Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XII.—No. 14. (NEW SERIES.) NEW YORK, APRIL 1, 1865. $3 PER ANNUM (IN ADVANCE.)

Hand Drill.

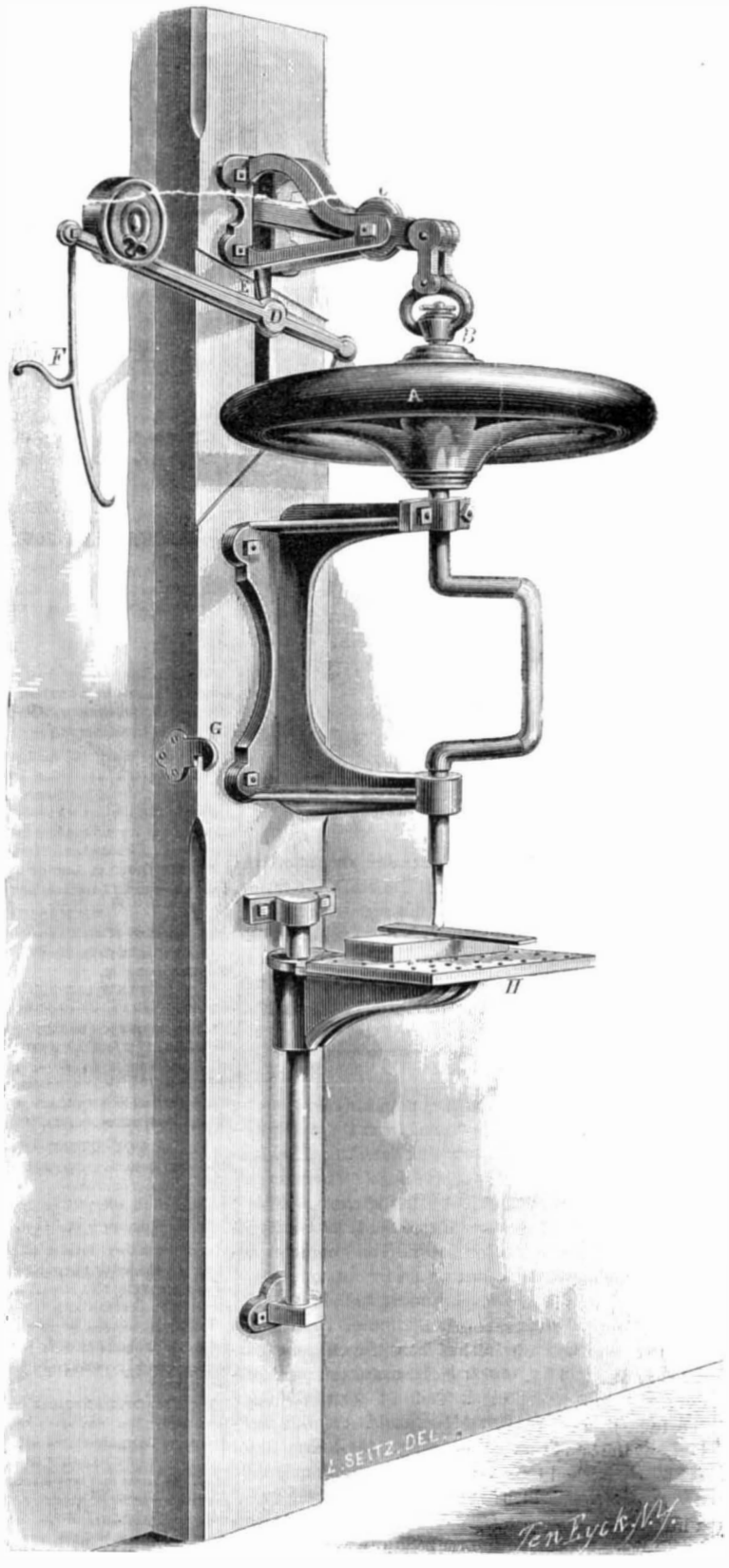
Small manufacturers—such as wagon and iron-railing makers, and workers of iron in general, have frequent occasion to drill holes in metal, and where steam or water power is used it is easy to apply it for the purpose. Sometimes, however, neither of the motors are available, and resort must be had to hand power.

The drill machine here illustrated is convenient for the purpose. It is provided with a balance wheel, A, as shown, which serves to steady the action of the drill, and also as a weight to feed it down. The upper end of the spindle is provided with a swivel joint, B, to which the lever, C, is connected; by working the second lever, D, which is attached to the first by a link, E, the brace and wheel may be elevated so as to put the work in place; there is also a hook, F, which fastens over a catch, G, on the post and keeps the wheel suspended while the work is adjusted. The table, H, is made to raise and lower to suit different kinds of work. This drill may be erected any where and is very easily turned by one man or a stout boy.

Fig. 2 represents an attachment used for holding bars so that they can be drilled endwise for the reception of bolts or other pieces; either round or square bars can be held in it. Another advantage claimed in the drilling machine is that it has a gage connected with it, so that any number of holes can be drilled or countersunk to any depth, say from an eighth of an inch to 3 inches, and they will all be the same without spending any time to measure them. This is of great importance, as in many cases they require to drill almost through the plate; and as the drill will regulate this it is admitted by all who have used them to be of great importance.

This drilling machine is now used by gas companies, railroads, founderies, steam engine shops, scale makers, carriage makers, and in iron railing works; in all of these places they are much approved of and commended.

The machine was patented by Warren Lyon through the Scientific American Patent Agency on the 21st of January, 1865; for further information address Messrs. Lyon & Isaacs, No. 12 Pine street, New York, or at the factory, No. 9 Jane street, New York.



LYON'S SELF-FEEDING HAND DRILL.

The Manufacture of Steel in Pittsburgh.

We make the following extracts from the *Oil News and Mining Chronicle*, of Pittsburgh:—

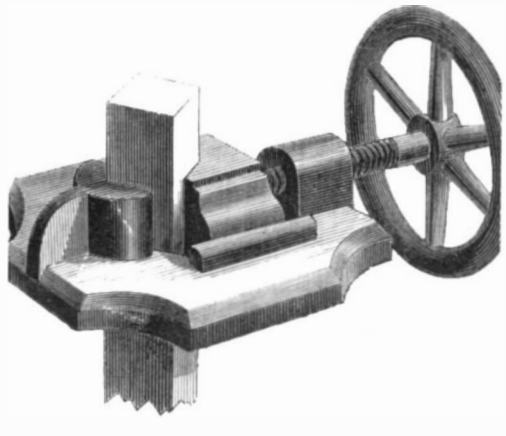
To a stranger visting our "smoky city," nothing in the way of sight seeing would be of greater interest than an inspection of any one of our large steel works. We were greatly interested as well as astonished. a few days ago, on visiting the "Black Diamond Steel Works," of Messrs. Park, Brother & Co., to find that the business of manufacturing cast-steel had made such strides in this, "the Birmingham of America," which is as well entitled to be called "The Sheffield of America."

The "Black Diamond Steel Works" are situated in the Ninth Ward, and bounded by the Allegheny River, and Butler, Smith, and Taylor streets. The works proper, consist of a "converting house," "melting room," "rolling mill," and "forge," of which, with the machinery and furnaces they contain, we propose to give a brief description. The process of manufacturing cast-steel at these works is the same as that adopted by the celebrated cast-steel manufacturers of Sheffield, England! The iron is first carefully "blowed" with charcoal, after which it is rolled into bars of the required size. These bars are then handed over to the "converters" who place them into the converting furnace (in each of which there are two "pots") with alternate layers of charcoal; when the pots are filled the tops are carefully sealed over with a tenacious red clay, and a fire then kindled in the furnace. This fire is kept up from seven to eight days, after which which the furnaces are allowed to cool down, and the "converters" enter the "pots" and take out the charge. The bars which have now been evenly carbonized or converted into "blister-steel," are broken into small pieces and sent to the melting room.

The converting house contains six large furnaces for converting or carbonizing iron, the capacity of each being twenty-five tuns per week or ten days. We now visit the melting house.

THE MELTING HOUSE.

In this building there are seventy-two furnaces or "melting holes," in each of which are placed two "pots" or "crucibles" filled with the broken pieces of carbonized iron as it comes from the "converting" house. Hard coke is used as fuel and as each "furnace" or melting hole has its separate stack or chimmey, a strong draft is obtained, and consequently an immense heat created. After the "melter" decides that the "pots" or "crucibles" containing the steel



are ready to be drawn or "pulled out," the workman whose duty it is to do this being covered up with old cloths and pieces of old carpet saturated in water, takes hold of the pots with peculiar shaped tongs and lifts them out, handing them, intensely hot, to the "melter" who taking hold of them with his tongs, skillfully pours their contents into cast-iron molds.

INGOTS.

The steel is then in the shape called ingots, and

these are taken to the forge or to the rolling mill to be hammered or rolled. The capacity of the melting department is fifteen tuns daily, which will, ere long, be increased to twenty tuns.

In this building there is one fifty horse "Corliss" engine which is used to drive the helve hammers and the fans which give blast to the many furnaces used for the heating of the steel ingots. Fourteen steam hammers and four helve hammers are driving away making so much noise that no one when in the building need attempt to speak with any notion of being heard. Here the ingots are forged into finished bars, when they are taken to the "inspection house" for examination, before being sent to market.

The mill, one of the most complete, in this or any other country, contains costly machinery of the most improved description. which is driven by three ponderous vertical steam engines and one horizontal steam engine of the "Corliss patent." To give some idea of the power of these engines it is only necessary to state that one, the largest, is of 550 horse power, one of 225 horse power, one of 150 horse power, and the smallest of 50 horse power; the three largest have each two heavy fly-wheels, 25, 20, and 18 feet in diameter. Two "trains" of rod and sheet rolls are driven by each of these vertical engines, whilst the horizontal engine drives the shears, &c., needed for cutting the steel bars and trimming sheets. We were shown a new description of patent rolls, which are to be used in finishing and polishing round bars of steel which is expected to make a great improvement in the finish of the bars.

The foundations upon which the engines and the mill machinery are placed, are built in the most substantial manner, and no wood or timber of any kind being used they may be expected to last for ages.

Twelve large steam boilers generate the steam used by the seven engines and fourteen steam hammers in use at these works.

Several of the furnaces in use at these Steel Works are built upon the gas generative principle, as patented by the Messrs. Siemen, of England, and are the first of the character erected in this country. These furnaces, after abundant trial, are found to work to the entire satisfaction of the firm, saving full 50 per cent of fuel over the old plan.

SIEMEN'S FURNACE AT PITTSBURGH.

Some time since we published a description of the furnace invented in England by Mr. Siemen, a German,and we expressed the opinion that it would prove a very important invention wherever bituminous coal is used for fuel in the arts. The *Pittsburgh Commercial* gives this account of the use of the furnace in that city:

"The process was first introduced into this country by Park Brothers, extensive manufacturers of steel and sheet copper, at Pittsburgh, under the supervision of Mr. Powe, their capable and accomplished superintendent, who had seen it applied in England. Mr. Powe erected a producer, modified to suit our American coal, and applied to the reheating furnaces of the establishment. It has done all, and in some respects even more than the inventor promised. The quality of the steel turned out of this establishment is equal to any in the world, while the facility of managing the heat is the admiration of every practical man who visits the works. The process requires of course superior intelligence in the manager, but this is rather a virtue than otherwise, as no other class of men should be employed in superintendence.

"In the extensive flint glass works near Park Brothers, Mr. Davis has tested the process for eight months, with the most satisfactory results. The furnaces formerly used about nine tuns of the best coal to do work which is now done by about five tuns of the poorest coal. The finest quality of glass is made at these works. The manageableness of the heat is shown by the fact that a furnace exposed to a temperature of 4000 degrees showed no signs of fluxing, the central pillars coming out with every angle as sharp as when the heat was first applied. In other establishments preparations are making to introduce the new process, and it is very clear that it must rapidly come into general use."

Perhaps a brief description of this furnace will be acceptable to some of our readers, who may have overlooked the one previously given. The first object of the invention is to produce an intense heat. When solid fuel is burned in an ordinary furnace, at least 1000° of heat are absorbed and made latent by the change from the solid to the gaseous form. In Siemen's furnace this change is effected before the fuel is introduced into the heating chamber. This is done by setting a mass of coal on fire in a close chamber, and subjecting it to slow combustion with an imperfect supply of air. In this operation a large portion of the coal undergoes destructive distillation, and is converted into hydrocarbon gases and vapors of a highly combustible nature, while that portion of the coal which is burned is formed into carbonic oxide only, in itself a combustible gas. The gases thus generated are led into the heating chamber, where they are mingled with just the proper supply of atmospheric air to effect their complete combustion. The absorption of heat by the change of state, having taken place in the gas generating chamber, the heat resulting from the combustion of gases in the heating chamber is at least 1000° greater than that which results from the burning of solid coal.

But a considerable portion of the heat resulting from the chemical union of the gases with the oxygen of the air is absorbed in raising the temperature of these substances. Mr. Siemen, therefore, to still further augment the intensity of his heat, raises the temperature of both the atmospheric air and the gases before they are introduced into the heating chamber. This is effected by passing each through a honeycomb mass of brick work previously raised to the temperature of white heat. There are two pairs of these masses of brick work, and they are heated alternately by the passage through them of the products of combustion, on the exit of these products from the heating chamber.

As the supply of air and combustible gases may be readily controlled by valves in the conducting pipes, the quality of the flame may be varied at will. By adjusting the flow of gas slightly in excess of the air required to effect its combustion, the presence of free oxygen to attack the iron would be avoided, and bars might be raised to a welding heat without being burned in the least.

From the clearness and controlability of the flame, the intensity of heat, the absence of smoke, and other advantages, this furnace is doubtless destined to play a very important part in the mechanic arts.

THE WAY ROGERS'S STATUARY IS MADE.

Many of our readers are doubtless familiar with Rogers's exceedingly life-like and spirited groups of statuary representing scenes of the war, and would like to know how they are made. Having just returned from a visit to Mr. Rogers's studio and workshops, we can give a correct description of the process.

FORMING THE MODEL.

The very first step is the formation of the immaterial image in the artist's mind. The gift of this intellectual conception is, of course, possessed in all varying degrees by different artists, and the few whose names will never die owe the immortality of their fame to the possession in a rare and eminent degree of this spiritual power.

The next step is to embody the thought in material form. For this purpose some substance is needed that can be enlarged or diminished at will with the greatest ease and facility, and the best material yet discovered is moistened clay. A lump is placed upon the table at a convenient hight, and is roughly fashioned by the hands, approximating to the desired form. It is then finished by a very simple instrument called a molding stick, which is simply a stick of pine with a little spoon of boxwood fastened to each end, one spoon being more delicate than the other. By means of this implement the artist cuts away the clay where it is redundant, and adds where it is needed, the material being worked either way with surprising ease. During this process the clay is kept of the proper degree of moisture by being sprinkled with water.

THE PATTERN FOR THE CASTINGS.

When the clay model is complete, a single plaster cast is taken for a pattern, and is finished with the most scrupulous care by the artist. This cast is used as a pattern for making whatever number of molds may be needed, to supply the demand for any particular group or statue.

THE MOLDS.

The molds are made of glue softened with water so as to be about as limber and elastic as india-rubber, or of about the consistence of a printer's roller. This is poured over the pattern while in a warm and liquid condition; it is therefore necessary to surround the pattern with a stiff case to hold the glue in place. This case is made of plaster and is built up by hand around the pattern. The statue is placed upon a table, and the workman forms the case around it, leaving a space about an inch in thickness between the statue and the inner surface of the case. The case is made in two parts, the dividing line being a smooth plane, as near as may be in the middle. When the case is finished it is inverted with the pattern statue in the middle of the cavity, and liquid glue is poured into the space around the statue till the space is filled. When the glue has become sufficiently hard, the two parts of the case are removed, and the glue envelope is cut by a thin sharp knife in a line corresponding pretty nearly with that dividing the case. Then the two parts of the glue mold are pulled from off the pattern, and placed again in the corresponding parts of the case, which are bound together by means of a cord, the precise position being secured by dowel pins, and then the mold is ready for casting.

The use of glue for these molds is a French invention, and is a very great improvement. The yielding and elastic nature of the substance enables the mold to be drawn from off the pattern where the pattern is "cut under," and where a rigid substance could not be employed. This permits the mold to be made in only two pieces, thus avoiding a great many seams in the statue, saving labor in finishing, and producing a more perfect and beautiful work.

THE CASTING.

The statuary is made of plaster of Paris. The workman inverts the mold and pours into it a quart or two of a liquid mixture of plaster of Paris and water, shaking it about and pouring all that does not adhere to the inner surface of the mold. He then drops in a number of bent wires, to strengthen the statue at the bends of the limbs and other places particularly liable to be broken, after which he fills the mold with plaster moistened to a soft paste. In about twenty minutes the plaster sets so as to allow the case to be opened, and the glue mold to be pulled off.

THE FINISHING.

Notwithstanding the yielding nature of the glue mold, it is frequently necessary to cut off limbs and other portions from the pattern, and to cast these separately. The parts thus cast are then attached by means of wires to their places on the statue, and the joints are finished by plaster paste. Some parts are apt to be broken in drawing off the mold, and these also must be added in paste applied by hand. These operations, together with the removal of the seams and other imperfections, absorbs a large portion of the labor of casting these statues. Mr. Rogers has three men employed in casting, eight in finishing and two in coloring, besides one or two in boxing and other incidental operations.

THE COLORING.

Mr. Rogers's statuary we regard as among the most exquisite works of art that we have ever seen, and their pleasing effect we attribute in no small degree to their color. This is simply an oil wash which is applied in three successive coatings by means of a delicate brush.

THE ARTIST.

Mr. John Rogers is from the neighborhood of Boston, in Massachusetts, and his statuary must certainly be placed in the very highest rank in this department of art. While the anatomy and features are produced with the utmost fidelity to nature, there is a life, a spirit, an emotion, a soul, beaming forth from the inanimate material that has rarely indeed been equalled or approached by the workers in marble. The emotions, too, excited by this artist's works are the highest and noblest that belong to humanity.

THE manufacturers of Troy have, by mixing different irons, produced one that will resist a tensile strain of 100,000 pounds per square inch of section. 60,000 pounds is considered about the average of good iron.

Horse Chestnuts.

Of all the waste substances which might be profitably employed in domestic economy, there is none which has given rise to more discussion or on which so many attempts have been made as the fruit of the horse chestnut, which contains a large quantity of starch. At various periods the utilization of this product has attracted public attention, and many speculators have essayed to make it an object of commerce.

When first introduced from Constantinople, the fruit of the horse chestnut was considered edible: and Parkinson, writing in 1629, included it among his fruit trees, and described the nut as of "a sweet taste and agreeable to eat when roasted." Very little use has ever been made of the nuts in this country; though in Turkey they are mixed with horse food, and are considered good for horses which are broken-winded. When ground into flour, they are used in some places to whiten linen cloth, and are said to add to the strength of book binder's paste. They contain, moreover, so large a quantity of potash, as to be a useful substitute for soap, and on the latter account they were formerly extensively employed in the process of bleaching. The nuts contain a great deal of starch.

In March, 1776, Lord Wm. Murray obtained a patent for extracting starch from horse chestnuts, which was merely by peeling them, grating the nuts, washing the pulp several times, and baking it or drying it.

Various attempts have been made to utilize them by producing sugar and spirit from them; and on removal of the bitter principle, excellent edible fecula and maccaroni have been made from horse chestnuts in France.

"Fecule de marrons d' Inde" is now made by H. de Callais, sold at twenty-two francs the kilo, 18 Rue de Bellevue, Passy, near Paris. The process adopted by this maker permits the purifying of the fecula without having recourse to the peeling which was formerly considered indispensable, and hence the extraction of the starch is as easy and cheap as that from the potato. The following is given as the cost :—

	Francs.
Collection of 20,000 kilograms of horse chestnuts in the park of St. Cloud	400
Conveyance to the factory of the Abbey de Val, belonging to Mr. Becappe	280
Manufacture and total other charges	200
Total	880

Horse chestnuts are much used on the Continent, especially in the Rhine districts, for fattening cattle and for feeding milch cows. Hermstadt gives the following analysis of a sample dried in the air, and with 21·8 per cent of the shell removed :—

Starch	35·42
Flour fiber	19·78
Albumen	17·19
Bitter extract	11·45
Oil	1·21
Gum	13·54
Total	98·59

Pabet estimates that 100 lbs. of dried horse chestnuts are equal in nutritive value to 150 lbs. of average hay. Another authority, Petri, makes them equal, weight for weight, to oatmeal.

The starch obtained from the horse chestnuts is white, and when thoroughly washed, perfectly free from any bitterness. They yield 29 to 30 per cent, and sometimes nearly 35 per cent, and contain besides a glutinous matter which, according to Liebig, possesses eminently nutritive properties, but which experience proves very inferior to the gluten of cereals. Adopting the analysis of M. Chevallier and M. Lefrage, 17 per cent may be taken as the main yield of starch with operation conducted on a large scale. Therefore, in its starch produce, the horse chestnut may be taken to be equivalent to the potato, which contains about 25 per cent in the solid state, but after deducting the pulp rarely yields more than 18 per cent of starch.

Mr. Mercandier, in the "Journal Economique" for December, 1757, stated that horse chestnuts furnish a soapy water, proper for bleaching linen. The same observer remarks that the pulp or residue of the starch furnishes an excellent food for the poultry in the farmyard, and which can be employed as a fuel.

In 1780, M. Bon, President of the Royal Society of Montpellier, published a process founded on the use of alkaline leys "for softening horse chestnuts and rendering them fit for fattening cattle in countries where acorns and pulse are not used for that purpose." About the same period an abbot of Anchin, in French Flanders, discovered a means of extracting from horse chestnuts a good oil for burning, and obtained from their flour a weaver's starch, which was used subsequently by weavers of Geneva.

FARMERS' CLUB.

From the great variety of subjects discussed at the meeting of Tuesday, March 21, we select the following:

FROZEN POTATOES AND FISH.

The question of the effect of freezing on potatoes being again introduced, Dr. Trimble remarked that whether the potatoes were injured or not depended wholly on the rapidity of the thawing. If they are thawed very quickly they are ruined, but if they are immersed in cold water, or, better still, if they are buried deeply in cold ground, where they will thaw very slowly, they will not be injured. The same is the case with apples and with fish. The speaker had seen a basket of fish frozen so solid that they rattled like dry sticks, and, on being placed in well water, in half an hour they were swimming about as lively as ever.

GRAFTING.

Solon Robinson, in reply to a correspondent, stated that a rose may be grafted with success upon the yellow locust, and that the large Spanish chestnut may be grafted upon our common chestnut.

ABOLITION OF FENCES.

It seems that Solon Robinson and some other members of the Club have long been contending for the general abolition of fences, advocating a law compelling owners of stock who wished to pasture their animals to fence them in or herd them, so that farmers who chose to dispense with fences might do so with impunity.

A communication was read from Livingston County, in Illinois, saying that in that county the plan is in successful operation, the general practice of farmers being to dispense with fences. Solon Robinson stated that he was informed on good authority that the unfenced lands in that county are quite as high in price as the fenced farms of other counties, showing that this simple regulation will save the great expense of fencing the western prairies.

Mr. Ely, the President, remarked that the same system is in operation in the valley of the Connecticut River, both in Connecticut and Massachusetts.

CLOTH FROM MILKWEED.

Dr. Henry Guernsey, of 37 East Eleventh street, New York City, exhibited samples of cloth made in part from the down of the milkweed, the warp being of silk, wool or cotton, and the filling of the milkweed down. It is necessary to remove the glossy smoothness from the fibers to make them adhere to each other, and this is done by treating them with vegetable oil. The process is patented. It is estimated that 500 pounds may be obtained from an acre, and the fiber takes colors as readily as silk.

BOOKS AND PUBLICATIONS.

DEMOREST'S ILLUSTRATED MONTHLY MIRROR OF FASHIONS.

This is an exceedingly useful publication to ladies who desire to dress handsomely at a low price. By the aid of the illustrated patterns, not fashion plates, all the latest styles of children's garments, cuffs, neckties, and a great many other things which are so fearfully and wonderfully made that we don't know the names of them, any person can cut and make their own decorations as well as those sold in the stores.

Combined with this leading feature, there are a number of short stories and poems which will serve to pass an idle hour pleasantly. For sale at all bookstores.

MANUAL OF DRAFTING INSTRUMENTS AND OPERATIONS. By S. Edward Warren, C. E. John Wiley, publisher, 535 Broadway, N. Y.

Mr. Warren has in this work given a great deal of practical information upon the use of drawing instruments, both as relates to the construction and use of them. It is a very useful and indeed indispensable work to artisans who are learning mechanical drawing by themselves or without a teacher. Shading in white and colors is also treated of, and instructions are given to represent woods of different kinds, also iron and brass. Every one interested in this subject should procure the work.

UNDINE, THE WATER SPRITE; THIODOLPH, THE ICELANDER, and GHOST STORIES, illustrated by Darley, are all romances published by Isaac Miller, 525 Broadway, N. Y.

The first named is the charming, world renowned tale of Fouque, and needs nothing further to commend it to our readers. The Ghost Stories are, says the title page, "collected with a particular view to counteract the vulgar belief in ghosts and apparitions," which they will doubtless do, if there are persons nowadays who believe in such nonsense.

A Water Propeller.

At the Sheffield Literary and Philosophical Society's annual gathering, a model was exhibited of an improved invention for propelling ships. The idea is an old one, but there is considerable novelty in the details. A screw is placed in a horizontal cylinder or tube in the bottom of the vessel, with a short perpendicular suction pipe. The motion of the screw forces water into a valve-box, from which are four open tubes, two to the bows and two to the stern of the vessel. The forward motion of the vessel is obtained by closing the bow tubes and running the water out of the valve-box by the stern tubes in a strong stream. The vessel is backed by closing the stern tubes and running the water out at the bow, and can be kept motionless by running half the water in each direction. All this being done by a mere regulation of the valves, without stopping, reversing, or otherwise interfering with the speed of the engine. The invention has been tried on the Sheffield dams, it is said, with complete success. The inventor is Mr. Terry, clerk at Sheffield.

[Why not put the propeller itself in the water and have done with it?—EDS.

Method of Working Poor Ores of Lead.

The operation on lead ores, which contain too little lead and too much quartz to be smelted profitably, Lampadius treats with muriatic acid, with heat, upon plates on stone or lead, by which the galena is completely converted, if the ore has been properly prepared, into chloride of lead. The mass is then lixiviated in tubs with double bottoms, holding each 15 or 20 cwts., with boiling water, to extract the chloride of lead, which crystallizes out in great part on cooling, the mother liquid being again heated to boiling, and used over again continually. The deposited chloride of lead is reduced to the metallic state by zinc, forming a spongy lead, which may be either melted down or used for making white lead, &c. Some iron having been thrown down from the chloride of zinc solution by chloride of lime, the zinc must be precipitated by lime as pure white oxide of zinc, suitable for pigmentary purposes.—*Chemical Centralblatt.*

Paper Carriages.

"A Patent Carriage Company, Limited," has been formed at Birmingham, for the purpose of bringing into use sundry novel improvements. The framework is of angle-iron, welded. By using this several inches of space are saved, and added to the accommodation. The panels, which in ordinary cabs are of wood, in these new ones are of papier mache. The paper resembles leather, but is stiffer and very tough. Every part of a cab usually of wood, indeed, is in this instance made of paper. The springs are beneath the body, which brings the wheels 5in. nearer than in the ordinary vehicle, and yet also gives additional room in the width. The window runs along the roof on the inside, and draws down like a sash; and there is a sash door, which may be pushed down, and coils itself below the body of the vehicle. The ventilation is also improved. One style of Hansom has a top which slides down, and thus an open carriage is provided. The cost of vehicles is said to be considerably reduced by the new mode of construction.

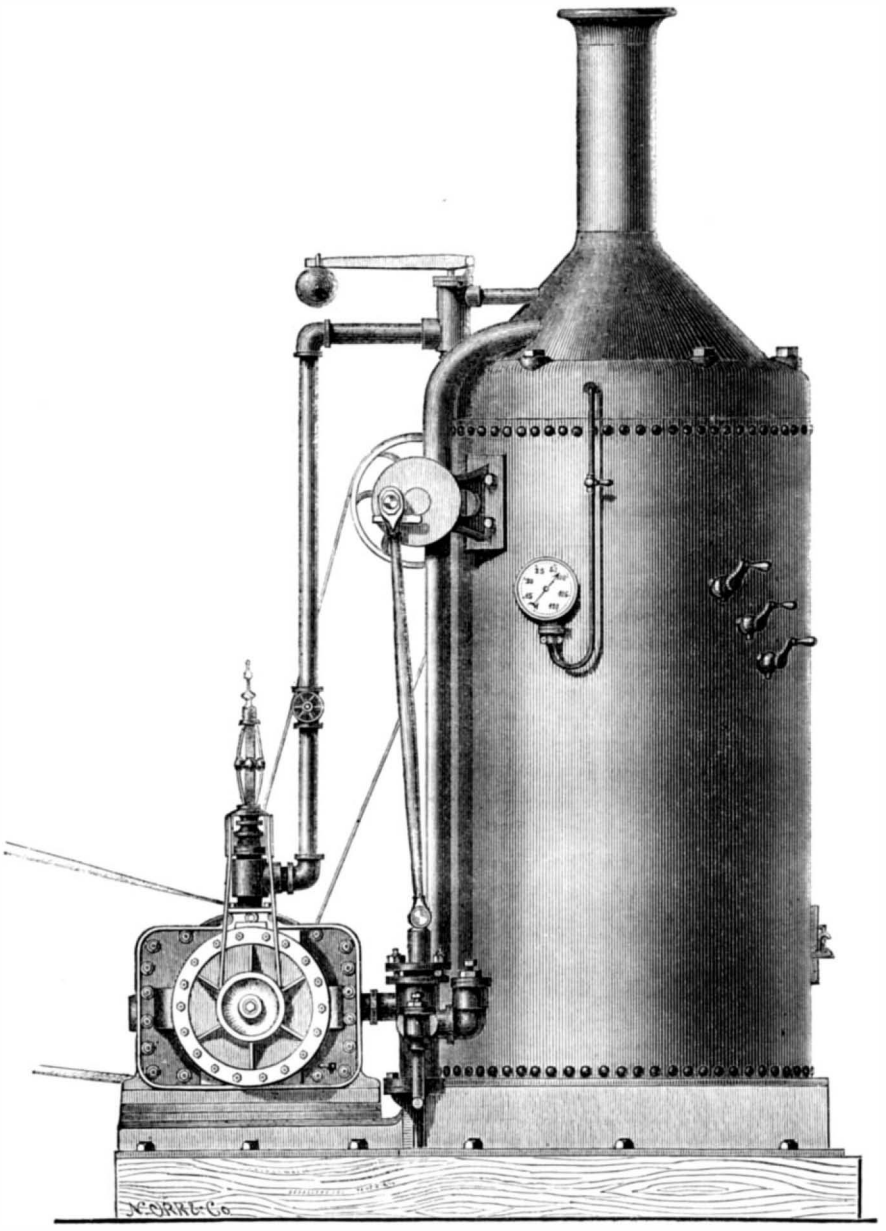
AT the mines of Traversella, in Savoy, magnets revolving on a wheel are used to pick up the iron from the powdered ore, leaving the copper-pyrites behind.

Double Piston Square Engine.

This new and simple steam engine continues to attract a great deal of attention from the engineering world, and having in several previous numbers referred to its novel construction and great practical efficiency, we now present it in a portable form, with boiler, heater, pump and fixtures, ready for the application of steam, adapted to mining, boring, pumping petroleum, and for any other use to which its capacity may be applied.

The engraving represents an engine of 15 horse-power, with upright cylinder boiler, with fixtures and connections complete, on a scale of one twenty-fourth or one-half inch per foot; the boiler is four feet diameter, seven feet high, with 127 tubes four feet long, of two inches external diameter, and ample space for circulation. The fire-box is 36 inches high and 42 inches diameter, has 9½ square feet of grate, and over 200 square feet of heating surface. The steam is taken from a circular dome attached to the top of the boiler with perforated tubes, to avoid priming. The exhaust passes through a heater into the funnel, which is 12 feet high and 12 inches diameter.

These portable engines, of 5, 10, and 15 horse power, are manufactured by "The Root Square Engine Company, and are for sale by Benjamin & Root, 155 Duane street, New York, where they can be seen in operation, and all further information be obtained.



ROOT'S DOUBLE PISTON SQUARE ENGINE.

The Great Floods.

From all parts of the country the telegraph sends tidings of great disaster to life and property from freshets. The severe winter left behind it huge snow drifts which, melting on the approach of warmer weather, swelled the small streams, feeding the large rivers so that they overran their banks, with the results as above stated.

In some portions of the country the damage has been much greater than others, and in the valley of the Susquehanna particularly the loss is great. At Harrisburgh, in 1846, the year of the great flood, the water rose to 22 feet above low water mark.

This year, however, in one day the water had reached nineteen feet above low water, and at seven in the evening it reached twenty-four feet eight inches, eighteen inches higher than in 1846. Some idea of the rapidity of increase in volume, may be gathered from the fact that during the space of eleven minutes by the watch, the river had risen three inches. From nine to four o'clock it rose two feet, and continued to rise at the rate of seven inches per hour.

Between two and six o'clock the following afternoon there was a rise of some twenty inches, being a decrease of rate as to hight attained, but not as to volume.

Early in the morning the engine room of the City Water Works was submerged, the fires extinguished, and the engines stopped working.

The scenes and incidents are thus described by the Philadelphia *Inquirer*:—

"Timber, in all shapes came rushing down with the rolling torrent at the rate of about eight miles per hour. It was curious to see, as they approached the bridge, how they appeared like so many battering rams, bent on a war of extermination. They seemed to prepare themselves for the occasion. Now and then a sleek, fat 'boom log' would come sailing along like a clipper ship, and, nearing the bridge, would poise itself for the attack, and go crashing through the weather-boarding and timbers much to the delight of the urchins assembled; or, failing in that, would gracefully rebound, and then dive under to reappear on the other side, on its voyage to the Chesapeake. But the bridge stood these damaging attacks most manfully. Stretching far as eye could reach, almost, was the yellow, muddy element, raging and roaring where it met with obstacles, like the billows of a troubled sea, spitting its white foam in mad glee. An immense concourse of people were intent upon watching the bridge and the mad capers of the floating timber."

The damage in Harrisburgh alone is estimated at $1,000,000.

Browning Iron and Steel.

The *Moniteur des Interets Materiels* publishes this receipt for giving a brown color to the surface of polished iron or steel: Mix four parts of water by weight, one part gallic acid, two parts chloride of iron, two parts chloride of antimony. The chloride of antimony (butter of antimony) should contain the least possible acid in excess. Dip a sponge in the mixture and rub the metal to be colored. By repeating the process the color can be deepened at will. Wash thoroughly with water, and when the surface is dry cover it with a light coating of boiled linseed oil.

APPLE WINE.—Williams Pratt, of East Hartford, has been experimenting in making and preserving cider, and has an article which he calls "refined" cider. He removes all impurities by refining, which leaves the cider nearly as colorless as water. It is then colored a light olive color by putting in a little burnt sugar and chopped raisins, and the cider comes out perfect in flavor and color, and will keep for years. It is really apple wine.

Effects of Shot on our Iron-clads.

The *Montauk* recently arrived at the Washington Navy Yard. This vessel has been on active picket service off Charleston and Savannah for over two years, and shows some two hundred and fifty marks of the enemy's shot, shell, etc., expended in futile attempts to injure her, amongst the most dangerous of which was the explosion of a torpedo directly under her port boiler, while she was in front of Fort McAllister, in the Ogechee river, below Savannah, starting some bolts and rivets, and necessitating the bolting down of a large sheet over the break on the inside; also, on the port side the marks of four solid shot, three of which have cracked the five one-inch plate sheathing on the hull, and one going entirely through, lodging somewhere in the four and a half feet of wood, behind the five-inch plates, which composes the overhang. A solid shot fired from a ten-inch columbiad at direct short range, whilst on picket duty in Charleston harbor, has left an indentation in the turret (which is composed of eleven one-inch sheets) of about three inches, without any very perceptible injury on the inside.

The *Montauk* comes to this yard to receive two 15-inch guns, now on the wharf at the yard-sheers, in place of her present 15-inch gun, which has been fired five hundred times, and is declared unfit for further service, and her 11-inch Dahlgren shell-gun. Her ports are to be enlarged in order to allow her new guns to be fired with the muzzles outside of the ports, and thus obtain more elevation and a better range.—*National Intelligencer.*

A Self-acting Candlestick

Among the objects recently displayed at the South London Exhibition was a rough model of a candlestick, which, the inventor says, possesses the following extraordinary properties:—"Indicates the time after the candle is partly consumed; repeats the hours over again if required; snuffs itself out, rings you up, opens your door, boils a pint of water, by a pot which boils at both ends, to make a cup of tea or coffee, and rings a bell when the water boils; rings the servant up, and drags off the bedclothes, and pulls her out of bed if refusing to get out at the proper time."

Damp Corn.

A Chicago contemporary says: Disappointment is expressed at the condition in which the new corn is coming to market, scarcely any of it passing inspection as No. 1, the great bulk coming in rejected, and very damp at that. The winter weather it seems has been too steadily cold for drying out the corn, which improves better under a changeable temperature if it is not too wet.

[How does this happen when there are so many kilns for drying grain invented, patented, illustrated and advertised yearly?—EDS.

THE DIFFERENCE.—"After staying eighteen years in this country," said Prof. Agassiz, "I have repeatedly asked myself what was the difference between the institutions of the old world and those of America; and I have found the answer in a few words. In Europe every thing is done to preserve and maintain the rights of the few; in America, *every thing is done to make a man of him who has any of the elements of manhood in him.*"

Improved Depthing Tool.

This engraving illustrates an invention used by watchmakers to determine the correct position or depth of the lever in relation to the balance. An ordinary tool of this description has two sets of centers side by side, one set to take in the arbor of the balance, and the other to take the lever staff, so that the correct position of the latter, in regard to the balance, can be ascertained. In such tools one of the centers, which takes the lever staff, passes through the balance, and the arms of the latter, by striking said center, prevent the mechanism from being set in motion until it is taken from the depthing tool and adjusted on the watch; the final adjustment of the watch has to be accomplished with great difficulty and loss of time. These disadvantages are overcome by this machine. It consists in the application to one of the centers intended to sustain the lever staff, of a U-shaped supporting bar, provided with a suitable center to take in the loose end of the lever staff, in such a manner that the whole mechanism can be set in motion while in the depthing tool, so that the relations of the principal parts can be found with ease and celerity; precisely the same as if the movement were in the watch.

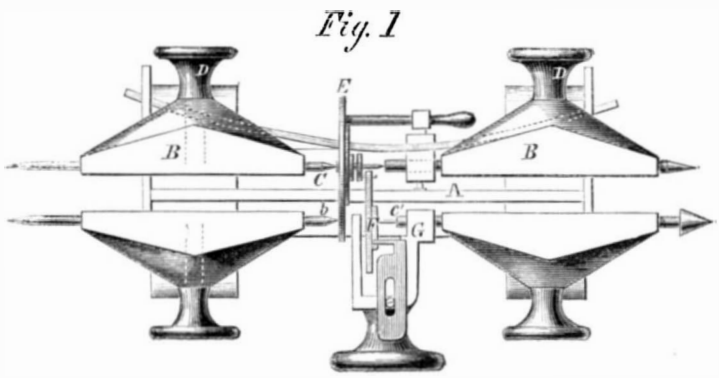


Fig. 1

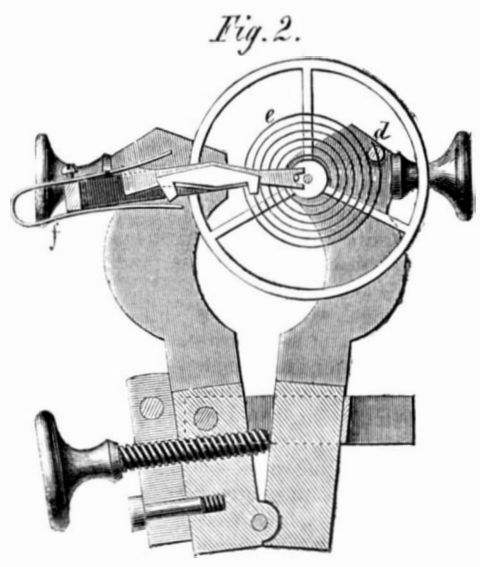


Fig. 2.

RUSH'S DEPTHING TOOL.

The construction is as follows:—The bed, A, is similar to all others; on this bed there are two sets of heads, B, which carry four centers, C; these centers can be adjusted by the screws, D, to suit the lengths of the staffs to be held in them. The centers, C and *c'*, are intended to take the arbor of the balance, E; and the staff of the lever, F, is placed with one end in the center, *c'*, and the other end in the center in the U-shaped bar, G, before spoken of, which is attached to the center, *c'*, by a set screw or otherwise. The center, *b*, which would otherwise interfere with the motion of the balance, is not required to support the lever, F, and the various parts of the escapement can be adjusted without difficulty. The loose end of the hair spring, *e*, Fig. 2, is secured in a stud, *d*, which, in turn, is attached to the center, C, being adjustable thereon by means of a set screw. The U-shaped bar bears the spring, *f*, Fig. 2, with projections or pins on the ends to take the place of the banking pins that have to be used in an ordinary lever watch. By means of this tool the lever can be adjusted to the correct depth without placing it in the watch, and the entire operation may be per formed while all parts are plainly visible. This invention was patented through the Scientific American Patent Agency, Dec. 6, 1864, by Artemus Rush, of Fairfield, Iowa; for further information address him at that place.

Asiatic Manna.

A letter from Mr. Hardinge, to Sir Roderick Murchison, describing the appearance of a large quantity of manna in July, 1864, observed near Diarberker, Asia Minor, was published some time since, and created a good deal of controversy regarding the nature of manna. We believe, however, that there can be very little doubt that it is a species of lichen, which, like a fungus, springs up in the course of a single night, and thus gives rise to the notion that it has fallen from the skies. This manna is ground into flour and baked into bread, the Turkish name of it being "Kudert-bogh-dasi," which means wonder-corn, or grain. Though used as bread, its composition is remarkable; for it contains more than 65 per cent of oxalate of lime, and has about 25 per cent of amylaceous matter. This substance is evidently the manna of the Hebrews, who gave it the name of "Man-hu," which signifies "What is it?" from the circumstance of its sudden appearance and their previous unfamiliarity with it.—*Technologist.*

Use of the Common Nettle in Yellow Fever.

Mr. P. W. Nicoll, of Jersey, Eng., having seen the accounts in the papers of the fearful ravages of the yellow fever at Bermuda, writes to an English journal as follows:—"I have a French work stating that the common nettle dried and reduced to powder, and used as a condiment for preparing food, is a preserver against this fearful malady. It is made into a liqueur and sirup in France, and is preferable to absinthe. I have succeeded in bringing this useful but despised plant into general use here with great benefit, as acknowledged by several medical men, both here and in London. To preserve it it should be put in bottles or any package which preserves it from damp and mildew. By its use a man can be his own doctor, and if living in the country, without any expense. The late M. Soyer, the prince of cooks, recommends it justly as a good and wholesome vegetable."

National Defenses.

During the last session of Congress Mr. Sherman, of Ohio, in the course of debate made the following sensible remarks:

"We have provided here $1,000,000 for field-works and field operations, and the very fact that during this war these improvised earthworks made entirely of earth, with wooden magazines, which are drier and better for many purposes, according to the books, have resisted us more than any other form of fortification, ought to prevent us from continuing the old system of fortifications. Wherever earth can be found, wherever it can be hauled, wherever it can be reached, it is admitted now to be the best basis of fortification, and granite works and stone-works are to be only used where earth cannot be found. That is shown by one case of Fort Fisher and by the case of Fort McAllister. Not a single one of the old fortifications which cost this country $150,000,000 has ever been of any material service to us or, I believe, to the rebels. The $150,000,000 which have been expended in fortifications, if put out at interest at the time the money was expended, and accumulated to this hour, would carry on this war for one year. There never has been money worse wasted than that we have spent in building a system of fortifications which must be changed every ten or twelve years to adapt them to modern improvements.

"I have been perfectly willing to vote any amount of money for building iron-clads and iron boats wherever they have been demanded. I believe the only way to defend our sea-coast is by building a certain class of monitors and boats to float in our harbors. It appears to me sensible and reasonable that a single battery floating upon a monitor in the port of New York, for instance, in such a position that it can be moved from place to place, can follow a public enemy, itself impervious against attack, so strongly armed that the most powerful projectile now known to modern warfare cannot penetrate, is the proper kind of harbor defense upon which we must rely. Earthworks, and stoneworks, and guns planted on the shores will not answer the purpose. Hereafter naval contests and all contests along the shore will be such contests as that between the *Monitor* and *Merrimac*, where they were eye to eye, face to face; and the cannon exploded within eight feet of where the shot struck. If ever hereafter two maritime nations are engaged in war, the great battles on the sea will not be at the distance of a mile, like the battles of the Nile and Trafalgar, but they will be wrapped together face to face, more like the battle of Lake Erie, under the gallant Perry. Sir, we shall hereafter rely for the defense of our ports upon the iron-clads. Iron supersedes stone. This is the age of iron; no longer the age of stone. Earthworks which may be improvised in a month will disappear, and iron-clad turrets and monitors, and all the numerous progeny that will spring from the inventive race of which we are a part, will supply us with ample coast defense in case we have a foreign war. These can be made within a year. These can be made within one tenth of the time that a single field-work or fortification can be built. We must rely upon them, and therefore I am opposed to this constant expenditure upon an old system of fortifications.

Analine Black.

Aniline black is a colored derivative of aniline, which, so to say, completes the series of brilliant colors derived from this base. It differs, however, in many respects from the other colored derivatives. The mode of production, the way of fixing it on fabrics, and the insensibility to physical and chemical agents which it presents are points on which it differs essentially from the red, blue, and violet of aniline. M. Lauth's process, which is admitted to be but a simple modification of Mr. Lightfoot's, consists in printing with the mixture of hydrochlorate of aniline and chlorine of potassium an insoluble oxidizable salt, which will become soluble on the fabric—sulphide of copper, for example. By the oxidizing action of the chloric acid (or the chlorine which is set free by the reaction of hydrochlorate of aniline on chlorate of potassium), the sulphide of copper is transformed into sulphate. In this same process some of the disadvantages of Mr. Lightfoot's process are avoided. It is more economical, the mixture does not act on the steel rollers, nor does it weaken the fabric—not more, at all events, than madder black. The color is very permanent, and is fixed at from 20° to 40° C. Its composition allows of its being printed with all sorts of colors. Aniline black has a specially beautiful appearance; it has a very rich black velvety look. It is completely insoluble in water, alkaline, or acid, and is not affected by soap. Acids change the black to green, but the original color is restored by an alkali. Bichromate of potash deepens the shade, but a very strong solution slightly reddens it. Strong chloride of lime bleaches it, but the color returns after a time.

COMPOSITION FOR COATING WOOD.—A method of coating wood with a varnish as hard as stone has been recently introduced in Germany: the ingredients are forty parts of chalk, forty of rosin, four of linseed oil, to be melted together in an iron pot. One part of native oxide of copper, and one of sulphuric acid, are then to be added, after which the composition is ready for use. It is applied hot to the wood with a brush, in the same way as paint, and, as before observed, becomes exceedingly hard on drying.

Correspondence

Facts Concerning Screw Propulsion.

MESSRS. EDITORS:—The subject of screw propulsion being much under consideration by engineers and scientific people it may not be amiss to give a few details to the point. Noticing a communication on page 150, Vol. XI., on twin screws, and another, page 182, and having the details of one very successful twin screw steamer, as well as being somewhat acquainted with many others, I take the liberty to send the following:—

At the time the propeller *Independence* was built, which your correspondent, R. C. B., writes of, 300 tuns was about the largest ever built, while now 700 to 800 tuns is the usual size. They were not confined so much in the size of their wheels as now, and the notion prevailed that large wheels would be more effective with the same engine power, than smaller wheels wholly submerged; the consequence was the engines were almost always overloaded with wheel. The wheel being turned slow the water had time to slip away, and much power was lost. It is now found that wheels small in proportion to engine and a rapid motion is best if the wheels are properly submerged. This is perhaps the reason why with engines and boiler the same, the power applied to one wheel drove the *Independence* so much faster than when applied to two wheels; her motion was very slow at best. There have been many twin screw steamers built lately and all have been very successful, and we can draw from them some arguments in their favor. The opinion is still held by many that one screw is preferable; "first cost," perhaps, influencing some, but as the size of vessels increase the feeling grows in favor of twin screws. The distribution of the weight over greater space increases the durability of the vessel, and in case of accident to one there is still a fair propelling power in the other. In the summer of 1860 the twin screw steamer, *Iron City*, made a voyage from Saut St. Marie, through Lake Huron, to Detroit, she having lost one wheel a few miles above the "Saut"; many instances have been known of the same kind. Twin screws being smaller can be more submerged and can be hung further forward which diminishes the danger to machinery when the stern is lifted by a wave; the greater exemption from dangers of collision in consequence of the greater ease with which they can be maneuvered in all circumstances, are arguments strongly in favor of twin screws.

The steamer *Monitor* came out in the spring of 1863; her dimensions are as follows:—Length of keel 201 feet, breadth of beam 30 feet, depth of hold 12 6 in. She has two vertical, direct, high pressure engines, 26½ inches bore, 30 inches stroke, attached to Loper wheels 8 feet 6 inches in diameter, and two return flue boilers 20 feet long, 8 feet diameter of shell. She was built for speed and has been a decided success, beating the fastest propellers on the lakes so far.

In the fall of 1863 the steamer *Fewabic* came out. This boat was built principally for freight; her performances have been very remarkable; her dimensions are:—Length of keel 200 feet, breadth of beam 31 ft., depth of hold 12 feet 6 inches. Govt. tunnage 738, draft of water with 80 tuns fuel and 400 tuns freight on board—forward, 8 feet; aft, 9 feet 6 inches. She has two boilers, length of each 21 feet; diameter shell 9 feet, with 5 direct flues; two of 14 inches diameter, 3 of 10 inches diameter, 110 return flues 3 inches diameter; length of grates 5 feet 6 inches, width of same 6 feet 9 inches; one smoke stack for both boilers, 60 inches diameter; two vertical, direct, high pressure engines, bore 26½ inches; stroke, 30 inches; two Loper wheels 8 feet 6 inches, 16 feet pitch; steam pressure used, 72 lbs., distance cut off, ⅜, revolutions per minute, 86; speed with everything as above, 12 miles per hour. She has beaten everything she has been alongside of yet, either screw or paddle, without any increase of steam pressure, using steam full stroke; she has been so remarkable a success that it has occasioned many inquiries. It seems to be partly due to the genius of her engineer, who superintended her machinery from the beginning, and partly to her water lines being very hollow near the stern post giving a very free current of water to and from the wheels.

Screws seem to be more successful as hollow water lines are more used. Your correspondent, "Naval Engineer," thinks single screws best on full vessels; perhaps it is because single screws are farther away from the hull than twin screws are, but the growing improvements in marine architecture must soon do away with such a reason. The vibration occasioned when the fans of a single screw pass the stern and rudder posts must be very destructive to the hull. I notice all the older one-wheeled propellers are badly hogged aft, probably occasioned by this vibration. For many purposes the single screw will no doubt be best especially where sufficient immersion is attainable and for small crafts, but it is still to be ascertained by experiment with properly proportioned wheels—boiler, and engine power being the same—which will give the best results, one or two screws, and we can only await the decision. Meantime it is certain all kinds of arrangements have their appropriate place; paddle wheels for very shoal waters, twin screws for medium depths and screws for deep waters. The following are the details of a small one screw tug built here last spring called the *Pioneer*. length over all 54 feet 4 inches, breadth of beam 11 feet 4 inches, depth of hold 4 feet 5 inches, draft of water with fuel for 24 hours, forward, 3 feet 3 inches, aft, 4 feet 3 inches, immersed cross section 26.5 square feet. Engine, single, vertical, direct high pressure, bore 10 inches, stroke 12 inches, wheel Loper, diameter 4 feet, pitch 7 feet 6 inches. Boiler length, 8 feet, hight, 6 feet, width, 40 inches, with 50 return flues 2 inches diameter, length of grates, 4 feet, width, 2 feet 8½ inches, square feet heating surface, 232·6, pressure steam used, 70 lbs., revolutions per minute, 130, fuel used per hour, ⅓ cord of wood; speed as above, 10 miles per hour. She is a very hollow line model with largest frame located at mid length of load line. J. W. C.

Sugar Island, Mich., Feb., 22, 1865.

[These are interesting facts; it is believed by our leading engineers here that single screws are more economical than double ones.—EDS.

Comments on Slovenly Workmanship and Want of System.

MESSRS. EDITORS:—Your remarks in a late number on turning and boring tools are very true, especially as regards keeping the cutting edges the same shape until the tools are worn out. Grinding a little off the extreme edge in a hurry until the tools are the reverse of their original bevel, is a very slovenly practice, and a sure sign of a botch. In order to do first-rate work, great care is necessary in the grinding of lathe tools. It is an utter impossibility to keep the requisite edge and slant upon them unless the grindstone is kept in good trim. In some shops the foreman objects to have the stone turned up frequently, from a mistaken notion that it is wasting it. There is a large propeller shop in Buffalo, N. Y., where several hundred hands are employed, and only one grindstone for machinists, boiler-makers and blacksmiths. The consequence is that after one day's use the stone becomes about the shape of a horse's head. I have seen instances of good workmen leaving because the foreman obstinately declined to have it turned up. Further comments on such slovenly style are unnecessary.

I see by your last week's issue that grinding valves together with emery had gone out of practice for fifteen years. I can assure you that in the aforesaid shop of untrue grindstone notoriety this slovenly and abominable habit of grinding valves is still continued, although everybody that knows anything about it knows that a scraped joint is vastly superior to a ground one. The fact is they have no true iron surface plate in these shops, or they would quickly find out by applying it to a ground surface that it is further from perfection than before the oil and emery were applied. The same remarks may be applied to piston rings. In such shops, after the piston and packing are turned, the piston is put in the lathe again; a sheet-iron spring clamp is put round the rings; the follower is tightened up by degrees, and emery and oil are showered on in the most filthy and wasteful manner for hours. The antiquated style in which work is still done in some shops has to be seen to be believed. There is a total want of system—"a place for nothing, and nothing in its place." New mandrels have to be made for every job; wooden chucks and bolts to be got ready. A man that has been accustomed to work in a shop with tools to work with, and seeing work done as it ought to be done, feels in a shop of that kind a regret that he was not brought up a feeder of swine.

Another thing I wish to call your attention to is the shocking bad care that some men take of machines. A splendid new lathe, got up in the best and most modern style, will in a few years become a perfect scrap heap, through the dirty, slovenly, and careless work-in-a-hurry style of the men. The shears of a slide lathe are often got up with great care and accuracy, and might be just as good after twenty years' use, but for the abominable practice of not having boards to lay over them. Nothing ought to be laid on the shears or bearing parts of any machine. I have seen a shop where not even a wrench was allowed to be laid on them. The consequence was that after being in constant use for upward of a dozen years, the tools sold for above their value when new. A VETERAN LATHEMAN.

Fort Wayne, Ind.

Dental Plates.

MESSRS. EDITORS:—In your issue of Feb. 18, 1865, I observed a communication headed "Dental Plates." Your correspondent complains of his upper set of artificial teeth producing a galvanic action in the mouth since the teeth were repaired. I think the trouble with his plate is that the solder used in repairing them was of an inferior kind, alloyed with too much copper or brass. The fluids of the mouth being probably more or less acid, from decomposed food around the teeth or other causes, a galvanic action might very possibly obtain. A pure article of gold will not usually produce any unpleasant sensation of a galvanic nature, or cause a brassy taste in the mouth. There are cases, however, but very rare, where a metallic plate cannot be used with comfort, owing to an unpleasant feeling and taste. A perfectly pure plate of gold would be too soft; it must be alloyed, or it would soon wear out. The solder which is used to attach the teeth to the plate must flow at a lower temperature than the plate, otherwise the plate would melt in soldering. To cause the solder to flow it must be alloyed to a lower grade than the plate, and in extremely sensitive mouths, unless pretty pure, it will cause an unpleasant taste. Hard rubber as a base for artificial teeth does not produce any unpleasant sensations. It is easier to keep a rubber set clean, there being no interstices between the teeth and plate for the food and fluids of the mouth to lodge, decompose, and become offensive, as in a metallic plate. I should recommend "S. H." to provide himself with a set upon rubber. If he will, his troubles will all be over, and he will be able to masticate his food the rest of his days in peace and comfort.

Although my name is not upon your books as a subscriber, yet for years I have taken the SCIENTIFIC AMERICAN from newsdealers, and feel that I cannot do without it. It is more popular with my patients than any other publication which I keep upon my table. E. J. CHURCH.

Michigan City, March 13, 1865.

Raw Pork and Tape-worms.

MESSRS. EDITORS:—In your paper of March 18th I notice an article entitled "Raw Pork and Tape-Worm," by Dr. C. A. Canfield, of Monterey, Cal., in which he says:—"As for the tape-worm being caused by eating raw pork, that is about the last thing to which an intelligent observer who had resided in California would attribute it."

The Doctor argues thus:—"Tape-worms are found in herbivorous animals, therefore men cannot get them from pork." The Doctor is certainly a logician; but his logic does not agree with the natural history of the parasite.

The whole class of vertebrates is liable to these invaders, fishes not excepted—

> "Fleas have other fleas to bite 'em;
> And these fleas, fleas, *ad infinitum*."

so every animal has its own tape-worm that can never be perfected except in its own intestines, and in every case must be introduced in the food. The propagation of this kind of parasite is in a cycle. In man

for example, the *cysticercus cellulosae*, or larvæ of the tape-worm is taken into the stomach in measly pork, and developes in the intestines into the full-grown worm. The eggs of this tape-worm, after passing off in the feces are taken up in the sap of succulent plants, eaten by the hog, and developed into the *cysticercus*. The eggs of the tape-worm, taken into the human stomach, will undergo no change, and, in short, will never develop save in the intestines of the hog, whence they find their way over the entire animal. So also the *cysticercus*, eaten by the hog, never developes, nor will it in any case except when eaten by man.

The tape-worm of the sheep, of which Dr. Canfield speaks, is from the eggs passed from the dog. In like manner the tape-worm of the rat is from the cat.

These are facts in natural history, established beyond a doubt by actual experiment, our California friend to the contrary notwithstanding.

I have noticed the article in order that the good effects of your very proper caution in your issue of Nov. 19th may not be lost. If one must eat that filthy article of food, pork, let him be sure that it is fully cooked, otherwise the vitality of the *cysticercus* will not be destroyed.

By experiment I found that when the well-known anthelmintics, kousso, pomegranate, male-fern, and others, failed, the old woman's remedy of pumpkin seeds invariably brought the parasite away. Two ounces of pumpkin seed deprived of the outer covering and beaten up with sugar and water into an emulcient, taken at a single draught and followed in two hours by castor oil removes the troublesome and disgusting parasite.

A scientific friend at my elbow says that Washington officials are troubled with a new species which he calls *taenia rubra*, or red-tape, and he recommends in some instances *tinctura auri* applied to the palm of the hand. A. G. W.

Washington March 21, 1865.

[These statements are the same as those made in our first article on the subject, in Vol. V., page 100. —EDS.

Opposite Motions of the Earth at the Poles.

MESSRS. EDITORS:—To give a clear illustration of the motion of the earth at the poles, it will be necessary to take in hand a small globe and bring the poles to a horizontal position by giving the globe a motion from west to east, and at the same time bringing the equator to the horizon. Here we find (say at the north pole) a left-hand horizontal motion. We now turn the globe, still keeping up the motion, so as to bring the south pole vertical; here at this pole we find a right-hand horizontal motion directly opposite the motion just witnessed at the north pole. We never have seen these ideas advanced by philosophers, but this simple experiment will satisfy the most skeptical that opposite motions exist at the poles. F. D. SPALDING.

Elkhart, Wis., March 7, 1865.

SPECIAL NOTICES.

PHEBE ANN FISH, executrix of Almond D. Fish, deceased, of Chazy, Clinton Co., N. Y., has petitioned for the extension of a patent granted to Almond D. Fish on the 14th day of November, 1848, for an improvement in coffins.

Parties wishing to oppose the above extension must appear and show cause on the 15th day of May next, at 12 o'clock, M., when the petition will be heard.

HENRY MOESER, of Pittsburgh, Pa., has petitioned for the extension of a patent granted to him on the 24th day of June, 1851, for an improvement in printing names of subscribers on newspapers, etc.

Parties wishing to oppose the above extension must appear and show cause on the 5th day of June next, at 12 o'clock, M., when the petition will be heard.

JOHN CRUM, of Ramapo, N. Y., has petitioned for the extension of a patent granted to him on the 1st day of July, 1851, for an improvement in machinery for cutting files.

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

A BILL punishing strikers who interfere with workmen with a fine of $100 and six month's imprisonment, has passed the Legislature of Minnesota.

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:—

Mouth-piece for Cigars and Cigarettes.- In the manufacture of cigarettes the mouth piece is one of the most important parts. Cigarettes without a mouth-piece are disagreeable to smoke, because the tobacco which forms the filling is liable to be drawn into the mouth of the smoker, much to his annoyance. The mouth-piece which forms the subject of this patent is made of the stems of tobacco or stalks of other suitable plants; enough of these are taken to form the desired size for the mouth-piece and wrapped or rolled up in paper or leaf tobacco, and then cut up in pieces of the requisite length for insertion in the end of the cigarette. Mouth-pieces made in the same way are inserted or formed in the ends of cigars. To explain: a prepared Havanna stem, long enough to reach the entire length of the cigar, is placed with one of its ends in the mouth-piece, above described, and the filling placed around the same, then the binder is rolled around this, and afterward the wrapper is wound around the whole, and the ends finished in the usual manner. The mouth-piece thus inserted in the cigar affords a firm bearing for the teeth, and the smoker cannot easily chew up the end of the cigar; a better draught is insured by means of the mouth-piece, and the strips running through causes the cigar to burn more evenly; and at any stage in the smoking the cigar may be inserted, if desirable, in a cigar holder, and it will draw freely, which is not the case with the ordinary cigar after the end has been wet. Cigars made in this way are about as agreeable to smoke without a cigar-holder as ordinary cigars are with one. The inventor of this mouth-piece is M. J. Danziger, tobacconist, No. 54½ Division street, New York.

Combined Friction Wheel and Oil Chamber.—This invention is more especially intended for railroad car brakes, but is also applicable to other machinery to which power is transmitted through the medium of a friction wheel. It consists in combining with a friction wheel an oil chamber arranged in such a manner that the former will always be kept in a perfect state of lubrication, the importance of which, in connection with a friction wheel for transmitting power, may be easily imagined. A. I. Ambler, of Chicago, Ill., is the inventor.

Steam Whistle.—This invention consists in the arrangement of two or more apertures of different size, in the lower end of the bell in such a manner that different sounds are produced by the action of the steam issuing from the whistle. Said bell is supported by strips extending between the round apertures and screwed into the bowl which connects with the steam supply pipe so that the center of the bell is left perfectly free, and no central bearing is required. The plug, around the edge of which the steam issues, is provided with two surfaces corresponding to the supports of the bell, and secured by the same in the pawl in such a manner that the steam extending from the supply pipe is divided, causing it to strike the edge of the bell with more force than it does in a whistle of the ordinary construction. Chas. K. Ward, of Cincinnati, Ohio, is the inventor.

Improved Waterfall.—This invention consists in the use of horse hair instead of human hair in the manufacture of waterfalls, Horse hair or other hair of sufficient length can be doubled up at the upper edge of the waterfalls. and drawn in double strands over the pillow or stuffing, and when it is secured by braiding extending across the waterfalls near the upper ends of the strands; then again, a little further down, and again on the under side of the pillow in two different places, the strands of hair used as a covering of the pillow are securely held in place, and an article is produced which is not liable to get out of order. The stuffing in ordinary waterfalls is composed of hair inclosed in the inner ends by a piece of gauze or other suitable textile fabric, and on the other directly by the covering hair, so that when the covering hair is slightly dislodged, nothing but hair is visible below. But in these improved waterfalls the stuffing is made of a pillow composed of hair or other suitable material inclosed in a case made of some textile fabric, and each waterfall can be worn with perfect safety because the covering hair of the same is held so firm in its place that it is not liable to become dislodged, and the pillow is effectually concealed. The inventor is Philip Walter, who is manufacturing the article at 113 Leonard street, New York.

Dress Skirt Plaiter and Adjuster.—This invention is intended to do away with the old and tedious process of plaiting and gathering the material for the dress skirt, and to render this part of dressmaking more easy. The invention consists of a flexible metallic band, which can be adjusted to any sized waist, so that the exact measure of the lady's waist is obtained. An elastic card is placed around the metallic band which serves to compress the goods when plaited, and while in process of plaiting; there are also metallic clasps to secure the goods at each quarter. By means of this unique and useful instrument a lady may plait her dress and try it on, and the goods being firmly held in the adjuster, she can regulate the length and shape of the lining, and then sew it to the waist or band while the goods are still within the cord and band, and all this is done without the use of a pin. The inventor of this useful and convenient article is Israel M. Rose, of New York city. The manufacturers are Messrs. W. S. Thomson, Langdon & Co., 391 Broadway, New York.

Separating Gold and Silver from other Mineral Substances.—This invention consists in a new process of separating gold, silver and other metals from metalliferous rock, in which ashes and coal are used as a flux, and the metals are finally obtained by a novel solution, composed of ashes or charcoal, and mineral salts, and sulphuric or other suitable acid, the whole being then subjected to heat and afterwards allowed to settle, when the valuable metals will be found at the bottom, the earthy matters in the middle, and the chloride at the top and in the liquor. George N. Jennings, of Virginia City, Nevada Ter., is the inventor.

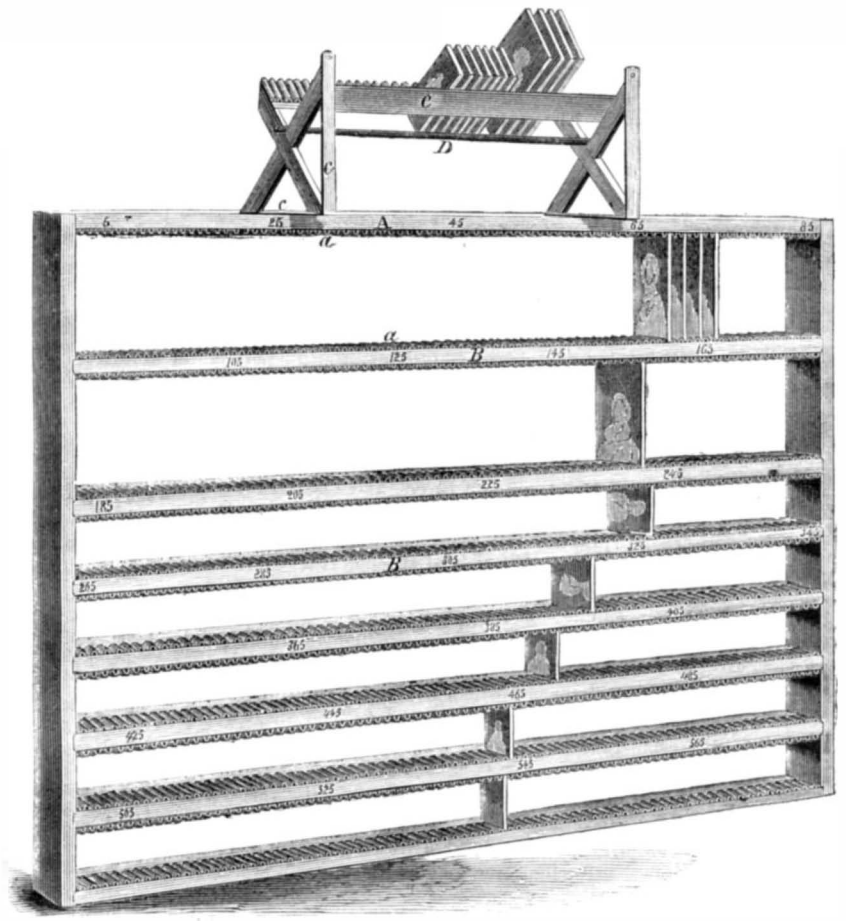
Oil Ejector.—This invention consists in closing the bottom of a well tube in which an oil ejector is used, and placing a valve therein below the embouchure of the ejector. The effect of this construction is to prevent the pressure of the currents of fluid or liquid delivered into the tube from the ejector from acting upon the gaseous or liquid contents of the well, and so to relieve the packing and also the gases and liquids in the surrounding rock from such pressure. By means of this invention the whole energy of the currents which pass through the ejector is used directly to litt the column of gases and liquids in the well tube, and none of it is allowed to react against the packing or against the incoming oil and gases. F. S. Pease, of Buffalo, N. Y., is the inventor.

Still for Oil and other Liquids.—This invention consists in a still with two chambers, one above the other, and communicating with each other through suitable pipes or valves arranged in combination with a supply pipe and with separate heads and escape pipes in such a manner that oil or other liquid introduced into the upper chamber can be freed from its most volatile constituents and heated to a high temperature before it is let down into the lower compartment in which the first distillation is effected. The valves which open and close the supply pipe and the passage leading from the upper to the lower compartment are connected to floats in such a manner that the level of the liquid in both compartments remains uniform by the automatic action of said floats and valves. The formation of a sediment in the bottom of the still is prevented by a stirrer to which a continuous rotary motion is imparted while the distilling operation is in progress. Cearles A. Hardy, Pittsburgh, Pa., is the inventor.

THE *Cronstadt Messenger* describes a rare phenomenon witnessed there a few days ago, when two parhelia, or false suns, were seen flanking the real sun right and left, on a line parallel to the horizon. Between the sun and the two parhelia the light assumed all the shades between a yellowish green and a bright red, while streaks of white light, not unlike the tails of comets, seemed to issue from the parhelia. This phenomenon occurred in a remarkably fine day, the sky was perfectly clear, there was no wind, the thermometer steed at about 5 degrees Fah., and the barometer at 30 inches.

Photographers' Registering and Drying Rack.

Great progress is being made in photography, and also in the apparatus and mechanical appliances of the work-rooms. The registering rack here illustrated, consists of a frame, A, with as many cross-pieces, B, as are necessary. Upon the opposite faces of the cross-pieces, B, strips of corrugated metal, *a*, are tacked, whose grooves or depressions are of the same depth and width; those in the strips above are opposite to each other, so that the plates will stand when inserted in the grooves, in vertical parallel planes. The grooves of the rack are distinguished by attaching a printed series of numbers corresponding to each groove, so as to assist the operator in enumerating the negatives and enable him to readily select the required negative or plate. The drying rack and negative porte, C, is shown sitting upon the registering rack, but it is arranged to be hung up by the iron straps, *c*, at the convenience of the operator. The gutter, D, will carry off the drippings from the corners of the plates, as shown in the figure? The drying rack is light and easily carried, thus making a negative porte, which will prevent the negatives from getting scratched while being carried or handled while printing. It also saves the plates of glass from breakage while handling in washing, cleaning and varnishing, thus furnishing a complete drying rack.



SMITH'S NEGATIVE REGISTERING AND DRYING RACK FOR PHOTOGRAPHS.

The great advantages of these racks consist in the saving of space and in the indestructibility of their metal surfaces. A registering rack, such as shown in the engraving, five feet long, four feet wide and one foot deep, will hold 4,140 half-size negatives, while the drying rack, two feet three inches long, will hold 92 plates In a well-regulated gallery no piling of negatives ought ever be allowed, neither should the collodion face of a negative ever be allowed to touch any other surface.

The numbers are printed upon strips of paper and pasted on, so that the great labor of numbering the racks is saved the operator. The register will be numbered to suit the purchaser when desired. This improvement was patented through the Scientific American Patent Agency in December, 1864, by W. G. Smith, of Carlisle, Pa. For further information address the manufacturers, Messrs. G. and J. D. Scott, Ansonia, Conn.

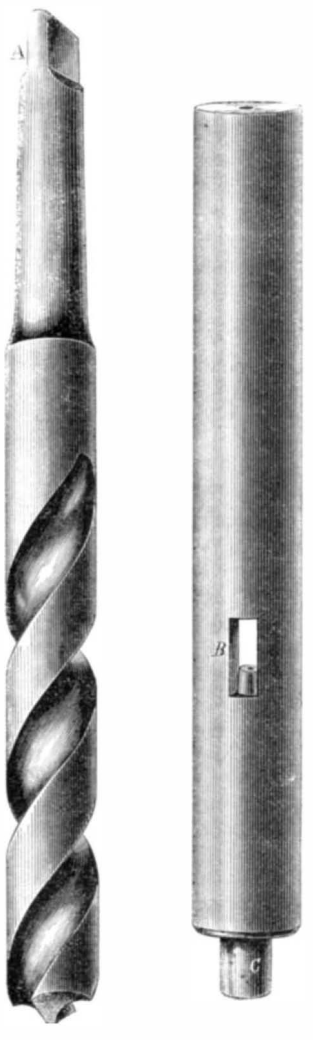
Did the Monitors Damage Fort Sumter?

Time that reveals all things seems to have disclosed the extent of the damage done to Fort Sumter at the time of Dupont's first attack. A correspondent writing from Charleston since it has fallen into our hands says: "I had the curiosity to make an inspection of the wall facing Moultrie to see what was the effect of the fire of the iron-clads in Dupont's attack. A close inspection shews that it was a very damaging fire. There are seams in the masonry and great gashes where the solid bolts crumbled the bricks to dust. It is evident that if the fire could have been continued any considerable length of time there that wall would have fallen. The effect of that fire led to the filling up of the lower casemates."

The latest novelty in card photographs is an album frontispiece consisting of a couple of simple stanzas, asking those who examine the collection of pictures to add their own portraits to the list. The verses are enclosed in a neat and appropriate border, and photographed in a size and shape to fill the first page in the album.

STANDARD TWIST DRILL.

There is no tool more indispensable in a machine shop than the drill, yet, strange as it may seem, very few persons take much pains in making one properly, or using it right when made. In half the machine shops in the country, drills lie around on the floor, or are left sticking in window corners where no one can find them. They are also altered at will by any person who is too lazy to look for the proper size; they are improperly ground, and, in short, ill used in so many ways that great delay and loss is the result.



The Manhattan Fire-arms Company, of Newark, N. J., have, at great expenditure of time and money, perfected a system for manufacturing twist drills for the trade, and a sample of them is shown herewith. As a specimen of workmanship these drills have been greatly admired by all mechanics, and as tools are unequaled. We have had an opportunity of seeing these drills at work, and they certainly cut to perfection. They feed easily and without straining through the work, and leave a round, true hole from end to end.

These drills are all turned from shank to point in a turning lathe, and milled out in the grooves by a peculiar machine invented by Mr. Arnold, of the Manhattan Fire Arms Co.; they are of standard sizes, varying by 32ds of an inch, from $\frac{3}{8}$ths up to $1\frac{1}{4}$ inches, so that a hole of any known size can be made with the set; any such hole drilled to-day will fit the same work years hence. Machinists will see the great advantage resulting from this feature. They are tempered up to the end of the twist, and one may be run into the shank without withdrawing it from the work to clear the chips.

Accompanying these drills are sockets, like that shown by the side of the tool illustrated. These are to be fitted in the machine the drills are to be used in, and may be planed square on the blank end or turned taper, for which purpose a plug center, C, is fitted in and a center left in the other. The shank of the drill fits in the socket, and the flattened end, A, is held by the keyway, B, in the socket, so that the tool cannot turn; a key driven into this keyway loosens the drill, so that it can be taken out.

The advantages to be derived from the use of these drills over those ordinarily made are very great: they are always ready for use; any size can be found in the set without altering; they require no dressing, and when properly used will last for years. They are, withal, sold remarkably cheap, much lower, in fact, than they could be made by individuals. They are about twelve inches long, and will drill from seven to nine inches deep; they are made of the best cast-steel, and are, in all respects, first-class goods. They are now in use in the United States Navy Yard, at Brooklyn, and all over the country, by our largest manufacturers.

For small metal workers, such as model makers, watch and clock makers and dentists the Company make drills of Stubb's steel wire, with straight shanks of all sizes, from No. 1 to 60, which is about 1-32d of an inch. Every one should try them.

For further information address the Manhattan Fire Arms Company, Newark, N. J.

THE COAL-TAR COLORS.—The trade in coal-tar dyes, which began in 1860, continues to expand, amounting probably to from a quarter to half a million annually. The colors are magenta, various shades of blue and violet, purple, yellow, orange, and green. The dyes are sent from London to Lancashire and Yorkshire and other places, to be used in the preparation of silk and cotton velvets, printed calicoes, delaines, merinoes, finished cottons, silks, ribbons, flannels, and fancy and flannel shirtings. An export trade is beginning to China and the United States, the dyes being sent in their solid form to save freight It is said that several thousand pounds are annually spent in defending the patent.

THE

Scientific American.

MUNN & COMPANY, Editors & Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ "The American News Company," Agents, 121 Nassau street, New York.

☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XII. NO. 14...| NEW SERIES. |....*Twentieth Year.*

NEW YORK, SATURDAY, APRIL 1, 1865.

Contents:

(Illustrations are indicated by an asterisk.)

PRODUCTION OF LIGHT.

Doubtless the cheapest and most portable apparatus for making gas from petroleum is a kerosene lamp. This apparatus also overcomes the most serious difficulty that has been encountered in the various attempts to manufacture illuminating gas from petroleum, that is, the condensation of vapors in the pipes; these vapors being produced in the lamp so near the flame that they have no opportunity to condense before they are consumed.

It has also been argued that in the lamp the greatest possible amount of light must be produced from a given quantity of oil, as the oil is all burned without a particle of waste. But this conclusion does not follow from the premises. If we were considering the production of heat it would be a safe inference, but not in the production of light.

Gases, however highly heated, give out very little light, differing in this respect from even the same substances when in a liquid or solid condition. According to the experiments of Dr. Draper, of this city, all solid bodies begin to grow luminous at the same temperature, about 977° Fahr., and the light rapidly increases with the rise of the temperature. When first perceptible it is of a dull red color, and as the temperature rises, it passes through orange and yellow into a pure white, which, when the heat becomes extremely intense, assumes something of a violet tinge.

When hydrogen gas is burned in pure oxygen, in the compound blow-pipe, though the heat is intense, there is scarcely any light; but if some solid substance that will not be fused, such as lime, be placed in the flame, the light becomes too dazzling to be borne by the eye. The still more brilliant electric light is emitted from intensely heated particles of carbon, as they are carried over from one point to the other. The light also from a lamp or candle comes from solid particles of carbon highly heated in the flame for an instant before they are consumed.

In a kerosene lamp the liquid oil is drawn up by the wick, and when it reaches so near the flame that the temperature is equal to its boiling point, it is evaporated. As it floats upward in the flame it is decomposed, the hydrogen maintaining the gaseous form, and the carbon being precipitated in the solid state. The particles of carbon thus precipitated, being extremely minute, are instantly heated to a very high temperature, in which state they give out the light of the blaze. As soon as these particles of carbon reach the outer surface of the body of burning vapor, where they come in contact with the atmospheric air, they encounter the oxygen of the air, and combine with it to form carbonic acid. Carbonic acid is a gas, and though it remain at the temperature of the shining carbon, it emits no light.

Now, it is conceivable that by the mere dilution of hydrocarbon vapors with hydrogen or carbonic oxide the particles of carbon may be kept in a heated condition one thousandth of a second longer, and that the quantity of light which they emit might thus be doubled. The process by which light is produced is such that the effect of any apparatus cannot be predicted by *a priori* reasoning, but must be determined by experiment.

SYSTEM.

The application of machinery to the production of wares, fabrics, utensils of whatever description, texture or nature, is in these days of competition indispensible to prosperity; but system, or a fixed plan of procedure to regulate the operation of the works is oftener wanting than present.

It is surprising to see what lack of appreciation there is for habits of order and routine among many of our manufacturers, and it is strange that any profits accrue where such make-shift policy as some practice prevails. We know of one shop in this city, the largest and the oldest concern of its kind in the country, which has literally no beginning nor ending, for the construction of its work. If a man wants a tool for some particular job he makes it out of another tool, and in the end throws it on the floor, or leaves it where he gets through with it. The work is sometimes commenced in one part, sometimes in another; it goes backward and forward, and round about, is hoisted up, lowered down, carried on trucks, or left on one side altogether, at the will and pleasure of the foreman in charge. Holes are drilled for which there are no bolts, and bolts are forged which are too long or too short, and new ones are made while the old ones are kicked around under foot. The yard is full of iron scraps; washers, nuts, bolts and rivets lie about indiscriminately vexing the sight of orderly persons, and running to loss and waste generally.

What excuse is there for such a style of things? Not the slightest. The picture is so far from overdrawn that we dare not tell all that may be seen lest those at a distance should deem the statement incredible. Work is polished in a lathe, put somewhere on one side, becomes damp, gets rusty, and then a laborer comes with his emery paper and oil and does "lathe work" sitting on a bench. What an absurdity. It is more than this; it is a positive wrong; no workshop should be permitted to fall into such hands, for, apart from the actual loss involved in wasted time and material, the example has a mischievous tendency and destroys the ambition of the workmen.

There can be no dividends where such outrageous disorder prevails. Said a New England man to us a short time ago, "I came a long distance to see your works, and from the time they have been in existence I expected to find the latest improvements, but after I had gone through ore or two rooms I got homesick and went out; such disorder I never saw before."

If there was any necessity for this slovenliness and waste there would be some excuse, but there is none, and it should be remedied. There is nothing that men admire more than clean, well arranged workshops, and we have noticed in our travels about the country that order and system have a marked effect on the men themselves. Good workmen will not stay in a place where they are up to their knees in filth, or where they see the jobs in hand made to cost four times what they should. Let every one interested in manufactures of any kind examine their factories and they will find ample room for improvement in many places.

SOME FACTS ABOUT PIANO MAKING.

At the last meeting of the Polytechnic Association Mr. Weber described the mode of making pianos, and made the following statements in relation to the industry.

The largest manufacturers in the world are Broadwood & Sons, of London. The business was established in 1780, by the grandfather of the present proprietors, and the establishment has turned out 132,000 instruments.

In the city of New York there are seventy separate establishments engaged in the manufacture of pianos and the weekly product is from 250 to 300 instruments. The whole number manufactured annually in the United States is between 35,000 and 40,000, surpassing considerably the product of any other nation.

The hammers are covered with felt which is imported from France, and a single piece less than a yard square costs $56 in gold. It is made expressly for the purpose, the pieces being wedge-shaped, with a thickness ranging from three eighths to one inch.

IMPROVEMENTS IN THE STEAM ENGINE.

Very great improvements in the steam engine are being made at the present time. These relate to reduction in the size, simplicity in detail, freedom from abrupt and complicated movements, and a general absence of working parts which were formerly thought indispensable. An oscillating engine with a slide valve on the side of the cylinder connected directly to the eccentric without the intervention of a rock shaft, was in former years thought to be the essence of simplicity, yet inventors have so far improved upon this plan that they have no slide valves in some instances and in others the connections are so close as to be exceedingly economical of space. In Root's engine the cylinder is square; the piston is on the crank pin, and the valve is on the eccentric—a disposition of the parts which every one will, without controversy, admit to be compact.

In Hicks's engine, lately patented, the piston is the slide valve, or performs the office of this detail for itself—admitting and releasing the steam at the proper times without choking or compression. Here four cylinders are combined in a small space, radiating at angles of 90 degrees from a common center; the shaft and all the pistons working on one crank pin through connecting rods. This engine may be seen at 480 Broadway. In still another engine now being patented, four cylinders revolve about the shaft, taking and receiving steam without valves, and requiring no balance wheel, since the cylinders themselves act as such. Many other improvements involving radical changes are going forward both in engines and boilers, which will result in enhancing the value of the steam engine—king of motors—very greatly. In any one or all of these engines before specified steam can be used expansively or as a dead weight to impel the piston without expansion.

The economy which is claimed for these two systems can therefore be or not be realized according to which ever theory the proprietor of the engine favors. Besides the special engines there are many others in progress which for obvious reasons we have no right here to allude to.

ILLUSTRATIONS OF THE PATENT OFFICE REPORTS.

We are indebted to Messrs. E. R. Jewett & Co., of Buffalo, for a copy of the illustrations engraved to accompany the Report of the Commissioner of Patents for 1863. It is a large, handsome volume of 1,063 pages, with the engravings printed on only one side of the leaves. The engravings are in the same style as those made by the same firm for the reports of previous years; and the high quality of the workmanship, of which we have heretofore spoken, is at least equaled, if not surpassed.

We are pleased to learn that the contract for engraving the illustrations for the report of 1864 has been awarded to the same firm. For that year the inventions to be illustrated number more than 4,400—which shows considerable progress.

QUICK WORKING.—In one of the processes of steel-pen making done by females at Birmingham, a quick worker will cut out in one day of ten working hours 250 gross, or 36,000 pens, which involves 72,000 distinct motions of the arm, two in every second.

SHARP'S rifle-works, at Hartford, employ 500 workmen, and the machinery is kept running night and day. Twenty-five hundred rifles and carbines are manufactured every month for the Government.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING MARCH 21, 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.

46,867.—Friction Wheels and Oil Chamber.—Augustine I. Ambler, Chicago, Ill. Ante-dated March 10, 1865:

I claim, first, The wheel, C, combined and arranged with the bushing or collar, B, upon a shaft, A, in such a manner as to form a friction clutch and anvil chamber substantially as set forth.

Second, In combination with the male and female parts of the clutch, the feather and groove, a b, spring, G, nut, F, when used with a friction wheel, C, substantially as and for the purpose specified.

Third, The bi-conical spiral grooved head, I, placed on the shaft, A, in combination with the friction wheel, C, for the purpose specified.

46,868.—Thread and Needle Box.—Hamlin Babcock, New York City:

I claim a thread and needle box for soldiers and travelers constructed of a hollow spool, adapted to having thread wound upon its exterior and to contain thimble, needles, buttons or other articles substantially as above described.

[This invention consists in the construction of a box to contain thread, needles, wax, pins, buttons and other articles which are necessary or desirable for travelers and other persons away from home, and which have hitherto been carried in receptacles called housewives, needle-books and similar arrangements.]

46,869.—Grain Binder.—W. P. Barker, Grand Rapids, Mich. Ante-dated March 6, 1865:

I claim the revolving and longitudinally moving tube. A, provided with the hook, h, the sliding tube, F and the rod, G, provided with the hook, l, in connection with the shield, E, or its equivalent, all arranged to operate in the manner as and for the purposes herein set forth.

I further claim the sector. D, connected with the tube, A, by a cord, C, or by gearing, in connection with the bar, m, provided with the curve, n, and the pivoted bar, H, and the spirally slotted hub, B, and pin, d, all arranged as shown for operating the tubes, A F, and rod, G, as described.

46,870.—Smoking Pipe.—James P. Baxter, Portland, Me.:

I claim, first, A diaphragm or septum placed below the smoke passage in the bowl of a tobacco pipe.

Second, A diaphragm composed of one or more pieces of metal or other suitable material, so arranged in relation to each other or the inner surface of the pipe as to form a concavity for the retention of air or any material which may have a cooling effect on the contents of the pipe.

Third, The channels, e f in combination with the diaphragm, D, in the bowl, A, and with the stem, C, constructed and operating substantially as and for the purpose described.

Fourth, The diaphragm or septum as described with the plug as described.

46,871.—Tuck-creasing Device for Sewing Machines.—James Bolton, Chicago, Ill.:

I claim first, The tuck marker, A, for use with a sewing machine, made and operated substantially as above described.

Second, I also claim marking parallel lines for tucks or for seaming or for perforating of material on a sewing machine, by means of a marker which is operated by a presser bar having a positive vertical motion substantially as above described.

[This invention consists in a novel mode of constructing and operating tuckers to be used on sewing machines, being composed only two pieces hinged together so as to make one instrument, and so attached to the presser-bar as to be operated at every movement of the feeding devices.]

46,872.—Mop.—Alonzo T. Roon and Wm. W. Spaulding, Galesburg, Ill. Ante-dated Feb. 1, 1865:

I claim the rod, B, with cross rod, C, and heads, H H, the handle, D, with crop rod, E, and set screw, I, and spiral springs, F F, when their parts are arranged as specified in combination with the handle, A, for the purpose set forth.

46,873.—Composition for Preserving Wood and Coating Oil Barrels.—Charles Brandenburg, New York City:

I claim the within described compound for preserving wood and coating barrels and other vessels.

46,874.—Window Springs.—E. K. Breckenridge, Meriden, Conn.:

I claim the combination of the plate, A, latch, B, and spring, D, constructed as described to operate in the manner specified.

46,875.—Process for Refining Amalgam.—Wm. Bruckvner, San Francisco, Cal.:

I claim the application and use of bichloride of copper or its equivalent, together with iron pyrites and salt without reference to the exact proportion of each ingredient in the manner and for the purpose herein described.

46,876.—Grain Conveyer.—D. W. Bryant, Chicago, Ill.:

First, I claim the combination of the metallic buckets, I, the endless chains, D D, and pulleys, A A, arranged and operating substantially as and for the purposes herein set forth and shown.

Second, I claim the combination and arrangement of the metallic buckets, I, the shafts, C, the endless chains, D D, the friction wheels, F, and trucks, G, operating as and for the purposes specified and shown.

46,877.—Seeding Machine.—Marvin S. and J. R. Cadwell, Dexter, Mich.:

We claim the employment of the revolving seed box, D, in combination with the gage plates, m m m m, and distributing plates, P P P P, substantially in the manner and for the purposes as herein specified.

Second, The arrangements of plates, P, on a revolving box, substantially in the manner and for the purpose described.

Third, The arrangement of the revolving box, constructed and operating as described, in rear of the axle, for the purpose set forth.

46,878.—Marine Railway.—Wm. F. Channing, Providence, R. I.:

I claim the employment of a water support or caisson in the manner and for the purposes described for the overland transportation of vessels between navigable waters.

Also the combination of a water tank or basin for floating a vessel, with a railway car truck or trucks.

Also in a marine railway a compound or multiple railway track having parallel rails so disposed, that each rail excepting the two outer rails, may serve as a part of a track at each side thereof, in the manner and for the purposes herein described.

Also the combination of a multiple or compound track with a dock or docks at one or both extremities of a marine railway, for transportation of vessels from one body of water to another as herein described.

Also the vertically moving terminal section of the track as herein described, constructed and arranged to operate in connection with elevating, supporting and lowering apparatus and with the water support or caisson to receive and discharge the vessel substantially as set forth.

46,879.—Sofa Bed and Crib.—Solomon Chapin, Cincinnati, Ohio:

I claim the combination of the several parts as described for the purposes set forth.

46,880.—Churns.—Edgar Chipman, New York City:

I claim the rockers, B, in combination with the ledges or cleats, b', on the ways or guides, C C, to prevent any lateral movement of the churn on the ways or guides as set forth.

Second, The cords or chains, D D, applied to the churn and the cross-bar, E, of the ways or guides to prevent longitudinal slipping of the churn, on the ways or guides as specified.

Third, The tubular fixed dasher, E, when used in connection with a rocking or oscillating churn, substantially as and for the purpose specified.

[This invention relates to a means employed for keeping the churn in proper position on the ways on which it oscillates or rocks and also in an improved means for keeping the cream at a proper temperature most favorable for the production of butter.]

46,881.—Fence.—J. R. and C. B. Clark, Mount Pleasant, Iowa:

We claim a roller or series of rollers applied to a fence substantially as and for the purpose herein set forth.

46,882.—Carpet Stretcher.—F. J. Collier, Canonsburg, Penn.:

I claim the carpet stretcher above shown constructed to operate by friction substantially as above described.

[This invention consists in constructing an implement for stretching and straightening carpets preparatory to securing them to a floor, by means of a friction surface, and in the use of which no injuryis done to the fabric.]

46,883.—Flood Gates for Mill Dams.—Martin Colton, Sardinia, N. Y.;

I claim a self-acting safety flood gate, composed of the gate, C, working beams, F, and connecting rods, I, placed and used in a plume, B, for the purposes and substantially as herein described.

46,884.—Railway Gates.—Samuel N. Cushing, Waltham, Mass:

I claim the combination for operating the gates arranged with respect to the roadway and railway as described, the same consisting in the arms, the impelling rods, the carriage or its equivalent, and the carriage windlass and ropes or a mechanism for moving the carriage in manner as explained, the whole being applied to a frame erected at the crossing or junction of the roadway and railway and so as to separate, and be capable of being operated substantially as specified.

46,885.—Cigarettes.—M. J. Danziger, New York City:

I claim forming the mouth piece of a cigarette, of stocks or stems of tobacco in the manner and for the purpose described.

46,886.—Knap-sack Supporter.—Adam Dickey, Cincinnati, Ohio:

I claim the knap-sack supporter composed of the parts, D E E', and their described or equivalent accessories, substantially as set forth.

46,887.—Preserve Jar.—Timothy Earle, Valley Falls, Smithfield, R. I.:

I claim the use of the detached ring, C, in combination with the cover and neck of a preserve jar substantially as described.

46,888.—Producing Coloring Matter for Dyers.—Jonas Eberhardt, Philadelphia, Pa.:

I claim the phenico described, as a new article of manufacture for the use of dyers.

46,889.—Seeding Machine.—Charles H. Eggleston, Marshall, Mich.:

I claim the employment of the seed slide, s, and brush slide, K, when connected together substantially as described, in combination with the spring, M, and guard plate, N, as and for the purposes specified.

46,890.—Fly Wheel.—David Eldridge, Philadelphia, Pa.:

I claim the combination of the flanged wheel, B, fly wheel, D, pulley, F and G, belts, J and K, and treadle, H, or its equivalent arranged to operate substantially as described.

46,891.—Bolts for Doors and shutters.—Julius Feldman, New York City:

I claim the application to a slide bolt for doors, shutters, etc. of a pinion ratchet, spring and pawl, to operate in the manner substantially as and for the purpose herein set forth.

[This invention relates to a new and useful improvement in slide bolts, such as are applied to doors, shutters, etc., to serve as a fastening for the same.]

46,892.—Jacquard for Weaving Three-ply Fabrics.—John S, Ferguson, Poughkeepsie, N. Y.:

First, I claim the mode herein described of arranging the needles, and inserting the cords through them, for the purpose of giving to the cords the three positions above described.

Second, The mode herein described of constructing the middle trap board, and the use and motions of the rods or bars placed above them, for the purposes substantially as set forth

Third, Giving to the front and rear trap boards the motions herein described, for the purposes specified above.

Fourth, Tying the harness in three equal and uniform parts in looms for weaving three-ply goods, as above specified.

46,893.—Engine for Preparing Paper Stock.—Joseph G. Fuller, Brooklyn, N. Y.:

I claim a revolving wheel, composed of teeth in sections, with stone intermediate, or other rough material, in combination with a hopper containing the vegetable material, to be operated on as set forth.

And in combination with the said revolving wheel of alternate teeth and roughened surfaces, I claim the stationary concave of teeth in the trough, a, as and for the purposes specified.

46,894.—Coal and Ash Sifter.—J. L. Gilbert, Boston, Mass.:

I claim the box, B, provided with a spout, C, and flange, a, and fitted over a proper ash receptacle, A, in connection with a reciprocating screen, D, placed within B, and having an inclined sieve, e, to discharge into spout, C, and with the hopper, E, upon the box, B, all arranged substantially as described.

I further claim suspending the screen, D, upon parallel guide rods, c c, to admit of the ready working of the screen, as set forth.

[This invention relates to a new and improved device for sifting coal ashes, without allowing the ashes to escape during the sifting operation.]

46,895.—Base-burning Stove.—H. G. Giles, Troy, N. Y. Antedated Sept. 21, 1864:

I claim the combination of apertures, e, in the fire pot of a base-burning stove, communicating with hollow radial bars, b, provided with openings in the sides, and mica windows, d d, arranged and operating substantially as and for the purposes set forth.

Second, I claim the air pipes, g g, in combination with the openings, f f, air chamber, h, reservoir, C, and cylinder, A, arranged and operating substantially as and for the purposes set forth.

46,896.—Spinning Roller.—Isaac Goodspeed, Norwich, Conn., and Gurdon S. Goodspeed, Providence, R. I. Antedated March 8, 1865:

We claim a roll for drawing, roving or spinning machinery, constructed with a surface of cork applied with its flaws or interstices parallel with the axis, and compressed and turned, as hereinbefore described.

46,897.—Transparent Sign for Street Lamp.—Francis L. Hagadorn, Brooklyn, N. Y.:

I claim the application of printed lettering, or its equivalent, to the glass plates of street lamps, or their equivalents, in combination with paper, which performs with the said glass plates the function of ground glass, substantially in the manner and for the purpose herein set forth.

46,898.—Regulating Ventilator.—Nelson Hammond, Tioga, Pa.:

First, I claim adapting both the bar, B', and the weight, J, to be adjusted longitudinally upon the lever, C, to maintain a uniform effect of the weight while varying the extent to which the ventilator will be moved by a given motion of the piston.

Second, I claim, in combination with the close vessel, A, the piston, B, arm, B', when connected to the lever, C, in the manner described, so as to permit the said arm or bar, B', to be adjusted vertically upon the lever, to adjust it to the hight of the fluid, or the position of the ventilator, the whole constituting a thermal medium for regulating ventilators, substantially as set forth.

Third, In combination with the lever, C, operated as described, I claim the rod, G, and cord, G', for raising and lowering the sashes, F F', as explained.

Fourth, I also claim, in combination with the aforesaid lever, C, and the close vessel, A, cylinder, A', and piston, B, the levers, H, and rods, b, for transmitting motion from the sashes of one window to those of the other or others, substantially as specified.

Fifth, I claim the combination of the vertical slots, e, with the weight, J, and piston, B, for restricting the motion of the lever, C, to the operating end thereof, while the ventilator is being opened or closed, and permitting the fulcrum end of the lever to move after the operating end has reached the extremity of its movement, substantially as and for the purpose set forth.

46,899.—Still for Oils, Etc.—Charles A. Hardy, Pittsburgh, Pa.:

I claim the arrangement and combination of parts in the diaphragm still, consisting of the float valves, m p and k g, governing the inlets to the upper and lower compartments, B and C, respectively, and the heads, D E, communicating with the separate escape pipes, D' E', as described and represented.

46,900.—Window-sash Supporter.—J. O. Harris, Ottawa, Ill.:

I claim the combination and arrangement of the two ratchet wheels, lever pawl and spring aforesaid, with the tumbler, g h i, operated by a removable key, substantially as and for the purposes shown and described.

46,901.—Lamp Burner.—John O. Harris, Reading Pa.:

I claim the combination of the jackets, D D', intermediate space, d, apertures, d', and tube, E, the whole being employed in connection with a wick tube, C, in the manner and for the purposes herein set forth.

46,902.—Submarine Safety Mouthpiece.—James Hawkins, Braddock's Field, Pa:

I claim the T-shaped piece, A, provided with a mouthpiece, a, flexible tubes, d d', and valves, e e', and applied to the face of a diver, substantially as and for the purpose set forth.

[This invention relates to the application of air exhaust and supply valves, in combination with a mouthpiece fitted to a mask, which is applied to the face of the diver, and with two pipes leading to the surface of the water, in such a manner that the inhaling of the breath is regulated, and the diver is supplied with the requisite quantity of pure air, to enable him to live under water for the desired length of time.]

46,903.—Gang Plow.—L. Holloway, Gilroy, Cal.:

I claim the link joint, I, in combination with the adjustable rods, h i, lever, J, plow frame, H, and truck, A, constructed and operating in the manner and for the purpose substantially as herein shown and described.

[This invention relates to an improvement in that class of gang plows in which the plows are attached to a separate frame, which connects by a hinge with a truck, so that by drawing the truck through a field the plows are caused to act on the soil to any desired depth.]

46,904.—Doubletree for Carriages.—John Hoover, Manchester, Md.:

I claim the elastic double and singletrees, when arranged, constructed and combined, as herein described and set forth.

46,905.—Band Cutter and Feeder for Threshing Machine.—H. Upton Hoover, Macomb, Ill.:

I claim, First, In combination with the rollers, c c, and frame, A, the revolving smooth or sickle-edged knife, F, substantially as described and for the purpose set forth.

Second, The L L, constructed and operated substantially as described.

Third, The vibrating table, N, substantially as described and for the purpose set forth.

Fourth, In combination with the vibrating table, N, the vibrating fork or fingers, Q, substantially as described and for the purpose set forth.

Fifth, The combination of the revolving knife, E, rakes, L, vibrating table, N, vibrating fork or fingers, Q, constructed and operated substantially as described.

46,906.—Method of Transporting Oil.—W. W. Horton, Freeport Ill.:

I claim, First, Oil tanks, both stationary and movable, constructed and operating as and for the purposes herein set forth.

Second, I claim the method or process herein described for storing and transporting oil in bulk, substantially as set forth.

46,907.—Spoon.—R. Humphrey, Unionville, Conn.:

I claim a spoon or fork handle provided with a projection, d, at the juncture of its widest part with its stem, and with a similar projection at its juncture with the bowl, substantially as described.

[The object of this invention is to strengthen the handle of a spoon or fork at such places where the same, as now constructed, is most liable to bend and break; and the invention relates more particularly to such handles which are produced of thin sheet metal, and rendered stiff by turning the edge downward.]

46,908.—Machine for Cutting Tobacco.—W. W. Huse, Brooklyn, N. Y.:

I claim the combination, substantially as herein described, of the non-rotating feeding screw, the rotating nut, mounted thereon, and provided with a ratchet wheel, the vibrating pawl or ratchet hand, and the adjustable cam plate for determining the extent of feed motion which shall be imparted to the ratchet wheel, for the purpose specified.

46,909.—Process for Separating Gold and Silver from Mineral and Earthy Substances.—Geo. N. Jennings, Virginia City, N. T.:

First, I claim the process herein substantially described, for the purpose set forth.

Second, I also claim the use of ashes and charcoal as a flux in reducing quartz and other rock for separating gold and silver and other metals therefrom, substantially in the manner above described.

Third, I also claim the amalgamating solution, composed substantially as above described.

46,910.—Steam Whistle.—C. Kupferle and J. H. Ward, Cincinnati, Ohio:

First, I claim the bell, C, constructed with supporting strips, d e, dispensing with a central support, and forming a plurality of apertures, f g, substantially as and for the purposes herein described.

Second, The shoulder, b, of the plug, B, and segmental annular spaces, c, produced thereby between said plug and the bowl, substantially as and for the purpose set forth.

46,911.—Letter Envelope.—T. S. Lambert, Peekskill, N. Y.:

I claim constructing a letter tab or flap, substantially as shown and described.

46,912.—Winders for Oyster Dredges.—Henry S. Lawson, Baltimore, Md.:

I claim the arrangement of the reel shaft and reels with the crank shaft and cranks, the whole being constructed and susceptible of being operated as herein set forth.

46,913.—Ventilator.—Peter Lear, Medford, Mass.:

I claim the combination as well as the arrangement of the wind wheel, B, the conduit, A, the inverted conical case, D, and its series of radial flanges, b b, the whole being applied to a spindle, C, substantially as and so as to operate as herein before explained.

I also claim the combination as well as the arrangement of the wind wheel, B, the conduit, A, the inverted conical case, D, the series of radial flanges, b b, and the deflector, E, the whole being applied to a spindle, C, substantially as and so as to operate as herein before specified.

I also claim the combination as well as the arrangement of the wind wheel, B, the conduit, A, the inverted conical case, D, the series of radial flanges, b b, and the weather cap, F, the whole being applied to a spindle, C, substantially as and so as to operate as herein before described.

I also claim the combination as well as the arrangement of the wind wheel, B, the conduit, A, the inverted conical case, D, the series of radial flanges or wings, b b, the deflector, E, and the weather cap, F, the whole being applied to a spindle, C, substantially as and so as to operate as herein before set forth,

46,914.—Lock-key Guard.—Charles Leavitt, Cleveland, Ohio:

I claim the guard, D, in combination with the lock key, and the escutcheon, and keyholes at right angles to each other, as and for the purpose set forth.

46,915.—Apparatus for Washing Paper Stuff.—Samuel Lenher and Hallam H. Spencer, Philadelphia, Pa.:

We claim, First, The application of jets of water forcibly impelled against the stuff produced from refuse newspapers and waste paper in the manner herein before described, for the purpose of separating from said stuff the coloring matters and carbonaceous particles of ink and other fine impurities and retaining the fibrous pulp on sieves, whether the latter be rectangular circular arranged as an endless band, or in any other form whatsoever, and whether the same be made of wire gauze or muslin or any other textile fabric.

Second, The application of the above process, substantially as set forth, for the removal of dust and other like fine impurities from rag stuffs and other fibrous stuffs used in the manufacture of paper.

46,916.—Fruit Gatherer.—James A. Little, Danville, Ind.:

First, I claim the raking device, A B, employed substantially in the manner and for the purpose herein explained.

Second, I claim the knives, D F, employed as accessories to the fingers, A, in detaching the fruit, as set forth.

Third, I claim the extension rod, C C', in connection with the fruit gatherer, as described, to adapt the device for gathering fruit from different hights.

46,917.—Coffee Pot.—Lewis H. Little, Copake, N. Y.:

I claim placing a cone within a coffee pot for the purpose and in the manner substantially as above described.

[This invention consists in placing a body of conical form centrally within a coffee pot so as to leave an annular space between the base of the cone and the inner sides of the pot. The object is to "settle" the coffee, or prevent the sediment from rising in the upper part of the vessel.]

46,918.—Chaff and Straw Stacker.—Wm. H. Loomis, Fairfield, Iowa:

I claim, First, A stacker which is so constructed as to receive the straw and chaff from a thrashing machine upon an elevator, and within chambers which are closed at their sides, substantially as described.

Second, The removable wings, C C, in combination with a trunk which is adapted for receiving the straw directly from a straw carrier of a thrashing machine, substantially as deicribed.

Third, The armholes, D D, through the wings, C C, arranged substantially as and for the purpose described.

46,919.—Apparatus for Bolting Flour.—James E. Madigan, Beloit, Wis.:

I claim, First, The bolting apparatus, herein described, consisting of the cylinder, A, blast pipe, G, air chest, C, series of internal perforated pipes, b b b, conducting pipe, g, and external perforated pipe, d, all combined and operating in the manner and for the purpose specified.

Second, I further claim so mounting the pipe, d, that it may be turned by a crank, i, or other suitable means to deliver the blast at any angle desired.

[This invention consists in introducing currents of air into the bolt for the purpose of cooling the flour and increasing the efficiency of the bolt, and also in directing a blast of air downward upon the outside of the bolt for the purpose of keeping its meshes clear.]

46,920.—Farm Gate.—Joseph Martin, New Oxford, Pa.:

I claim the automatic closing gate which opens only in one direction, constructed with the several parts as described, so that it can be opened by a person approaching it from either side, and also latched open and unlatched, substantially as set forth and described.

46,921.—Flyer for Roving Frames.—Thomas Mayor, Pawtucket, R. I.:

I claim the combination of two or more lateral orifices in the neck of the flyer as described at unequal distances from the mouth of the delivery tube with the said delivery tube, for the purposes specified

46,922.—Manufacture from the Fibers of Epilobium.—Rutger B. Miller, Utica, N. Y.:

I claim the utilization of the fiber of the epilobium plant for the manufacture of the articles above enumerated, and for all articles to which it is applicable, as a substitute for the cotton fiber.

46,923.—Apparatus for Distilling Petroleum, etc.—Adolph Millochau, New York City:

I claim the distillation of heavy and light oils jointly to produce a burning oil by means of a second still within the main still for petroleum and similar oils, substantially as specified.

46,924.—Process for Purifying Metallic Oxides.—Alfred Monnier, Philadelphia, Pa.:

I claim the treatment of metallic oxides for their purification, substantially as set forth.

46,925.—Oil Ejector.—George M. Mowbray, Titusville, Pa.:

I claim the coupling, D, when combined with a stuffing box, E, so constructed that while one pipe is fixed another may be moved in the stuffing box without disturbing the seed bag or other packing, substantially as herein described and for the purpose set forth.

46,926.—Hand Cultivator.—John Naugle, Mooresville, Ind.:

I claim as a new article of manufacture the herein described hand cultivator when constructed substantially as herein set forth.

46,927.—Washing Photographic Prints.—Marcus Ormsbee, New York City:

First, I claim the elastic yielding rollers, C C, journaled within the frame, D D', in the manner explained and employed in the process of washing photographic prints, substantially as set forth.

Second, In combination with the above, I further claim the elastic or impervious cloth, A, to contain the prints between its folds and receive the direct pressure of the rollers, as and for the purpose described.

46,928.—Hand Corn Planter.—M. S. Orton, Galesburg, Ind.:

I claim the perforated plate, B, operated substantially as shown, in combination with the perforated bottom, b, of case, A, and seed spouts, E, arranged to open and close through the movement of plate, B, substantially as and for the purpose set forth.

I further claim the arms, m, applied to the pin, l, of plate, B, when used in combination with the spouts, E, and all arranged to operate in the manner substantially as and for the purpose specified.

[This invention relates to a new and improved machine for planting corn by hand, and has for its object the planting of the corn in the hill in a scattered state or with the grains or kernels at a suitable distance apart, and by a means which admits of being operated with facility or with but little labor, and without the liability of becoming choked or clogged.]

46,929.—Harvesting Machine.—Samuel N. Page, Salona, Pa.:

I claim, First, In combination with the driving wheel, A, adapted for adjustment upon its shaft in the manner explained, the crank wheels, D D', fixed upon one and the same rotating shaft, d, the latter carrying a pinion, d', to receive motion from the driving wheel, A, as set forth.

Second, In combination with the above parts, I claim the lever, H, and rack, H' h', constructed, arranged, and employed substantially in the manner and for the purposes herein described and represented.

46,930.—Raking Attachment to Harvester.—Samuel N. Page, Salona, Pa.:

I claim the combination of the slotted bar, L, and crank arm, L', the latter carrying a wrist pin, l, which actuates said bar, L, for the purpose of operating the rake, I, in the manner explained.

46,931.—Oil Ejector.—F. S. Pease, Buffalo, N. Y.:

I claim in oil ejectors closing the well tube below the place of delivery of the currents of air or other fluids or liquids by means of a valve, substantially as described.

46,932.—Variable Cut-off Valve Gear for Steam Engines. Horatio O. Perry, Buffalo, N. Y.:

I claim, First, The combination with the rocking steam toes having a motion coincident (or nearly so) with the piston, of two independent steam lifting toes acting upon one valve stem in such a manner that as one ascends the other will descend, by which construction and the operation of an appropriate adjustable tripping device, the steam may be cut off at any required part of the stroke.

Second, In the combination with the independent steam lifting toes, E', of the spring catches, G, and spring bolt, J, and adjustable tripping cams, H, operating for the purposes and substantially as described.

46,933.—Mowing Machine.—John G. Perry, South Kingston, R. I.:

First, I claim the arrangement of the escapement wheel, X, rocker shaft, V, and connecting rod, P, in combination with the stationary tubular axle, K, substantially as herein set forth and for the purpose specified

Second, I claim the arrangement of the frame, D, and sliding plate, I, having the standard a, and lever, O, attached to it in combination with the tubular axle, K, substantially as herein described and for the purpose set forth.

46,934.—Stove-pipe Elbow.—John G. Perry, South Kingston, R. I.:

First, I claim making a cast metal stove-pipe elbow frame by leaving openings through its surface, substantially as herein described and for the purposes set forth.

Second, I claim closing the openings through the sides of a cast metal stove pipe elbow frame with a piece or pieces of sheet metal or any suitable mineral substance, substantially as herein described and for the purposes specified

46,935.—Washing Machine.—William H. Perry and Wallace Woodworth, Los Angelos, Cal.:

I claim providing a washing machine with a chamber, M, to receive the water after it has been expressed from the clothes and retain the sediment, substantially as described.

46,936.—Quartz Crusher.—George K. Peterson, San Francisco, Cal. Antedated March 3, 1865:

I claim the crushing plates, A A', connected and arranged to operate substantially as described for the purpose set forth.

I claim the mode described of connecting the journals, K K, of the plates, A A', or such an equivalent device as will enable the operator to lengthen or shorten the rods which connect the journals, K K.

46,937.—Plow.—Norman Platt, St. Louis, Mo.:

I claim the combination of the frame, b, plate, a, and colter, a', the several parts being constructed and arranged as and for the purpose set forth.

46,938.—Sirup Valves.—A. D. Puffer, Somerville, Mass.:

I claim the shouldered, hollow screw plug, with its packing, the washers, d, the screw collar, e, and the screw thread on the valve case body when arranged with a sirup valve or faucet, substantially as shown and specified.

Also, conducting the air tube which facilitates the emptying of the measuring chamber through the passage of the valve case, substantially as and for the purpose described.

46,939.—Grate Bars.—A. D. Puffer, Somerville, Mass.:

I claim in a recessed bar, the reversed arched form given to the bifurcated portion thereof, for the purpose described.

Also, sharpening or beveling the surfaces of the bar upon which the coal is supported into thin edges, for the purpose set forth.

Also, the radiating braces, h, substantially as shown and described.

46,940.—Tobacco Hooks.—A. Putnam, Jr., Chester, Vt.:

I claim the tobacco hook constructed and operated substantially as above described, as a new article of manufacture.

[This invention consists of a tobacco hook for suspending tobacco plants in a drying house, constructed with spring sides, an eye for suspending it to a nail, and prongs for securing the stalk.

46,941.—Heat Radiator for Stoves.—William E. Rennolds, Chicago, Ill.:

I claim an air heating drum or radiator, formed or composed of tubes, a a', arranged within a cylinder, or drum so as to form flues or draught passages, e f h, around the tubes, the latter being perforated at their lower ends for the admission of cold air and open at their upper ends for the escape of the heated air, substantially as shown and described.

[This invention relates to a new and improved heat radiator or air heating drum to be applied to stoves, whereby cold air is admitted into the drum, heated and diffused into the apartment in which the stove is placed; or, the heated air may be conveyed by pipes into other compartments of the building.

46,942.—Machine for Cutting Meat.—Wm. E. Richardson, Chicago, Ill.:

I claim the employment of a circular saw for cutting meat or other like substances, in combination with contrivances for spreading said substances during the operation of sawing, and keeping its surfaces from forcible contact with the sides of the saw, substantially as described.

46,943.—Manufacture of Vinegar.—Moritz Rino, Williamsburg, N. Y.:

I claim the manufacture of vinegar by the quick process directly from the natural unmanufactured or unrefined vegetable produce which contains starch or saccharine matter, or both starch and saccharine matter, substantially in the manner herein described.

46,944.—Frames for Gathering Skirts.—J. M, Rose, New York City:

I claim, first, The frame for gathering and plaiting the skirts of dresses, constructed and operated substantially as above described.

Second, I also claim in combination with the frame, the elastic cord, B, or any equivalent means of holding the plaits and gathers of a skirt in place, substantially as above described.

Third, I also claim the clamp, D, one or more in combination with the said frame for the purpose of holding the skirt thereon, constructed and applied substantially as above described.

46,945.—Apparatus for Triturating and Heating Linseed &c.—Thomas Rowe, Brooklyn, N. Y.:

I claim the combined arrangement of the chauffer pan, E, heated by steam or other means and the platform, D, of the triturating apparatus in the manner and for the purpose substantially as herein shown and described.

[This invention consists in the combination of the chauffer pan heated by steam or other means with the ordinary edge runners or mullers in such a manner that the seed or other material after it has been triturated by the action of said mullers can be discharged directly into the chauffer pan and thereby all the labor usually required for removing or transporting said seed or other material from the triturating apparatus to the chauffer pan is saved, and furthermore, said material on arriving in the chauffer pan retains the heat imparted to it by the action of the mullers and the operation of heating is attended with less expenditure of fuel or steam.

46,946.—Combined Shovel and Ash Sifter.—Richard Schaap, Jr., Brooklyn, N. Y.:

I claim a combined shovel and ash sifter, composed of a shovel blade perforated and provided with a perforated sliding plate, substantially as herein set forth.

[The object of this invention is to combine with the ordinary fire-shovel, such as is used for putting coal on a fire, taking up ashes, etc., etc., an ash sifter and having the implement devised, constructed or arranged in such manner that it may, by a very simple adjustment or manipulation, be made to serve either as a shovel or sifter as may be required, equally as well as if made for either purpose specially, thereby combining in the most perfect manner, and at an inappreciable cost the two implements specified.

46,947.—Hopper for Grain Separators.—Frederick H. Shroeder, Bushnell, Ill.:

I claim the employment of the rollers, D, and E, in combination with the seed hopper, A, when arranged and operating substantially as and for the purposes set forth.

46,948.—Buckles.—Charles Sears, Monmouth Co., N. J., and Tappen Townsend, Kings Co., N. Y.:

We claim, first, A double acting lever for buckles.

Second, A concave strap bearing surface upon buckle frames.

Third, We further claim making and attaching the double lever to the buckle frame, in form and manner substantially as described.

Fourth, The combination of the double acting lever with buckle frames, thus making buckles with double acting levers, substantially as described.

46,949.—Drills.—Alexander Shiland, West Troy, N. Y.:

I claim the combination of the tube, A, with the inner shaft, B, having the spiral part, C, acting between parallel bars segments or grooves; these parts or their equivalents arranged and operating as and for the purpose set forth.

46,950.—Cooling, Drying and Ventilating Granaries and other Buildings.—Danl. E. Somes, Washington, D. C.:

I claim, first, Constructing granaries and similar buildings with bins or apartments containing air passages, flues or channels so as to furnish means for cooling and ventilating them substantially as set forth.

Second, I claim cooling and ventilating granaries or buildings for storing grain by means of air compressed and dried substantially as herein set forth and described.

Third, I claim cooling the air for ventilating granaries by means of subterranean coolers as set forth and described.

Fourth, I claim in combination with devices for cooling and introducing air into granaries suitable channels for carrying off any moisture that may be deposited, so as to prevent its coming in contact with the grain.

Fifth, I claim drying air to be used in ventilating granaries by means of hygrometric or absorbent materials as set forth.

Sixth, I claim in combination with multiple walls, any or all of the devices herein described for cooling and ventilating granaries and other similar buildings.

Seventh, I claim constructing bins or apartments for grain or other materials to be injured by being kept in a close chamber, with a system of cooling and ventilating devices, substantially as herein set forth and described.

46,951.—Machine for Sharpening Saws.—Reuben Sparks, Buffalo, N. Y.:

I claim the combination of the grinding wheel, B, sliding saw table, C, or C', and adjustable guide bar, D, for the purposes and substantially as set forth.

46,952.—Churn Dashers.—N. Starbuck, Wilmington, Ohio:

I claim the knob, B, or an equivalent support on the lower end of the rod or staff, B', in connection with a rod, C, passing through the rod or staff and a groove, c, or equivalent pins or projections on the upper surface of the dash, all arranged to operate in the manner substantially as and for the purpose set forth.

[This invention relates to an improvement in that class of churn dashers which are placed loosely on their ends or staffs, so that they may rotate thereon under the action or resistance of the cream while being operated or worked up and down therein.

46,953.—Butter Worker.—Le Roy S. Starrett, Newburyport, Mass.:

I claim the box, A, provided with the rails, B B, in combination with the shaft or bar, C, with lever, D, attached and the latter having the plunger, F, connected to it, all being arranged to operate in the manner substantially as and for the purpose herein set forth.

[This invention relates to a new and improved butter worker, for expressing the buttermilk from butter, and it consists in the employment or use of an oblong box provided at each side, above its upper edge, with a rail, between which rails and the top of the box there is placed a shaft or bar having a lever attached, to which there is suspended a pcessure plate, all being arranged in such a manner as to admit of the work aforesaid being performed expeditiously and in a perfect manner.]

46,954.—Gate.—George Stovel, Chicago, Ill.:

I claim the combination and arrangement of the swinging gate, A B; with the vertically adjustable gate, E, operating substantially as and for the purposes herein specified and shown.

46,955.—Machine for Winding Sewing-Machine Bobbins.—A. W. Todd, Chicago, Ill.:

I claim the combination and arrangement of all the parts of the machine, as and for the purpose described.

46,956.—Molding and Pressing Brick.—John Treadway, Haverstraw, N. Y.:

I claim in that part of the above-described machinery for driving out the molds, the weighted lever, in combination with the rock shaft and its arms, or the equivalents thereof, and the cam lever operated by the crank, substantially as described and for the purpose set forth.

And I also claim the platen with its two standards, with cross grooves to receive the wedge key, in combination with the connecting rod, adapted to slide between the said standards, and provided with projecting pins adapted to slide in longitudinal grooves in the standards, as and for the purpose described.

46,957.—Composition for Preventing Disease in Vegetables.—Joanna B. Tribble, Middleborough, Mass.:

I claim the said composition, made and for use, substantially as specified.

46,958.—Car Coupling.—Thomas Tripp, Chicago, Ill.:

First, I claim providing the drawhead, A, with the vertical slot, S, constructed, arranged and operating as and for the purposes specified and shown.

Second, I claim the combination of the drawhead, A, and link, D, constructed, arranged and operating substantially as and for the purposes shown and described.

Third, I claim the combination and arrangement of the drawhead, A, hook, B, and link, D, constructed and operating as and for the purposes delineated and set forth.

Fourth, I claim the combination of the drawhead, A, hook, B, and spring, C, arranged and operating as and for the purposes shown and described.

46,959.—Tobacco Pipe.—Luther C. Walker, Baltimore, Md.:

First, I claim the converging apertures, a a, in combination with the chamber, C, and channel, b, the whole being arranged as set forth.

Second, I claim forming a pipe stem with chamber, b, opening at the upper side of the stem, as at b', instead of at the end, substantially as described.

Third, I claim providing the mouthpiece of a pipe stem with a cavity, b2, in the manner and for the purpose explained.

46,960.—Hand Shears or Nippers.—Theodore Wallis and Thomas Witbeck, Scipio, N. Y.:

We claim the toothed segmental fulcrumed levers, B, in combina-

tion with the shears, and attached thereto, and operating thereby the stirrups, all constructed as herein described.

46,961.—Waterfall Head-dresses for Ladies.—Philip Walter, New York City:

I claim, First, The use in the manufacture of waterfalls of strands of horse hair, C, doubled up at the upper edge of the pillow or stuffing, and secured to the same by binding, a b c d, substantially as and for the purpose set forth.

Second, In combination with the above the employment in waterfalls of stuffing inclosed in a case of gauze or other textile material, substantially as and for the purpose described.

46,962.—Neck-tie.—Thomas S. Wiles, Troy, N. Y.:

I claim, First, The neck-tie, B, with the loop, C, attached to the collar, A, the said tie being susceptible of expansion for laundrying, all arranged and combined in the manner substantially as and for the purposes herein described and set forth.

Second, I also claim the employment of the loop, C, arranged and combined with the neck-tie, B, at the upper edge thereof, in the manner substantially as and for the purposes herein described and set forth.

46,963.—Dressing Mill Stone.—Abram Wing, Mayville, N. Y.:

I claim the described method of dressing mill stones, consisting of the narrowed lands, a, extending in full hight to the eye, C, in combination with the tangential and intermediate inclined furrows, b, and e e, widened toward the eye, and gradually narrowing outward to the periphery of the stone, substantially as and for the purposes herein specified.

46,964.—Fence.—Orson H. Woodworth, Columbia City, Ind.:

I claim the combination and arrangement of the permanent jaw, o, the movable jaw, i, the block, m, and the keys, n n, substantially as described and shown.

46,965.—Time Fuse for Explosive Shells.—Geo. Wright, Washington, D. C.:

I claim the longitudinal time fuse, B, constructed and located substantially as described, for the purpose set forth.

46,966.—Sawing Machine.—A Beekman (assignor to Theodore and Charles Wenzel), New York City:

I claim the rack, C in combination with the pinion, G, and strap, D, placed on the vertical shaft, E, and all arranged with the radius bar, B, to operate in the manner as and for the purpose herein set forth.

[This invention relates to a new and useful means employed for feeding the bolt to the saw of sawing machines designed for sawing cured stuff, such, for instance, as chair backs, fellies, and other articles which are sawed in the form of segments of circles.]

46,967.—Machine for Making Beaded Wire.—Edward Croft (assignor to Benedict & Burnham Manufacturing Company), Waterbury, Conn.:

I claim, First, A machine for producing beaded wire, having a connected series of gradually increasing semicircular grooves adapted to act successively upon the beads, in the manner herein described.

Second, The helical graduated grooves, h h', in the peripheries of the rollers, B B', revolving in the same direction, and operating substantially as and for the purpose set forth.

[This invention consists in the employment or use, for the purpose of rolling beaded wire, of two rollers revolving in the same direction, and provided on their peripheries with helical grooves, of gradually increasing pitch, in such a manner that a thin piece of wire is passed through between the rollers lengthwise, the grooves at one end, and gradually rolling the wire along, finish the same at the other, the grooves being so graduated that there is just enough metal taken into the groove at the beginning to form a complete bead, without closing the metal together and forming cold sheets, as would be the case were the grooves hot or not properly graduated.]

46,968.—Boring Wells.—Charles E. Foster (assignor by mesne assignment to George O. Evans and W. S. Hassall), Philadelphia, Pa:

I claim, first, The movable plate, G, in combination with the dogs, J J, or their equivalents, when combined and operating substantially as described, for the purpose specified.

Second, The shaft, H, with its worm, i, and pinion, h, and stationary rack, m, in combination with the plate, G, the whole being arranged and operating substantially as set forth.

46,969.—Cane Juice Evaporator.—F. Groves (assignor to Chas. A. Diehl), New Oxford, Pa.:

I claim, First, The combination and arrangement of heating pipe, c, through the furnace, with a series of pans, one above the other, substantially as described.

Second, The arrangement of the oblong pans, H II, etc., with openings on alternate sides, so as to keep the juice flowing briskly as it is evaporated

Third, The fire door, o o, in combination with doors A and A A, so as to regulate the fires and throw off the scum, as described.

46,970.—Device for Moving Churn Dasher.—A. W. Hall, New York, assignor to Benjamin W. Robinson, South Reading, Mass., and Chas. W. Clark, Brooklyn, N. Y.:

I claim, First, The employment or use in a churn, provided with a rising and falling dasher, of a spring attached to the dasher rod, and a plurality of hooks, applied to any suitable fixture, to admit of the suspension of the spring at different lengths, substantially as and for the purpose specified.

Second, The graduating of the spring or lengthening and shortening the same, in connection with one or more hooks or points of suspension, substantially as and for the purpose set forth.

46,971.—Loom.—Orange B. Hubbard (assignor to himself, Lyman S. Smith and Lucas I. McMasters), Lowell, Mass:

I claim the combination and arrangement of the adjustable spring H, the clasp, I I, and picker staff, E, substantially as herein set forth and for the purpose specified

I also claim the method of adjusting the spring, H, substantially as herein set forth and for the purpose specified.

46,972.—Mallet.—Allen Partridge, Medway, Mass., assignor to himself and Butterfield & Haven, Boston, Mass.:

I claim as a new article of manufacture the mallet constructed substantially as herein described.

46,973.—Process for obtaining the Condensed Extract of Hops.—Samuel R. Percy and Walter S. Wells (assignors to George R. Percy and Walter S. Wells), New York City:

We claim, First, The process of making a condensed extract of hops by a continuous vacuum and exhaustion, whether with or without the addition of alkali or alkaline salts, molasses, saccharine matter, or the extracted liquor of grain, or with or without the addition of one or all of these, such process being vastly superior to any other, and contains the fine aroma of the hops, which is entirely lost and dissipated when made in the open air.

Second, We claim the use of steam in the steeping vessel to exhaust the properties and virtues of the hops.

Third, We claim the use of alkali or alkaline salts in the water or steam used in extracting the essential qualities of the hops, as it tends to make the resin of the hops more soluble, and also counteracts the acid in the molasses or other saccharine matter.

Fourth, We claim the process of coating or covering the inner surface of the vacuum condensing pan with any oily or fatty substance to prevent burning, etc.

Fifth, We claim the commingling of a sufficient quantity of molasses, saccharine matter, or the extracted liquor of grain, whether matted or not, to the watery extract of hops.

46,974.—Sulky Gang Plow.—Ira C. Pratt (assignor to J. M. Campbell, D. Moobery, E. Emerson and H. Reeves), Morton, Ind.:

I claim, First, Attaching one or more plows, E, direct to the draught pole, C, when the latter is connected to the main frame, A, and all arranged to operate as and for the purpose set forth.

Second, The oblique bar, D, attached to the rear part of the draught pole, C, and having a plow, E, secured to it, and arranged as shown, so as to be capable of being adjusted substantially as and for the purpose specified.

Third, The lever, H, with cam, I, attached, arranged and applied to the draught pole to operate in relation with the axle, a, of frame, A, and for the purpose specified.

[This invention relates to a new and useful improvement in the construction and arrangement of certain parts pertaining to a sulky gang plow.]

46,975.—Asphaltic Cement.—C. G. Reinhold (assi nor to himself and John F. Sharretts, assignors to themselves and Clifford Arick), Milton, Pa.:

I claim, First, The use of distilled or inspissated coal tar, secured by the process of boiling, which when compounded with a calcareous earth, while hot, may be reduced to lumps or loaves of cement, substantially as and in the manner and for the purposes described.

Second, Combining with these pulverized earths plumbago for the purpose of uniting the same when combined with inspissated coal tar, reducible to lumps or loaves of cement when cold, substantially as and in the manner and for the purpose described.

Third, Combining with these pulverized earths, pebble stones, sand, crushed stone, granite or other concreted earthy matter, for the purpose of uniting the same when combined with distilled or inspissated coal tar, reducible to slabs or blocks of stone when cold, substantially as and for the purpose described.

Fourth, Combining with these pulverized earths, pebbles, sand, crushed stone, or other concreted earthy matter, as described plumbago or other analogous substance, for the purpose of uniting the same when combined with inspissated coal tar, reducible to slabs or blocks of stone when cold, substantially as and for the purpose described.

Fifth. I claim as an article of manufacture, trade or commerce, the said "asphaltic cement," compounded and manufactured as described, when reduced to lumps or loaves as set forth.

Sixth, I claim as an article of manufacture, trade and commerce, the said "asphaltic stones," compounded and manufactured as described, when reduced to any desired form and size, substantially as and for the purpose described.

46,976.—Apparatus for Carburreting Air.—Warren A. Simonds, (assignor to himself and S. Ingersoll Lovett,) Boston, Mass.:

First, I claim the arrangement and combination of the reservoir generator air pump and force pump with the pipes connecting the same substantially as described.

Second, I claim, in combination for the purpose of constituting a carburreting apparatus suitable for steamboats, ships, etc., the reservoir generator air pump, or dry meter and receiver or their equivalents substantially as described.

Third, I claim the combination of the receiver generator air pump reservoir and force pump or their equivalents substantially as described.

Fourth, I claim the process of throwing back or returning the unabsorbed portion of the fluid employed to the head or upper reservoir without exposing it to the air and therefore without loss of vapor or material by means substantially as described.

Fifth, I claim in combination the use of pipes connecting the reservoir, to equalize the atmospheric pressure in all of them substantially as described.

Sixth, I claim as new the combination of reservoirs to be used as distributors generators and receivers as above described.

Seventh, I claim the pump in connection with the receiver and distributor as above described in specifications substantially as described.

Eighth, I claim as new the combination of gearing and pumps in the direct production of gas substantially as described.

46,977.—Breech-loading Fire Arms.—David Williamson (assignor to Moore's Patent Fire Arm Co.) Brooklyn, N. Y.

First, I claim The combination of the breech blocks, d and e, and lever, h, having a changeable fulcrum and actuating the said blocks, d and e, substantially as specified.

Second, I claim the spring, l, and the toe, n, or its equivalent in combination with the lever, h, and breech blocks, d and e, as specified.

46,978.—Manufacture of Ordnance.—Thomas Edward Vickers, Sheffield, Eng.:

I claim re-heating gun blocks made from cast steel or other metal or alloy, either cast or wrought, and cooling the same while in the annealing furnace in the manner described.

46,979.—Process of Liberating Potash or Soda from Alkaline Silicate.—Frederic Oldfield Ward, London, Eng.:

First, I claim the mode of producing or liberating potash or soda or both as the case may be from natural alkaliferous silicates, substantially as herein before described.

Secondly, I claim the employment of fluoride of calcium in conjunction with earthy material or mixture of earthy material, to act with the aid of heat on natural alkaliferous silicates, so as to produce or liberate therefrom potash or soda or both, as the case may be, substantially as herein before described.

Thirdly, I claim the extraction by water of the soluble alkaline contents of calcined produce or frit, obtained when liberating alkali from alkaliferous silicates and distinguished by the double character that it contains both alkaline matter and fluorine.

Lastly, I claim the application of insoluble residuum obtained when liberating alkali from alkaliferous silicates, and characterized by its containing as one of its ingredients fluorine, in the manufacture of manure, of hydraulic current or of puzzolana at the operator's choice substantially as herein before described.

REISSUES.

1,904.—Artificial Gums and Palate.—John A. Cummings, (assignor through mesne assignments to the Dental Vulcanite Company), Boston, Mass. Patented June 7, 1864. Reissued Jan. 10, 1865:

I claim the plate of hard rubber or vulcanite or its equivalent for holding artificial teeth or teeth and gums, substantially as described.

1,905.—Brewing.—Adolph Hammer, New York City. Patented Aug. 17, 1858:

I claim, First, The arrangement of a heater, C, on the outside of a mash tun, and in combination therewith, constructed and operating substantially in the manner and for the purposes set forth.

Second, Heating the contents of a mash tun by a current of liquid which is drawn therefrom and returned to it, and while passing from and to the malt has its temperature gradually raised, by means substantially as herein described, or any equivalent means, for the purposes specified.

Third, The arrangement of one or more horizontal perforated partitions, B, in the upper part of a mash tun, constructed as herein set forth, or in any other suitable manner, so that the malt is prevented from rising to the surface of the liquid and from coming in contact with the external atmosphere.

Fourth, Making the partition, B, in sections, substantially as and for the purpose set forth.

1,906.—Straw Cutter.—Jacob H. Mumma, Harrisburg, Pa. Patented Nov. 8, 1859:

I claim, First, The hawks bill cutters, a a, in combination with the cutting bar, C, of a straw cutter, the whole being arranged and operating substantially as set forth.

Second, The bed of slats, h, operating for the purpose of feeding the material to the rollers, and of cleaning it from dust and dirt, substantially as set forth.

Third, The ribbed feed rollers, in combination with the cutter and cutter bar, C, the whole being arranged substantially as described.

Fourth, The intermediate pinion, e, carried by a shaft which is adjustable in the head or side plate of the straw cutter, in combination with the wheel, E, on the roller shaft, and pinion, G, on the cutter shaft, the whole being arranged and operating substantially as described, for the purpose specified.

1,907.—Artificial Leg.—Dubois D. Parmelee, New York City. Patented Feb. 10, 1863:

I claim, First, Fastening the bucket of artificial limbs to the stump by means of atmospheric pressure, substantially in the manner specified.

Second, The adjustability, by the means herein described, or by means substantially the same, of the limb with respect to length, as set forth.

Third, Forming the articulation or movable connection between two parts of an artificial limb, by means of a clasp linked to or swinging in both, substantially as described.

Fourth, Combining with the two parts of an artificial limb an intermediate stop, when the said parts and stop are connected by means of a clasp or the equivalent thereof, linked to and swinging in the three parts, substantially as described.

Fifth, Making the opposite ends of the limb at the movable joint of cylindrical form, and holding the same in such relative position as to move upon each other with rolling friction, substantially as set forth.

Sixth, In combination with the last-named device, I claim the double concave sector or artificial knee pan, together with projections or stops on the cylindrical ends of the limbs, as herein shown and described.

Seventh, The movable joint, constructed and arranged as described, in combination with a spring or elastic band, operating in the manner and for the purposes set forth.

Eighth, The combination of the ball and socket with an elastic sleeve, the whole forming a movable joint, substantially as herein set forth.

Ninth, Forming the foot of two parts, to wit: a foot piece proper and a toe piece, when the latter is arranged to rock upon the former, and the two held by flexible and elastic straps, in the manner and for the purpose set forth.

Tenth, The divided toe piece, so as to allow of its adapting itself to the inequalities of the ground, substantially as set forth.

Eleventh, The arrangement of the stems or tails projecting from the under side of the toe pieces in combination with the bands of leather or other suitable material, and with the elastic bands adjustable by a metal clasp or its equivalent, all constructed and operating substantially in the manner and for the purpose described.

1,908.—Artificial Leg.—Dubois D. Parmalee, New York City. Patented Feb. 10, 1863:

I claim, First, The method of making the bucket of artificial limbs of a plastic substance capable of being subsequently indurated upon a mold or cast of the stump in the manner and for the purpose set forth.

Second, Shaping the interior of buckets when made of a substance rendered plastic by heat by means of a core which is the fac-simile of the stump, in combination with the requisite degree of heat, substantially in the manner and for the purpose set forth.

Third, The manufacture of artificial limbs with buckets of hard rubber or vulcanite, or its equivalent, for holding the stump, substantially as described.

1,909.—Construction of Rooms, Cases, etc., for preserving and transporting articles of Food and other substances.—Daniel E. Somes, Washington, D. C. Patented Sept. 15, 1863. Antedated July 20, 1862:

First, I claim a vessel or chamber suitable for transporting or storing articles of food with multiple walls and air spaces

Second, I claim connecting with a preserving vessel or chamber, such as described, a separate apparatus for cooling the air to be introduced into said chamber or vessel for the purpose of lowering the temperature and preserving articles therein contained, substantially as set forth.

1,910.—Railroad Car.—Lawrence Myers, Philadelphia, Pa. Patented June 24, 1851:

I claim, First, The combination, substantially as described, of a hollow vessel with flanged wheels or tires adapted to the rails of a railroad for the purpose specified.

Second, One or more partitions combined with the said hollow vessel, substantially as and for the purpose described.

DESIGN.

2,039.—Trade Mark.—Louis Seitz (assignor to James Toft), New York City:

EXTENSIONS.

Machine for arranging and feeding Screw Blanks.—Thomas J. Sloan, New York City. Patented Feb. 25, 1851. Reissued March 29, 1853, and extended Feb. 25, 1865:

I claim the lifters which select and lift the blanks, etc., from the hopper, substantially as specified, in combination with ways or conductors, or the equivalents thereof, substantially as specified, into or on to which the blanks, etc., are transferred as specified.

And I also claim giving to the lifters or to the inclined ways, or their equivalents, a lateral motion, in combination with a stop or detector, substantially as specified, for the purpose of arresting the operation of the lifters until a further supply is required, as specified.

And, finally, I claim the sliding carrier with its recess for receiving and holding the screw blanks, substantially as specified, in combination with the spring fingers, substantially as specified, for taking the screw blanks from the carrier and presenting them to the jaws, as specified.

Steam Engine Governor.—Junius Judson, Rochester, N. Y. Patented March 4, 1851. Reissued Feb. 28, 1865. Extended March 3, 1865:

I claim communicating the action of a governor to its valve or valves, gate, or equivalent regulating device, in such a manner that when the speed of the engine or motor becomes low, either from increase of resistance to overcome, or from diminution of pressure of the motive power, the said valve or equivalent will be accelerated or caused to move through a comparatively large space, to uncover or cover a comparatively large area of the valve or gate opening, so as to add to or take from the engine or motor, by a given change of its speed, comparatively large amounts of power; and also when the speed becomes high, either from diminution of resistance to overcome or from increase of pressure of the motive power, the said valve or equivalent will be by a like change of speed retarded or caused to move through a comparatively small space to uncover or cover a comparatively small area of valve opening, so as to add to or take from the engine or motor comparatively small amounts of power for the purpose of securing as nearly as may be uniform speed of the engine or motor under all variations of the power or resistance, substantially as herein set forth.

Steam Drilling Machine.—Joseph W. Fowle, Boston, Mass. Patented March 11, 1851. Extended March 6, 1865:

I claim the combination of a direct action steam drill in which both engine and drill are mounted on a frame which slides in a swinging frame capable of being adjusted in any required position with the apparatus substantially as herein above described, which is connected with and actuated by the cross-head of the engine, for causing the sliding frame to move along the swinging frame toward the rock.

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

MODELS are required to accompany applications for Patents under the new law, the same as formerly, except on design patents, when two good drawings are all that are required to accompany the petition, specification and oath, except the Government fee.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

Back Numbers and Volumes of the "Scientific American."

VOLUME IV., AND VOLUME XI., (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $3 00 per volume, by mail, $3 75 which includes postage. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding. VOLS. I., II., III., V., VI., VII., VIII., IX. and X., are out of print and cannot be supplied.

NOTICE TO SUBSCRIBERS.

The first five numbers of the present volume of the SCIENTIFIC AMERICAN being out of print, we shall commence the time of each new subscriber from the date of receipt of the order, unless the writer states specifically that he wishes such back numbers as can be furnished.

SPECIAL NOTICE TO INVENTORS.

The money receipts on account of patent business, which have heretofore been published in this column, and the notification of cases sent to the Patent Office, will for the present be discontinued. The receipt of specifications and money from inventors will be acknowledged promptly by mail.

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

OFFICE A. A. PROVOST-MARSHAL-GENERAL, AND SUP'T VOLUNTEER RECRUITING SERVICE, SOUTHERN DIVISION OF NEW-YORK, NEW-YORK, March 20, 1865.

THE FOLLOWING CIRCULAR IS PUBLISHED FOR the information of the public.

RICHARD I. DODGE,
Maj. 12th Infl., A. A. P. M, Gen.

WAR DEPARTMENT, PROVOST-MARSHAL-GENERAL'S OFFICE, WASHINGTON, D. C., March 8, 1865.

CIRCULAR No. 5—The following Act of Congress is published for the information and guidance of all concerned :

"AN ACT to amend the several Acts heretofore passed to provide for the enrolling and calling out the national forces, and for other purposes.

* * * * * * * * *

"Section 13. And be it further enacted, That where any revised enrollment in any Congressional or draft district has been obtained or made, prior to any actual drawing of names from the enrollment lists, the quota of such district may be adjusted and apportioned to such revised enrollment, instead of being applied to or based upon the enrollment as it may have stood before the revision.

"Section 14. And be it further enacted, That hereafter all persons mustered into the military or naval service, whether as volunteers, substitutes, representatives, or otherwise, shall be credited to the State, and to the ward, township, precinct, or other enrollment sub-district, where such persons belong by actual residence, (if such persons have an actual residence within the United States,) and where such persons were or shall be enrolled, (if liable to enrollment,) and it is hereby made the duty of the Provost-Marshal-General to make such rules and give such instructions to the several Provost-Marshals, Boards of Enrollment, and Mustering Officers, as shall be necessary for the faithful enforcement of the provisions of this section, to the end that fair and just credit shall be given to every section of the country : *Provided*, That in any call for troops hereafter no county, town, township, ward, precinct, or election district, shall have credit except for men actually furnished on said call, or the preceding call, by said county, town, township, ward, precinct, or election district, and mustered into the military or naval service on the quota thereof.

"Section 15. And, be it further enacted, That in computing quotas hereafter, credit shall be given to the several States, districts, and sub-districts, for all men furnished from them, respectively, and not heretofore credited, during the present rebellion, for any period of service of not less than three months, calculating the number of days for which such service was furnished, and reducing the same to years : *Provided*, That such credits shall not be applied to the call for additional troops made by the President on the twenty-first day of December, eighteen hundred and sixty-four.

"Section 16. And be it further enacted, That persons who have been, or may hereafter be drafted, under the provisions of the several acts to which this is an amendment, for the term of one year, and who have actually furnished, or may actually furnish, acceptable substitutes (not liable to draft) for the term of three years, shall be exempt from military duty during the time for which such substitutes shall not be liable to draft, not exceeding the time for which such substitutes shall have been mustered into the service, anything in the act of February twenty-fourth, eighteen hundred and sixty-four, to the contrary notwithstanding.

"Section 17. And be it further enacted, That any recruiting agent, substitute broker, or other person, who for pay or profit, shall enlist, or cause to be enlisted, as a volunteer or substitute, any insane person, or convict, or person under indictment for a felony, or who is held to bail to answer for a felony, or person in a condition of intoxication, or a deserter from the military or naval service, or any minor between the ages of sixteen and eighteen years, knowing him in either case before mentioned, to be such, or who shall defraud or illegally deprive any volunteer or substitute of any portion of the State, local, or United States bounty, to which he may be entitled, shall upon any conviction in any court of competent jurisdiction, be fined not exceeding one thousand dollars, nor less than two hundred dollars, or imprisoned not exceeding two years and not less than three months, or both, in the discretion of the court aforesaid.

"Section 18. And be it further enacted That any officer who shall muster into the military or naval service, of the United States any deserter from said service, or insane person, or person in a condition of intoxication, or any minor between the ages of sixteen or eighteen years, without the consent of his parents or guardian, or any minor under the age of sixteen years, knowing him to be such, shall, upon conviction by any court-martial, be dishonorably dismissed the service of the United States.

"Section 19. And be it further enacted, That in every case where a substitute is furnished to take the place of an enrolled or drafted man, and it is shown by evidence that shall be satisfactory to the Secretary of War, that such substitute was, at the time of his enlistment, known by the party furnishing him to be *non-compos mentis*, or in a condition of intoxication, or under conviction or indictment for any offence of the grade of felony at the common law, or to have been guilty of a previous act of desertion unsatisfied by pardon or punishment, or by reason of any existing infirmity or ailment, physically incapable of performing the ordinary duties of a soldier in actual service in the ranks, or minor between the ages of sixteen and eighteen years, without the consent of his parent or guardian, or a minor under the age of sixteen years, it shall be the duty of the Provost-Marshal-General, on advice of the fact, to report the same to the Provost-Marshal of the proper district ; and if such person so enlisted and incapable shall have been, since the passage of this act, mustered into the service as a substitute for a person liable to draft, and not actually drafted, the name of the person so liable who furnished such substitute shall be again placed on the list, and he shall be subject to draft thereafter, as though no such substitute had been furnished by him ; and if such substitute so enlisted, and incapable aforesaid, shall have been, since the passage of this act, mustered into the service as a substitute for a person actually drafted, then it shall be the duty of the Provost-Marshal General to direct the Provost-Marshal of the district immediately to notify the person who furnished such substitute that he is held to service in the place of such substitute, and he shall stand in the same relation and be subject to the same liability as before the furnishing of such substitute.

"Section 20. And be it further enacted, That in case any substitute shall desert from the army, and it shall appear by evidence satisfactory to the Secretary of War, that the party furnishing such substitute shall have, in any way, directly or indirectly, aided or abetted such desertion, or to have been privy to any intention on the part of such substitute to desert, then such person shall be immediately placed in the army, and shall serve for the period for which he was liable to draft, such service to commence at the date of the desertion of the substitute.

"Section 21. And be it further enacted, That, in addition to the other lawful penalties of the crime of desertion from the military or naval service, all persons who have deserted the military or naval service of the United States who shall not return to said service, or report themselves to a Provost-Marshal within sixty days after the proclamation hereinafter mentioned, shall be deemed and taken to have voluntarily relinquished and forfeited their rights of citizenship and their rights to become citizens ; and such deserters shall be forever incapable of holding any office of trust or profit under the United States, or of exercising any rights of citizens thereof ; and all persons who shall hereafter desert the military naval service, and all persons who, being duly enrolled, shall depart the jurisdiction of the district in which he is enrolled, or go beyond the limits of the United States, with intent to avoid any draft into the military or naval service, duly ordered, shall be liable to the penalties of this section. And the President is hereby authorized and required forthwith, on the passage of this act, to issue his proclamation setting forth the provisions of this section, in which proclamation the President is requested to notify all deserters returning within sixty days as aforesaid, that they shall be pardoned on condition of returning to their regiments and companies, or to such other organizations as they may be assigned to, until they shall have served for a period of time equal to their orignal term of enlistment.

"Section 22. And be it further enacted, That the third section of the act, entitled "An act (further) to regulate and provide for the enrolling and calling out the national forces, and for other purposes," approved July fourth, eighteen hundred and sixty-four, be, and the same is hereby repealed.

"Section 23. And be it further enacted, That any person or persons enrolled in any sub-district may, after notice of a draft, and before the same shall have taken place, cause to be mustered into the service of the United States, such number of recruits, not subject to the draft, as they may deem expedient, which recruits shall stand to the credit of the persons thus causing them to be mustered in, and shall be taken as substitutes for such persons, or so many of them as may be drafted, to the extent of the number of such recruits, and in the order designated by the principals at the time such recruits are thus as aforesaid mustered in.

"Section 24. And be it further enacted, That section fifteen of the Act approved February twenty-fourth, eighteen hundred and sixty-four, entitled "An act for enrolling and calling out the national forces, and for other purposes," be and the same is hereby amended, by inserting after the words "any civil magistrate," the words "or any person authorized by law to administer oaths."

"Section 25. And be it further enacted, That the Secretary of War is hereby authorized to detail one or more of the employees of the War Department for the purpose of administering the oaths required by law in the settlement of officers' accounts for clothing, camp and garrison equipage, quartermaster's stores, and ordnance, which oaths shall be administered without expense to the parties taking them, and shall be as binding upon the persons taking the same, and if falsely taken, shall subject them to the same penalties, as if the same were administered by a magistrate or justice of the peace.

"Section 26. And be it further enacted, That Acting Assistant-Surgeons, Contract Surgeons, and Surgeons and Commissioners on the Enrolling Boards, while in the military service of the United States, shall hereafter be exempt from all liability to be drafted under the provisions of any act for enrolling and calling out the national forces.

"Section 27. And be it further enacted, That this act shall take effect from and after its passage : *Provided*, That nothing herein contained shall operate to postpone the pending draft, or interfere with the quotas assigned therefor.

"Approved March 3. 1865."

[Sections from one to twelve, inclusive, do not relate to this Bureau, and are omitted.]

JAMES B. FRY,
14-1 Provost-Marshal-General.

OFFICE A. A. PROVOST-MARSHAL-GENERAL, AND SUP'T VOLUNTEER RECRUITING SERVICE, SOUTHERN DIVISION OF NEW-YORK, NEW-YORK, March 20, 1865.

THE FOLLOWING "OPINION" IS PUBLISHED for the information of the public.

RICHARD I. DODGE,
Major, 12th Inf., A. A. P. M. Gen.

OPINION.

ATTORNEY-GENERAL'S OFFICE, Feb. 9, 1865.

SIR ; In your letter of the 28th January, you ask my opinion on the legal points presented in the letter of Gov. A. G. Curtin, to you, of date the 25th January.

Gov. Curtin's letter is in relation to the construction of the Act of Congress, approved 3d March, 1863, commonly called the Enrollment Act. He insists—

1st. That the words "periods of service," since the commencement of the Rebellion, as used in the 12th section of the Act, do not require the President, in assigning the quotas to the several States, to take into consideration the whole term of enlistment of the volunteer and militia man ; and

2d. That that part of the Act of the 3d of March, 1863, which makes the period of service an element in the calculation necessary to determine the number of men due from a State, district, county, or town, has been repealed by the 2d section of the Act amendatory of the Enrollment Act, approved 24th February, 1864.

It will be more convenient to consider these questions in the reverse order, inasmuch as if it shall be found that the repeal has been made, as contended for, the first point made by the Governor need not be considered.

The great objects of the Enrollment Act are :

1st. To declare who shall constitute the national forces ; and

2d. To organize a plan by which the national forces can be made available.

Subordinate to the purpose of raising and organizing the national forces, the plan adopted by Congress shows a desire that the draft upon the industrial population of the several States, and the communities thereof, should be equalized as nearly as practicable.

By the 4th section of the Act of the 3d of March, 1863, the United States is divided into districts, of which the District of Columbia shall constitute one, each Territory of the United States shall constitute one or more, as the President shall direct, and each Congressional District of the respective States, as fixed by a law of the State next preceding the enrollment, shall constitute one. The 8th section provides, that there shall be a Board of Enrollment in each District. By the 9th section, it is provided, that if the Board of Enrolment shall deem it necessary, a District may be divided into two, and, with the assent of the Secretary of War, into any greater number of sub-divisions.

By the 12th section, it is made the duty of the President, in assigning to the Districts the number of men to be furnished therefrom, to take into consideration the number of volunteers and militia furnished by and from the *several States* in which said Districts are situated, and the period of their service since the commencement of the present Rebellion ; and shall so make said assignment as to equalize the numbers among the Districts of the several States, considering and allowing for the numbers already furnished as aforesaid, and the time of their service.

It is evident, from the face of this Act, that the several States and Districts had furnished a number of volunteers and militia, and for periods of service.

The first duty of the President was to have the National forces enrolled ; his next duty was to ascertain what number of volunteers and militia had been furnished from the several States, and the periods of their service since the commencement of the present Rebellion ; and then, from what Districts in the several States they came, that he might equalize the numbers among the Districts of the several States, considering and allowing for the numbers already furnished as aforesaid, and the time of their service. Under the Act of the 3d of March, 1863, it is plain that he had no right and power to cut up a District into counties, townships, precincts, or wards, in order to equalize the draft therein. The authority given in the 9th section to sub-divide a District was for the purpose of facilitating or expediting the enrollment, and with no reference to equalization. It might, and doubtless did happen in many Districts, that one well defined portion of a District, as a county, township, or ward, had furnished greatly more than the number due therefrom, whilst other parts of the same District, equally well defined, had furnished a few or none, thereby making a draft upon the District necessary ; and yet, under the Act, it was not in the power of the President to make the draft otherwise than equal over the whole District. This was unjust and oppressive. In order to correct this flagrant hardship and injustice, Congress by the 2d section of the Act of 24th February, 1864, and which is an amendment of the Act of 3d of March, 1863, declared that the quota of each ward of a city, town, township, precinct, or election district, or of a county, where the county is not divided into wards, towns, townships, precincts, or election districts, shall be, as nearly as possible, in proportion to the number of men resident therein liable to military service, taking into account, as far as practicable, the number which has been previously furnished therefrom.

It is earnestly insisted, and most ingeniously argued, that this 2d section of the amended Act repeals so much of the 12th section of the Act of the 2d of March, 1863, as makes it the duty of the President to take into consideration the period of service of the volunteers and militia from the several States. The argument in favor of the repeal rests wholly upon the words of the amendatory Act—"the *number* which has been previously furnished therefrom." It is insisted that "number," as here used, means an arithmetical count. I cannot so understand it.

The Act of the 3d of March, 1863, had prescribed a mode by which the number of men due from the several States, and the Districts of the several States, should be ascertained ; and that mode required, not a simple count but a consideration of the period of service of men previously furnished. Congress used the word *number* in the 2d section of the amendatory Act, understanding that the mode of count prescribed in the original Act would be preserved.

There are many evidences upon the face of the amendatory Act which show that it was not the intention of Congress to change the mode of count prescribed in the original Act.

The amended Act does not undertake to say how the quota of a State or District is to be ascertained. In ascertaining what number is due from a State or District, the President must pursue the mode prescribed in the 12th section of the original Act—he must take in consideration the period of service ; and yet, under the construction insisted upon, when he comes to equalize the draft, as authorized to do by the amended Act, in the Districts, he must be controlled by simple numbers. It cannot be that Congress intended one mode of count for the States and Districts, and a different and wholly inconsistent one for the Sub-division of Districts. Inextricable confusion would result.

From the language used in various parts of the amendatory Act, it is evident that Congress did not intend to disturb the mode of count prescribed in the original Act. For instance, in the 8th section of the amendatory Act, it is said that the town, ward or township shall be *credited by his services*, and in the 7th section, "the period for which he shall have been enlisted," and the "period for which he shall have been drafted," all going to show that time of service was held to be an element in the count.

Nor do I think that the argument in favor of the repeal is aided by the language of the 1st section of the act, entitled "An act further to regulate and provide for the calling out of the national forces," approved 4th July, 1864. The act says, that "any such volunteer, or in case of draft, as hereinafter provided, any substitute, shall be credited to the town," &c. Congress meant that the credit should be given according to the mode of count prescribed in the act of 3d March, 1863.

The whole purpose of the 2d section of the amendatory act was to enable the President to equalize the draft in the several districts, surely not to have one mode of count in ascertaining the quotas of the several States and districts, and another mode for equalizing the districts. Besides, it is hardly to be considered that Congress would thus incidentally strike from so important a statute a feature so prominent and equitable.

I am, therefore, of the opinion that the mode of ascertaining and assigning to States and districts their respective quotas, as prescribed in the 12th section of the act of the 3d July, 1863, is not repealed, and that the same mode must be pursued in equalizing the draft among the sub-divisions of each district.

Next comes the the question, what is the mode of count prescribed in the 12th section of the act of 3d March, 1863?

It is very plain that Congress regarded that a consideration of the period of service would change the rule from a merely numerical one. Some credit was to be given for the period of service as well as for the man. Congress has fixed various periods of service, and States and districts, and fractions of districts, had furnished men for those periods of service Now, how is the credit to be given?

Before proceeding to answer the question, it may be proper to state, that it is insisted that the words "period of time" and "time of service," as used in the 12th section of the act of March 3, 1863, means something different from *term of service*. It seems to me that the phrases mean one and the same thing. When the word *term* is used in reference to time, it is, according to the lexicographers, very nearly the synonym of *period*. The difference betwixt them, if any, is too uncertain and shadowy to believe that Congress meant by the use of one, something different from what is understood by the other. But the words *period* and *term*, both occur in after parts of the acts now under consideration. In the 18th section of the act of 1863, the term of service is spoken of, and the term of re-enlistment, whilst in the 7th section of the amended act, it is the period for which he shall have enlisted, and the period for which he shall have been drafted. Thus it will be perceived, that upon the very face of these acts, Congress used these words as meaning the same thing. It happens too in the act, that neither word may be used and yet the same idea intended, as in the 8th section of the amended act, where the language is "shall be credited by his services."

Regarding then "period of service," and "term of service," as meaning the same thing, any argument predicated upon a difference must be disregarded. And thus we are brought back to the question, how is the credit to be given? Must the credit be for the time of actual service, or the period of enlistment?

I think that Congress intended by the words "period of service," to give credit for the time of his enlistment. When a man enlists in the service of the Government for one, two, or three years, his services are due to the Government for that period, and during that period his services are withdrawn from the industrial pursuits of life. The act speaks as though there was a certain and fixed period for the services of each man, and yet, if any period or time is taken, other than the term of enlistment, by some system of averages or guesses, a rule must be fixed. To do so would violate the certainty contemplated by the act.

I am, therefore, of the opinion that the President must, under the act, give credit by the whole period or term for which the man enlisted.

Whether this is the rule which should have been adopted by Congress, whether it does not operate unequally, and whether it is exactly just or not, are questions that cannot now be considered. It is familiar to all that special cases of hardship will occur by the application of any general rule, nevertheless the law, as written, must be pursued and enforced.

Very respectfully, your obedient servant,
(Signed) JAMES SPEED,
To the PRESIDENT. Attorney-General.

1t

OFFICE A. A. PROVOST-MARSHAL GENERAL AND SUP'T. VOLUNTEER RECRUITING SERVICE, SOUTHERN DIVISION OF NEW YORK, NEW YORK, March 20, 1865.

THE FOLLOWING "OPINION" IS PUBLISHED for the information of the public.

RICHARD I. DODGE, Major 12th Inf., A. A. P. M. Gen.

OPINION.

ATTORNEY-GENERAL'S OFFICE, March 14, 1865.

Hon. EDWIN M. STANTON, Secretary of War.

SIR:—The first question propounded in your letter of the 10th inst., is, whether the 23d section of the Act of March 3, 1865, "supersedes" the 4th section of the Act of February 24, 1864?

The 4th section of the Act of February 24, 1864, enables any enrolled person, before a draft, to furnish "an acceptable substitute who is not liable to draft, nor, at the time, in the military or naval service of the United States," and provides that the person so furnishing such substitute, "shall be exempt from draft during the time for which such substitute shall not be liable to draft, not exceeding the time for which such substitute shall have been accepted."

Under this enactment, any person enrolled and liable to draft, may obtain exemption from the draft during the whole period of time for which he shall procure a substitute to be enlisted, provided the substitute shall be so long not liable to draft. It is not a mere credit for a particular draft which such person obtains by furnishing a substitute before the anticipated draft, but it is an absolute exemption which he acquires from liability to be drawn at any and every draft which may occur during the entire time for which his substitute has been accepted by the Government, provided the substitute be so long not liable to draft. If, for example, his substitute is accepted as a three years' volunteer, and remains so long not liable to draft, the principal, by the provision of the law of 1864, just referred to, is insured against the risk of being drafted during the whole period for which his substitute enlisted, no matter how many drafts may occur between the enlistment of the substitute and the expiration of his term of service. But the Government, under this provision, is to be at no expense in consequence of the authorized substitution of one individual for another in the draft. The party who desires to avail himself of the benefit of the privilege conferred by the law, is properly and justly required to compensate the substitute.

Such being the provision of the law of 1864 on the subject of "substitutes" furnished in anticipation of a draft, the law of March 3 1865, provides (in its 23d section) as follows:—

"That any person or persons enrolled in any sub-district may, after notice of a draft, and before the same shall have taken place, cause to be mustered into the service of the United States such number of recruits, not subject to draft, as they may deem expedient, which recruits shall stand to the credit of the persons thus causing them to be mustered in, and shall be taken as substitutes for such persons, or as many of them as may be drafted, to the extent of the number of such recruits, and in the order designated by the principals at the time such recruits are thus as aforesaid mustered in."

It is clear that this enactment provides for quite another case than that contemplated by the provision to which I have been adverting in the statute of 1864, and confers upon an enrolled person a privilege entirely distinct from that given to him by that statute, of which he may avail himself at his option, in preference to the privilege conferred by the act of 1864.

Under the provision of the 23d section of the Act of 3d March, 1865, he may, in advance of a draft, "cause to be mustered into the service" a "recruit not subject to draft," which "recruit" will "stand to the credit" of the enrolled person, causing him to be mustered in, in the event of the principal being drafted, and be taken, on the happening of that contingency, as a substitute for such principal. But the "credit" shall avail him only for the particular draft in advance and anticipation of which he may have secured the "recruit."

There is no provision in the Act of 1865 that the person furnishing a "recruit," under the 23d section, shall be "exempt from draft" during the time for which the recruit may have been accepted and enlisted. But the only benefit which a person so furnishing a recruit derives, under the Act of 1865, is the securing, in the event of his being drafted, of a "credit" on the particular draft in anticipation of which the "recruit" may have been furnished The "recruit" may be mustered into the service for three years, and yet, as a substitute, he can only avail the person who caused him to be mustered in for, and with respect to the one draft before, and in anticipation of which he was obtained. The liability of the principal to be drafted at any other drafts occurring after the mustering in of the "recruit," and during the term of his service, is not at all affected. There is manifestly, therefore, no conflict between the respective sections of the Acts of 1864 and 1865, to which you have called my attention. One does not impinge upon, nor even cross the path of, the other. They give different and distinct rights and privileges to

the citizen liable to draft. He has the alternative course to pursue before any draft, either to buy a "substitute," and secure him to be mustered in, and thus obtain exemption from the draft during the entire term of enlistment of the substitute, if the latter be so long not liable to draft, or he may procure for the Government a "recruit" not liable to draft, and obtain credit for such recruit in case he should be dratted, subjecting himself, however, to the liability of being compelled to repeat the operation at every succeeding draft that may be ordered by the President.

Chiefly, I suppose, the design of the provision of the Act of 1865, under consideration, was to offer inducement and present a stimulus to numbers or associations of individuals in any sub-district, before the liability of any of them became fixed by a draft, to optain volunteer recruits for the Army. Congress, in this law, offers such associations a premium to use their exertions to fill up the armies. It says to the residents of the multitudinous counties, townships, wards and precincts throughout the country, "Organize yourselves into recruiting societies; induce volunteers to enlist into the service before the draft; pay them such amounts of bounty as you may be able to raise by your contributions to the recruiting funds of your several districts; and, when they have enlisted into the service, the volunteers you may have raised will stand to the credit of as many of you as may happen to be drafted, to the extent of the number of recruits, in the order designated,' at the time the recruits are mustered in."

Such is the declaration and promise of the new law. Its policy is to encourage recruiting, not the procuration of substitutes; to induce the people to organize associations for the advancement of volunteering, rather than the purchase of substitutes.

In enacting this new law, and inaugurating this new policy, Congress, however, has not taken away the right of the enrolled persons, before the drait, to furnish a substitute, with the qualification before stated, and thus secure his exemption from draft during the time for which his substitute shall have been accepted. He still has it in his power to exercise that right in preference to the right conferred by the 23d section of the Act of the 3d of March, 1865, of obtaining a "recruit" previous to each draft, as it may occur, and securing thereby a credit in the event, on any occasion, of his being dratted.

I am of the opinion, therefore, that the 23d section of the Act of March 3d, 1865, does not supersede the 4th section of the Act of Feb. 24 1864.

The second question which you have referred to me is whether the "recruits" which are "to be taken as substitutes" are to be considered and borne upon the muster rolls and records of the office of the Provost-Marshal-General as other volunteer recruits which are obtained at the expense of the United States or as substitutes which are furnished at the cost of the principals.

I am of opinion that the "recruits" whom persons enrolled in any sub-district may "cause to be mustered in to the service of the United States," in pursuance of the 23d section of the act of 31 March, 1865, are to be considered and treated as other volunteers who are obtained at the expense of the United States. It will be observed from the analysis of the law contained in the foregoing remarks that the idea involved in the law of 1864 is substitution, while the idea of the law of 1865 is crediting. The section of the act of 1865 under consideration does not speak of the "recruits" in question as "substitutes," but declares that they shall "be taken as substitutes" for the persons who cause them to be mustered in. They are not substitutes, but only of the nature of substitutes. Their primary and essential character under the law is that of credits for their procurers or principals; and this description is the first description given of them in the section in question, for, after saying "which recruits shall stand to the credit of the persons thus causing them to be mustered in," the section proceeds, "and shall be taken as substitutes for such persons, or so many of them as may be drafted, to the extent of the number of such recruits."

A critical study of the words of the statute thus develops the fundamental idea which I have supposed from other indications was intended to be embodied in the law. The "recruits" who are to stand "to the credit" of the enrolled persons causing them to be mustered in before the occurrence of a draft, I am of opinion, then, are to be considered as other volunteer recruits which are obtained at the expense of the United States, and not as "substitutes," in the ordinary sense of that term, which are furnished at the cost of the principals.

Very respectfully, your obedient servant,
14 1t JAMES SPEED, Attorney General.

OFFICE A. A. PROVOST-MARSHAL-GENERAL AND SUP'T VOLUNTEER RECRUITING SERVICE, SOUTHERN DIVISION OF NEW YORK, NEW-YORK, March 20, 1865.

THE FOLLOWING "OPINION" IS PUBLISHED for the information of the public.

RICHARD I. DODGE, Major 12th Inf., A. A. P. M. Gen.

OPINION.

ATTORNEY-GENERAL'S OFFICE, March 15, 1865.

Hon. EDWIN M. STANTON, Secretary of War

SIR:—Upon the 14th section of the Act entitled "An Act to amend the several Acts heretofore passed to provide for the enrolling and calling out of the national forces," which provides as follows:

"That hereafter all persons mustered into the military or naval service, whether as volunteers, substitutes, representatives or otherwise, shall be credited to the State, and to the ward, township, precinct or other enrollment sub-district, where such persons belong by actual residence (if such persons have an actual residence within the United States), and where such persons were or shall be enrolled (if liable to enrollment); and it is hereby made the duty of the Provost-Marshal-General to make such rules and give such instructions to the several Provost-Marshals, Boards of Enrollment, and Mustering Officers, as shall be necessary for the faithful enforcement of the provisions of this section, to the end that fair and just credit shall be given to every section of the country: Provided, That in any call for troops hereafter no county, town, township, ward, precinct, or election district, shall have credit except for men actually furnished on said call, or the preceding call, by said county, town, township, ward, precinct, or election district, mustered into the military or naval service on the quota thereof."

You, in your letter of the 12th of March, ask my opinion on the following points:—

First; As to the meaning of the words "actual residence," as employed in the above section, and the proper mode, according to law, of determining the actual residence of men offering as recruits.

Second: Where the "actual residence" of the recruit is in one sub-district, and he is enrolled in a different sub-district, where shall the credit be given?

Third: In cases where the recruit has no legal domicil or actual residence in any enrollment sub-district, shall he be credited to the sub-district or district where he is enrolled, or shall he be allowed to select his locality?

I. The first of the above questions may be divided into two parts: First, as to the meaning of the words "actual residence;" and, secondly, as to the proper mode of ascertaining the "actual residence."

It is very difficult to give a test by which the question of actual residence may be determined in each particular case. A few general rules may be given, however, by which a vast majority of the cases can be readily determined.

1. Every person must be presumed to have an actual residence somewhere.

2. A man can have but one actual residence at one and the same time.

3. A residence once acquired remains until another is acquired.

4. The place of a man's origin is that of his actual residence until he acquires another.

5. Minors have their actual residence with their parents, guardians, or, if apprentices, with their masters.

6. Adults reside at the places of their dwelling. A man's dwelling is in contradistinction to his place of business, trade or occupation. He dwells at the place he habitually sleeps or passes his nights.

7. In every country there is more or less population floating like drift. They never expect to remain long at any place, and go thence whenever and wherever the hope of employment may invite or fancy dictate. Such persons have their actual residence in the community in which they may dwell at the time of the enrollment.

As to the mode of ascertaining the actual residence of a recruit, the statute gives authority to the Provost-Marshal-General to make such rules and give such instructions as will enable the Boards of Enrollment and Mustering Officers to ascertain the facts and assign the credit according to the truth of the case. In most cases the affidavit of the enrolled man would determine the matter. But as it is a question in which the sub-districts have an interest as well as the recruits, and as the recruits may, for bounties or bribes, declare contrary to the fact their places of residence, the rules to be prescribed should admit of counter proof.

II. My opinion is that where the actual residence is in one sub-district and the man is enrolled in a different sub-district, the credit should be given to the district of his actual residence.

The whole object and purpose of this section is to fix a rule by which places are to receive credits for enrolled men. It gives a rule of credits to the State, and to the ward, township, precinct, or other enrollment sub-district, for enrolled men only. It is silent as to how or where recruits not enrolled, or liable to be enrolled, are to be credited. In order that the credit may be made according to the rule in this section prescribed, the man must not only have an actual residence, but he must be enrolled. The words of the section—"and where such persons were or shall be enrolled"—relate to the fact of enrollment rather than the place of enrollment. Those words are introduced to announce the fact of enrollment, and not to affect or control the question as to the place of credit. This is manifest from the context, and especially from the words in parenthesis just following those above quoted, to wit: ("if liable to enrollment.")

III. Nothing else appearing, it must be taken for granted that the actual residence is the place of enrollment, and the credit be given accordingly. If, however, it should be made to appear that, though enrolled in a particular sub-district, the person has no actual residence, then this statute furnishes no rule by which the credit can be given. In such case the credit must be given under the law or according to the rule in force before and independently of this act.

I am, Sir, very respectfully, your obedient servant,
14 1t JAMES SPEED, Attorney-General.

OFFICE A. A. PROVOST-MARSHAL-GENERAL, AND SUP'T VOLUNTEER RECRUITING SERVICE SOUTHERN DIVISION OF NEW YORK, NEW YORK, March 20, 1865.

THE FOLLOWING CIRCULAR IS PUBLISHED FOR the information of those concerned.

RICHARD I. DODGE, Major 12th Infantry, A. A. P. M. General.

WAR DEPARTMENT. PROVOST-MARSHAL-GENERAL'S OFFICE. WASHINGTON, D. C., March 11, 1865.

CIRCULAR NO. 6.—In conformity with the proclamation of the President herewith published, all officers and employees of this Bureau are instructed to give prompt attention to the receiving and forwarding of such deserters as present themselves in accordance with its provisions.

"BY THE PRESIDENT OF THE UNITED STATES OF AMERICA:

"A PROCLAMATION.

"Whereas the twenty-first section of the act of Congress, approved on the third instant, entitled 'An act to amend the several acts heretofore passed to provide for the enrolling and calling out the national forces, and for other purposes,' requires, 'that in addition to the other lawful penalties of the crime of desertion from the military or naval service, all persons who have deserted the military or naval service of the United States who shall not return to said service, or report themselves to a Provost-Marshal within sixty days after the proclamation hereinafter mentioned, shall be deemed and taken to have voluntarily relinquished and forfeited their rights of citizenship and their rights to become citizens, and such deserters shall be forever incapable of holding any office of trust or profit under the United States, or of exercising any rights of citizens thereof; and all persons who shall hereafter desert the military or naval service, and all persons who, being duly enrolled, shall depart the jurisdiction of the district in which he is enrolled, or go beyond the limits of the United States with intent to avoid any draft into the military or naval service, duly ordered, shall be liable to the penalties of this section. And the President is hereby authorized and required forthwith, on the passage of this act, to issue his proclamation setting forth the provisions of this section, in which Proclamation the President is request d to notify all deserters returning within sixty days, as aforesaid, that they shall be pardoned on condition of returning to their regiments and companies, or to such other organizations as they may be assigned to, until they shall have served for a period of time equal to their original term of enlistment.'

"Now, therefore, be it known that I, ABRAHAM LINCOLN, President of the United States, do issue this my Proclamation, as required by said act, ordering and requiring all deserters to return to their proper posts; and I do hereby notify them that all deserters who shall, within sixty days from the date of this Proclamation, viz: on or before the 10th of May, 1865, return to service, or report themselves to a Provost-Marshal, shall be pardoned, on condition that they return to their regiments and companies, or to such other organizations as they may be assigned to, and serve the remainder of their original terms of enlistment, and, in addition thereto, a period equal to the time lost by desertion.

"In testimony whereof, I have hereunto set my hand, and caused the seal of the United States to be affixed.

"Done at the City of Washington, this eleventh day of March, in the year of our Lord one thousand eight hundred and sixty-five, and of the independence of the United States, the eighty-ninth.

[L. S.]

"ABRAHAM LINCOLN.

"By the President: WILLIAM H. SEWARD, Secretary of State."

The records and returns of these deserters will be made up in the same manner as is provided for in other cases by existing regulations, except that it will be noted on the book of deserters arrested, opposite the name of deserter, the fact of his having voluntarily surrendered himself in conformity with the President's Proclamation; and the number thus surrendering themselves to be separately stated on the report to this office.

The Secretary of War directs that no reward be paid for the arrest of deserters who may be arrested subsequent to the receipt of this order by the District Provost-Marshals.

14 3t JAMES B. FRY, Provost Marshal-General.

CLOTHING BUREAU, Q. M. GENERAL'S OFFICE, WASHINGTON, March 23, 1865.

ARMY SUPPLIES.—SEALED PROPOSALS WILL be received at the office of Army Clothing and Equipage, New York City, until 12 o'clock, M., WEDNESDAY, the 29th inst., for furnishing by contract at the Depot of Army Clothing and Equipage, New York,

Pegged Boots, standard, to be delivered immediately.
Brass Castles for Hats, do.
Brass Crossed Sabers, do.
Brass Crossed Cannon, do.
Canvas Gaiters, do.
Brass Drum-stick Carriages, do.
Drum-head Batter, do.
Drum-head Snare, do.

Further information can be had, and samples of the articles can be seen, at the Office of Army Clothing and Equipage, New York City.

Bidders will state the number they propose to furnish, how soon they can commence, and the number they can deliver weekly.

Proposals must be accompanied by a proper guaranty, signed by at least two responsible parties, setting forth that if a contract is awarded to the party making the bid that he or they will at once execute the contract and give bonds for the proper fulfillment of the same.

The right is reserved to the United States to reject any part or the whole of the bids that may be deemed objectionable.

The articles must be delivered in good, new boxes.

Proposals should be indorsed "Proposals for furnishing (here insert the name of the article bid for), and addressed to

Bt. Brig.-Gen. D. H. VINTON,
1 D. Q. M. Gen., New York City.

THE CHEAPEST MODE OF INTRODUCING INVENTIONS.

INVENTORS AND CONSTRUCTORS OF NEW AND useful Contrivances or Machines, whatever kind, can have their inventions illustrated and described in the columns of the SCIENTIFIC AMERICAN on payment of a reasonable charge for the engraving.

No charge is made for the publication, and the cuts are furnished to the party for whom they are executed as soon as they have been used. We wish it understood, however, that no second-hand or poor engravings, such as patentees often get executed by inexperienced artists for printing circulars and handbills from, can be admitted into these pages. We also reserve the right to accept or reject such subjects as are presented for publication. It is not our desire to receive orders for engraving and publishing any but good Inventions or Machines, and such as do not meet our approbation in this respect, we shall decline to publish.

For further particulars address—

MUNN & CO.,
Publishers of the SCIENTIFIC AMERICAN.
No. 37 Park Row, New York City

CHIEF QUARTERMASTER'S OFFICE,
No. 1139 Girard street, Philadelphia Depot, March 15, 1865.

SEALED PROPOSALS will be received at this office till TUESDAY, March 28, 1865, at 12 o'clock M., for delivery at the Schuylkill Arsenal:—

¾ or 6-4 Blue Wool Flannel, indigo wool-dye, to weigh 5½ ounces to the yard, of ¾ width, for sack coats, Army Standard.
¾ Gray Twilled Flannel for Shirts, Army Standard.
Red, White, and Blue Bunting, Army Standard.
½-inch Yellow Silk Lace, Army Standard.
⅞-inch Sky-blue Silk Lace Army Standard.
½ inch Scarlet Lace, Army Standard.
W. Brown Thread, No. 35. Bidders to furnish sample.
Red Spool Cotton, No. 40. Bidders to furnish sample.
4-4 Black Silesia. Bidders to furnish sample.
Straw Wrapping Paper, 36x40, to weigh about 95 pounds per ream.

Parties offering goods should make separate proposals for each article offered and must distinctly state in their bids when they will commence their deliveries, the quantity they propose to furnish each week, the price (*which should be written both in words and figures*), and conform to the terms of this advertisement, *a copy of which should accompany each proposal.*

Standard samples of the articles required may be seen at this office. Samples when submitted must be marked and numbered to correspond with the proposals; and the parties thereto must guarantee that the goods shall be in every respect equal to army standard, otherwise the proposals will not be considered.

Bids will be opened on Tuesday, March 28, 1865, at 12 o'clock M., and bidders are requested to be present.

Each bid must be guaranteed by two responsible persons, whose signatures must be appended to the guaranty, and certified to as being good and sufficient security for the amount involved, by some public functionary of the United States.

All proposals should be made out on the regular forms, which will be furnished on application at this office.

The right is reserved to reject any bid deemed unreasonable, and no bid from a defaulting contractor will be received.

Indorse envelope, "Proposals for (here insert the name of the article offered)," and address

Colonel WILLIAM W. MCKIM, Chief Quartermaster,
13 2t Philadelphia Depot.

ASSISTANT QUARTERMASTER'S OFFICE,
No. 451 EIGHTH AVENUE, NEW YORK, March 9, 1865.

CAVALRY AND ARTILLERY HORSES WANTED.—I will purchase in open market all horses that may be presented and pass inspection at the Government stables on Thirty-fifth street, near Tenth avenue, until further notice, as follows:—

Cavalry horses, 5 to 10 years old, 15 to 16 hands high.
Artillery horses, 6 to 10 years old, 15½ hands high, and over 1,100 pounds, and dark color.

Price for cavalry horses, $175. Price for artillery horses, $180. Payable in such funds as may be furnished by the Government.
13 2 L. L. MOORE, Capt. and A. Q. M.

ERICSSON'S CALORIC ENGINES,

Of greatly improved construction. For all light work a perfect motor. Safe, economical, durable.

Also Pumps of all kinds, Hoisting Gear, Steam Engines for Oil Wells, and Machinery of every description at

ERICSSON'S CALORIC ENGINE AGENCY,
13 4* No. 164 Duane street, New York.

$150 A MONTH MADE BY DISCHARGED SOLDIERS and others with Stencil Tools. Don't fail to send for our free catalogue, containing full particulars. Address
1:10* S. M. SPENCER, Brattleboro, Vt.

WANTED.—A POWER PUNCH OF SUFFICIENT capacity to punch a hole one inch diameter through half-inch iron, either new or second hand. Address GEORGE MILBURN & CO., Michawaka, Ind. 12 4*

N. C. STILES'S PATENT POWER FOOT AND DROP PRESSES.—Dies of every description made to order. Send for a circular. N. C. STILES & CO.,
12 8* West Meriden, Conn.

SPECIAL NOTICE TO INVENTORS AND OTHERS.—Small Iron Castings made to order, plain and fancy. Patterns made at short notice. Also Machinery to finish all kinds of small work. Japanning and Bronzing done in the neatest styles. Address READING HARDWARE WORKS, Reading, Pa. 11 8*

FOR SALE—5,000 SRINGFIELD MUSKET LOCKS; also, parts of the Lock, finished and unfinished. PROVIDENCE GUN LOCK Co., No. 106 South Water st., Providence, R. I.
10 6t* H. B. METCALF, Agent.

GRINDSTONES.—500 TUNS ON HAND, OF ALL sizes, for Spring trade, twelve miles from Cleveland, Ohio, on C. C. and C. and C. and T. Railroads. Address orders to F. M. STEARNS & CO., Berea, Ohio. 1 tf*

PAGE'S PATENT PERPETUAL DRAW BRICK AND Limekiln. Brickkiln will burn 40,000 No. 1 Brick per day, with four cords of wood or two tuns of soft coal. Limekiln will burn 300 bushels with three cords of wood or two tuns of coal. Address C. D. PAGE, Rochester, N. Y. 12 8*

BOILER INCRUSTATIONS.—A MOST VALUABLE discovery and perfect remedy for the removal of scale in fresh and salt water boilers. Has been thoroughly tried with perfect success. High testimonials and circular furnished on application to
12 11* TEMPLE & FITCH, Bridgeport, Conn.

CLARK'S PATENT FERULES FOR LEAKY BOILER TUBES.—Illustrated No. 9, Vol. XII., SCIENTIFIC AMERICAN.
12 8* E. CLARK, No. 321 Spring street, New York.

NEW LATHES.—S. H. NICHOLS, OF BALDWINSVILLE, N. Y., has just finished two new Engine Screw Lathes; bed 12 feet long; swing, 32 inches, and are for sale at reasonable prices. 12 4*

WANTED.—A PRACTICAL MECHANIC WANTS employment as Draughtsman and Superintendent of Machine, Pattern and Smith Works. Has twenty years' experience on Steam Engines, Mill Works, Machinists' Tools, Wood-working Machinery, Oil Tools. Speaks English and German. Box 110, Harmar, O. 12 4*

LUNKENHEIMER'S IMPROVED GLOBE VALVE; A complete assortment of Brass Work for Locomotives, Portable and Stationary Engines. For samples and catalogue address
CINCINNATI BRASS WORKS,
11 XII 26* No. 13 East Seventh street, Cincinnati.

FOR SALE—A VALUABLE STEAM ENGINE, ABOUT 8-horse power, in excellent running order. Address HUMASON & BECKLEY MF'G CO., New Britain, Conn. 11 4*

THE VENEER FRUIT BASKET.—BEECHER'S PATENT, May 31, 1864.—To all parties engaged in the small-fruit business we offer the above basket. Our basket is stylish, durable and cheap. For circulars of description, price, etc., address
A. BEECHER & SONS,
10 4* Westville, Conn.

SPOKE AND HANDLE MACHINE.—THOSE DESIRING to purchase the best machine in the United States for making spokes, Yankee ax handles, etc., should address
E. K. WISELL, Patentee and Manufacturer,
10 4* Warren, Ohio.

PORTABLE ENGINES, FROM 8 TO 16-HORSE POWER, ready for immediate delivery. C. GAY, No. 29 Doane street, Boston, Mass. 7 13*

DAMPER REGULATORS—GUARANTEED TO EFFECT a great saving in fuel, and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 5 Park Place, New York 8XII. 26*

FOR A FORTUNE—ADDRESS FRANKLIN S. M. CO., Box 302, Boston, Mass. 8 10*

THE BISHOP GUTTA-PERCHA COMPANY, EXCLUSIVE Manufacturers in United States of every description of Pure Gutta-percha Goods, such as
Submarine Telegraph Cables,
Insulated Wire, of all kinds, for blasting, mining, and electric telegraph use,
Chemical Vessels for electroplating, etc.,
Photograph Baths and Dishes,
Tissue Sheet, of superior quality, for hatters, artificial flower makers, etc.,
Tubing for Pure Water, Beer, Soda, Etc.,
Bosses for Flax Machinery of all sizes—a very superior article; with a great variety of other articles made to order. Apply at office and sales room, No. 201 Broadway. SAML. C. BISHOP, General Agent.
8 12*

PLATINA—WHOLESALE AND RETAIL—FOR ALL purposes. H. M. RAYNOR, Importer, No. 748 Broadway, New York. Platinum Scrap of any sort purchased. 7 *8

HANCOCK'S PATENT STEAM BLOWER COMBINES all the advantages of the Fan Blower, and requires very little power to operate it. It is noiseless, occupies no space available for other purposes, requires no connection with any motor other than a boiler, and the steam used to produce the blast is utilized in the furnace to promote combustion.

For sale by the Agents, F. W. BACON & CO., 84 John street, New York. 6 12*

FOR WOODWORTH PATENT PLANING AND MATCHING MACHINES, Patent Siding and Resawing Machines address J. A. FAY & CO., Cincinnati, Ohio. 3 1y

---

CAST-STEEL RAKE TEETH, OF A SUPERIOR quality, made to any pattern required, at low rates. No extra charge for coiling teeth. Address C. COLEMAN, Allegheny City Pa. 7 12*

DEL. LIT. INST. ENGINEERING SCHOOL, AT Franklin, Delaware Co., N. Y.—Advantages—Full set best Engineering Instruments, worth $1500; Laboratory, fitted up with furnace, still, balance, &c.; full set Reagents for analysis; full set Mineral Specimens; $200 pays Board, Books and Tuition one year. GEO. W. JONES A. M. (Yale Col.), Prof Math., Instr. in Field Work. W. A. ANTHONY, B. Ph. (Yale Col.), Prof. Nat. Sci., Instr. in Drawing. 3 12*

PORTABLE STEAM ENGINES—COMBINING THE maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 300 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & CO., Lawrence, Mass. 3 tf

---

J. A. FAY & CO.,
CINCINNATI, OHIO,
Patentees and Manufacturers of all kinds of
PATENT WOOD-WORKING MACHINERY
of the latest and most approved description.
particularly designed for

Navy Yards	Sash, Blind and Door,
Ship Yards,	Wheel, Felly and Spoke,
Railroad,	Stave and Barrel,
Car and	Shingle and Lath,
Agricultural Shops,	Planing and Resawing,
Mills, &c.	

Warranted superior to any in use. Send for Circulars.
For further particulars address J. A. FAY & CO.,
Corner John and Front streets,
Cincinnati, Ohio,
Who are the only manufacturers of J. A. Fay & Co's Patent Wood-Working Machinery in the United States. 3 1y

---

IRON PLANERS, ENGINE LATHES, DRILLS AND other machinists' tools, of superior quality, on hand and finishing, for sale low. For description and price address NEW HAVEN MANUFACTURING COMPANY, New Haven, Conn. 1tf

---

FOR PATENT SCROLL SAWS, PATENT POWER Mortising Machines, Tenoning, Boring and Doweling Machines, Sash, Blind and Door Machinery, of the latest and most improved description, address J. A. FAY & CO., Cincinnati, Ohio. 6dtf

---

ALCOTT'S CONCENTRIC LATHES.—FOR BROOM, Hoe, and Rake Handles, Chair Rounds, &c.—Price $25; and all other kinds of Wood-working Machinery, for sale by S. C. HILLS, No 12 Platt street, New York. b

---

GRAIN BINDERS.—RIGHTS FOR SALE IN TERRITORY, by T. G. ORWIG, No. 229 Broadway. 8 6*eow

---

FOR FIRST-CLASS, EASTERN MADE, FAY & CO.'S Wood-working Machinery address as formerly, J. A. FAY & CO., or E. C. TAINTER, succeeding partner, Worcester, Mass. 12eow

---

FOR PATENT UNION MILL-STONE PICK, WITH extension edges, address D. C. STONE & CO., Kingston, N. Y. 12 4*eow

---

PECK'S PATENT DROP PRESS MANUFACTURED in all its varieties, by M. & C. PECK & CO., Founders and Machinists, New Haven, Conn. Vol. XI. 16 26*

A MESSIEURS LES INVENTEURS.—A VIS IMPORTANT Les inventeurs non familiers avec la langue Anglaise, et qui préféreraient nous communiquer leurs inventions en Français, peu vent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confidence. MUNN & CO.,
Scientific American office, No. 37 Park-Row, New York.

A VALUABLE WORK FOR INVENTORS PATENTEES AND MANUFACTURERS.

The publishers of the SCIENTIFIC AMERICAN have just prepared with much care, a pamphlet of information about Patents and the Patent Laws, which ought to be in the hands of every inventor and patentee, and also of manufacturers who use patented inventions. The character of this useful work will be better understood after reading the following synopsis of its contents:—

The complete Patent Law Amendment Act of 1861—Practical Instructions to Inventors, how to obtain Letters Patent, also about Models—Designs—Caveats—Trade-marks—Assignments—Revenue Tax—Extensions—Interferences—Infringements—Appeals—Re-issues of Defective Patents—Validity of Patents—Abandonment of Inventions—Best Mode of Introducing them—Importance of the Specification—Who are entitled to Patents—What will prevent the granting of a Patent—Patents in Canada and European Patents—Schedule of Patent Fees; also a variety of miscellaneous items on patent law questions.

It has been the design of the publishers to not only furnish, in convenient form for preservation, a synopsis of the PATENT LAW and PRACTICE, but to answer a great variety of questions which have been put to them from time to time during their practice of upwards of *seventeen years*, which replies are not accessible in any other form. The publishers will promptly forward the pamphlet by mail, on receipt of six cents in postage stamps.

Address MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, No. 37 Park Row New York.

OIL! OIL! OIL

For Railroads, Steamers, and for machinery and Burning, PEASE'S Improved Engine Signal, and Car Oils, indorsed and recommended by the highest authority in the United States and Europe. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The "Scientific American," after several tests, pronounces it "superior to any other they have used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No. 61 and 63 Main street, Buffalo, N. Y.

N. B.—Reliable orders filled for any part of the world. 1tf

D. L. HARRIS & CO., SPRINGFIELD, MASS., Manufacturers of Machinists' Tools, Steam and Power Pumps Bridges, Turn Tables, Bolts, Etc.
7 10* W. H. BURRALL, Superintendent.

FOR DANIELS'S PLANING MACHINES, CAR MORTISING, Boring Machines, Car-Tenoning Machines, Car Planing and Beading Machines, &c., address J. A. FAY & CO., Cincinnati, Ohio. 3 1y

---

MILL STONE DRESSING DIAMONDS SET IN Patent Protector and Guide.—For sale by JOHN DICKINSON, Patentee and Sole Manufacturer and Importer of Diamonds for all Mechanical purposes. Also, Manufacturer of Glazier's Diamonds, No. 64 Nassau street, New York City. Old Diamonds reset. N. B.—Send postage stamp for Descriptive Circular of the Dresser. 4 12*

$2,000 A YEAR MADE BY ANY ONE WITH $15. Stencil Tools. No experience necessary The Presidents, Cashiers and Treasurers of three Banks indorse the circular. Sent free with samples. Address The American Stencil Tool Works, Springfield, Vt. 25 tf

---

STEAM ENGINES, MACHINERY, ETC.—STEAM ENGINES from 10 to 150-horse power with link motion, variable cut-off, of the most approved construction; also lathes, mill-gearing, shafting, hangers, etc., and Machinery in general. Address
4 XII., 1y M. & T. SAULT, New Haven, Conn.

HARTMANN & LAIST, 64 SYCAMORE STREET, Cincinnati, Ohio, Manufacturers of Glycerine for Gas Meters, Hydraulic Presses, etc. Warranted not to freeze at the lowest temperature. Glycerine for Perfumers, Tobacco Manufacturers, Printers, Druggists etc. Asetic Acid, Acetate of Lime. Acetate of Soda at the lowest prices. PAUL BALLUFF, Agent, 95 Maiden Lane.
2 16*

WATER WHEELS.—THOSE WHO WISH TO GET a large amount of power from a small quantity of water should use Warren's Turbine Water Wheel. For circulars, &c., address A. WARREN, Agent, American Water Wheel Company, 31 Exchange street, Boston, Mass. 13 12*

IMPORTANT TO HORSE RAKE MANUFACTURERS.—The subscribers, yielding to the solicitations of many manufacturers of Horse Rakes, have at length completed arrangements for furnishing Rake Teeth of any shape desired, bent and tempered to any pattern. We have no hesitation in assuring Rake Manufacturers that they can now rely upon procuring from us good reliable Teeth, of very superior temper, and in any quantity, on short notice. We furnish, in addition to the ordinary sizes of Round Teeth, Sprout's Patent Shape Teeth, for which we have the exclusive right of manufacture. We annex List of Sizes:—7-16 inch Round, No. 1; 13-32 inch Round, No. 2; 3-8 inch Round, No. 3; Sprout's Patent, No. 1; Sprout's Patent, No. 2; Sprout's Patent, No. 3. Extra price for all Teeth over 5 feet in length, also when a coil or spring is made on the tooth. Nos. 1, 2 and 3, Sprout's Patent, correspond for strength with the same Nos. of Round, and are much lighter and more elastic. Our Teeth are all tested before leaving the shop, and warranted to be a perfect spring temper. Parties ordering Teeth should be careful to send pattern. We also furnish Rake Steel to order, cut to lengths, at lowest market rates. Terms cash. HUSSEY, WELLS & CO., Pittsburgh, Pa., Manufacturers of best Refined and all descriptions of Cast-steel. 1 13*

REYNOLDS' TURBINE WATER WHEELS.—COMPETENT men are employed to measure streams, make plans and put in flumes, wheels, and gearing. TALLCOT & UNDERHILL, No. 170 Broadway, New York. 1 XII. 1y*

GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, New York.

GUN AND PISTOL SCREWS.—COMSTOCK, LYON & CO., Manufacturers (Office 74 Beekman street, New York, are always prepared to furnish Gun and Pistol Screws to samples Screws to fit the U. S. Musket, Sewing Machine Screws, and Metal Screws generally, of the best quality, at short notice. 16 26*

HOLSKE & KNEELAND, MODEL MAKERS. PATENT Office Models, Working Models and Experimental Machinery, made to order at 528 Water street, near Jefferson street, New York. Refer to Munn & Co., SCIENTIFIC AMERICAN Office. 1tf

---

Zur Beachtung für deutsche Erfinder.

Die Unterzeichneten haben eine Anleitung, die Erfindern das Verhalten angibt, um sich ihre Patente zu sichern, herausgegeben, und verabfolgen solche gratis an dieselben.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu addressiren an

Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.
Daselbst ist zu haben:

Die Patent-Gesetze der Vereinigten Staaten,

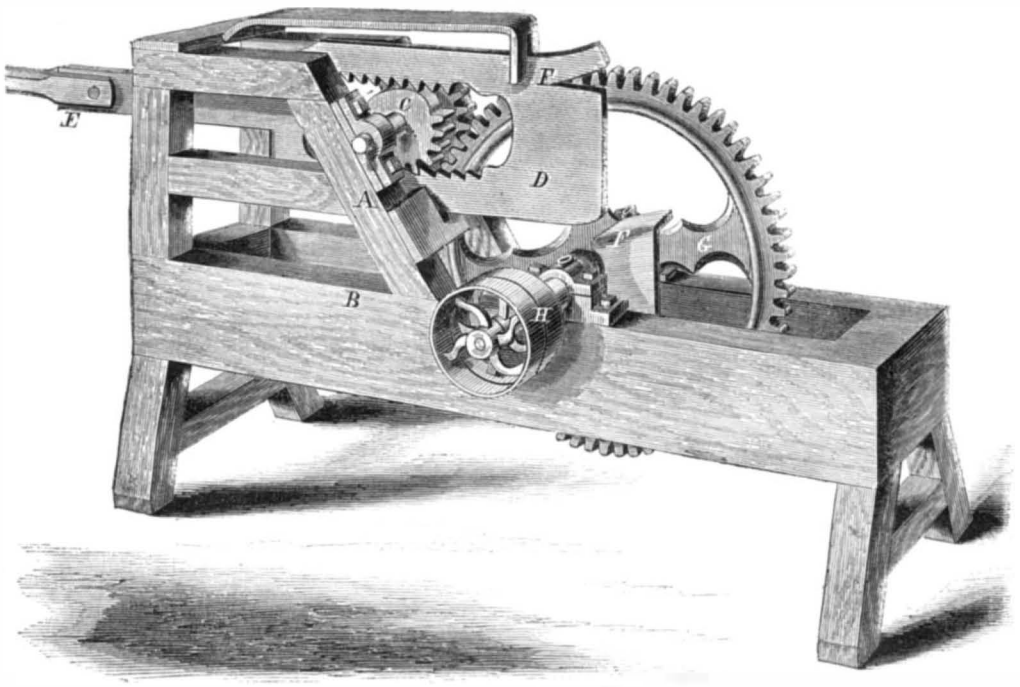
nebst den Regeln und der Geschäftsordnung der Patent-Office und Anleitungen für den Erfinder, um sich Patente zu sichern, in den Vereinigten Staaten sowohl als in Europa. Ferner Auszüge aus den Patent-Gesetzen fremder Länder und darauf bezügliche Rathschläge; ebenfalls nützliche Winke für Erfinder und solche, welche patentiren wollen.

Preis 20 Cts., per Post 25 Cts.

Machine for Converting Reciprocating into Rotary Motion.

This machine is for the conversion of reciprocating into rotary motion, and is intended to be used on steam engines in the place of the crank, or for other purposes where such details are generally employed.

The parts are few and the arrangement simple. A stout frame, A, is erected on the main one, B, and on this frame is a cog wheel or pinion, C, having a shaft which runs in suitable bearings. This pinion is toothed for a portion of its circumference only, and has a rack or frame, D, encompassing it. The teeth of the rack are inclined in opposite directions, and when it is moved back and forth in a straight line, by the rod, E, the teeth in contact with the pinion cause the shaft of the same to revolve half a turn; as the last tooth of the pinion leaves the last tooth of the rack, the first tooth on the other side of the pinion is thrown up in contact with the upper set of teeth in the rack and the pinion shaft is caused to revolve the other half turn so as to complete one revolution. The rack is thrown in and out of gear by the inclined planes, F. Motion is conveyed from the pinion shaft by an additional wheel to the main spur wheel, G; in this way a continual rotation is kept up and power may be taken from the pulleys, H, to any machine to be driven. A patent for this device was obtained through the Scientific American Patent Agency by P. Werni, on the 3d of January, 1865; for further information address the inventor at Manchester, Mich.



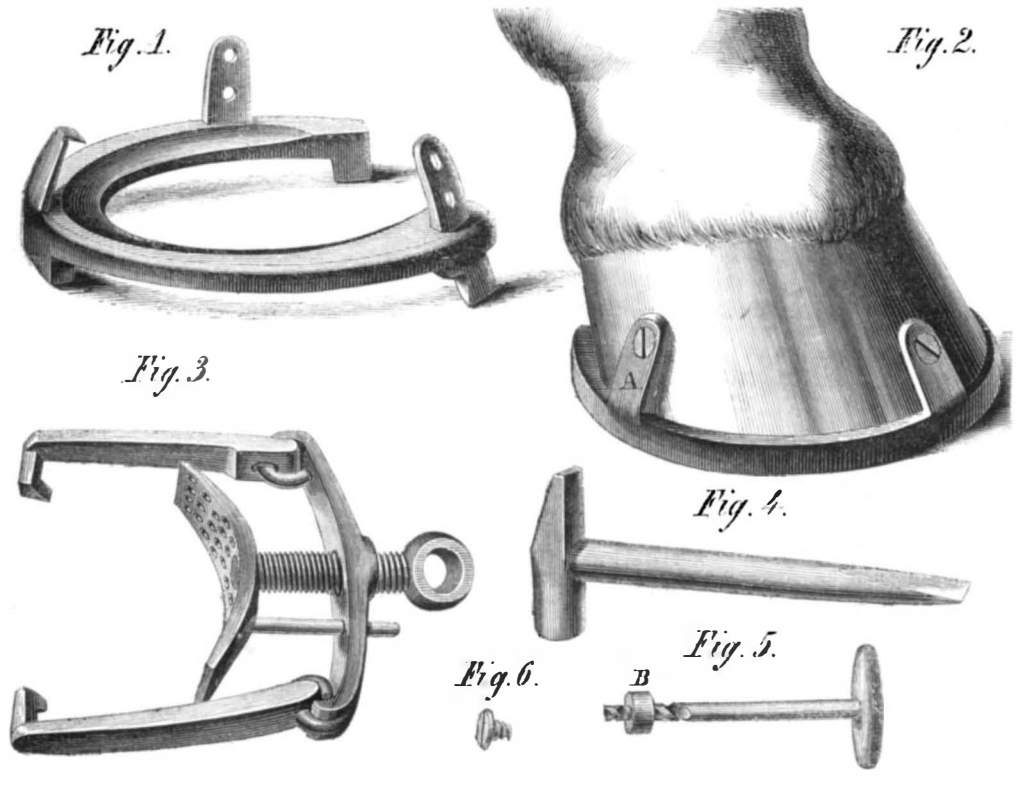
CONVERTING RECIPROCATING INTO ROTARY MOTION.

Improved Horse-shoe.

These engravings represent a new horse-shoe which is remarkable for the method by which it is attached to the hoof. The usual plan of nailing is dispensed with, and the shoe has three clips, A, forged on it, which are bent to embrace the hoof, and are provided with holes through which screws are passed and driven into the hoot by a screwdriver. The forward clip is made with a spur inside, so as to penetrate the hoof and retain the shoe without straining the screw, as in Fig. 1.

The tools used for applying this shoe are shown in connection with it; Fig. 3 is the screw clamp, which is employed where large numbers of horses have to be shod. It is made of iron and is for the purpose of drawing the shoe up to the hoof, in its place, before the screws are inserted.

The gimblet, Fig. 5, is provided with a collar, B, to prevent it from entering too far and destroying the hoof; Fig. 6 shows the screw. Fig. 4 is the hammer and the screwdriver combined. Fig. 2 represents a flat or plain shoe, and Fig. 1 a corked shoe; in the latter the screw holes are not countersunk, this secures the shoe more firmly to the hoof and adapts it for heavy work. The corks are of steel and so designed as to be screwed in when the shoe is to be used in frosty weather; by this plan they can be taken out and sharpened when necessary, or omitted entirely if not needed.



JOHNSON'S HORSE-SHOE.

Any person, says the inventor, can attach a shoe to a horse by this plan in a few minutes, and it is impossible to lame a horse with it; it leaves the hoof in a natural state and does not cramp the horse in his motions. They are cheaply made and tight when properly put on. The shoe was patented through the Scientific American Patent Agency by John M. Johnson, of Washington, D. C., on the 24th of May, 1864; for further information address the inventor at Station D, New York city.

Watering plants with the rinsings of the milk pails makes them grow finely.

FROM THE STEAM PRESS OF JOHN A. GRAY & GREEN