money employed in such efforts will be uselessly expended. The apprentices are bound by the consent of their parents and guardians to serve their country until they are 21 years of age, receiving for their services their living and pay, which varies from eight to ten dollars per month, a portion being retained until the term of service expires.

After passing the examination before the surgeon and instructors, the paymaster furnishes the apprentice, for immediate use, the following articles of clothing:—one pea-jacket, cloth cap, pair of cloth trousers, flannel over and under shirts, pair of drawers, shoes, neck-tie, socks, white duck pants and frock, comb, knife, pot, pan and spoon, one bar soap, clothes bag, and a badge. The boy is then taken to the ship's corporal, who assists him in the transformation from a landsman to a sailor boy. Next the sailmaker furnishes him with a hammock—his bed until of age. Then the master-at-arms places him in a mess, and at the same time gives him a printed form, on which is registered his number, that of his bag and hammock, a list of his clothing, and points out the place where he is to swing his hammock. Each boy has a number given him when he enlists, and he retains that number as long as he is an apprentice. Thus "191" is always "191," no matter where he is transferred.

For the first two or three days after coming on board the boy is allowed some latitude, and is under the care of the ship's corporal and other petty officers, who instruct him in the general routine of the vessel and in a familiar and friendly way smooth the first steps of the little stranger. Gradually he begins to feel at home, and on the fourth day of his new life he is mustered before the executive officer, who assigns him to the proper classes for instruction. On the afternoon of that day he is furnished with the balance of his clothing, and from that time he becomes fully identified with the daily routine of the ship and school. The treatment of the boys is of parental character, and made to conform to the requirements of young and growing minds and bodies.

One tailor is allowed to every hundred boys, whose duty it is to repair their clothing, and instruct them in the art of repairing, cutting and fitting their own clothes. The boys must learn this branch of nautical accomplishments. One great trouble which has arisen in reference to clothing the boys is, that they are served with men's sizes, none other being made by the contractors. Of course they are too large, and some time must elapse before a new boy can be fitted out in uniform. Much time and considerable valuable material is lost by this state of things. A shoemaker and barber attend to the feet and head of the boys. A fine barber's shop and bath room are located forward on the starboard side of the vessel, and to enforce cleanliness and cultivate a taste as well as the habit for the care of the person is one of the first laws of the school.

The moral training of the apprentices is very carefully attended to by the officers; and the kind, parental supervision of Rev. Mr. Salter, chaplain of the ship, gives a guaranty of its faithful performance. Divine services are held every Sunday, and are of a character both simple and instructive. No pompous or weary discourses are given to prejudice the young and restless mind against religious service, and no sectarianism is forced upon them. A Sunday school to teach Bible history is being organized, and good books and papers are distributed at stated intervals. The boys own a fine and well-selected library of about one thousand volumes. Great care is taken of them, and they are read with much interest.

The naval apprentice system is working admirably, and promises great success. It is of much importance to us as a nation, and is worthy of support and

commendation. The sailing corvette, *Savannah*, will be put in commission in a day or two, and be moored in New London as a permanent receiving and practice ship of the school. The steam gunboat, *Tioga*, is now on the Eastern coast recruiting boys. The *Michigan*, on the lakes, is also employed in the same service. It is hoped in a short time to obtain three or four thousand boys for this great work.—*Boston Commercial Advertiser*.

The "Crib" for the Chicago Lake Tunnel.

The walls of the crib are constructed of blocks or logs, hewn square, and one foot in thickness. The distance between the walls is eleven feet, leaving with the inmost wall a pentagonal inclosure, comprising an inscribed crib of twenty-five feet in diameter. The crib is barred so thoroughly that it might be tumbled over without injury. It contains 750,000 feet of lumber, hand measure, and about 150,000 pounds of iron bolts, making in all about 1,800 tons weight. The outside wall was thoroughly caulked, equal to a first-class vessel, and over it was placed a layer of lagging, to keep the caulking in place and protect the crib from the action of the waves. It will stand about seven feet above the water-line, and five feet will be built above.

The center of the crib is a large hollow space into which a huge cylinder of cast iron, nine feet in diameter, will be lowered in sections about ten feet in length. The lower section will have a chisel edge to cut through the soil. The joists are water-tight, with broad flanges turned true and grooved so as to take in a ridge of cement. The cylinder will pierce the clay to the total depth of sixty-four feet from the surface of the water. After reaching the bed of the lake, the top will be covered with a plate of iron, and the tube exhausted by means of an air pump. The pressure of the atmosphere outside will force the piece into the ground. The air will then be admitted, another piece lowered to it, and the same process repeated. This will be continued till the entire cylinder is fixed. When this is done, all will be ready for the workmen to descend into the tube of the cylinder and proceed to excavating. It is expected that this will be about the middle of September. The water will be pumped out and the workmen will then begin to excavate, striking out to meet those at the other extremity. It is considered to be certain that the engineers have made their calculations so accurately, that the party of workmen excavating from the way of the crib will, in about a year, meet those at work on the present tube, and the walls of the tunnel fit exactly together.

It is intended, when the tunnel shall have been completed, to let in the water through the sluices in the walls of the crib. At this point the water is very pure and clear. It has never been found to contain more than eight grains of solid matter to the gallon; and the distance from shore, two miles, is so far that storms will not affect its quality. The northwestern current in the lake will carry away the filth emptied into the lake round the head and to the Michigan shore. The tunnel ascends or slopes, as it goes out from the shore, about two feet per mile. Many apprehend that the pressure of the water on its first entrance will sweep away the brick work and collapse the walls; but as the bricks are set into the clay, which is almost as firm as solid rock, and the internal pressure of water will be equivalent to that from the outside, this is hardly to be feared. If nothing occurs to interrupt the completion of the tunnel, or to destroy it when finished, Chicago will have secured an inexhaustible supply of as pure and wholesome water as is to be found on the western continent.—*Financial Chronicle*.

The Electrical Torpedo.

We have recently had occasion to refer to the experiments which have been carried out at Toulon with this subtle agent; others have since been instituted on a much larger scale, and with extraordinary results. Hitherto the torpedo has not been properly appreciated as a defense in war; but it is now an established fact that it is as available for defense as ironclads and rifled guns are for attack. Mr. Nathaniel J. Holmes, however, and the scientific gentlemen associated with him, have recently made such progress in this new department of military engineering, that hereafter, in all plans for coast, harbor

and river defenses, and in all works for the protection of cities, whether against attack by armies on land or by ships afloat, the electrical torpedo will probably play an important part. The latest experiment made by the French Government at Toulon, affords some idea of the amount of destructive power which lies stored up within the electrical torpedo. With a charge of little more than 100 lbs. of gunpowder, a vessel 150 feet long, and upwards of 40 feet broad, was instantaneously destroyed while floating in deep water in apparent security. At the word of command, given by Admiral Chabannes, a dull crashing sound filled the air, and the devoted craft was effaced from the surface of the water. The portions of the vessel examined afterwards all bore testimony to the tremendous effects of the concussion even with a water depth of 16 feet clear between the ship's bottom and the top of the sunken torpedo, and with a charge of only 100 lbs. of powder. Striking as was the experiment performed by Admiral Chabannes, it is said to have been but a rough indication of the power embodied in the new engine of defense. The French Government have signified their intention to repeat the experiment, and to add to it another in which a ship will be annihilated under full sail. Meanwhile Mr. N. J. Holmes affirms that he has not revealed the secrets discovered by him with respect to the practical employment of the torpedo in warfare. The result of this experiment plainly indicates what may be expected to accrue to even an ironclad, if sailing within range of one of those formidable engines of multiplied power.—*Mechanics' Magazine*.

The Cotton Supply.

Cotton goods are nearly as high now as when gold was at 250—45 and 50 cents a yard being the price for good qualities. The Cincinnati Times says:—"From a variety of Southern letters we deduce the conclusion that there will be a very small yield of cotton this year. In pursuance of Jeff Davis's orders the people had generally planted their lands in grain. There will be an unusually large corn crop, which will save the people from starvation, but owing to the scanty yield of cotton, very little money. This will, perhaps, prove a good state of affairs yet for the South. Their old system of labor is broken up, and planters will find it impossible to manage immense farms. They will be compelled to subdivide and sell. This will bring immigration into the country, and the destruction of that wealth which was the substratum of a heartless aristocracy, will conduce to elevate the masses, who have been hitherto kept under."

Filthy Currency.

About fifty thousand dollars' worth of fractional currency, defaced or worn, is redeemed per day, and an equal quantity of new issued in its place. The entire amount of fractional currency being upwards of \$21,000,000, the re-issue at such rate of new notes for the whole amount, occurs once only in fourteen months. This period is entirely too protracted, for the notes in that time get dirty, greasy, and repulsive to use. Convenience of the public and a sure preventive of successful counterfeiting could be effected by devising a method of redemption and re-issue that would renew the outstanding fractional currency once in every six months or oftener. The expense of this to the Government would be inconsiderable. A proper standard of cleanliness could be established, and all notes below it paid for taxes or for postage might be retained redeemed, and new ones supplied.—*Internal Revenue Record*.

GAS MACHINES.—The gas companies will probably have their own way until machinery is perfected by which every family or neighborhood can manufacture its own gas; but the machinery for that purpose is every year becoming more complete and easily managed, by the improvements of inventors who are busy with them. The gas companies of this city and Brooklyn are the best friends of these inventors, for their extortionate charges prepare the public to welcome any change, and hasten the day when no house will be thought comfortably furnished without a gas resort in the cellar.—*Post*.

The propellers *Meteor* and *Pewabic* collided in Thunder Bay, Lake Huron. The *Pewabic* was sunk in three minutes, and from seventy-five to one hundred lives are supposed to have been lost.

Improved Lamp Chimney.

This chimney is said to be a great improvement over the common ones used on kerosene lamps. The inventor says:—"It is less liable to break from expanding and contracting—being of equal thickness throughout—whereas the ordinary chimney is large in the center and small at each end. As a proof of the capability of this chimney to resist a sudden application of cold when heated, water may be sprinkled upon one of them with impunity, while a single drop upon the others will fracture them. They can be cleaned as readily as a tea-cup, which is quite an advantage. The cap, suspended on the top of the glass by the wires which support the shade, intensifies the light very much, and the heat is not great enough by this arrangement to injure a paper or metal shade in the least. The average breakage of these chimneys is very much less than the ordinary kinds, and they are in all other respects adapted to lamps now in use."

A patent on this chimney is pending through the Scientific American Patent Agency, by Jos. H. Connelly, of Wheeling, West Virginia; for further particulars address him at that place.

NOTES ON NEW DISCOVERIES AND NEW APPLICATIONS OF SCIENCE.

Professor Wheatstone has constructed a very powerful thermo-electric battery on the principle of that exhibited by Mr. Ladd at the Royal Institution. The battery constructed by Professor Wheatstone consists of sixty pairs of small bars, and its electro-motive force is said to be equal to that of two of Daniell's cells. The battery was recently exhibited to a select circle of Professor Wheatstone's friends, and it is stated that "on connecting the terminals of this battery, excited as Marcus's, a brilliant spark was obtained, and about half an inch of fine platinum wire when interposed was raised to incandescence and fused; water was decomposed, and a penny electro-plated with silver in a few seconds, while an electro magnet was made to lift upwards of a hundred weight and a half. Bright sparks were obtained from the primary and secondary terminals of a Ruhmkorff's coil connected with the battery. In fact, all the effects obtained from small voltaic combination were reproduced with ease by this thermo-electric battery." In constructing this battery, Professor Wheatstone found confirmation of the curious fact, first announced by M. Marcus, that the power of a battery of this kind is very greatly increased by frequently remelting the alloys of which its elements are composed. This is supposed to be due to the repeated fusion breaking down the crystalline structure of the alloys.

Not unnaturally, this thermo-electric battery is exciting the imaginations of men of science, causing them to call up wonderful visions of a future when much of the work of the world shall be done by sunshine. Thus a cotemporary suggests that, "like windmills, thermo-electric batteries might be erected all over the country—finally converting into mechanical force, and thus into money—gleams of sunshine, which would be to them as wind to the sails of a mill. What stores of fabulous wealth are, as far as our earth is concerned, constantly wasted by the non-retention of the solar rays poured on the Desert of Sahara. Nature here refuses to use her wonderful radiation-net, for we cannot cover the desert sands with trees, and man is left alone to try his skill in retaining solar energy. Hitherto helpless, we need not be so much longer, and the force of a Sahara sun may be carried through wires to Cairo, and thence irrigate the desert, or, possibly, if need be, it could pulsate under our streets, and be made to burn in Greenland." A fascinating dream enough—and one which may prove to be "not all a dream."

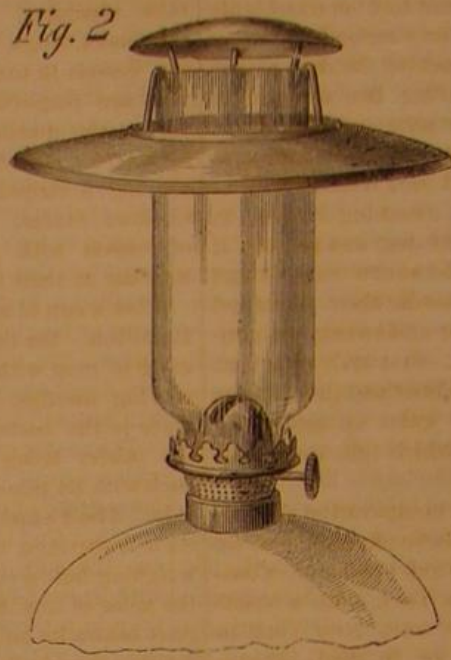
In extracting gold and silver from their matrices by the process of amalgamation, the mercury employed often "sickens" and "flours." "Sick" mercury is mercury which has become tarnished at the surface by oxidation; "floured" mercury is mercury which has been tarnished by combination with sulphur. When triturated, in the amalgamating machines, with the rock from which the gold or silver is to be extracted, mercury tarnished by either of the causes mentioned "breaks up into minute particles, which

been done with our usual battery power, without the aid or interference of the auroral current, yet it was a great satisfaction to many wonder-stricken telegraphers, who had never seen the like before.

Many of the effects of the phenomenon and accounts of experiments made upon telegraph lines were placed on record in the various newspapers at that time, some of which were also published in works on electricity and telegraphy. As the effect of the auroral current of Thursday, August 3, 1865,

upon the electro-magnetic needle and telegraphic instruments differed considerably from that of August, 1859, we wish to place on record, for comparison with the previous experiments and for future reference, the result of comparatively rude observations, made with instruments, on a wire running from Boston to Springfield, Mass.

Although the auroral current was undoubtedly as powerful as that of August, 1859, it was observed that our wires were not so greatly disturbed by fluctuations (with our usual batteries on duty), but rather showed a weakness of currents, as though the batteries were not in

**CONNELLY'S LAMP CHIMNEY.**

will not again unite, and are carried off with the slimes, so that with many ores the loss of mercury forms a considerable item in the cost of extracting the precious metals." Mr. Crookes, however, the editor of the *Chemical News* and the discoverer of thallium, has found that "by the addition of a small quantity of the metal of sodium the sickening of mercury is entirely prevented, floured mercury is immediately brought together again, and the amalgamating action of ordinary mercury is greatly increased." Mr. Thomas Belt, who has experimented with sodium amalgam, at Mr. Crookes's suggestion, adds the following particulars:—"It is found," he says, "that a surprisingly small amount of sodium is sufficient to effect the clearing of fouled mercury. It will require a longer series of experiments than there has yet been time to carry out, to determine the smallest effectual proportion, but it has already been proved that one 20,000th part of sodium, added to the mercury is amply sufficient, so that this discovery has the great advantage of cheapness to recommend it. Sodium may even now be obtained in large quantities for 5s. per lb., and if a demand were to spring up for it, its price would be greatly reduced; but calculating at the present price of the metal, and using the quantity that experiments have proven to be amply sufficient for any description of ore, the cost is a mere trifle, in comparison with the advantage gained. With the ordinary amalgamating troughs used in mining, 120 lbs. of mercury are used to each set of four stamps, reducing 4 tons of quartz in twelve hours; the cost would be less than 1d. per ton of quartz treated, which would certainly be more than covered by the loss of mercury prevented, without reference to the greater quantity of gold obtained, in consequence of the improved condition of the mercury." The sodium would seem to produce the beneficial effects thus indicated by virtue of its energetic power of reducing oxides and sulphides.

Interesting Experiments Upon the Auroral Current.

In the month of August, 1859, the beautiful phenomenon of the aurora borealis excited wonder and admiration in the minds of the people, both from the grandeur of the display and its effects upon the magnetic needle, particularly the electro-magnetic needle, with the coil of wire in the circuit of a telegraph line. In addition to the experiments made with the galvanometer at that time, several telegraph lines were worked, messages transmitted, etc., without the aid of artificial electricity, the aurora borealis assuming the entire duty of the usual batteries, and although the work was not performed as well as it might have

proper working condition, while the effect in August, 1859, was to alternately and continually augment and decrease our battery currents, in consequence of the continual reversing of the polarity of the auroral current, thus making it exceedingly difficult to keep the instruments adjusted for the currents and rendering for a while lines almost useless.

In our experiments on the 3d instant we found, after removing the batteries, quite a powerful and steady current, each wave of which appeared of much longer duration, and the increasing and decreasing of the current more gradual, than was observed in August, 1859. But the most remarkable effect shown in our recent experiments with the galvanometer, was the almost entire absence of the changes of polarity, which were very marked in the experiments of 1859, each wave having been almost invariably succeeded by a wave of opposite polarity.

In the experiments of the 3d instant the positive polarity of the auroral currents was almost invariably west during the observations, which is the reverse of the usual battery currents on the Western wires, thus accounting for the weakness of currents observed previous to the experiments—as the two currents, being generally opposed, were partially neutralized.

The following observations of the needle will roughly show the power, constancy and polarity of the auroral current during the fifty minutes occupied by the experiments:—

The batteries having been removed and the galvanometer placed in the circuit of the wire extending from Boston to Springfield, Mass., at twelve hours fifty-one minutes P.M., a deflection of 3 deg. east was observed, the needle at the time gradually ascending. It should be remarked that a deflection in the needle east in this instance simply shows the polarity of the auroral current to have been the reverse of the usual battery current. After a comparatively steady upward movement of three minutes duration, with an occasional check or slight downward movement (a characteristic observable throughout the experiments), the needle remained stationary at 44 deg. deflection, but for only a few seconds, having descended rapidly to zero in the succeeding thirty seconds. After remaining quietly at zero one minute another ascent was commenced east, stopping at 28 deg. at twelve hours fifty-seven minutes thirty seconds, the duration of that ascent having been two minutes. Remaining at 28 deg. one minute, it descended to zero in one minute and thirty seconds, but immediately commenced another ascent in the same direction, reaching 60 deg. at one hour three minutes, this ascent occupying three minutes. The needle remaining steady at 60 deg. for three minutes,

when, during the succeeding minute, it ascended to 70 deg. and returned to 67 deg., where it remained two minutes. During the next succeeding minute it ascended to 72 deg., descended to 65 deg., and again ascended to 78 deg.

Remaining at 78 deg. two minutes, it commenced a descent occupying one minute, and remaining stationary at 38 deg. for thirty seconds, when it rapidly descended to zero, as if the current had been suddenly removed. Remaining at zero thirty seconds, another ascent was commenced east, reaching 50 deg. at one hour and sixteen minutes. During the succeeding minute the needle descended to zero, ascended three degrees, met and returned to zero. After remaining at zero one minute, an ascent west was commenced at one hour and eighteen minutes, reaching 34 deg. in thirty seconds. Remaining at 34 deg. one minute, it rapidly descended, as though the entire current had been suddenly removed. The needle then remained stationary at zero until one hour and twenty-six minutes, when it ascended five deg. east and remained between that and zero until one hour and thirty-three minutes, when it stood perfectly quiet at zero until one hour and forty minutes, at which time the observations were discontinued.

In order to give an idea of the comparative value of the auroral current during the above experiments, we would state that, with the same galvanometer, a battery with thirty-four cells in New York, with a resistance of No. 8 galvanized wire from New York to Boston, produces a deflection of 70 deg.—*Boston Journal, August 5.*

A DAY AT THE NARROWS.

There is probably no spot on the face of the earth that has experienced a greater change since 1630 than the island and bay of New York.

"Then all the broad and boundless mainland lay
Cooled by the interminable wood; and where yon bright
blue bay
Sends up his willing waves to kiss his decorated brim,
And cradles in his soft embrace the gay
Young group of grassy islands born of him,
And, crowding nigh or in the distance dim,
Lifts the white throng of sails, that bear or bring
The commerce of the world, with tawny skin
And belt and beads in sunlight glistening,
The savage urged his skiff like wild bird on the wing."

There is probably no spot in the country where a more comprehensive idea may be obtained of the movement of the national industry than on this same bay. At 10 o'clock in the forenoon of August 5th, we stepped from Pier No. 4, North River, on board the *Naushon*, one of those white, fleet steamboats that give life to all American waters, and, fanned by the cool, delicious sea breeze, were borne swiftly southward through that busy scene which characterizes perpetually, day and night, without ceasing, the harbor of the commercial metropolis.

Immediately after leaving the wharf we passed through a fleet of naval vessels at anchor. A gentleman at our side pointed out the *Hartford*, the flagship of Admiral Farragut, the vessel of the most heroic achievements of any that floats upon the waters of this globe. Two years ago we saw her proudly steaming up through the Narrows, receiving and returning salutes from the forts and from the vessels of foreign navies, as she bore the old "Salamander" from the scene of his glory to the substantial rewards and the undying gratitude of the Republic. Then she was painted the lead color of the blockaders, but she is now glistening in a new coat of black, and presents the clean and trim appearance characteristic of men-of-war.

Not far from the *Hartford* was a French gunboat, with a curiously cut cap for her smoke-pipe, and otherwise loaded with ornaments. Near her was an American gunboat of about the same size, neat and snug like the Frenchman, but in her smooth, plain smoke pipe and entire absence of ornament, exhibiting that love of severe simplicity which marks the taste of American ship-builders—a taste that commands our highest admiration.

A little to the left, towards Governor's Island, was a large, dingy, dirty sailing ship, crowded with passengers, and bearing the English flag at the peak—manifestly an immigrant passenger ship from Liverpool.

A little further down the bay we met a large American propeller, also crowded with passengers, but these are men who are going to their homes. They

are soldiers returning from their many marches and battles, and their final glorious triumph, to hearts that are yearning to welcome them, and to communities that will delight to do them honor, and which will transmit the memory of their services, with ever-increasing veneration and gratitude, from generation to generation.

On our swift way down the bay we pass several other steamers, besides large numbers of sloops, schooners, brigs, barks and ships, many of the sailing vessels in tow of those vigorous little screw tugs that are perpetually swarming all over the harbor. One of the steamers was a long iron ship propelled by a screw, crowded with immigrant passengers, and bearing a striped flag—we suppose of one of the German States. At the quarantine were a number of vessels with their flags in their shrouds, as a warning of their dangerous character.

After a run of seven miles we step on shore at Fort Hamilton. On the dock are five 15-inch guns, and a gang of men with a horse and windlass are slowly moving another up the sloping road towards its place in the battery. These are the last of the 31, the others being mounted on their iron carriages, each with its pile of 300 or 400-pound shells by its side. The 23-inch 1,000-pounder is also mounted on its iron carriage, and a pile of cast-iron globes, each weighing half a ton, are ready to be hurled through the sides of any hostile ship that may attempt to pass before its hollow throat. Across the Narrows, a mile away, is Fort Richmond, with its long lines of intrenchment, with the walls of the Water Battery glistening in white granite below, and the row of massive guns in Battery Hudson stretching away to the south. The old 64-pounders of this battery have been replaced by a large number of the heavy Rodman artillery, and, as we are looking, a flash rises from one of these, followed by the booming report and a great splash near a buoy in the water of the Lower Bay. The artillerymen are evidently practicing to get the range of the new ordnance. After a few more shots some military officers near us remark that the distance is about two miles, and that the practice is very fine. We came to the conclusion that our warning given three years ago in regard to the light ordnance of the harbor forts is no longer needed, but that if the combined iron-clad fleets of England and France should attempt to force their way into this harbor, every vessel would be sent to the bottom.

Now, however, the scene is one of peaceful, though busy life. Far down towards Sandy Hook a long line of smoke is rising against the sky, showing that some bituminous-coal-burning steamer is coming in—doubtless a European steam ship just arriving from across the Atlantic. As far as the water can be seen from the neighborhood of New York City to the southeast horizon, it is studded with craft of various kinds—pilot boats with their huge figures painted on their sails, oyster sloops in large numbers, coastwise propellers of various sizes, white steamboats, and great ships—all coming and going perpetually—and they will doubtless continue to thus come and go through countless centuries.

The same swash and roar that here beats perpetually on the shore of Long Island is sounded along the coast from Cape Horn to Labrador. Beyond the south-eastern horizon stretches the Atlantic Ocean, a waste of waters, to the coast of Africa,

"At all times, calm or convulsed,
Being the pole or in the torrid clime
Dark heaving, boundless, endless and sublime."

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Helix for Electro-magnets.—The helices which are generally used with electro-magnets are made out of a number of strands of wire, which is covered with silk or some other non-conducting material, and which is wound very close on a cylinder or roller of wood or other suitable material, and such helices really answer every purpose. They are not produced, however, without the use of covered wire, which renders them very expensive, and all experiments which may have previously been made for the purpose of producing a helix of naked wire, have proved abortive for want of the proper precaution in placing the

several strands. It is obvious that when naked wire is to be used for a helix, the strands have to be so arranged that each convolution of the coil is perfectly and completely separated from the adjoining convolutions, in order to compel the electric current to travel through the entire length of the wire from which the helix is formed, and, notwithstanding it may perhaps have been tried before to accomplish this object, it is certain that hitherto no helix made of naked wire has been successfully used, and that no helix has ever been made of naked wire having each strand or convolution completely and perfectly separated from the other. Such is the helix which forms the object of this invention, and which has the naked wire, constituting its coil, wound in such a manner that each convolution of the coil is separated from the convolution adjoining it, in a radial direction, by means of sheets of paper placed between it and the adjoining convolution, and in a longitudinal direction, or in a direction parallel to the axis of the helix, by winding the wire so as to leave a space between the convolutions sufficient to cause the electric current to pass through the entire length of the wire. Dr. L. Bradley, of Exchange Place, Jersey City, N. J., is the inventor.

Gage for Quartering Cork.—In the manufacture of cork stoppers the cork is first cut into strips of the requisite width and thickness for the size of cork desired, and these strips are again cut up into cubical pieces, each just large enough to make one stopper. This last-named operation of cutting up the strips of cork is technically termed "quartering" corks, and it is generally performed by hand with a large and sharp knife. During this operation it is necessary to have the end of the strip of cork bear against a gage which is in the proper position to correspond to the requisite size of corks. In this invention the gage is made adjustable in a longitudinal and in a transverse direction, and the plug, against which the end of the strip of cork bears, is made adjustable and yielding in such a manner that when the main part of the gage is set a final adjustment can be given to the plug; and, furthermore, by having the plug yielding it is allowed to give as the knife passes through the cork, and the operation of cutting is considerably facilitated. John Power, of Boston, Mass., is the inventor.

Grease Cup.—This invention consists in the application of two valves, connected together by a jointed stem, which can be easily lengthened or shortened, in combination with two seats, one above and the other below the bulb or reservoir of the grease cup, in such a manner that, by turning the handle attached to the valve stem in one direction, the lower valve is closed and the upper valve opened ready to admit the lubricating material from the receiving cup into the bulb, and by turning said handle in the opposite direction, the upper valve is closed and the lower valve opened, and the interior of the bulb brought in communication with the steam cylinder or other device to be oiled. In order to allow the steam and air contained in the bulb to escape, when it is desired to introduce the lubricating material into the same, it is provided with a spring valve, which will open by a slight pressure of the hand, and when released, close by the action of a spring combined with that of the steam in the interior of the bulb. Gebhard Hagenmeyer, of Big River, Cal., is the inventor.

Jar for Well-boring Tools.—In boring deep wells, such for instance as oil wells, a device is connected with the drill or drill rod to admit of the drill, in case of the latter becoming fast, being subjected to a series of blows or concussions in order to loosen it. This device, commonly termed a "jar," is indispensable in boring deep wells, owing to the great difficulty which would be otherwise experienced in withdrawing or loosening the auger. The ordinary jar in use is attended with some disadvantages. It is liable to get fast itself, and is subjected to considerable wear in consequence of being in contact with the grit in the wall of the well. It is also liable to break or give way when worn, and the withdrawing it from the well is attended with considerable difficulty; these disadvantages, it is believed, are fully obviated by this invention. Miles Joy, of West Greenville, Pa., is the inventor.

Musical Instrument.—The object of this invention is to improve the valves of cabinet organs and other musical instruments. It consists in so constructing the valve that the face thereof shall be free to adjust

itself to the valve seat. It also consists in a peculiar mode of connecting the face of the valve to its stock or shank, whereby it can be removed therefrom and again replaced, merely by laying off the spring which holds it against its seat. George Woods, of Cambridge, Mass., is the inventor.

Machine for Tapering Spoke Tenons.—The object of this invention is to obtain a simple, economical and efficient device for expeditiously tapering the tenons at the inner ends of spokes, whereby the proper dish is given the wheel. The invention consists in the employment of a reciprocating cutter, working or moving in a right line in connection with an adjustable gage, to which the spokes are applied when their tenons are tapered; the above parts are used in connection with stops, and all are so arranged that the desired work may be expeditiously and accurately performed—far more so than can be done by the hitherto exclusive manual process or mode. Junius Foster, of Long Branch, N. J., is the inventor.



Cotton-picking Machines.

MESSRS. EDITORS:—In your last issue you call attention to the importance of an invention for picking or harvesting cotton. I have had some experience in cotton culture, and from my own observation and the information gathered from others, I am firmly of the opinion that an economical machine which, with the same running expense, will perform four times the labor that can be done by hand, would be the most important invention that could be made at this time. Slaves were averse to using agricultural machinery, in fact, studied, "from the cradle to the grave, how not to do it."

But a new era has dawned. Slavery, with its snailish conveniences, is gone forever. And thousands of the hands that have heretofore picked the cotton in its season, and did little or nothing the balance of the year, will not be available hereafter. For if the negro is really free, he has the same right that any other freeman has to support his wife and children, without their being compelled to work in the field. Thus, gradually, the old source of extra hands for picking will be withdrawn. Now, in Illinois, three men, with six mules or horses, can cultivate 100 acres of corn; they commence plowing in April, and lay by their corn in July, doing the work in three months. Then the same force ought to be able to cultivate an equal area in cotton, with the same labor-saving appliances, in six or seven months—as they can break cotton ground in December or January, and lay it by in July. It is computed that one person will pick, by hand, from 6 to 10 bales of cotton. The average yield on the bottom lands of the Mississippi is one bale, of 400 lbs., per acre. Then, if three men can cultivate 100 acres, there must be some labor-saving invention to enable them to pick 100 acres, or here is a check on the expansive energies of our nation. If the country must support three or four times the number of inhabitants that are required to till the soil, simply in order to have the necessary force at hand to harvest the crop, then truly there is one spot where labor-saving agricultural implements are at a discount, because it would be better to have all the inhabitants constantly employed than loafing around while improved machinery did the work they could do in the old-fashioned way, quite as well as they could pick the crop. Therefore, in my opinion, for the quickening of the enterprise of the cotton region, and the general advantage of the people thereof, and the certainty of an independent fortune to the inventor, there is no invention so much wanted as a practical cotton picker. It would add at least one-half to the producing force of the cotton country.

CARROLL.

New York, Aug. 3, 1865.

A Huge Boiler of Platinum.

MESSRS. EDITORS:—I notice on page 82, current volume of the SCIENTIFIC AMERICAN, a paragraph stating that the new apparatus of Messrs. Crosse & Blackwell, London, for boiling vinegar, is "alumi-

num;" I think it was intended for "platinum." I have the pleasure of inclosing you a sheet giving a few items in reference to the apparatus. It may interest our pickle men. As a matter of interest to another trade, I may mention the use of platinum crucibles instead of clay, at the great glass factory of St. Gobain, France, by M. Pelouze, in order to obtain the purest possible glass, free from the yellow tinge which has been so difficult to banish from clear flint glass. He uses amorphous and pulverulent phosphorus, in place of charcoal, in the mixture.

H. M. RAYNOR.

No. 748 Broadway, New York, Aug. 5, 1865.

[The platinum steam coil referred to in the above letter, is made of pure platinum tubing, proved at steam pressure of 60 lbs. per square inch. Its value is £800, or \$4,000; and was manufactured for Messrs. Crosse & Blackwell, and used by them for boiling their pickling vinegar. The coil is the first of the kind that has been made; it boils 325 gallons of vinegar—the capacity of the vat—in an hour and a quarter, with steam at 30 lbs. pressure. It is made of pure platinum, autogenously soldered. The length of tubing (an inch and a half in diameter) consumed being 32 feet, and was manufactured by Messrs. Johnson Matthey & Co., England.—Eds.]

Breech-loaders Triumphant!

MESSRS. EDITORS:—When I began my crusade in favor of the adoption of breech loading fire-arms, in 1861-2, you will recollect that the subject not only met with the serious opposition of men in authority, but that it was absolutely treated with contempt by many, and my efforts were denounced as fanatical and in bad taste.

Well, since then the French Government has adopted them for its entire army; the English Government has advertised for proposals for changing all its guns to breech-loaders; our own Government has adopted them; and herewith I send you the circular of the Swiss Consul-General, inviting breech-loaders for trial, in order to secure the best for its army. So the world does move in spite of the old "fogies." Whose turn is it to laugh now?

It may not be generally known, but is a fact, that several, if not all the European governments have agents in this country looking up our improvements in fire-arms and other warlike implements. The recent war has opened the eyes of other parties besides John Bull, and the sequel is one of which our inventors may well feel proud, for all this is the direct result of their skill. The bravery of American soldiers and the skill of American inventors have secured for us a character among the nations of the earth which politicians and so-called statesmen could never have secured. It is a national compliment that our sister Republic should come here to select the best arms for her army, and one of which our inventors have a special right to feel proud.

W. C. DODGE.

Washington, D. C., August 1, 1865.

Patent Sale Agency.

MESSRS. EDITORS:—I saw in a recent issue of your journal an article entitled the "Defense of Patent Sale Agents," written by Mr. J. H. Beardsley, who, I must confess, takes the part of the agent very much like a man of sense, and I am very much obliged to him for his kindness in so doing; for he, in doing so, vindicates my cause as well as his. I saw the article he refers to and felt somewhat indignant at the spirit in which it was written. If the gentleman who wrote the first article will come to my office I will show him that patent agents are not all dishonest. I consider his article a slander not only upon Mr. Beardsley's business but upon mine, and every one who has anything to do with the sale of patent rights. He should be more careful and inquire into the business before he passes his opinion in such sweeping and public terms. If any man comes to me, and if, after full explanation of my terms, is not satisfied, he can go his way and I'll go mine. I have had no complaint yet, and do not anticipate any.

J. C. DAVIS.

Newark, N. J., July 28, 1861.

Lee's Fire-arms Company

MESSRS. MUNN & Co.:—My subscription to your valuable paper having expired, I asked some of my

workmen if they wanted to benefit themselves \$25 per annum (and they are careless readers that can't do that), myself \$500, and another party about \$10. I admit the motive a selfish one, but, knowing your generous disposition, you will overlook that. I only wish manufacturers would look at it even in a dollar and cents light. In response, I send draft for ten copies of your paper from the beginning of the present volume, to be addressed to this office. Being the only establishment of the kind in the West, it is a pleasure for me to say that the rifle we are making was patented in 1862 through your very successful Agency. Our sporting rifle is much thought of by Western hunters, and they are a fastidious class. We are also finishing a contract for Government of carbines.

JAMES LEE.

Milwaukee, Wis., July 31, 1865.

[We thank Mr. Lee for his generous appreciation of the value of our journal. We take this occasion, also, to thank our patrons for their efforts to increase our circulation. At the beginning of the present volume, with a view to encourage our readers to organize clubs, we decided to reduce our terms of subscription to \$2 50 per annum for all clubs of ten or more names; this reduction has resulted in bringing us a large number of clubs. There is, however, room for more, and we hope there are hundreds of others who will now avail themselves of our liberal clubbing terms.—Eds.]

Why Plated Goods Tarnish.

MESSRS. EDITORS:—In No. 2, present volume of the SCIENTIFIC AMERICAN, a correspondent inquires why electro-plated wares tarnish sooner under the same circumstances than solid silver articles. You answer him by stating, "It doubtless arises from imperfect cleaning of the electro-plated articles," and also state, "it is well known that the solution adheres, and cannot be removed by mere washing." Your explanation is correct to a certain extent. Careless and slovenly platers do leave some of the solution remaining in the pores of the metal—a very little of which does mischief. But good first-class platers remove all the solution, so there is seldom if ever any trouble from this source in really first-class goods.

The real and principal cause is this, viz.: In electro-plating pure silver is deposited on the article plated, and when removed from the solution the silver is in a soft, porous state. Passing the finger over the surface it feels like velvet. The microscope shows the spongy texture perfectly. If there is a thick deposit it is very difficult to compress and solidify the silver in burnishing, which leaves the silver more or less spongy. This is especially the case with goods plated on soft or britannia metal, as the metal under the silver yields under the pressure of the burnisher and fails to produce so solid and compact a surface as can be obtained on hard metal goods or solid silver. Now it is well known that a polished surface of pure silver is one of the most sensitive metals known, to the action of the various gases, moisture, etc., which prevail at almost all times and places; hence if these articles with pure silver surfaces, and those surfaces soft and more or less spongy, are exposed to the atmosphere for any considerable length of time they will be promptly acted upon by these agents, and tarnish. Solid silver articles have the advantage of at least ten per cent alloy—a very great protection against tarnishing; besides, these articles are drawn under the hammer and are as hard as the silver can be worked, having often to be annealed while in process of making. The surface is made very smooth, after which it is carefully burnished by a strong hand, which leaves the surface as smooth, hard and compact as is possible, which, with the alloy, is the great secret why it is less susceptible to tarnish than plated wares. Some of the finest qualities of goods, plated on fine German silver, can be finished so as to keep their color nearly as well as solid silver. The above is the result of ten years' experience and observation in the manufacture of plated wares.

If you think it would interest your readers I could give the best modes of preventing and removing tarnish on plated and solid silver wares.

E. W. C.

New York, Aug. 2, 1865.

[We should be pleased to receive the directions.—Eds.]

Important to Manufacturers of Fire-arms.

The following circular is addressed to manufacturers of breech-loading guns, and will explain itself on perusal:—

CONSULATE-GENERAL OF SWITZERLAND,
WASHINGTON, D. C., July 26, 1865.

SIR:—Your attention is invited to the inclosed circular of the Honorable War Department of Switzerland inviting competition in breech-loading fire-arms suitable for infantry service. As a considerable portion of the circular is devoted to technical points, intelligible only to those familiar with the fire-arms now in use in Switzerland, I would here extract from the circular in question the essential points of interest for the manufacturer of arms in the United States. The main object of the prize offered by the military authorities of Switzerland appears to be to secure the best system of breech-loading arms which could be adapted for the use of infantry. It is stipulated that metallic percussion cartridges are to be used, and the barrel of the arm is to be connected securely with the stock, and not require to be moved when loading. The further stipulations named in the circular are as follows:—

9. The outward shape of the arm shall not present any obstacles which might prevent its easy handling.

10. The ignition of the charge shall be perfectly regular and sure.

11. The arm shall possess all the important advantages of a breech-loading weapon, such as simplicity, durability, solidity and strength of mechanism, facility of handling it after long-continuous firing, and to be easily cleansed and kept in good order, especially as to the complete and durable closing of the breech.

12. The War Department of Switzerland invites manufacturers of arms, and inventors who may be disposed to submit models of arms which will comply with the required conditions, to make their proposals at the earliest date.

13. The time appointed for the delivery of the arms to be tried ends October 1, 1865.

14. A special officially selected commission will examine the various models, experiment with them, and ascertain their efficiency.

15. The Government of Switzerland has decided to award to the inventor of a system or style of breech-loading fire-arm which can be introduced and adopted into the Swiss army, a premium of 20,000 francs.

16. In case that no model should be submitted which answer all the requirements mentioned, the Government reserves the privilege to divide, wholly or partially, the stated amount among those who have forwarded the most effective models of the arm.

Should you desire to compete for the prize offered, and thereby perhaps succeed in introducing your system of breech-loading fire-arms into the Swiss service, it will secure to your arm a most enviable reputation; for no manufacturers of arms on the continent of Europe are more expert than the Swiss, and no government is known to devote more zealous and discriminative attention to the introduction of the best fire-arms into the military service.

Arms intended for competition should be well packed, and provided with at least one thousand rounds of cartridges. They must be sent to this Consulate by the 1st of September, and all expenses of shipment from Washington to Switzerland will be borne by the undersigned. If desired, after trial, the unsuccessful arms will be returned free of charge, or purchased, if a price can be agreed upon. Full description of each arm should accompany it, and also the price at which the arms could be furnished per piece or by the quantity.

JOHN HITZ,
Consul-General of Switzerland.

The First Defect in the Cable, and How it was Repaired.

The following interesting account of the first accident to the Atlantic cable is given by a correspondent of the *London Times*, writing from Valentia, July 27, 1865:—

At last the mystery of the breakdown of the cable is known in all its details. The master of the *Hawk*, which returned here this evening, having left the great ship last night, brings full particulars, both of the extraordinary nature of the accident and the still

more curious manner in which it was discovered, its place ascertained, the cable hauled in and the piece cut out. When about eighty miles off land, with dead calm weather, the ship going six knots, and the cable, we are told, running out as softly as a "silk rope," the usual test signals were being sent through, when suddenly both those to and from the shore gave most serious indications of faulty insulation. The utmost alarm was felt on this discovery. The connections of the instruments were carefully re-examined and the most rigid exactness observed in the final tests. All gave the same result, and what was a still more certain and ominous proof, the return currents from Valentia showed an equal loss. Notice was instantly given to Mr. Canning and Captain Anderson, and the speed of the *Great Eastern*, which was then in 300 fathoms, was reduced almost to a standstill. It must be remembered that all these signals were sent and received through the whole length of 2,300 nautical miles, or about 2,700 statute miles of wire.

LOCALIZING THE DEFECTIVE POINT.

Valentia was instantly communicated with, and the whole electrical staff under Mr. De Sauty set to work to ascertain by resistance tests whether the fault was in the ship or in the eighty miles that had been paid out. Trials of so delicate a nature and of such vital importance to the success of the undertaking were, of course, conducted with the most vigilant caution, and the calculations based upon their data made and re-made to insure certainty. The result of all was a unanimous decision that the fault was not on board, but in the eighty miles of submerged wire. When this decision had been arrived at, the cable was at once cut on board the *Great Eastern*, and the length under water tested by Mr. Saunders. With wonderful skill his tests at once "localized" the spot where the fault existed—eleven miles from the stern of the ship, and within a quarter of a mile from where it actually was.

WINDING IN THE CABLE.

Instantly preparations were made for getting the *Great Eastern* round and employing the winding-in apparatus fixed forward specially to be used in case of such mishaps. It was hoped, of course, that its use would never be required, and very many believed that, whether required or not, it would never accomplish what it was intended to achieve. The result proved the fallacy of both hopes and fears. The severed portion of the cable was passed into this machine, and, the *Great Eastern* steaming back over the rope's course, the work of reeling-in at once began. The cable came up with singular ease. The strain on the dynamometer of the machine never exceeded eighteen hundred, which was nothing to a cable guaranteed not to break under seven tons, and equal, from its specific gravity, to support eleven miles of its weight in water, or through a deeper sea than soundings have ever yet been found in the world. As we have said, within a quarter of a mile of the spot indicated by Mr. Saunders the fault was found; and nothing can more strongly indicate the endless perils with which successful submarine telegraphy is beset than the trivial and almost unavoidable accident which had caused it.

THE ORIGIN AND NATURE OF THE DEFECT.

As the lengths of wire of one hundred or one hundred and fifty miles were manufactured at Messrs. Gloss & Elliott's, they were taken down in barges and coiled away in the tanks on board the *Great Eastern*. Each as it arrived was, of course, spliced up to that which had preceded it, and this was often done in the tanks themselves. The operation of splicing not only means joining the conductor, but also joining the outside wires, the junction of the latter being made at different lengths—the bits of wire cut out being thrown away. It seems, however, that one of these atoms of wire, about two inches long, and as thick as a stout darning needle, fell on the coil unnoticed, as, indeed, who would notice it, or for a moment think of the consequences which this disregarded presence in such a spot might surely occasion? The weight of the layers of cable laid above this fragment—as insignificant as a shaving in a carpenter's shop—pressed it firmly into the tarred hemp which forms the outside coverings of the cable. To this it adhered. While in the tank it did no harm, but when this portion came to be paid out the small diameter of the eight leading wheels which give access to the paying-out machine, and the

weight of the jockey pulleys over those which keep the rope in its place, bent the stout iron wire so sharply that it passed between the hemp, pierced the gutta-percha through at least two or three of its four folds, and there remained. In this state it was found, and instantly recognized as a piece of wire from a splice joint.

HOW IT WAS REPAIRED.

A short length of cable was at once cut out, a new splice made, vigilantly tested, and gradually sunk. When on the bottom it was again retested for some hours, and the signals were shown to be absolutely perfect.

HOW THE "GREAT EASTERN" BEHAVED DURING THE TIME.

During all this time the *Great Eastern* remained quietly hove to. The sea was calm, and even the throbbing swell of the Atlantic had died away into the mere undulations of a wave. The motion in her, therefore, was barely perceptible to the feeling, and could certainly not be detected by the sight, save by watching the little arc of a circle which her topmasts now and then described. The whole accident caused a delay of nearly twenty-four hours, during which the drift of the vessel was almost nothing.

SPECIAL NOTICES.

Jacob Constant, administrator of the estate of Isaac Constant, deceased, of Dawson, Ill., has petitioned for the extension of a patent granted to him on the 4th day of November, 1851, for an improvement in cultivators.

Parties wishing to oppose the above extension must appear and show cause on the 23d day of October next, at 12 o'clock, M., when the petition will be heard.

Thos. J. Sloan, of New York City, has petitioned for the extension of a patent granted to him on the 21st of October, 1851, for an improvement in machinery for shaving, nicking, and re-shaving wood screws.

Parties wishing to oppose the above extension must appear and show cause on the 2d day of October next, at 12 o'clock, M., when the petition will be heard.

Wm. Kenyon, of Steubenville, Ohio, has petitioned for the extension of a patent granted to him on the 14th of October, 1851, for an improvement in machines for making nuts, washers, etc.

Parties wishing to oppose the above extension must appear and show cause on the 25th of September next, at 12 o'clock, M., when the petition will be heard.

Louis S. Robbins, New York City, has petitioned for the extension of a patent granted to him on the 4th day of November, 1851, for an improvement in lubricating oil from rosins.

Louis S. Robbins, New York City, has petitioned for the extension of a patent granted to him on the 4th day of November, 1851, for an improvement in distilling acid and naphtha from rosins.

Louis S. Robbins, New York City, has petitioned for the extension of a patent granted to him on the 4th day of November, 1851, for an improvement in tanner's oil from rosins.

Newton Foster, Gilbert Jessup, Hiram L. Brown and Calvin P. Brown, of Palmyra, Chapinville, and Shortsville, N. Y., have petitioned for the extension of a patent granted to them on the 4th day of November, 1851, for an improvement in seed planter.

Parties wishing to oppose the above extensions must appear and show cause on the 23d day of October next, at 12 o'clock, M., when the petition will be heard.

The New England Agricultural Society will hold its second annual fair at Concord, N. H., on the 5th, 6th, 7th and 8th days of September next. The society offer the large sum of eight thousand dollars in premiums. Among the novelties to be exhibited will be a locomotive steam plow, invented by a New England mechanic.

MISS MARIA MITCHELL, of Nantucket, Mass., is to be Professor of Astronomy at the Vassar College, Poughkeepsie, N. Y., which is to be opened in September. Miss Mitchell has a world-wide reputation among astronomers.

IMPROVEMENT IN ELECTRO-MAGNETS.

Dr. L. Bradley, of No. 7 Exchange Place, Jersey City, N. J., has just obtained, through the Scientific American Patent Agency, a patent for an interesting and important improvement in electro-magnets.

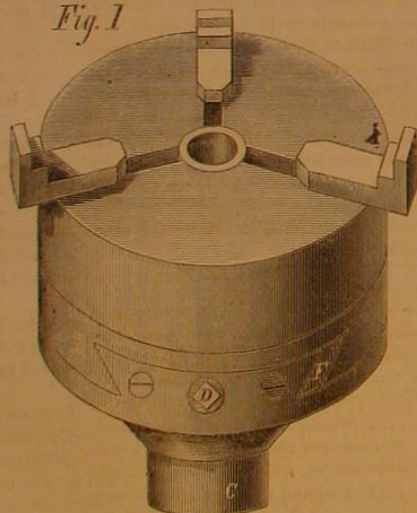
An electro-magnet is a rod of pure, soft iron, around which is wound, in spiral folds, an insulated wire; so long as a current of electricity is passing through the wire, the iron core is a magnet, but the instant the electro-current ceases, the iron loses its magnetism. The power of the magnet with currents of given strength is in proportion to the number of convolutions in the surrounding wire, and to their proximity to its surface. Dr. Bradley conceived that both these might be increased by using a naked wire in place of those covered with silk or cotton thread, which are usually employed, separating the several layers from each other by thin sheets of paper, and trusting for insulation to the dry air between the convolutions. Magnets made in this way require, of course, that the wire should be very carefully laid, so as to make the space between the folds of perfect uniformity.

For the last four years Dr. Bradley has been manufacturing magnets in this way for telegraph instruments, and they have met the general approval of operators. He has just shown us two spools—one of naked wire, and the other of wire insulated with silk, and made, as he says, of wire of the same size and length, or, at all events, of the same resistance, as measured by the rheostat—each being of No. 30 wire, and having a resistance equal to that of $4\frac{1}{2}$ miles of No. 8 galvanized wire—the standard in use for telegraph lines. The spool of naked wire is 1 inch in diameter, and contains 3,256 convolutions, while that of insulated wire is $1\frac{3}{4}$ ths inch in diameter, and contains 2,912 convolutions, showing a larger number of convolutions, and greater proximity in the naked wire, with a corresponding increase in magnetic power for a given resistance. The outer and inner layers are fastened by gum-shellac, and Dr. Bradley says the wire is never shaken or jarred from its position.

KING'S LATHE CHUCK.

This modification in the chuck for lathes is intended to facilitate setting irregular forms, such as eccentrics

Fig. 1



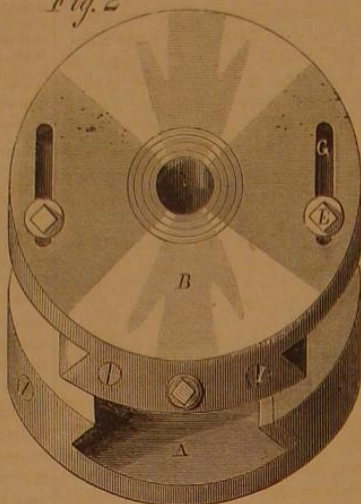
or cams, and it is to be applied particularly to scroll chucks, which are arbitrary in their motions and cannot be set out of the center unless one of the jaws be taken out and started on the thread after the other jaws have been run in one turn or two. Even this will not always bring the work true, and some simple arrangement of the kind here shown will prove a great convenience. The details are as follows:—

A is the plate, which is fastened securely to the main chuck, forming a part thereof, into which the dovetail projection of the plate, B, slides; C is the hub, which screws on the lathe spindle; D is the screw, by the use of which the chuck may be adjusted to any required position with the spindle of the lathe. The face side of the dovetail projection is laid off to fractional parts of an inch, and marked with figures, so that there is no difficulty in setting the work ac-

curately. The screws, I, hold the piece to which the screw, C, is secured firmly to the plate, B. F is the gib, which is tightened up as it wears, by screws, as usual. G G (Fig. 2), are slots through which bolts, E, pass, for the purpose of firmly securing plate, B, to the chuck, A, at any desired point.

The utility of this improvement is universally conceded by all first-class machinists who have seen it, and the proprietors of several of the largest and best machine shops have already expressed a wish to adopt it in their own workshops. This attachment may be applied to any size or kind of chuck already in use,

Fig. 2



equally as well as to new ones, and will add only from one to one and a half inches to the depth of the entire chuck, including the attachment. Although only one sliding plate is represented in this engraving, says the inventor, another slide can be added if necessary.

For further particulars address the inventor and patentee, W. Haskell King, 561 River street, Troy, N. Y., by whom it was patented, through the Scientific American Patent Agency, on April 25, 1865.

IMPROVEMENT IN THE DISTILLATION OF PETROLEUM OIL.

On page 112, Vol. XII, SCIENTIFIC AMERICAN, we have already described the method and still in general use for refining petroleum oil, by which it will be perceived that a proper distillation can only be obtained when the heat used is perfectly controlled by the operation. The most careful management is required to prevent burning the oil or the still, and if the crude article is allowed to boil too rapidly heavy gases are generated, which will not pass through the pipe leading into the room or condenser, but fall back into the still and incrust it with tar and coke. These incondensable gases, mingling with the oil vapor, also materially affect the color of the distilled article and convert it into an inferior illuminating oil.

In distilling petroleum, the profit of the operation depends very much upon the economy of fuel, and the time required for running off a "charge," and resuming operations with the same still. An ordinary still, having a capacity of one thousand gallons, will require nearly one ton of coal. The boiling point is reached in about four hours, and the "charge," is distilled in from 36 to 48 hours. From four to six hours are subsequently lost in cooling the still for the purpose of removing the tar and coke that has been formed during the process of distillation.

The merchantable product of one thousand gallons of crude oil refined, according to the above method, is as follows:—

Illuminating oil, 65 per cent; naphtha, 15 per cent; tar and coke, 12 per cent; gases, loss, evaporation, 8 per cent.

From this it appears that about twenty per cent of the material is either lost or converted into substances of little value to the refiner.

In August of last year George H. S. Duffus obtained a patent for a still designed to overcome all the difficulties above described. One of these stills has recently been put in operation at the refinery of

Messrs. Buckhout & Roberts, at the foot of 106th street, E. R. (Harlem), and others will soon be supplied. It is built entirely of wrought and cast iron; requires no brickwork or chimneys; can be easily transported to any part of the United States, and set up within 24 hours after arriving at its destination. The heat is completely under control of the most ignorant operator, and, within one hour after the fires are lighted, the distillation commences. The heat can be readily raised to any required temperature and retained at a uniform point until the whole charge has been distilled; then this still can be immediately refilled, and the new distillation commenced, without any material loss of time or heat, for cleaning purposes. Less than two dollars' worth of fuel is required for each charge of oil, which is run off in from 24 to 30 hours. No coke or tar is deposited, and the only residuum yet discovered, after many distillations, is about three per cent of heavy oil, which is redistilled and converted into lubricating oil. One thousand gallons of crude oil, refined in the Duffus still, gives the following product:—

Illuminating oil, 50 per cent; naphtha, 15 per cent; heavy oil, 3 per cent; loss (watery evaporation), 2 per cent.

With this improved still, every valuable constituent of the crude oil is obtained in some merchantable form, a result that cannot fail to commend such an invention to the attention of refiners and others interested in distillation. The illuminating oil produced is equal to the best in the market, and exceeds the Government fire test of 115°.

KELLY'S BIT FASTENER.

It is very annoying, when withdrawing a bit after a hole has been bored, to have the tool part company with the brace, so that it has to be replaced for every operation. Where many holes have to be bored this

Fig. 2

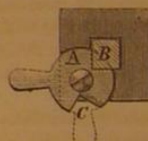
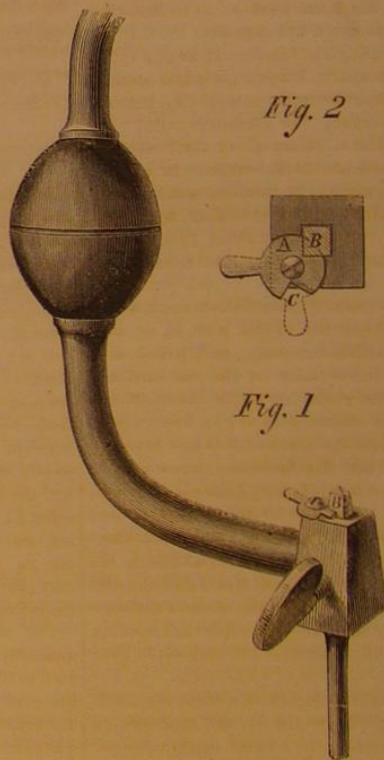


Fig. 1



becomes a serious hindrance, and many plans have been devised to prevent it.

The one here illustrated is a very efficient device for the purpose. It consists simply of a cam-shaped slide, A, fitting in a notch, B, cut in the upper end of the bit shank. By turning the slide so that the notch, C, comes round, the bit can be taken out. The engraving shows the manner of using it very clearly, and it will be seen that it can be applied to any brace at a trifling cost. New goods now in stock can be fitted with this appliance in a short time.

It was patented through the Scientific American Patent Agency by Daniel Kelly, of Grand Rapids, Mich., on Dec. 16, 1862. Address him at that place for further information.

THE Scientific American.

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NEW YORK, SATURDAY, AUGUST 19, 1865.

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TRANSATLANTIC STEAM COMMUNICATION.

Great activity is manifested in Europe over the establishment of new steamship lines to compete for the carrying trade between the two continents. In addition to the vessels already running, there are new ones building which are intended to be first-class in all that relates to speed and capacity.

The Hampshire (England) *Independent* of a recent date says that a company, long-projected, is about to go into active operation with new ships, between New York and Liverpool. The alliance is called "The Imperial Transatlantic Steam Company," and the steamers are to be 4,000 tons burden. In addition to this line others, already in working order, are extending their operations, adding to their fleets, and remodeling them, so that every thing necessary to success will be insured so far as human foresight can go.

The French line recently established, running the *Washington* and *Lafayette* to this port, is, or was, worked by an English company, and called at a French port only incidentally on the outward and return trips. These ships are to be taken off and their places filled by others (worked by a French company) better fitted for the service. It is now intended to put on not less than five first-class screw ships—the *Europe*, *Napoleon III.*, *St. Laurent*, *Pereire*, and *Ville de Paris*. They are to run fortnightly, and will receive a liberal subsidy from the French Government. Thus it will be seen that, although the communication between the New World and the Old is already well provided for, in the view of disinterested persons, other ships and other lines are starting up, with large capital, determined to succeed in their enterprises.

While this activity is taking place abroad very little is being done here. There are no new steamers on the stocks, no engines for them in the machine shops. If any are projected they have been kept very secret, for we have not heard of them.

On Saturday, the 19th inst., the steamer *Circassian*—a British-built vessel, captured while running the blockade—is to be dispatched by Messrs. Leary, of this city, to Bremen and Southampton, as a pioneer ship, in a new effort to give our steam vessels and shipping interests their proper place on the seas. With this, and a rumor that the *Fulton* and *Arago*, of the old line to Havre, are to be re-established, there are no signs of vitality among our shipping merchants on what is a most important subject. So far as ships are concerned, we have them, or can have them, on proper notice, either of iron or wood, as is deemed most suitable; either screw or paddle propeller, as is thought best. The engines can soon be fitted up, for

Government contracts are ended, and the machine shops are almost idle. All that is wanted is the word from the owners, and the keels would be laid and the bed-plates cast.

The always-to-be quoted "Collins Line" was the only national one we ever had worthy of the name, and its ships were efficient ones. We can build better and faster ones at this period, but their engines ought not to be ponderous and complicated side-levers, that are forever getting out of line, forever having hot brasses, and in chronic difficulties with broken shafts.

The *Re d'Italia*, built by William H. Webb, Esq., for a war vessel, can make ten or twelve miles easily, as a regular duty, in decent weather. She went from this port to Naples, Italy, a distance of 4,920 miles, in 400 hours—or an average speed of 12 miles an hour all the way over. She is a full model, heavily rigged vessel, with great carrying capacity, and is, moreover, an iron-clad screw ship. With such improvements in her model as her talented designer well knows how to make, a vessel of this class would be a magnificent ocean trader that would challenge the best efforts of foreign ship-builders.

What is wanted, we presume, is a reasonable assurance that a new line "will pay." Men, however patriotic, will not subscribe for stock on national principles, unless they are certain of getting the full value of their investment. This can only be met by the suggestion that if Englishmen can build ships in England, and run them at a profit, Americans ought to build ships in America and make a good thing out of it. Giving Britannia to understand that she does not always rule the waves, is very nice, and easily done at a yacht race, but to keep up a line of steamships at a loss, solely to show the world what smart mechanics we are and what enterprising capitalists we have, is something that won't be done in a hurry.

We sincerely hope the day is not far distant when, as of old, our steamers shall be upon the ocean again. With the experience gained in past years, our ship-builders can design models which shall leave foreign builders far behind, and it only requires some energy among capitalists and ship owners to begin at once.

HOUSES FOR MECHANICS.

It is one of the social evils of large cities that dwellings for persons of small means are not to be had. There are none who feel this more keenly than mechanics. After toiling hard all day in the noise and clatter of the factory, they need a clean and quiet home to refresh them for the labor of the day coming. But, in New York, and in most large cities, this is a thing unattainable. Every mechanic who desires to live comfortably pays rent far beyond his means; or, if he chose the other alternative—a low rent—he must put up with quarters unfit to stable a horse in. We speak advisedly. No man can afford to pay more than one-sixth of his income for rent, and the laboring man cannot spare that even. Consider \$2 a day the average wages earned by mechanics, and we shall find that for \$100 per annum there are no accommodations fit to be called such. The only places offered are crowded rooms, high up above the street, and reeking with vermin and stench.

The attention of capitalists, and philanthropists generally, has been frequently called to this subject, and many projects have been started to ameliorate the evils complained of. Not one ever succeeded. The reasons are plain. In one case, a plausible scheme was planned, which was to erect a large building in the suburbs, where, under one roof, all things necessary were to be had at a moderate price; such as gas, baths, washing apparatus, sun-light, ventilation, and good order. This was encouraging, but, inasmuch as the projectors required workmen to come forward and subscribe for about \$1,000 worth of stock each, it is needless to say it fell stillborn.

By a recent issue of the *Evening Post* we learn that another plan is about to be tried. It is called "The Home-building Association," and is composed of the solid men of the city. Among them are Messrs. Lenox, Aspinwall, Russel, James and Ketchum. They propose to build houses and sell them at the actual cost and interest, and have contributed a large sum for this purpose. They have purchased a lot of ground in Williamsburgh, L. I., at the corner of

North Eighth and Ninth streets, on which they have now in process of completion six buildings. We quote:—

The plot of land at present owned by the company is two hundred feet square. It fronts on both North Ninth and North Eighth streets. Twelve houses will be built on each of the streets, making twenty-four in all. The width of the lots is sixteen feet eight inches, and their depth seventy feet, leaving a space between the two rows of houses sixty feet wide by two hundred feet long. This space it is intended to preserve as a private playground for the children of the occupants of the dwellings that border on it.

The houses are thirty feet in depth, and are built of a good quality of brick; they are two stories high, with flat roof and basement and cellar. They are so divided that the upper floor has three rooms with closets; two of the rooms in back and one in front. The front room is large, occupying the whole width. The first or parlor floor has two rooms. The hall, which is comparatively large, divides them, but does not extend from the front to the back of the house—it having been so arranged that the stairs leading to the second story and to the basement are in the middle of the house, and run transversely. By this plan a large back parlor is secured; and the front parlor or reception room is also of good size. The basement story comprises cellar and kitchen; these have many conveniences.

The houses will be finished in a plain, substantial and neat manner. The walls are eight inches in thickness, and are well built. The inside work will be tasteful. Cornices and center pieces will ornament the parlors, and the walls and ceilings are to be "hard-finished." Gas pipes are laid in every room, and Ridgewood water is introduced into each cellar.

It is impossible not to wish this scheme to succeed, but, we fear it is a dead failure. Such houses as are described above could not be built now for less than \$3,500 or \$4,000, and, unless two families are to occupy them, no advantage will be gained, for no mechanic, and but few professional men, can afford to live in them. To pay a rent of \$300 one must be in receipt of at least \$1,500; and if, in addition to this, we consider the car fares and ferryage, it is easy to foresee that the plans of these benevolent gentlemen cannot succeed. Therefore, the laboring man is no better off than before.

The obvious and only remedy is to build houses where four or six families can live under the same roof. A multitude gathered together do not necessarily generate filth and create dissension, unless there be unworthy members. So, if such dwellings were guarded by porters or janitors, whose special business it should be to see that the several floors were kept clean, the entries tidy, and the water privileges and property generally well treated, we should have dwellings that could be let reasonably, and which would contain all the comforts requisite.

Various improvements could be introduced with economy. The landlord should heat the whole house and light it for so much a month. A furnace in the cellar would do the first, and the gas would perform the latter. Only fuel sufficient for cooking would have to be carried up stairs, and the dust and dirt thus saved would be an item.

We are firm in our faith that workmen can have much better dwellings at a lower price than those mentioned above, and we shall be glad when some promising project appears.

The "Dictator."

The *Dictator* and *Agamenticus*, which left this port on Tuesday morning, Aug. 1st, had an exciting race after they got outside. They finally arrived off Portsmouth harbor, the *Dictator* forty minutes ahead, notwithstanding the bursting of a tube in one of her boilers, which rendered it for the time comparatively useless. The *Agamenticus* also claims to have been under some disadvantages, owing to bad coal, etc. From Portsmouth to Portland the monitors will have another trial of speed, and the friends of the *Dictator* believe that within that distance she can beat the *Agamenticus*. The *Dictator* is said to have worked admirably on her passage round to Portsmouth.—*Boston Advertiser*.

[The *Agamenticus* is a naval-built vessel, iron-clad, with a revolving turret on Ericsson's plan.—Eds.]

THE Thirteenth Annual Indiana State Fair will be held in Fort Wayne, commencing on Monday, Oct. 2d, and closing on Saturday, the 7th. The secretary's office will be open at Fort Wayne, for entries in the several classes, on Monday, September 25th.

At a Russian industrial exhibition, recently closed, there was a large portrait of Peter the Great, made up of many colored lucifer matches, contributed by Warsaw firm.



ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING AUGUST 8, 1865.

Reported Officially for the Scientific American.

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

49,209.—Manufacture of Paper.—J. W. Allen, Marion, Mass.:

I claim the described new article of manufacture.

49,210.—Pencil-sharpener.—H. P. Andrews, Cleveland, Ohio:

I claim, First, A pencil-sharpener, made with two binged jaws, B B', and a sheath, C, substantially as and for the purpose set forth.

Second, The groove, b, and tongues, a a', in combination with the sheath and jaws, applied and operating substantially as and for the purpose described.

[This invention consists of a pencil-sharpener, composed of two converging jaws, which are hinged to each other and to a sheath, and provided with projecting tongues, which drop into a groove of the sheath in such a manner that when the two are turned up together they are held closed by the grooves in the sheath, and in this case they are precisely like a pencil-sharpener of the ordinary construction, but if they are turned out each jaw can be readily cleaned and sharpened, or the jaw be removed and replaced by another whenever it should be desirable, without throwing away the whole instrument.]

49,211.—Inkstand.—John Axtman, East Cambridge, Mass.:

I claim the combination of the stationary or inferior perforated cap, b, or its equivalent, the perforated gate, d, and the rotary or superior perforated cap, a, arranged and applied together, substantially in manner and so as to operate as specified.

I also claim the construction of the rotary cap, concavo-convex, in manner and to act as a spring, as described, with respect to the gate.

I also claim the construction of the two caps, a b, when having the gate arranged between them, with the concavo-convex head, n, arranged in the manner and for the purposes specified.

49,212.—Submerged Force Pump.—A. Balding, Flora, Ill.:

I claim the combination of the upper and lower chambers, provided respectively with the ball valve and openings, and the hollow piston rod and chambered piston, the latter also provided with ball valves and openings, the whole arranged and constructed as described and represented.

[This invention relates to that class of pumps known as double-acting. It has a hollow piston-rod, and a valve-chamber within the piston. The piston-rod passes through the center of the upper valve-chamber.]

49,213.—Book Cover.—George F. Barden, South Adams, Mass.:

I claim a book cover, made substantially as herein described.

[The object of this invention is the production of an outside casting or covering for the covers and backs of books, so made and folded as to be readily and easily inserted or placed thereon when desired, which coverings are made of different sizes, to conform to the varying dimensions of books.]

49,214.—File-cutting Machine.—James K. Barker, Lawrence, Mass.:

First, I claim the springs, R, and the rods, U, to bear upon the springs, R, for the purpose herein set forth.

Second, I claim the frame, Fig. 7, which is attached to the bed, A, of the machine, and independent of the carriage, B, in combination with the chisel-holders, O rollers, Q, the springs, R, and the means of operating the springs and chisel-holder.

Third, I claim the springs, H, and the cam wheels, arranged as described, to regulate the force of the springs, H, for the purpose herein set forth.

Fourth, I claim the described improved machine for cutting a series of files at the same time, in the same machine, by a corresponding series of hammers and chisels, consisting essentially of the combination of the elements above claimed, and operating substantially as herein set forth and described.

49,215.—Process for Rendering Barrels Impervious to Petroleum, Etc.—Julius Baur, Brooklyn, N. Y. Antedated July 24, 1865:

I claim the within-described process of producing an oil-tight lining for barrels, etc., by first treating the wood with alum or its equivalent, and afterward with soluble glass, substantially as and for the purpose set forth.

49,216.—Snow Plow.—Abner L. Bausman, Minneapolis, Minn.:

I claim, First, A snow plow for railroads, constructed with double walls to admit of a steam, or hot-air chamber between its exterior surfaces, for the purpose of keeping said surfaces in a heated state to prevent the snow adhering thereto, substantially as set forth.

Second, The employment of use of rotary shovels and brushes placed at the rear of the plow and over the two lines of rails and arranged to operate in the manner substantially as and for the purpose set forth.

Third, The combination of the double-walled plow and rotary shovels and brushes, all arranged to operate substantially as and for the purpose specified.

49,217.—Water Elevator.—Jacob H. Best, Schenectady, N. Y.:

I claim the application to the usual barrel and axle used for hoisting and lowering the bucket of a well or any weight, of a wheel, E, operating as a ratchet and friction or brake wheel, in combination with the winch, W, its brake piece, b, and its pawl, R, also the pawl, P, the whole arranged substantially as described and for the purposes set forth in the within specification.

49,218.—Preparing Peat for Fuel.—Albert Betteley, Boston, Mass.:

I claim the employment of a tank in the preparation of peat for fuel, substantially as described.

49,219.—Nailed Boot or Shoe.—Lyman R. Blake, Boston, Mass.:

I claim a shoe in which the vamp and sole are united by nails having an inclination with respect to each other, substantially as set forth.

49,220.—Artificial Cork.—Louis Bock and Albert F. Wheeler, Sheboygan, Wis.:

We claim a compound of caoutchouc or India rubber and waddy dust or fiber, in the proportions hereinbefore set forth, or in any other proportions producing the same results, substantially in the manner and for the purposes herein set forth.

49,221.—Hygrometer.—Reinhold Bocklen and Wm. Staehlen, Brooklyn, N. Y.:

We claim, First, The employment of the spring, A, made of ratan or any other kind of wood, an artificially coiled and prepared, operating in the manner and for the purpose herein shown and described.

Second, The combination of the spring, A, made of ratan, with the hand, B, or its equivalent, for indicating moisture contained in the air surrounding it.

Third, The peculiar treatment and construction of the spring, A, in hardening, preparing and preserving the same, for the purpose and in the manner herein shown and described.

49,222.—Attaching Horn Handles to Knives, Etc.—Miles Bradley, Westport, Conn.:

I claim by means of a die, molding or compressing the horn into the desired form while on the tang and countersinking the heads of the rivets and washers at one and the same operation, substantially as set forth.

49,223.—Lock.—E. W. Brottell, Newark, N. J.:

First, I claim the vibrating knife, I, partaking of the motion of the bolt, B, out compelled to turn around a center, I, substantially in the manner and for the purpose herein set forth.

Second, I claim including the tumblers, M, within two separately constructed casings, E and G, arranged to operate substantially as and for the purpose herein set forth.

Third, I claim the arrangement of the open tumbler, M, in the turning part, E, and adapted to operate relatively to the swivelling or vibrating knife, I, substantially in the manner and for the purposes herein set forth.

49,224.—Blacking Box.—J. S. Brooks, Rochester, N. Y.:

I claim the combination of the form of the box with the holder, B, the same forming a new article of manufacture, when constructed as shown, and for the purposes specified.

49,225.—Bread and Meat Cutter.—Wm. Budd and J. L. Husband, Philadelphia, Pa.:

We claim the combination and application of the rod, C, frame, D, and knife, A, figure 2, as hereinbefore substantially set forth, and for the purpose described.

49,226.—Feathering Paddle Wheel.—James Burson, Yates City, Ill.:

I claim, First, A plurality of cam guides for feathering the buckets, as herein specified.

Second, In combination with the aforesaid cam guides, I further claim the guide rods, D, attached to opposite sides of the buckets in the manner described.

49,227.—Construction of Railway Train and Car.—Samuel R. Calthorp, Roxbury, Mass.:

I claim giving to the exterior surface of a railway train a form tapering from the center of the train toward either end, or tapering the engine or car at the front or rear of the train, substantially as described, for the purpose of diminishing the atmospheric resistance.

I also claim constructing the engine and its truck with a projection in front, in its several parts, of the shape substantially as set forth, and enclosing its body both above and below, substantially as set forth, and rounding its cab, so that its projection and main casing, while protecting its own surface from the direct resistance of the wind, may, together with its rounded cab, form a single prow to the whole of the train, in the manner and for the purpose herein described.

I also claim placing a false bottom, substantially as described, under each carriage of the train for the purpose of protecting the trucks and other projecting surfaces under the carriages from the adverse action of the wind.

I also claim inclosing the whole space between any two contiguous carriages of the train flush with the sides, top and bottom aforesaid, which is extended under the platform, in combination with the projecting roof already in use, and a flexible hood or hoods, substantially as set forth.

49,228.—Shingle Machine.—George Challoner Omro, Wis.:

First, I claim the means employed for operating or tilting the bed, I, to wit, the sliding bar, L, provided with inclined projections, q o, the lever, M, attached to L, and the lever, N, attached to wheel, C, all arranged substantially as set forth.

Second, The projection, t, at the inner side of the rim, b, of the wheel, C, in connection with the cranks, h j, springs, f, and rollers, k, all arranged substantially as shown for operating the jaws, F.

Third, The sliding bar, K, provided with arms, p, pivoted to pendents, o o, of the plate, n, which supports the bed, I, for the purpose of raising and lowering said bed, as set forth.

Fourth, The platform, O, in combination with the tilting bed, I, and the devices for releasing the jaw or dog from the bolt, substantially as described.

[This invention relates to a new and improved machine for sawing shingles, and of that class in which a series of bolts are placed upon a horizontal rotating wheel, and acted upon by a horizontal circular saw placed underneath the wheel.]

49,229.—Washing Machine.—John Champlin, East Middlebury, Vt.:

First, I claim the beaters or b title boards, C C, arranged in the box of a washing machine, so as to operate substantially in the manner specified.

Second, The combination of the trough, A, box, B, and battle battle boards, C C, substantially as shown and described.

[This invention consists in the employment or use, in a suitable revolving box, barrel, or other receptacle for clothes while being washed, of two or more beaters or battle boards, so arranged that they will act upon the clothes as the box is revolved, and thus the more effectually and quickly cleanse or extract the dirt from the same.]

49,230.—Apparatus for Filtering Petroleum.—Robert A. Chesebrough, New York City:

I claim the application of heat to a filter for hydro carbon or other oils by means of a triple cylinder or steam worm coiled inside or outside of the filter, as herein set forth.

49,231.—Mode of Constructing the Heads, Necks and Connections of Gas Retorts.—John Chicott, Brooklyn, N. Y. Antedated July 24, 1865:

I claim making the neck and head and the connection for the neck of a gas or other retort, or either of them with double walls having a space between the inner and outer walls filled with plaster of Paris, or other poor conducting material, substantially as and for the purpose herein specified.

49,232.—Amalgamator.—Thomas J. Chubb, Brooklyn, N. Y.:

First, I claim subjecting the ores of precious metals in a disintegrated state to the action of revolving or oscillating plates, which are coated with mercury, when such plates are arranged within chambers that are formed in such manner that the ore is subjected to both sides of the plates and caused to flow over a bath of mercury in a continuous stream, substantially as described.

Second, The arrangement of the fixed partitions, D, on each side of the movable disks, C, in such manner as to form a continuous passage through the cylinder, A, for the flow of the ore, substantially as described.

Third, The use of steam, in combination with a series of disks, C, moving in a bath of mercury, for the purpose of bringing the atoms in closer contact with the surface of said disks, substantially as described.

Fourth, Subjecting the ores of precious metals in a disintegrated state to the action of revolving or oscillating plates which are covered with mercury, when such plates are arranged in such manner that the ore is subjected to both sides thereof, and caused to flow past or over the same and over a mercury bath, the plates dipping into said bath for the purpose of removing the precious metals collected thereon and depositing them in the bath, the plates themselves becoming cleaned and freshly coated with mercury of the bath thereby, substantially as described.

49,233.—Steering Apparatus.—George Coffin, Boston, Mass.:

I claim the arrangement of the two sets of toggle-jointed levers

attached to the rudder post, and operated by the steering wheel substantially as hereinbefore described.

49,234.—Artificial Limb.—Jesse Coombs, Greenfield, Mass.:

I claim making artificial limbs of strips of metal or other material, woven spirally and riveted, or arranged spirally and riveted, substantially as described.

I also claim the spring, W', secured at the ankle joint, with one arm working in the leg and the other in the foot, substantially as described.

I also claim an air or water cushion, for the sole or under the sole of the foot, inside of the boot or shoe, to enable the wearer to walk without, or with far less, jar to his system when he steps than he could do without the cushion.

I also claim making two or more cylindrical air or water cushions, or cushions of other materials, with a vacuum or suction space between them around the stump of the natural limb, substantially as described, to hold the artificial limb on to the natural limb.

49,235.—Ditching Machine.—A. W. Cox, Dublin, Ind.:

I claim, First, The combination of trough, M, shovel, T, elevator, R S, pulleys, L L, constituting the apparatus for digging and carrying back the excavated material.

Second, The described digging and elevating apparatus, hinged to the rear upper part of the frame, and having its forward or digging end both suspended and vertically adjusted by the racked counters, gearing to pinions, O O, under control of the attendant.

Third, The slotted bearings, n, in the racked counters, for the purpose specified.

Fourth, The combination of the devices, F G H I, for suddenly changing the course of the shovel, in the manner set forth.

49,236.—Locomotive Boiler.—Samuel Crawford, New York City:

I claim the plan of making the bottoms of the water legs or hot low walls of the furnaces of steam boilers, of the character described, a removable out steam-tight frame, by the employment of the devices, substantially as described, and for the reasons and purposes explained.

49,237.—Pruning Metallic Cartridges.—Silas Crispin, New York City:

I claim the cartridge, constructed as described: that is to say, with the fulminate placed within a projecting annular recess or rim, which is formed at a point between the ends of the cartridge case, substantially as described.

49,238.—Process of Preserving the Roots of Hop Vines by Charring the Stems.—Schuyler Cummings, Middlefield, N. Y.:

I claim the process and mode of treating hop vines, substantially as above described, for the purpose of preventing them from bleeding after being cut in harvesting the crop.

[The object of this invention is to close the pores of that part of the vine which is connected with the root, and thereby prevent it from bleeding, and so preserve the root from exhaustion and premature decay when the vine is cut down in the work of harvesting a crop of hops.]

49,239.—Ditching Machine.—Wm. H. Dalbey, Clarksbury, Ind.:

I claim the team, A, having the mounted yoke, B, applied to it, as shown, in connection with the cutters, G H I, box, K, and inclined elevator, L, all arranged to operate in the manner substantially as and for the purpose herein set forth.

I further claim the toothed drum, M, armed with teeth, e, and connected to the roller, c, of the elevator, L, by gearing, f, for the purpose of driving the elevator, as set forth.

[This invention relates to a new and improved machine for cutting drains and ditches, and it consists in the employment or use of cutters and an elevator, arranged with a beam mounted on wheels, whereby the work may be done very expeditiously and in a perfect manner.]

49,240.—Apparatus for Dressing Silk Thread, Etc.—John Day, Brooklyn, N. Y.:

I claim the combination of a gumming apparatus, with a drying and finishing box, constructed and arranged substantially as and for the purposes set forth.

I also claim, in combination with the above, the hot-air blast for drying the threads, as specified.

49,241.—Steam Boiler Furnace.—T. B. Dexter, Lynn, Mass.:

I claim the arrangement of the devices for driving the blower, g, consisting of the team pipe, c, wheel, e, and shaft, f, operating substantially as set forth.

Also, The combination of devices, by which the blast can be changed from a hot to a cold, substantially as set forth.

49,242.—Manufacture of Capsules.—Dundas Dick, New York City:

I claim, in combination with the central cone or plug, a, the detachable encasing or surrounding side mold pieces, arranged together, substantially as and for the purpose described.

[This invention relates to the molds in which capsules are molded, and consists in a novel construction and arrangement of them, whereby the capsules can be molded with great rapidity and nicety.]

49,243.—Car Brake.—S. R. Dimmock, Syracuse, N. Y.:

I claim the arrangement of the pinions, l, and r, inside of the oscillating frame, E, the stop, n, on the side of the pinion, l, the drum, r, inclosing the spring, k, the two forms of spring latch, M and m', with their attachment, as above described, the double crank in its several parts, and with its attachments, as above described, and the plate, I, all constructed and operating as and for the purpose herein shown and described.

49,244.—Lamp Stand and Clothes Dryer Combined.—John Donaldson, Rockford, Ill.:

I claim, First, The combination of a lamp stand with a drying frame, arranged and operating substantially as described, for the purpose set forth.

Second, The combination of the slotted stem, carrying the drying arms with the screws on the pedestal or stem, substantially as described, for the purpose set forth.

49,245.—Steak Mangler.—J. P. Dorman, Galesburg, Ill.:

I claim the construction of the cast-iron longitudinal triangular-shaped tooth-plate, and the application of it, substantially in the manner and for the purpose herein set forth.

49,246.—Table Knife.—J. Olden Ely, Philadelphia, Pa.:

I claim, First, The metal bolster, H, cast t, and arranged to embrace the handle and blade of a knife, substantially as and for the purpose herein set forth.

Second, The projection, l, of a dovetailed or equivalent form on the end of the handle, when arranged for the retention of the bolster, X, as set forth.

Third, The bolster, X, the dovetailed projection, and shoulders, y y, of the handle, and the notches, e, of the blade, the whole being arranged as and for the purpose herein set forth.

49,247.—Manufacture of Pyroligneous Acid.—A. H. Emery, New York City:

I claim the use of steam or superheated steam in the distillation of wood in the manufacture of pyroligneous acid, etc., in those cases in which the amount of steam used is greatly decreased or discontinued during the whole or a large portion of the time in which the wood is being charred.

49,248.—Manufacture of Pitch.—A. H. Emery, New York City:

I claim the art of making pitch from pine wood by one distillation

49,249.—Manufacture of Turpentine, Etc.—A. H. Emery, New York City:

I claim distilling wood under more than atmospheric pressure without the application of steam or superheated steam.

49,250.—Corn Planter.—J. W. Fawkes, Decatur, Ill.:

I claim the pivoted bars, D D, and springs, E E, or their equivalents, in connection with the reciprocating slide, B, provided with the cells, a, substantially as and for the purpose set forth.

[This invention relates to a new and useful improvement in the corn-dropping device and has for its object the dropping of the corn without breaking it, and the consequent even distribution of the same]

49,251.—Wire Heddles for Loom Harness.—Milton Finkle, New York City:

First, Making weavers' heddles of a single strand of wire, substantially as and for the purpose above described.

Second, I also claim forming the eyes of wire heddles with smooth surfaces by bending the strand, so substantially as above described.

Third, I also claim soldering the eyes of wire heddles, for the purpose of keeping them compact and firm, substantially as above described.

49,252.—Lamp for Straps.—John J. G. Fisher, Foxboro, Mass.:

I claim the holding plate, D, operated by the screw, b, or equivalent mechanical device. In combination with the box or frame, B, operating substantially as set forth.

49,253.—Artificial Leg.—James A. Foster, West Stockholm, N. Y.:

I claim the lever, P, of the toe-piece, I, in combination with the spring, Q, of the foot, and the spring cord, K, substantially as and for the purpose herein specified.

In combination with the cord, K, I also claim the adjusting arm, M, and lever, H, so arranged and operating that the tension of said cord may be modified by merely moving the arm outward or downward, substantially as herein set forth.

I also claim the combination and arrangement of the lever, H, spring, M, and nut, N, with the bolt, G, and boxes, I, I, in such a manner as to tighten the knee joint and to obviate its rigidity, as herein specified.

I also claim the arrangement of the ankle joint, consisting of the iron, D, provided with the central bearing, F, the bolts, b, b, and the turning eye, E, constructed as described, the whole being used in combination with the foot, C, and ankle, B, substantially as specified.

I also claim holding the cord, K, in place, to prevent friction and wear in its action, by means of the loop, W, arranged and operating as herein set forth.

I also claim the inclined stop, S, in the heel of the foot, in combination with the bearing, E, of the ankle, substantially as herein set forth.

49,254.—Electric Gas Lighters.—Edward J. Frost and George A. Lawrence, Springfield, Mass. Antedated July 24, 1865:

We claim the combination of an electric magnet with a valve, D, or its equivalent, when applied to the pipe of a gas burner and operated by means of the axial bar, G, as set forth.

Second, The valve, D, as described, when used in combination with the axial bar, G, or its equivalent, substantially as described.

49,255.—Machine for Removing Scale from Steam Boiler Flues.—P. Eldredge Garvin, Philadelphia, Pa. Antedated March 30, 1865:

I claim the arrangement of the screw, D, the cutter, E, the base plate, F, with the conical-shaped collar, C, and the groove, d, the dog, H, and the thumb screw, K, constructed and operated for the purpose and in the manner as herein described.

49,256.—Fruit Jar.—William T. Gillinder and Edwin Bennett, Philadelphia, Pa.:

We claim the formation of the groove in the cover, with shoulders supporting the elastic pad, and with a central depression into which the pad is forced by the upper edge of the jar on the downward pressure on the cover by the screw cap, substantially as described.

49,257.—Gas Fitter's Hook Blank.—Elliott P. Gleason, New York City:

I claim the hook blank, or its equivalent, having a contour, substantially as described, as a new article of manufacture.

49,258.—Composition for Exterminating Grasshoppers.—Samuel Green, Denver, Colorado Territory:

I claim the combination and mixture and preparation of the above enumerated ingredients in the aforesaid manner for the purposes above set forth, and the exclusive right to prepare the same for use and sale in those sections of the United States where grasshoppers are so numerous as to completely destroy growing crops.

49,259.—Grease Cup.—Gebhard Hagenmeyer, Big River, Cal.:

I claim the arrangement of the valves, B B', the stems, C C', the seats, c c', bulb, A, cup, D, and vent-hole valve, I, in the manner and for the purpose substantially as herein shown and described.

49,260.—Cane Stripper.—Joel A. Hall, Memphis, Tenn.:

First, I claim stripping the blades from cane by means of two pair of curved yielding knives, arranged in such manner that the second pair of knives will complete the work left unfinished by the first pair, substantially as described.

Second, Providing the knife blades or strippers with auxiliary cutters, I, substantially as described.

Third, The combination of guide rollers with cane strippers, substantially as described.

49,261.—Buckle.—William Smith Hall, Quincy, Mass.:

I claim the improved clamp buckle as made with a tongue having hooks so applied that the strain of the strap upon them clamps the edge of the tongue down upon the strap, substantially as set forth.

49,262.—Sewing Machine.—Thomas J. Halligan, New York City. Antedated Feb. 8, 1865:

I claim, First, waxing the thread on its way to the needle by passing the thread through a wax cup, which is provided with an elastic bottom, t, and also with means for keeping the wax in the cup in a fluid state, substantially as described.

Second, The elastic bottom, t, and the guide tube, ti, which is attached to the wall of the wax cup, H', applied together in the construction of a sewing machine, substantially as described.

Third, The combination of the take-up, B', needle bar, A2, waxing contrivance, H', and shaft, B, substantially in the manner described for the purpose of re-waxing the thread, as set forth.

Fourth, The manner shown of arranging the vibrating take-up arm, B', in connection with the shaft, B, and operating this arm by means of this shaft, B, which is arranged at right angles to the line of feed and which also operates the needle bar, substantially as described.

Fifth, Holding the work down upon the table during the upward movement of the needle bar by means of a pressure foot, c', which rises at the proper time to allow the work to be fed under the needle, and which is located to one side of the needle and of the pressure pad, and is operated by the devices as described.

Sixth, The hinged screw rod, r2, and adjusting nut, S applied to the open, forked end of the pressure lever, r', substantially as described.

Seventh, So applying theawl, m, to the needle bar, A2, that this awl can be adjusted and set nearer to or farther from the needle, according to the length of stitch required, substantially as described.

Eighth, The use of the vibrating and longitudinally adjustable lever, n, in combination with the shaft, C, and pawl, e', for giving motion to the feed wheel, E, substantially as described.

Ninth, The combination of levers, D' E' and D, for adjusting the pawl, e', substantially as described.

Tenth, The use of two or more ratchet wheels having teeth of different lengths in combination with a feed wheel, E, and adjustable spring clamp, G, substantially as described.

Eleventh, In the construction of the stirrups, h h, bars i i, rear abutment, j and spring, k, these parts being formed and arranged in the manner and for the purpose as described.

Twelfth, The use of two or more transverse bars, t2 t3, within a space, l, of a shuttle, for the purpose of creating tension upon the lower thread of a sewing machine, combined with the depression, u, for allowing the thread to traverse laterally back and forth the full length of the bobbin, and preventing the thread from overrunning, as herein described, and set forth.

Thirteenth, A device for smoothing the wax thread on its way to the needle, consisting of a metallic clamp, p p', constructed and operating as described and encircling a rubber block, p2, through which the thread passes.

Fourteenth, A device for using wax thread which is formed with a groove, 2, extending above and below the eye, on one side, and a groove, 3, extending only above the eye, on the opposite side, and with its eye inclined as far as practicable in a direction approaching with the axis of the needle, and otherwise constructed substantially as and for the purpose set forth.

Fifteenth, Holding that part of the face of the shuttle race plate which is in close proximity to the place where the leather is being covered by means of a lamp or burner applied, substantially as and for the purpose set forth.

49,263.—Steam Generator.—Joseph Harrison, Jr., Philadelphia, Pa.:

I claim the manufacture of the slabs of my steam generator in

sections cast or formed of one or more pieces, omitting wholly or in part the tie rods or bolts and the joints described in specification of patent granted to me from the United States Patent Office, Oct. 4th, 1859.

I also claim the manner of making the cross connections at one or more corners, or other points of the slabs for water and steam by the use of intermediate casting, having spherical or curved surfaces at the joints. In the mode and for the object set forth, or in any other manner, substantially the same, for accomplishing the like purpose.

I further claim the manner of combining the thin web with the spheres, as described, for the purpose of making a tight wall or casting for boilers, in the setting of which it is desired wholly or in part to dispense with brick work.

49,264.—Mode of Making and Venting Cores for Casting.—Joseph Harrison, Jr., Philadelphia, Pa.:

I claim the mode of making, using and venting cores or molds for castings as above described, for the purpose of strengthening them when made of weak, moist sand or similar material, and for the better venting the same by availing of a vacuum as above described, when the molten metal is poured into the mold.

49,265.—Corn Planter.—A. A. Hazard, New York City:

I claim the oscillating and distributing roller, b, in combination with the furrow opener, B, track clearing wings, a, spring, g, lever, e, trigger, f, handles, D D, and adjustable covering roller, E, all constructed and operating in the manner and for the purpose herein shown and described.

[This invention relates to an improvement in that class of corn planters in which the seed is distributed by the action of a roller with one or more seed-cells, to which an oscillating motion is imparted either by a trigger attached to one of the handles of the plow or by the action of a pin or cam projecting from the covering roller, said seed-distributing roller being subjected to the action of a spring which carries it back to its original position after each discharge of seed.]

49,266.—Forging Cannon.—Alonzo Hitchcock, New York City. Antedated July 30, 1865:

I claim making a cannon or other large forging by welding it in the furnace by the apparatus and in the method substantially as described.

49,267.—Slide Valve for Steam Engines.—Samuel F. Hodge, Detroit, Mich.:

I claim the combination and arrangement of the follower, C, packing, b, stuffing box, B, adjustable gland, E, and valve, D, substantially as described.

49,268.—Tobacco Pipe.—Christian Hoffman, Philadelphia, Pa.:

I claim the combination and arrangement of the bowl, A, the drip pipe, C, the drip chamber, B, the tube, D, the drip chamber, E, and the neck, G, substantially as herein shown and described.

49,269.—Horse Rake.—Franklin Holden, Clyde, Ill.:

First, I claim the suspending of the rake head, G, to the frame, A, of the machine, by means of swinging rods, D D, connected by chains, H, to the axle, A, substantially as and for the purpose set forth.

Second, The pawl, O, connected with the rod, P, in connection with the bar, N, in the rake head and handle, K, all arranged substantially as and for the purpose specified.

Third, The combination of the handle, K, pawls, M O, bar, N, and suspended rake, all arranged with a mounted frame, to operate substantially as and for the purpose set forth.

[This invention relates to a new and improved horse rake, of this class which are provided with a revolving straight-toothed rake, and it consists in a novel construction and arrangement of parts, whereby the device may be manipulated with the greatest facility, and the rake adjusted to operate at a greater or less distance above the ground, as the nature of the work to be performed may require.]

49,270.—Stair Rod.—H. M. Hoover, New York City:

I claim the rubber stair rod, constructed substantially as herein described, as a new article of manufacture.

[This invention consists in making stair rods for holding down carpets, wholly or partly of india-rubber or gutta-percha.]

49,271.—Tension Mechanism for Looms for Weaving Goods, with Elastic Strands.—Liveras Hull, Charlestown, Mass.:

I claim the improved elastic strand tension apparatus, substantially as described, the same consisting of two or more wheels, A B C and a friction band, e, and weight, f, or the equivalent thereof, arranged and applied together, and to the strand, substantially as specified.

49,272.—Facing Mold.—Joseph and Abraham Hursh, Philadelphia, Pa.:

First, I claim the use of ochre, in its powdered state, for facing green sand molds, substantially as described.

Second, The use of ochre as a wash for facing cores and dry sand molds, substantially as above set forth.

49,273.—Apparatus for Separating Ochre from Sand.—Joseph and Abraham Hursh, Philadelphia, Pa.:

First, I claim a separating ochre from sand which contains it in its natural state by means of a current of air, in such a manner that the sand falls while the ochre is borne forward into a separate place or deposit.

Second, The combination of the fan, C, with the chamber, G, and rod, v, the whole being constructed and arranged in relation to each other, substantially as described and for the purpose specified.

Third, Burning the ochre, or subjecting it to a great heat for the purpose of completing its adaptability for facing molds for castings, substantially as described.

49,274.—Lantern.—James Ives, Mount Carmel, Conn.:

First, I claim a chimney or cone base fitted to the reflector base or globe frame of a lantern, so as to move with said frame, or maintain its position with relation thereto, when either the frame or the lamp is adjusted so as to expose the wick tube or top of the lamp, substantially as described.

Second, The device herein described for connecting the chimney or cone base to the reflector or globe frame of a lantern, in such a manner that the base may at will be disconnected from the said frame, substantially as set forth.

49,275.—Last.—Pickmore Jackson, Saugus, Mass.:

First, The spring fastener, C, applied to the base and back of a last block, and operating in combination with the mortice, substantially as set forth and for the purpose specified.

Second, The spring, G, and eye or staple, F, or their equivalents, in combination with the spring, C, substantially as and for the purpose specified.

49,276.—Ditching Machine.—Samuel F. Jones, St. Paul, Ind.:

I claim the drag bars, d d', with adjustable colters, W W', and braces, o o', when arranged as shown and described, for the purpose set forth.

Second, I claim the self-adjusting scoop, I, apron, F, and weighted lever, m, when arranged substantially as shown and described, for the purpose set forth.

Third, I claim the method of hanging the upper ends of the sides of the trough, M, on the projected ends of the boxes, a' a', whereby a uniform length of the carrying band is obtained independent of the position of the lower end of the trough.

Fourth, In combination with the colters, W W', scoop, I, apron, F, projected boxes, a' a', I claim the pulleys, n n, chains, l l, and carrying band, D, scraper, Z, and conveying spout, E, when arranged as shown and described for the purpose set forth.

49,277.—Boring Tool.—Miles Joy, West Greenfield, Pa.:

I claim, A, a bar for a well-boring apparatus, composed of a pipe, A, having a slot, d, in it, extending nearly its whole length, a plug, B, secured in its lower end, and a ratchet, C, on its upper end, containing a plug, D, having a square hole made in it for a rod, E, to work through which rod, E, is provided with a lead, F, at its lower end said plug, E, including the rod, E, with its head, F, and protecting it from injury, substantially as herein described.

49,278.—Cooking Stove.—Wm. B. Kimball, Peterboro, N. H.:

First, I claim, in cooking and heating stoves the bottom plate, H, constructed and operating substantially as described, so that it may

become at pleasure part of the bottom of an oven, or the fire back of a supplementary fire-place.

Second, I also claim sliding the partitions, N N, of the lower fire space, so as to contract or extend the flues Q P Q, substantially as and for the purpose described.

Third, I also claim the means above described for operating the sliding partitions, to wit: the extension, c, of the bottom plate, and the projections, e d, of the partitions, substantially as shown.

Fourth, I also claim the front flue, C, and its damper, B, in combination with the space, F, below the fire-place, A, for the purpose of making a flue when that space is formed into a fire-place, substantially as described.

[The object of this invention is to produce a cooking stove which is capable of being changed into an open fire-place, or Franklin stove or into a stove with a closed fire-place. This end is effected by converting the front part of the oven into an open fire-place, a portion of the oven-bottom becoming the back of the fire-place, and the flue division plates being the dogs of the fire-place.]

49,279.—Sewing Machine.—Wm. A. L. Kirk, Hamilton, Ohio:

I claim the arrangement herein described of the crank, B, pitman, C, cross-head, D, with a saw or saw-bar, connected to the pitman at a point intermediate between the said crank and cross-head, for the purpose specified.

49,280.—Machine for Cleaning and Finishing Silk and other Thread.—Tobias Kohn, Hartford, Conn.:

I claim the combination of the reciprocating rollers, d, reciprocating guiding bar, p, and the rotary shaft, N, upon which the spools are mounted when the said parts are constructed and arranged to operate in the manner and for the objects specified.

49,281.—Rock Drill.—O. B. Latham, Seneca Falls, N. Y.:

I claim constructing the reamer with cutting angles, both above and below, making them reversible and adjustable in the body of the drill, substantially as specified.

49,282.—Lock.—Lewis Lillie, Troy, N. Y.:

First, I claim the employment of the gripper, I, I, operated by means of the springs, h h, in combination with the combination wheel, F, and with the set wheel, L, the whole being constructed and arranged in the manner and for the purposes substantially as herein described and set forth.

Second, I claim the anti-micrometer or vertical latch, H, actuated by means of the spring, y, and by the triangular post or pin, t, in combination with the lifting slide, C, each being constructed and arranged in the manner substantially as and for the purposes herein described and set forth.

Third, I claim the employment of the triangular post or pin, t, in combination with the hexagonal slot, V, in the anti-micrometer latch, H, in the manner and for the purposes substantially as herein described and set forth.

Fourth, I claim the employment of the lock-bolt, store, R, and N, in combination with the lifter slide, C, and with the lock bolt, B, each being constructed and arranged in the manner and for the purposes substantially as herein described and set forth.

Fifth, I claim the employment of the bolt driver, S, firmly fastened to the inner end of the central shaft, G, in combination with the lock bolt, B, and with the lifting piece, E, securely fastened to the cross piece, E', of the lifting slide, C, in the manner and for the purposes substantially as herein described and set forth.

Sixth, I claim the combination of the conical barrel, D, with the central shaft, G, and with the combination wheels, F, in the manner and for the purposes substantially as set forth.

49,283.—Scaffold.—Horace Littlefield, Lewis, Iowa:

First, I claim the end supports, A B a b, in combination with the platform, D, and legs, C, constructed substantially as herein described.

Second, The legs, C, in combination with the end supports, A B a b, substantially as specified.

Third, The railing, E, stanchions, e e', in combination with the platform, D, and end supports or brackets, A b, substantially as herein specified.

[The object of this invention is to provide a portable scaffold, which may be quickly put together, readily adjusted for use to the side of a building or structure, and capable of having its height raised or lowered, as occasion may require, and it consists in constructing the end supports of the platform in the form of a triangle, one side of which rests against the building or structure, and in supporting the same on legs or props, which are forced into the ground.]

49,284.—Cut-off Valve Gear.—K. H. Loomis, Baltimore, Md.:

First, The plate, G, sliding in the lever, F, attached to the valve spindle and jointed to and operated by the governor rod V, and sliding rod, H, or its equivalent, all substantially as and for the purpose specified.

Second, The rod, H, with its adjustable lugs, k k, connected to the plate, G, and operated by the vibrating lever, W, or its equivalent, substantially as and for the purpose set forth.

49,285.—Whiffletree.—T. R. Markille, Winchester, Ill.:

First, I claim the lever, s, and F, combined with each other, and with braces, D and E, constructed and operated substantially as and for the purposes specified.

Second, In combination with devices for working three horses abreast, the braces, G, constructed and operated as and for the purposes specified, substantially as described.

49,286.—Gate.—John M. May, Janesville, Wis.:

I claim friction rollers, J, or its equivalent, in combination with grooved rod, N, used in constructing a gate, and wheels, E and F, used in operating a gate, and for analogous purposes, when the whole are arranged and operated substantially as described.

49,287.—Tool for Fastening Tubes in Boilers.—Robert McConnell, Jacksonville, Ill.:

I claim a tool for fastening boiler tubes composed of a mandrel, with a series of inclined grooves, in combination with a double set of dies, d e, and nut, h, to be used in connection with the expanding dies, e, substantially as and for the purpose set forth.

[This invention relates to a tool composed of a mandrel, provided with a series of inclined grooves, which form guides for a double set of dies—one set for expanding and the other for flanging—in combination with a follower nut, to be used particularly with the flanging dies, in such a manner that by the combined action of the mandrel and the expanding dies the expansion bead at the inner edge of the tube sheet is formed, and, at the same time the outer end of the tube is spread over the outer edge of the tube sheet, thus keeping the tube firmly in its place, and by the subsequent action of the flanging dies, the outside flange of the tube is pressed up firmly against the tube sheet, and a tight joint is effected, with little loss of time and without the use of a hammer, the mandrel being fed up and turned by the action of the ordinary ratchet brace.]

49,288.—Washing Roller.—H. L. Moservey, Boston, Mass.:

I claim a hand-washing roller, consisting of one or more revolving frames, B, carrying a series of rolls, C, in combination with a handle, operating substantially as described.

49,289.—Vehicle.—O. E. Miles, Aurora, Ill. Antedated Aug. 7, 1865:

I claim the spring, D, in combination with the truss, A, short axles, b and wheels, B, fixed on the latter, all arranged relative to each other, and to the other parts, E, etc., of the vehicle, substantially in the manner and for the purpose herein set forth.

49,290.—Lantern.—J. H. Multimore, Milwaukee, Wis.:

First, I claim the projections, d, of the base, B, arranged and operating as and for the purpose set forth.

Second, I claim the band, E, provided with the inclines, l, in combination with the rod, n, as and for the purpose set forth.

Third, I claim securing the lamp by means of the bar or strip, f, and arms, g, when arranged to operate as described.

49,291.—Scrubbing Knuckle Shield.—C. A. Moore, Westbrook, Conn.:

I claim the above-described article or shield as my invention, as and for the purpose specified.

49,292.—Car Coupling.—M. C. Morse, Boston, Mass.:

First, I claim the grooved and pivoted cheeks, J J', in combination with the yielding clamps, J J', substantially as set forth and for the purpose described.

Second, The arm, G, projecting in front of the hunter, A, in combination with the lever, E, and shackling pin, D, substantially as and for the purpose described.

Third, The link or dog, F, in combination with the arm, G, and lever, E, for the purpose of holding up the latter, substantially as described.

49,293.—Oscillating Steam Engine.—David Nation and T. B. Hall, St. Louis, Mo.:

We claim the combination and arrangement of the segmental boxes, B C, oscillating pistons, E E D, piston rod, G, steam chests, d d', valves, e', pitman, n, and eccentric wrist pins, e o, as and for the purposes herein specified.

[This invention relates to certain improvements in that class of engines known as oscillating piston engines. The cylinder is composed of two segmental boxes, which are bolted together by means of flanges, and the inner spaces of which are separated one from the other by a central boss, which is firmly keyed to the oscillating piston rod, and from which extend the pistons, in combination with suitable steam supply and exhaust ports, in such a manner that by the action of the steam on said pistons an oscillating motion is imparted to the shaft, which, by suitable connections, are converted into a continuous rotary motion of the fly-wheel shaft.]

49,294.—Machine for Bending Metal Rods.—G. J. Neveil, Philadelphia, Pa.:

I claim the lever, D, with its slot c, the anvil, C, and pin, b, combined with the levers, E F I, and the cam, H, or their equivalents, so that a bar of metal may be bent to a shape corresponding with that of the end of the lever, substantially as specified.

49,295.—Packing for Tubes of Boilers or Condensers.—Jacob Newkirk, Factoryville, N. Y.:

I claim the combination of a conically-recessed holding, and a conical-shaped packing ring fitting therein, both rings being held and tightened up against the head and the tube by screw bolts for holding and packing tubes to the heads of steam boilers or condensers, substantially in the manner and for the purpose described.

49,296.—Door Bolt.—J. E. Parker, West Meriden, Conn.:

I claim the combination of the bolt, a, spring, f, and dog, g, substantially in the manner and for the purposes set forth.

49,297.—Lock.—Jacob Post, Newark, N. J.:

I claim the combination with the notched latch bolt, c, of a lock of the spring bar or plate, g, and arranged together with regard to each other, and operating substantially as herein described and for the purpose specified.

49,298.—Lock.—Jacob Post, Newark, N. J.:

I claim the combination in locks of the turning cylinder, h, with its series of tumblers, n n n, outer casing or tube, d, and bridges, S S, arranged together and operating substantially in the manner described.

[The above inventions relate to a novel mode of hanging the latch bolt, and also to a peculiar arrangement of tumblers in the turning cylinder of a lock, the object being to produce a simple, cheap and strong lock for ordinary uses.]

49,299.—Machine for Slicing Cork.—John Power, Boston, Mass.:

I claim the yielding adjustable plug, E, in combination with the gage, D, constructed and operating substantially as and for the purpose described.

49,300.—Torpedo Boat.—G. M. Ramsey, New York City:

First, I claim the inclination of the roof, A, of a torpedo boat, as and for the purposes specified.

Second, The hole, e, constructed and situated substantially as described.

Third, The ratch, n, in combination with the pawl, P, bar, m, and boom, O, substantially as and for the purpose described.

Fourth, The springs, s, in combination with the bar, m, substantially as described.

Fifth, The bars, r r', in combination with the bar, m, as and for the purpose specified.

Sixth, The tube, b, running longitudinally through the torpedo, substantially as and for the purpose specified.

Seventh, The division, c, separating the magazine of the torpedo from the lock, a, substantially as and for the purpose specified.

Eighth, The cock, d, in combination with the powder tube, e, substantially as and for the purpose specified.

Ninth, The rod, f, also in combination with tube, g, and gutta-percha, and tube, i, substantially as and for the purpose specified.

Tenth, The pin, h, in combination with the lock, d, and rod tube, g, substantially as and for the purpose specified.

Eleventh, The hand hole through which the cap is supplied to the cock, d, substantially as and for the purpose specified.

49,301.—Air Pump.—Franklin Ransom, Buffalo, N. Y.:

First, I claim combining the elevated chamber, C, having the valve, d, as shown, with the pump cylinder, B, by means of a hollow bell plate, A, through which a constantly open communication between the said chamber and cylinder is maintained, substantially as herein specified.

Second, The arrangement of the chamber, C, condensing chamber, D, and valves, d c, substantially as and for the purpose herein specified.

49,302.—Seeding Machine.—E. D. and O. B. Reynolds, North Bridgewater, Mass.:

We claim a seed sower having a reciprocating seed box, operating in the manner and for the purpose substantially as set forth.

49,303.—Corn Sheller.—J. W. Ricker and T. S. Lewis, Chelsea, Mass.:

We claim the loosely-hung conductor, with its projection, arranged substantially as set forth, for insuring the proper presentation of the ear without clogging or obstructing the operation of the driving wheels.

Also, Combining with the teeth of the disk wheel for feeding out the cob the stationary guard teeth, operating in the manner and for the purpose set forth.

Also, The corrugated spring for keeping the cob up to the disk, without bearing upon its whole length, substantially as described.

Also, The weighted lever or arm, g, in combination with the spout or conductor, c, and its projection, d.

49,304.—Cartridge Box.—Wm. Rossiter, Newark, N. J.:

I claim the broad flat loop, d, consisting of a single piece of leather or other material, attached by its corners to the back of the cartridge box, a, and employed to confine both the belt, f, and shoulder straps, g g, which are passed between the said flat loop and the back of the box, all as herein specified.

[This invention relates to a novel mode of securing the shoulder and belt straps of cartridge boxes, whereby the many disadvantages and defects of the old method are obviated.]

49,305.—Shirt Stud.—Robert B. Ruggles, Hartford, Conn.:

I claim the button, a, having an unequally-perforated and slitted stud, b, in combination with the button, a', having an unequal-sized shank, c, working together substantially as and for the purpose described.

49,306.—Method of Making Wrist Pins.—E. P. Russell, Manlius, N. S.:

I claim an anti-friction crank or wrist pin, substantially as described, when constructed with a chilled metal surface or journal, surrounding a core of softer metal which projects from one end of said journal, the two metals being united mechanically in the casting of the former around the latter, substantially as and for the purposes set forth.

49,307.—Pocketbook.—Louis Saabach, Philadelphia, Pa.:

I claim the plate, B, attached to a pocketbook or portemonnaie so as to slide over the side of the same and secure the flap, b, substantially as described.

49,308.—Sliding Doors of Railway Cars.—Albert G. Sanford, Boston, Mass.:

I claim the improved rail, as made with the notches, a b c, for

reception of the wheels of the door, and to hold the door either open or closed.

I also claim the application of each of the wheels to the door in such a manner that while the door may be raised in its frame, and with respect to the rail, the wheels may rest in contact with the top surface of the rail.

I claim the combination and arrangement of the relieving friction spring or springs, k, with the door, and to operate therewith and with the door case, substantially in the manner described.

49,309.—Buckle.—Cyrus W. Saladee, Putnam, Ohio:

I claim, First, Fastening buckles to harness, etc., by means of rivets, a, and plate, A, the plate, A, being the back bar of the buckle flattened out, and provided with a metallic loop, B.

Second, The combination of the metallic loop, B, plate, A, and rivets, a, for the purpose of securing loops to harness, etc.

49,310.—Apparatus for Liquoring Sugar in Centrifugal Machines.—Frank Seiberlich, Charlestown, Mass.:

I claim the combination of the jet tubes, A, the gate, C, and the conduit, B, applied together substantially as and for the purpose specified.

I also claim the combination of the lifter, D, the jet tube, A, the gate, C, and the conduit, B, the whole being arranged and so as to operate together substantially in the manner as described.

49,311.—Hedge Trimmer.—A. Selover, Brooklyn, Ohio:

I claim the adjustable clamps, A B, adjusting screws, H, in combination with the adjustable standards, C D, substantially as and for the purpose set forth.

49,312.—Tightening Pulleys by Friction.—Franklin Skinner, New Haven, Conn.:

I claim the combination of the adjustable collar and its appendages, Fig. 3, with the conical slide, Fig. 5, and pulleys, C C', when they are constructed substantially as herein described, and are fitted for use, either double or single, on a proper arbor or shaft, as herein set forth.

49,313.—Fence.—Samuel Stanbro, Northville, Mich.:

I claim the stakes, H H, driven in the earth, bent over the sill, E, and secured at their outer or upper ends to the lower part of the fence, substantially in the manner as and for the purpose herein set forth.

[This invention relates to a new and improved manner of attaching or securing the fence to the earth, whereby the fence is securely held in position and at the same time rendered capable of being readily taken up or removed, and also readily secured in the position designed for it.]

49,314.—Bee Separator.—Jesse H. Starr, Middlebush, N. Y.:

I claim the bee separator consisting of a box divided into two compartments, which are made to communicate with each other by means of taper pipes, the lower compartment being provided with holes or apertures to admit of the exit of the bees, and all arranged substantially as and for the purpose specified.

49,315.—Photographic Camera.—John Stock, New York City:

I claim the arrangement of the front of the camera box, B, so that the same turns upon a horizontal axis passing through the center of the aperture, and also upon a vertical axis passing through the same center the bellows yielding to the motion without affecting their operation.

I also claim the tubular flange or ring, S, to which the lens tube is affixed, in combination with the tubular ring, T, acting as a universal joint, in the manner and for the purpose substantially as set forth.

49,316.—Elastic Mousing for Hooks.—Edward E. Stone, U. S. N.:

I claim a mousing of india-rubber or analogous non-corrosive material to be applied to hooks, substantially as described.

[This invention relates to a new and improved snap hook, and it has for its object the obviating of the difficulty attending the corrosion of the spring hitherto attached to this class of hooks, a contingency which precludes their use for marine purposes.]

49,317.—Machine for Cutting Tobacco.—Wiley J. Stratton, St. Louis, Mo., and H. G. Tidemann, New York City:

We claim the combination and arrangement of parts substantially as described and consisting of the rotating cutting wheel, moving at right angles to the feed, the feeding arrangement consisting of the shaft, cam, pawl, ratchet, feed screw and follower, the latter depressed by a single screw shaft, C, passing through the bridge nut, a, under the rotation of the wheel, D.

49,318.—Blowing off Steam.—Peter Taltavull, Washington, D. C.:

First, I claim the steam pipe, C, leading from the boiler, the water-inducting pipe, A, and the water-discharging pipe, B, combined and arranged so as to receive and discharge a powerful current of water through the side, M, of the vessel, substantially in the manner and for the purpose herein set forth.

Second, I claim the combination of the concentrically arranged and adjustable pieces, E F G and H, operating in the manner substantially as described and for the purpose set forth.

Third, I claim the combination of the pipes, A B and C, with the adjustable pieces, E F G and H, adapted to control the discharge of fluid, substantially as and for the purpose herein set forth.

49,319.—Bark Mill.—M. Spencer Thomas, Painted Post, N. Y.:

I claim the stationary hopper, A, provided with a circular rim, b, having a rough surface below, and with arms, c, having a rough surface below, and teeth, e, above, in combination with the revolving rough surface disk, E, and breaker, D, all constructed and operating as and for the purpose set forth.

[This invention consists in a stationary hopper provided with a rim and arms made rough at their lower surface, and with teeth projecting upwards from the upper surface of said arms, in combination with a revolving rough surface disk below and a toothed revolving breaker above, in such a manner that by the action of said revolving breaker and toothed stationary arms the bark thrown into the hopper is crushed, and by the combined action of the rough surface disk and the corresponding rough surface rim and arms of the stationary hopper the crushed bark is reduced to the desired fineness in a simple and effective way, the whole being so constructed that it is simple in its construction, not liable to get out of repair, and operated with comparatively little power.]

49,320.—Stave Machine.—John S. Thompson, Glen Falls, N. Y.:

I claim the combination of the endless chains, G G, guides, H H, circular saws, T, cutters, U, cutters, V W, plates, X, and yielding plates, Y, all constructed, arranged and operating as and for the purposes described.

[This invention relates to a new and improved machine for chamfering and crozing staves and also for sawing them of a uniform length, the several operations above-named being performed simultaneously or at the same time, and the work performed in a perfect manner by a very simple mechanism.]

49,321.—Milk Stand.—Addison R. Titus, Warren, Pa.:

I claim the construction and arrangement of the frame, A B C, revolving shaft, D, brackets, G, flanges, H, and cone, K, substantially as described, and for the purposes set forth.

49,322.—Desulphurizing and Disintegrating Ores.—George Vining, Boston, Mass.:

I claim the revolving cylinder, A, in combination with balls, G G', etc., or their equivalents, tubes, E and D, cock, M, and seals, H H', etc., constructed in the manner and for the purpose above described.

49,323.—Clock Escapement.—M. Weaver and J. M. Sandifer, Somerset, Ky.:

We claim, First, The exterior figure, composed of the parts, A A d d, with the adjustable pallets, b b, secured by the set screws, e e, as set forth forming a part of the pendulum.

Second, The combination of the said parts with the escapement wheel, B, in the manner and for the purpose described.

Third, The adjustable pallets, b b, arranged and operating as described.

Fourth, The movable plate, C, operated by the set screw, f, for the purpose of setting and keeping the pendulum exactly on beat, as set forth.

49,324.—Horse Shoe.—A. Weitman, West Union, Iowa:

I claim the securing of the shoe to the hoof by means of one or more detachable or removable flanges, D, provided with lips, d, and constructed and applied in such a manner as to draw the shoe towards the hoof and cause it to fit snugly thereto under the action of the screw, e, and inclined surface of the parts, c and b, in combination with one or more fixed or permanent flanges, B, provided with lips, a, substantially as described.

I further claim the projections, 2 2, in connection with the detachable and permanent flanges, substantially as and for the purpose specified.

[This invention relates to a new and improved manner of attaching the shoe to the hoof of the animal, whereby the shoe will be firmly secured to the hoof, readily applied to and detached therefrom, and some elasticity allowed the shoe in order to render the latter comfortable to the animal, by relieving the hoof from jars and concussions.]

49,325.—Fire-place Heater.—H. H. Welch, Athens, Ohio:

I claim the fire-place heater, A, constructed as herein shown and described; that is to say, with the projections, D E, recesses, E', and pipes, B C, for the purpose specified.

[The object of this invention is to save a large amount of the heat that is now lost when fuel is burnt in fire-places, and it consists in the construction and application of a heater, to be placed in a fire-place, next to and partly enclosed within the fire back thereof, which heater is to be constantly supplied with fresh air, which air, after being heated, is discharged through suitable conveying pipes, and registered to any part of a house.]

49,326.—Explosive Shell for Ordnance.—Samuel Wells, New York City. Antedated June 28, 1865:

I claim the fuse hole, formed in the tapering portion of the shell, in combination with the projection, K, on the latter.

49,327.—Tool for Sealing Boiler Tubes.—John Werner, Jr., Prairie du Lac, Wis. Antedated July 26, 1865:

I claim the combination of the cutting tool, c, screw, A, nut, B, guide plate, C, and plug, D, all arranged to operate substantially as and for the purpose herein set forth.

I further claim the slotting of the plate, C, and the connecting of the nut, B, so that it may slide or be adjusted laterally, and having the plate, C, provided with a plug, D, substantially as and for the purpose specified.

[This invention relates to a new and useful implement or tool for cutting out and removing the incrustation in the tubes of tubular boilers; and it consists in the employment or use of an auger, arranged with a screw and nut, and also with a guide plate, whereby the desired work may be performed expeditiously and in a perfect manner.]

49,328.—Evaporating and Distilling Apparatus.—W. P. Wheeler, Louisville, Ky.:

I claim the vacuum pipe, C, or equivalent, with its lower end up-turned, or otherwise sealed from the entrance of the atmosphere, applied in combination with the condenser, B, and evaporator or still, A, substantially as and for the purpose set forth.

49,329.—Method of Removing Incrustation from Gas Retorts.—A. J. White, New York City:

I claim the removing of the incrustation from the interior of gas retorts, by forcing a current of air through them by means of a pump, fan, or other equivalent device, substantially as shown and described.

49,330.—Grain Shovel.—E. P. Williams, Buffalo, N. Y. Antedated Aug. 4, 1865:

I claim a grain shovel, having a skeleton runner frame, A, and pendant flaps or shovel blades, F, with an elastic compressible top or covering, E, for the purposes and substantially as described.]

49,331.—Manufacture of Iron.—J. D. Williams, Allegheny City, Pa. Antedated July 9, 1865:

I claim the use of the ingredients herein named, when used in the manufacture of iron, said ingredients being used substantially in the manner herein described and for the purpose set forth.

49,332.—Steam-warming Apparatus.—C. A. Wilson, Cincinnati, Ohio:

I claim the separate return pipe, E, provided with the closable discharge passage, F f, and with the automatic valve-guarded return passage, G g, which empties into the boiler, the whole being combined and operating substantially as set forth.

49,333.—Coal Stove.—Gurdon G. Wolfe, Troy, N. Y.:

I claim, First, The employment of the said self-feeding reservoir or chamber, E, surrounded by the air heating chamber, D, with cold air supply tube, C, arranged and combined with a base-burning coal stove, in the manner substantially as and for the purpose herein described and set forth.

Second, I also claim the employment of a fire pot or combustion chamber, constructed with an annular hot-air chamber, with open flues, B B, arranged in the manner substantially as herein described and set forth.

Third, I also claim the combination of the damper, H, with the openings or dampers, O O, in the coal supply reservoir or chamber, and said air-heating annular chamber, D, in the manner substantially as and for the purpose herein described and set forth.

49,334.—Portable Steam Engine.—William Wright, New York City:

I claim the arrangement of portable steam engines, with reference to the manner herein described of attaching the engine proper to the boiler.

49,335.—Sirup Stand for Soda Fountains.—C. M. Berry and Charles C. Sheldrake (assignors to themselves and J. Bready), Philadelphia, Pa.:

We claim, constructing mineral water sirup stands of cast iron, and enameling the interior and exterior surfaces of the same, to protect them from the action of the acid contained in the sirups.

49,336.—Boring Tool.—Wesley Brodhead (assignor to C. L. Edmonds), Rondout, N. Y.:

I claim the boring tool herein described, consisting of a fine feeding screw, B, and arm, C, sliding in the head of the said feeding screw, and having permanently attached to it the shank, d, of a cutter, D, formed with a chisel point, e, a curved neck for the ejection of chips, and two beam shaped blades, f f, all the parts being constructed and arranged to operate as and for the purposes specified.

49,337.—Connecting Gages, Calipers and Rules.—Nelson H. Bundy (assignor to Nahum M. Dow), Boston, Mass.:

I claim the mode of connecting the several instruments, viz., the calipers, wire gage and foot rule, as hereinabove set forth.

49,338.—Fastening Keys in Locks.—Joseph H. Desluisse (assignor to Alfred B. Justice), Philadelphia, Pa.:

I claim the use of a revolving escutcheon, in combination with a pall, as set forth.

49,339.—Military Insignia Woven in Cloth.—A. M. Dorman (assignor to himself and Samuel Yewdall), Philadelphia, Pa.:

I claim military insignia woven in the cloth, and excised therefrom preparatory to attachment to the apparel, all substantially as herein shown and described.

49,340.—Oyster Dredge.—Edward Fairbanks (assignor to himself and Levi Bowen), Baltimore, Md.:

I claim the combination and arrangement of a reel with a revolving standard and crane arm, when so arranged as to compose a

winder for oyster dredges, substantially in the manner and for the purpose described.

49,341.—Spoke Machine.—Junius Foster (assignor to himself and John Slocum), Long Branch, N. J.:

I claim the arrangement of the cutter, G, attached to the reciprocating block, C, the adjustable gage bar, H, and slotted plates, I, J, J', all constructed as and for the purposes herein specified.

49,342.—Device for Raising Sunken Vessels.—George W. Fuller, Chelsea, Mass., assignor to himself and Peter E. Falcon, Cohasset, Mass.:

I claim the mode substantially as above described of overcoming the adhesion of a submerged vessel to the mud or ground on which she may be deposited.

49,343.—Plumber's Hook Blank.—Benjamin F. Gladding, Providence, R. I., assignor to Elliott P. Gleason, New York City:

I claim a new article of manufacture of my invention, the plumber's hook blank, with a disposition of its material, substantially as described.

49,344.—Stove Grate.—James Glass (assignor to Cox, Church & Co.), Troy, N. Y.:

I claim the removable end pieces, D, D, in combination with the grate, B, shaft, C, and bed plate, A, operating as, and for the purposes set forth.

49,345.—Churn.—Horace L. Hervey (assignor to himself and John Hart), Philadelphia, Pa.:

I claim the combination and arrangement of the two cylinders, A, and piston, D E, with the perforated plates, F, at the bottom of the cylinders, for the purpose of simultaneously forcing the cream up through one plate, F, by exhaustion, and down through the other plate, F, by pressure, substantially as described.

49,346.—Gas Engine.—Pierre Hugon (assignor to Emil Just), Paris, France.

I claim First, the method herein described of igniting in gas engines, the gaseous detonating compound, in the manner and for the purpose hereinbefore set forth, that is to say, by the employment, in combination with one or more side valves constructed for operation, substantially as shown and described, of one or more lighting and igniting burners, whereby the use of electricity as the medium to unite the said compound may be dispensed with.

Second, in gas engines, that is to say, in engines in which the motive power is a gaseous compound, to be ignited within the cylinder, or in any vessel communicating therewith, I claim the employment and combination with the said, a gaseous compound of water, or other vaporizing liquid, substantially in the manner and for the purposes hereinbefore set forth.

Third, I claim the arrangement substantially as herein described, of the slide valves for the distribution of the detonating mixture and of the ignition and lighting burners, as set forth.

Fourth, I claim the arrangement and combination of parts for the injection of water around and into the cylinder, substantially as herein described and for the purposes set forth.

Fifth, I claim the general arrangement and combination of gas engine, substantially as hereinbefore described and shown in the annexed drawings.

49,347.—Paper Collar.—S. B. Hutchinson, Nashua, N. H., assignor to himself, G. W. Ray and V. N. Taylor, Springfield, Mass.:

I claim a paper collar, part of the surface of which is enamelled, as herein described.

49,348.—Car Coupling.—Sylvanus D. Locke (assignor to G. G. Campbell), Janesville, Wis.:

I claim, First, A car coupler, when constructed and arranged substantially as and for the purpose set forth.

Second, The combination and arrangement of the dog, g, and swing table, d, substantially as and for the purpose set forth.

Third, The combination and arrangement of the case, m, and spring, k, substantially as and for the purpose set forth.

49,349.—Welt Machine.—B. U. Lyon (assignor to himself, Grant Judd, E. P. Whitney and J. P. Reed), Stamford, Conn.:

I claim the combination of the guides, G G', with the two pressure rollers, B B', all arranged to operate in the manner and for the purpose herein described.

49,350.—Snap Hook.—Clark Marsh, Bridgeport, Conn., assignor to Hotchkiss Sons, New York City:

First, I claim in snap hooks the employment of the spring, E, in combination with a bearing, d, at some distance from the clip or root of the spring, adapted to brace the spring stiffly against the strain thereon in one direction, while allowing the elasticity of the entire spring to be made available in the proper yielding action, substantially as herein set forth.

I claim in snap hooks the passing the spring, E, through the body, so that a portion shall serve in the front and another portion serve at the back, and contribute its elasticity to operate the portion in the front, substantially as and for the purposes herein set forth.

49,351.—Ice Pitcher.—Frederick C. Meyer (assignor to Ernestine Meyer), Philadelphia, Pa.:

I claim the valve, C, adapted to the spout and operated by the weight, D, through the lever, F, or its equivalent, all substantially as and for the purpose herein set forth.

49,352.—Oil Cup.—Robert Poole (assignor to himself and German H. Hunt), Baltimore, Md.:

I claim an oil cup in which the lid or cover is united to the bowl by a hinge, section and screw ring, substantially in the manner and for the purpose herein described.

49,353.—Felted Fabric.—Enoch Waite (assignor to Elliott Felting Mills), Franklin City, Mass.:

I claim the compound fabric made of felt cloth and hair combined or arranged substantially in the manner as described.

49,354.—Horse Hoe Cultivator.—Albion Webb (assignor to himself and D. M. Dunham), Bangor, Me.:

I claim, First, The manner in which the plates, E E, are secured to the cross bars, B B, of the machine, to wit, the oblong grooves, a, in said bars, E B, with notches, e, at their under surfaces, the covered rods, F, and eye bolts, G, all arranged in the manner substantially as and for the purposes specified.

Second, The securing of the blades, H, to the plates, E, by means of a single bolt, a, in connection with the ribs, b, and grooves, c, substantially as shown and described.

[This invention relates to certain improvements in horse hoes or cultivators of that class which are provided with oblique hoes or shares. The object of the invention is to render the hoes or shares of the machine capable of being adjusted with greater facility than hitherto, and also to render it stiffer and firmer, and to perform or work in a better manner.]

49,355.—Cabinet Organ.—George Woods, Cambridge, Mass., assignor to Mason & Hamlin, Boston, Mass.:

I claim the application to or within the aperture of the safety valve of cabinet organs or other wind instruments, or other apertures for the passage of air, of a perforated or porous diaphragm, whether of fibrous or other material, substantially as and for the purpose above described.

49,356.—Crimping Wire Cloth.—William Zerns (assignor to himself, J. R. Deighm and Jasper Snell, Pottsville, Pa.:

I claim the crimping of wire cloth, by placing the same, after being woven, between toothed plates, and subjecting it to pressure, substantially as set forth.

[Wire cloth of the coarse kind requires to have the wires crimped or bent, in order to bring the same as near as possible to a plane surface, and retain the wires in position. Hitherto the wires have been crimped before the weaving process, but, by this improvement, they are crimped after they are woven, by means of toothed plates.]

49,357.—Apparatus for Burning Hydro-carbons.—Wm. Lim and Arthur Barff, Glasgow, North Britain:

We claim the general arrangement and construction of apparatus for the utilization of the gases produced by the vaporization of min-

eral hydro-carbon oils, for the generation of steam and the production of heat generally, as hereinbefore described, or any mere modification thereof.

REISSUES.

2,047.—Harvester.—Rufus Dytton, New York City. Patented March 19, 1861. Reissued Sept. 13, 1864:

I claim, First, In machines having a hinged finger bar, raising such finger bar by means of a lever supported or pivoted at one end on the shoe or heel of the finger bar, and turning freely toward the finger bar, but rigid with it when turned in an opposite direction, by causing such lever, when the heel of the finger bar is raised, to be brought in contact with the pole or the frame of the machine, or a projection therefrom, so as to press or force down such lever, and thereby raise the outer end of the finger bar, substantially as set forth.

Second, In two-wheeled machines having a hinged finger bar and having the driver's seat controlled by the pole, instead of by the frame of the machine, and not using or employing a castor wheel to support the drooping end of the frame and the inner end of the finger bar, raising the inner end of the finger bar by means of a lever and cord or chain, or its equivalent, acting upon the pole or some part connected therewith as a fulcrum, when the outer end of such finger bar is raised by means of a lever supported or pivoted at one end on the shoe or heel of the finger bar, and turning freely toward the finger bar, but rigid with it when turned in an opposite direction, and operated as first set forth in the first claim.

Third, In two-wheeled machines having a hinged finger bar and a loose pole, and having the driver's seat controlled by the pole instead of by the frame of the machine, so arranging, with reference to the frame of the machine, the finger bar and the mechanism for raising it and the shoe that when the finger bar and shoe are raised by such mechanism their weight will be so thrown upon the two driving wheels that the use of a center wheel to support the drooping end of the frame can be dispensed with, and the machine can also be moved and turned with greater ease and facility.

Fourth, In a machine having two independent driving or supporting wheels, and having the driver not controlled by the pole of the machine, hanging the cutting apparatus by one of its ends, so that not only the entire cutting apparatus, but either end thereof, independently of the other end, can freely rise above or fall below the plane or surface on which the driving wheels are moving, in combination with mechanism or devices for raising both the outer and inner ends of the finger bar, by which the driver, when in his seat, by operating a single lever moving in one direction in a plane substantially parallel with the sides of the driving wheels, can raise the entire cutting apparatus, and support it upon the driving wheels, for the purposes set forth.

Fifth, In two-wheeled machines having a hinged finger bar and a loose pole, and having its driver's seat controlled by the pole instead of by the frame of the machine, so arranging the levers that raise the inner and outer ends of the finger bar, that as these levers are operated the outer end of the finger bar shall be raised higher than the inner end, for the purposes set forth.

Sixth, I do not claim forming a guard finger in a single piece, nor do I claim forming it in such a manner as to cover the sickle bar and have openings in its under side for the escape of grass, and other substances, as such a form of guard finger has been known; but I claim a guard finger made in a single piece, covering the sickle bar, and having openings in the bottom thereof for the escape of grass and other substances entering with the sickle, when such guard finger is provided with a bearing surface, as I, connecting the upper and lower portions of said guard finger and resting against the edge of the finger bar and braced and sustained against lateral strain, as herein set forth.

2,048.—Apparatus for Rendering Lard, Tallow, Etc.—C. E. Gray, New York City. Patented January 31, 1865:

I claim, First, Making a close water jacket, in combination with the tank and a part of it, and arranging said water jacket so made a part of said tank, in direct communication with the furnace so that the water jacket shall intervene between the fire and the tank, and act as a means of conducting and distributing the heat from the fire to and around the substance contained in the tank.

Second, Using the steam generated in a close tank from the constitutional water in the fat for the purpose of aiding and controlling the escape of the noxious gases and vapors, either to a superheater, for consumption in the furnace, or to a deodorizer, for the purpose of condensing them, in the manner substantially as described for the purpose specified.

2,049.—Apparatus for Rendering Oils and Fats.—C. E. Gray, New York City. Patented Aug. 18, 1863:

I claim, First, In connection with the digester, the use of a second steam-tight vessel, for receiving melted fat or other fluid material that may have been cooked under steam pressure, and for cooling down and purifying the same until it is in a proper condition for exposure to the atmosphere, substantially as described.

Second, The placing of a glass tube in the draw-off pipe from the digester or similar apparatus for the treatment of material under steam pressure, for the purpose specified, substantially as before described.

Third, In combination with the digester or receiver, the use of the jointed delivery pipe, V, supported near the surface of the fluid fat by the floats, as by W W, for the purpose of drawing off the supernatant contents of the receiver or tank automatically.

2,050.—Roof for Railroad Car.—A. P. Winslow, Cleveland, Ohio. Patented Aug. 9, 1859:

I claim, First, The plates, D, caps, F, and grooved rafters, B, when arranged substantially as herein set forth, for the purpose described.

Second, I claim forming an air chamber, G, between the sheeting or roof, A, and plates, D, when arranged as herein described, for giving free circulation of air to cool the car, and, at the same time, allow the water, dust, etc., to pass off at the end of said plates.

DESIGNS.

2,159.—Bust of Abraham Lincoln.—George J. Haller, Buffalo, N. Y.

2,160.—Trade Mark.—George Hosmer (assignor to himself and J. R. Winch), Boston, Mass.

2,161.—Bust of Abraham Lincoln.—Thomas D. Jones, Cincinnati, Ohio.

2,162.—Spoon Handle.—Rauldolph Wendt, New York City.



PATENTS GRANTED FOR SEVENTEEN YEARS.

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[See Judge Holt's letter on another page.]

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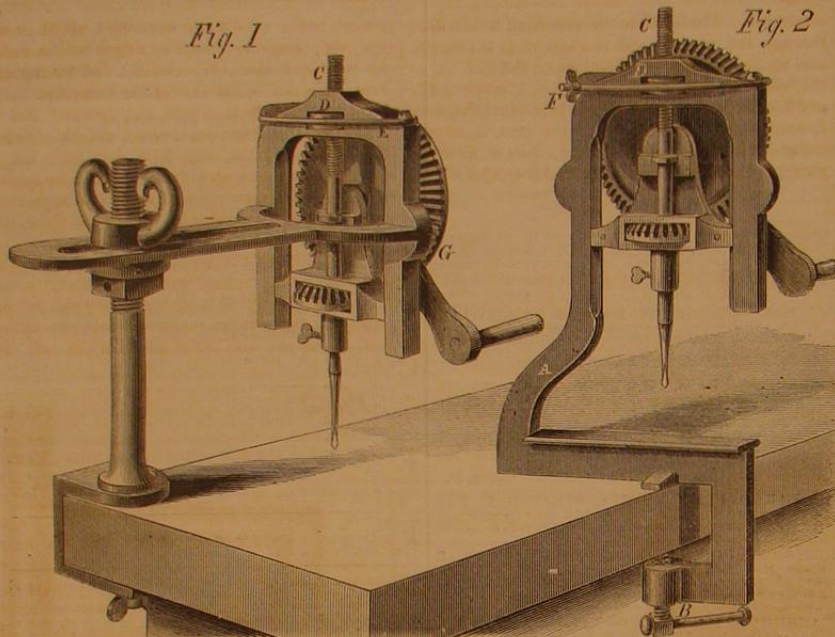
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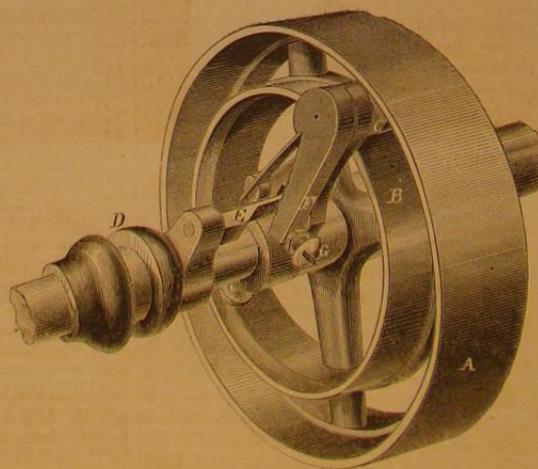
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