

Scientific American.

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

Vol. XIII--No. 1.
(NEW SERIES.)

NEW YORK, JULY 1, 1865.

\$3 PER ANNUM
IN ADVANCE.

Improved Ice House.

In these torrid days the very thought of ice is agreeable, and refrigerators or similar apparatuses, for preserving food cool and sweet, are not unpleasant topics of conversation.

The ice house here represented is intended for keeping large quantities of provisions in store for some time without allowing it to come in contact with the ice, or even be in the same inclosure with it. This ice house is intended principally, for use in hotels, restaurants, on board steamers, etc. It has been tried, practically on a large scale, and found to answer well. The idea is to ventilate the compartment in which the articles to be kept are placed so that

G, as shown by the arrows, while the warmer air rises through the flue previously indicated.

This ice house is constructed on philosophical principles and will answer the purpose for which it was designed.

A patent is now pending on it through the Scientific American Patent Agency by J. Hyde Fisher; address him for further information Box 2,730, Chicago, Ill.

A Steam Flying Machine.

A flying machine of novel form is now in process of construction at Hoboken, for the United States Government. It was commenced during the war,

We see every day in the streets toy vendors who give a quick twirl with a string to a little fan upon a stick, and lo! it shoots into the air to a height of 20 or 30 feet, and descends slowly, still revolving as it comes down. The government toy—as some persons will probably call it—is a cigar-shaped canoe, built of copper, with iron ribs. An engine is placed in the centre with sufficient power to work a screw fan with 20 ft. blades. There are four fans connected with the engine,—one below, one above the canoe, and one at each end. The upper and lower fans are worked together to produce an ascent; and the terminal fans are made to revolve together or separately in the same direction, or in opposite directions, for the

Fig. 1

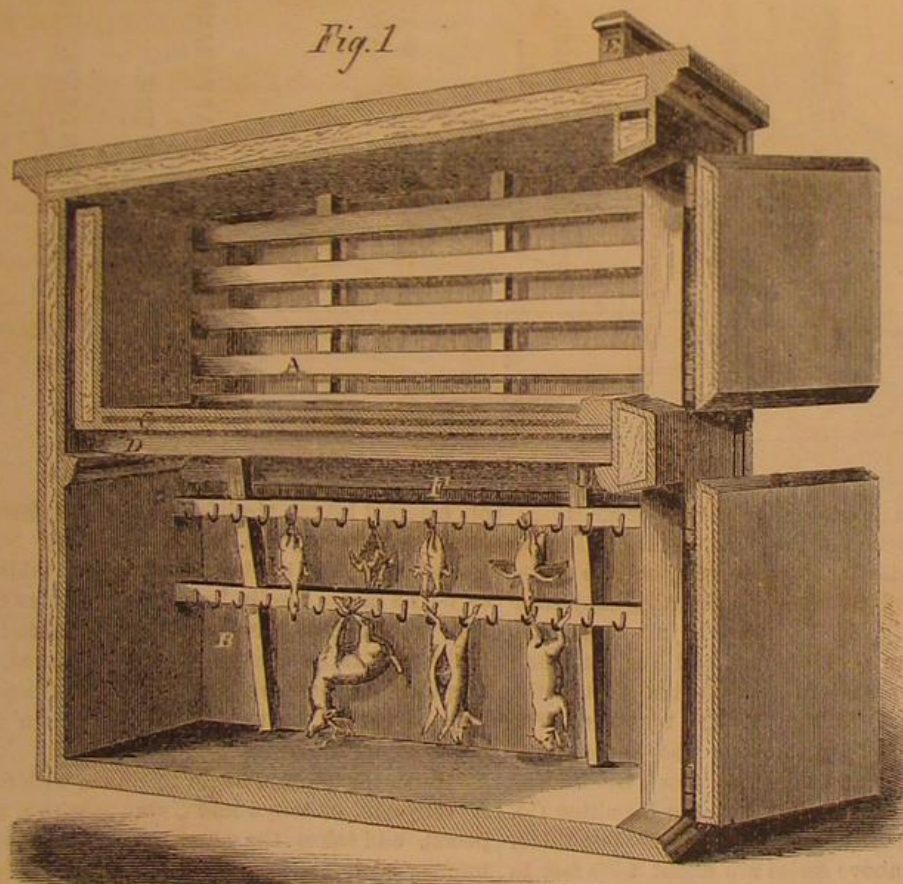
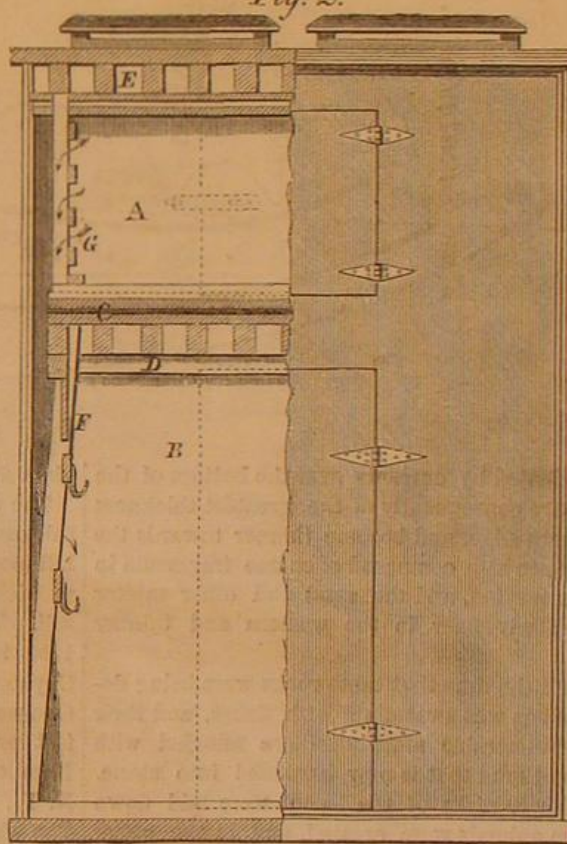


Fig. 2



FISHER'S ICE HOUSE.

the vapors, odors and gases, if any, pass off freely by one outlet and are succeeded or displaced by a current of cold air which pervades the apartment and keeps a pure dry atmosphere at all times. Fig. 1 shows a section vertically, and Fig. 2 one transversely. As cold air falls naturally, being heavier than warm air, the ice is placed in the upper compartment, A, and the food in the lower one, B, as shown. Between the two there is a floor which is slightly inclined and fitted with a water-proof filling, C, which prevents the ice either from leaking or condensing moisture to form on the ceiling below. This floor is likewise inclined slightly, and has strips at the side so as to cause the water from the ice to run off to the front where it is received in suitable vessels. The upper part of the lower chamber has a flue, D, through which the warm air and vapors aforesaid ascend to the ventilators, E, on top, and the air that enters the lower compartment, when it is opened to remove the articles, finds its way out again through the same channel.

The aprons, F, are an important feature of this ice house, for they prevent the two currents from mingling or coming in contact when in the course of changing. The cold air descends through the spaces,

and was intended for use in aerial reconnoissances of the enemy's position. The war is over, but the machine is going on till its success or failure is an established fact. The idea of the invention is an old one, but this is the first time that an attempt has been made to put it into practice. The government was induced to embark in the enterprise upon the strength of certain experiments made by the late distinguished General (and Professor) Mitchell. He had long been interested in the subject of aerial navigation, and believed that the principle of screw propulsion could be made to work in air as well as in water. His first and only point was to demonstrate the lifting power of a screw fan moving horizontally at different rates of speed. The experimental fan was placed upon a pole as an axis, up and down which it could move freely. The fan was then made to revolve at various rates of speed at the pleasure of the operator. At one rate it would merely lift itself; at another rate it would raise twice its own weight; at another three times; and so on, until the fact was ascertained by comparison that a fan with blades of 20 feet diameter, revolving at a certain rate of speed, would raise six tons, and have considerable power to spare. It is only a child's toy on a large scale.

purpose of propelling the craft horizontally. The weight of the whole, fully equipped and manned, is about six tons. It is claimed by those upon whose recommendation the machine is constructed, that it can be guided through the air with as much ease as a vessel through the water. This is conditional of course to some extent upon the wind. If a vessel can be propelled through still air at a given number of miles per hour, it may be made to stem a wind of an equal number of miles per hour. If the power of a head wind exceeds or is less than the propelling power, the machine actually falls back or progresses in exact proportion to the difference between the powers. This truth should be borne in mind in considering all schemes for air-sailing.

An accomplished government officer is superintending the work, and hopes to have it done in a month, when the pretensions of the new flying machine will be tested.—*Journal of Commerce.*

We are pleased to learn that the estate of the late President Lincoln is in much better condition than many persons were led to believe. It now appears that he had some \$75,000 invested in Government securities.

THE PETROLEUM ROCKS.

BY R. P. STEVENS, M. D.

If half a dozen saucers be placed one within another, and the edges ground down nearly to a level with the middle of the upper saucer, we shall have an illustration of the position of the several layers of rocks that form the basin in which our petroleum is found. This may serve indeed as an illustration of most of the rock formations that make up the crust of the earth, for, as they have generally been deposited in the bottoms of lakes or seas, they exist in the form of basins. The illustration does not present an exact parallel, as the rock basins are irregular in their outline, and unequal in the thickness of the several strata, as compared with each other, and in that of the different parts of the same stratum.

The basin in which petroleum is found embraces Lake Erie, the western part of Pennsylvania, and portions of Kentucky, Virginia and Ohio. The rocks were deposited in the bottom of an ocean which was bounded by land on the north and east, and was open to the south and west. The materials for these deposits were obtained by the wearing away of the eastern mountainous shore of the ocean, and they

group of rocks, in which seven-eighths of our petroleum is found. The rim of this deposit is traced nearly around the basin, extending south of the Portage a little inland from the shore of Lake Erie, bending southward through Ohio and Kentucky, and reappearing in several folds on the western slopes of the Alleghenies. The wells of Oil Creek are in the lower portion of the Chemung, those of Tidioute and Economite, in the middle portion, and those of Mecca and northeastern Ohio in the upper portion. The rocks of this group are mostly alternate layers of sandstone and soft slate or shale.

The interior of the basin is filled with the carboniferous, or coal deposit. The coal occurs in smaller basins, which might be represented in our illustration by tiny saucers set within the upper of the larger ones, the spaces above and below the basins of coal being filled with clay and sandstone, the last deposits upon the bottom of this sea, before the slow upheaval of the continent lifted it from the waters, and it became dry land.

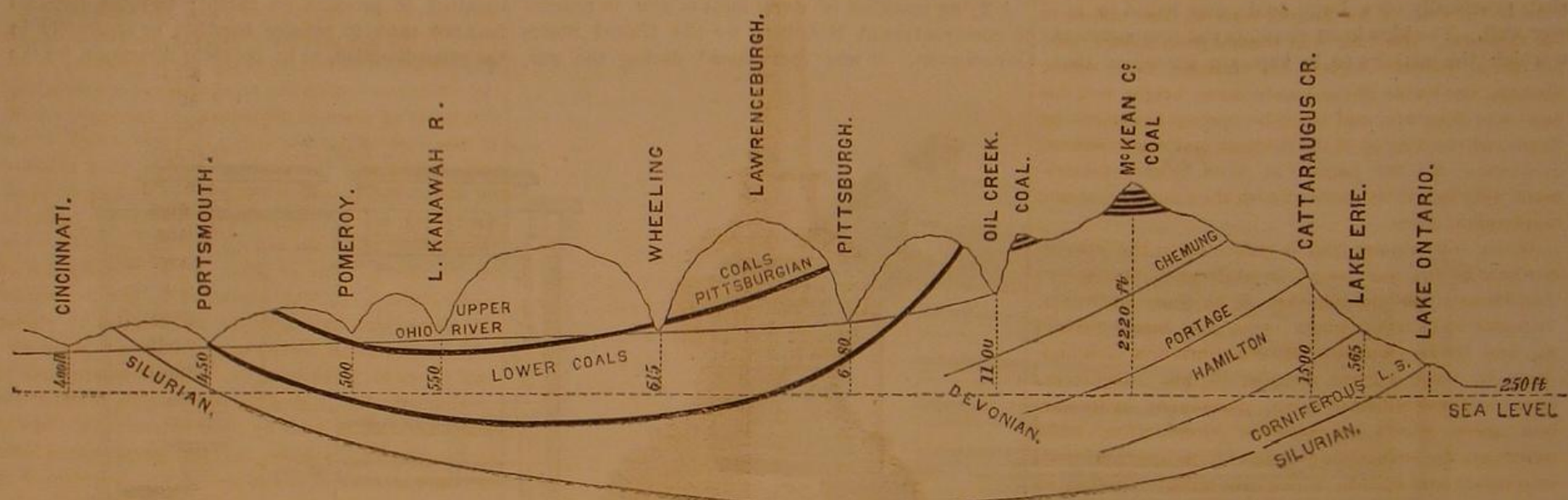
The wells of Smith's Ferry and Beaver R. oil are in the lower carboniferous; those of Dunkard Creek, Fayette and Green County, Penn., are in the middle carboniferous; and the shallow wells of West Vir-

haps some millions of years hence these plains of waving grain may be again lowered beneath the level of the sea, the waters may then be inhabited by new species of fishes yet to be created, and ships, propelled by engines at present undreamed of, may navigate the surface of a stormy ocean a thousand fathoms above the submerged ruins of Pittsburgh and Cincinnati.

The Strawberry Harvest.

The importance of this crop has increased greatly of late, and horticulturists are sedulously engaged in developing its best qualities. The scenes during the harvest are animated, and are thus described by the *Circular*:—

"Up early and late—men, women, boys and little children, Community folks and village folks, riding, driving and railroading, night and day, and all about strawberries. For why? Because there are five acres of the crimson, juicy fruit-cones, on which sun and dew are pouring their final ripeness, and which are to be picked now or never, and got to the waiting appetites and teaspoons of our city cousins. Come on and at five in the morning we will commence. The crates and boxes, cart-loads of them, are on the ground at the border of the field, where the long rows



were distributed by currents over the bottom of the sea; they are consequently of the greatest thickness at the eastern edge, and become thinner towards the west; they are also composed of coarse fragments in the eastern portion, and the sand and other matter grows regularly finer in the western and thinner strata.

During all the time that these rocks were being deposited the sea was swarming with fishes, and their bones in innumerable multitudes are mingled with the sand and mud that is now hardened into stone. After the lower rocks of the basin were laid down amphibious animals were created, and in the upper and more recent rocks their remains are found in great numbers mingled with those of fishes.

Prints of seaweeds are found in all the formations, but while the lower rocks contain no trace of any land plant, the vast coal deposits of the upper series have been formed by the decomposition of peat and marsh vegetation.

The accompanying diagram represents a vertical section through the basin, along the crooked line of the principal borings. The lowest formation in which oil occurs in paying quantities is the corniferous limestone, so called because it contains nodules of hornstone, or flint. This is that ancient coral reef which was built up immeasurable ages ago in the warm and shallow waters along what was then the southern shore of the North American continent. It can now be traced along the southern shore of Lake Ontario, the northern shores of Lakes Huron and Michigan and northwestward far towards the Pacific.

Next above the corniferous is the Hamilton formation, which furnishes the flagstones for our sidewalks. The rich oil wells of Enniskillen, in Canada, are in the corniferous and Hamilton rocks.

Next is the Portage group of sandstones, the rim of the deposit coming to the surface along the southern shore of Lake Erie, where oil has been found in this rock.

Continuing upward we now come to the Chemung

ginia and Marietta district are in the upper coals.

The Catskill portion of the Chemung is 800 feet in thickness, perpendicular to the strata, on the Catskill mountains, and thins out to the Allegheny river in McKean county, N. Y., where it just tinges the soil. The Portage is 1700 feet, and the Chemung 1200 feet in their eastern portion, but east of the Cuyhoga River in Ohio they merge together. The Genesee slate is 300 feet thick on the Genesee, 30 feet on Lake Erie and does not reach Ohio. The Hamilton group is 1000 feet thick in Hamilton Co. N. Y., and in Canada at the west only 150 feet thick. The whole of the above series are about 6500 feet in thickness in their eastern portion, about 600 feet in Portsmouth on the Ohio, and 50 feet on the Mississippi.

The three sandstones of Oil Creek are local deposits of very small extent, and it is labor lost to sink wells in Ohio in search of the "third sandstone." Those Canadian borers who regard the corniferous limestone as the mother of oil, and who are sinking wells at Oil Creek in search of that formation, are also doomed to disappointment.

The slow upheaval of the continent continued after the middle of the great basin was raised above the ocean, and it is now 800 feet above the level of the sea. Neither was the work of creation suspended; as the seas were inhabited by successive species of fishes and amphibians, so the vast plains have been the abodes of successive species of land animals, which have one after another become extinct. Even since the advent of man this order of succession has been continued. We know that the race of mound builders, with their skill in working copper, were succeeded by the more savage and warlike Indians, whose best implements were made of stone, and these have been swept away by a race who read the *SCIENTIFIC AMERICAN*, and discuss the problems of aerial navigation and the conservation of force.

In the slow oscillations of the earth's crust, per-

of emerald leaves stretch away, embroidered underneath with red. The crowd seize their boxes and spread along the border, each person taking a row, or if the plants are in beds, two persons to a bed. They toss two or three empty boxes ahead of them in the path to be convenient when wanted, and getting down to the work begin to move across the field. Now be careful not to step on the green fruit, and not to injure the vines.

"Soon the pickers begin to return with full boxes. A tallyman, or tallywoman, stands with a book and pencil, and takes the name of each, and scores the number of boxes he returns. They are placed in crates, holding from thirty to seventy boxes, which as fast as filled are wheeled to the fruit-house, where the boxes are all taken out and leveled up, that is, packed as full with fruit as they will bear to carry. The picking continues three or four hours. Then the pickers are paid from the tallyman's book, and invited to be on hand at 3 o'clock in the afternoon. By 8½ or 9 o'clock, the morning's picking is all packed and carried to the station in readiness for the forenoon train. The greatest gathering is in the afternoon, at which time crates are made up for the night train and boat for New York. This keeps many of our people busy till 9 or 10 o'clock. Such are the scenes daily, of the strawberry harvest. This harvest is very exacting of immediate attention during its time, but it does not last but two or three weeks. Twice this week the daily picking has amounted to 2300 quarts, or over 70 bushels. The pay for picking ranges from 1½ to 2½ cents per box, at which rate some girls make 60 cents in four hours.

THE Paris papers notice a novel method of preserving ice, which is often required to be kept by people who are not provided with an ice-safe. Put the ice on a dish and cover it with a napkin, then set the dish upon a feather bed or pillow, and place another bed or pillow on the top of it. In this way it is said, a few pounds of ice may be kept for a week.

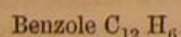
A MANUFACTORY OF ANILINE DYES.

On the 28th of January, 1860, we published a full account of the method of making aniline dyes from coal tar, then just commenced on a commercial scale in France. During the five years that have since elapsed these dyes have become known throughout the civilized world under the names of Magenta, Solferino, and others, and have been universally admired for their delicacy and brilliancy. The attention of the most eminent chemists has been directed to the production of different colors, and now, not only the primitive colors, red, yellow and blue, but all the others resulting from a combination of the primitive are obtained from that vile substance, coal tar, and all of the purest, deepest, and most perfect quality.

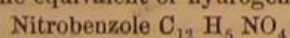
We now announce the establishment of the first manufactory of these dyes in the United States. Messrs. Thomas and Charles Holliday have commenced the business in the suburbs of Williamsburgh, on Long Island, and we have been favored with a look at their works. After wandering about for a while among the dirty manufactories for which Newton Creek is famous, we came upon a brick building, and saw a workman standing in the door way. As soon as our eye fell upon this man we saw that we had discovered the establishment that we were in search of, for he was dyed from the crown of his head to the ends of his fingers with all the colors of the rainbow. His hair was shaded from a dark purple to a delicate violet, his thumbs were yellow bronze, the backs of his hands were bright red, his nose was Magenta, and when he opened his mouth he displayed his tongue of the deepest and most brilliant Solferino. All the people at work in the establishment were indelibly marked with the same varied and resplendent hues.

When bituminous coal is subjected to the cherry-red heat of the gas retort, it undergoes destructive distillation, the combination of oxygen, hydrogen, nitrogen and carbon which forms coal being broken up, and these elements entering into new combinations to form a great number of new substances. Some of these substances are permanent hydro-carbon gases, which are used for illumination, while others on the reduction of temperature are condensed into solids and liquids, which are mixed together as coal tar. One of the liquids, though a very volatile liquid is benzole. If benzole is mixed with strong nitric acid, a new chemical compound is formed, which is called nitro-benzole. Then if this is subjected to the action of nascent hydrogen, aniline is produced.

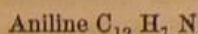
Benzole is composed of, carbon 12 atoms, and hydrogen 6.



When nitric acid, NO_3 , is added, the acid loses one equivalent of oxygen, becoming NO_2 , and this is substituted for one equivalent of hydrogen.



Then by contact with nascent hydrogen the 4 atoms of oxygen are displaced by 2 of hydrogen, and we have



The discovery that aniline can be made from benzole is one of the most valuable chemical discoveries of the century, for it has revolutionized the important art of dyeing.

After the aniline is formed the various colors are produced from it, principally from oxidizing it, which is effected by treating it with nitrates of potash, chlorate of potash and other compounds that hold oxygen by feeble affinity, and therefore surrender it readily to other substances with which they are brought in contact.

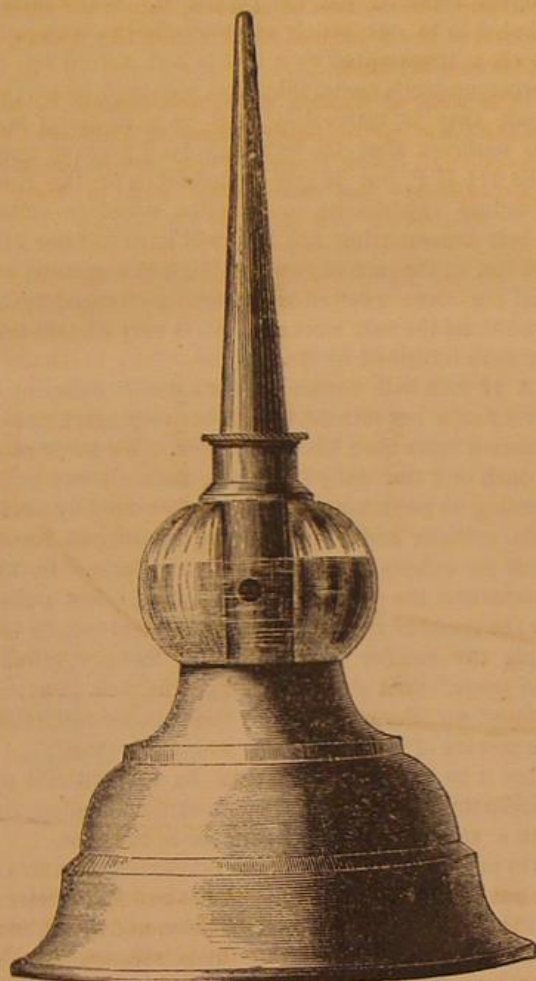
The apparatus required is a large retort, a steam boiler for heating it, and an immense supply of vats, for the purification and crystallization of the solutions. There is not much machinery, but a great deal of apparatus, and plenty of time required for the product. It is estimated that 30 cwt. coal yields 18 lbs. naphtha, which gives 6 lbs. benzole, which gives 5 lbs. aniline, which gives 1 lb. Magenta. 1 lb. of Magenta will dye 600 lbs. of silk, or 900 lbs. of wool. Magenta, which in solution is a beautiful purple, is in the solid crystal a bright bronze green.

SINCE the suppression of the rebellion 160,000 troops have left Washington for the north and west.

BROUGHTON'S GLASS TOP OILER.

The floor around an oil tank in a machine shop or factory, is continually slopped with oil, so that in a short time it becomes actually rotten. This is evidence of great waste and recklessness, for it is caused by carelessly filling oil cans, so that a quantity runs over and is wasted in the manner described. The common funnel is but a partial protection against this loss, for the spout of it fills the hole in the oil can tightly, while the funnel is full, the air is prevented from escaping, and if precaution is not taken the oil will be spilled after all.

The engraving published herewith represents an oiler which is completely guarded against loss from overflow; moreover, it always has a funnel with it, so that the oil may be run in and yet allow the air to escape at the same time. When the can is full it may be seen at a glance in time to prevent any loss from overflow. This can also shows the quantity remain-



ing in it at any time. By tipping it up more or less the glass globe will be filled immediately and without leakage.

The glass is extra heavy, annealed and made strong to resist an accidental blow, and the brass bottom is double spring and tinned throughout, to prevent the formation of verdigris. For sewing machines or cotton factories, or in any place where cleanliness is desirable, these oil cans will prove useful and economical.

It was patented March 7, 1865, and is manufactured by Broughton & Oakman, 41 Center street, New York; address them at that place.

A Pickpocket Catcher.

A few days ago an Englishman went to Paris to take out a patent in France for an invention to detect pickpockets. He entered an omnibus and sat by the side of an elegantly dressed lady, with a very charming face. Soon the Englishman saw an expression of distress and dismay come over that face, and felt a tugging at his pocket. With a cruel smile he looked at the fair creature, who, crimson with shame, implored him to let her go. He released her hand, and she thereupon stopped the omnibus, leaped out, and ran down the street with most unfeminine speed. The Englishman was highly pleased at the success of his device, which consists of a strong calico diaphragm stretched across the pocket with an India rubber opening that expands to permit the entrance of a strange hand, but will not do so to permit it to withdraw.

[We have heard of a sailor who lined his pockets with fish-hooks, barb down, so that any one could pass the hand in, but would be unable to pull it back. Tradition asserts that the first one he caught was himself.—EDS]

Trial of a New Cannon.

A very interesting trial of a small and novel rifled cannon is in progress at the water-shops, under Major Laidley's direction. The piece weighs only 167 pounds, yet has endured, without apparent injury, a test with a charge of powder and projectile such as are fired ordinarily from guns weighing over 800 pounds. Nearly 500 shots were fired with it, the charge being a pound of powder and a projectile weighing $7\frac{3}{4}$ pounds; and the charge has been increased to a pound of powder and a projectile weighing $10\frac{1}{4}$ pounds, ten charges of this kind having already been fired. About 200 more will be, if the gun holds together so long, as it undoubtedly will, and further testing then will be considered a waste of powder. The remarkable and previously unheard-of strength secured in this piece comes from a peculiarity of its construction. The core of the gun is bronze, which after the $2\frac{1}{2}$ -inch bore is made is only about a quarter of an inch thick. On the outside of this core or cylinder fine steel wire is tightly wound to the depth of an inch. The wires pass over diagonally, each successive layer being at right angles with the previous one. After this winding was completed, when the gun was manufactured, it was heated to a high temperature and then plunged into a quantity of molten bronze. The final result is a piece which it is impossible to burst except with a most extravagant and enormous charge, this great strength being secured by the new process of winding the wire as stated. The obvious disadvantages of a piece weighing so little, while possessing the capabilities of one weighing five times as much, is the immensely increased recoil. If this can be overcome in a measure, which is not improbable, and this mode of construction is found to work equally well with large as with small guns, the invention will undoubtedly effect a revolution in the artillery and heavy ordnance of this country, if not of the world. The inventor is Dr. Woodbridge, of Little Falls, N. Y., who was one of the first to discover the advantages which might be obtained by rifling cannon and small fire-arms, and who has made several valuable inventions in different departments of mechanics. The trial of his new cannon, the first one manufactured, is made by order of Gen Dyer, Chief of Ordnance, who will see that the government loses no time in taking advantage of the invention if it proves all that it now promises.—*Springfield Republican*.

New Way of Shaving Notes.

We have noticed in circulation several fifty-dollar Government notes from which the interest coupons have been cut off. These notes were issued August 15, 1864, and have three years to run, with 7 3-10 per cent interest, payable semi-annually. These notes are not a legal circulating medium, and with the coupons detached cannot be sold except at a shave of three years' interest. This is a petty swindle, and the public ought to be very careful to examine these Government interest-notes to see if the coupons are attached before taking them. The fifty-dollar compound-interest notes have no coupons attached, but these 7 3-10-interest notes specify at the bottom of the note as follows:—"Five coupons attached. Last six-months' interest payable only on presentation of coupons therefor."

Personal.

In our issue of April 22d we published a report that James E. A. Gibbs, the inventor of an improved sewing machine, was chief of the rebel torpedo corps. Mr. Gibbs has called upon us since and denies that he had anything to do with the manufacture of torpedoes. Mr. Gibbs is a native of Virginia, where he resided at the outbreak of the rebellion, and his papers show that he was a conscript in the rebel service, and was employed in the Nitro and Mining Bureau, at Staunton, Va. Mr. Gibbs has taken the oath of allegiance to the United States Government.

BARON LIEBIG is engaged, through the corporation of London, in a controversy upon the question whether grass will grow upon sea-sand if nutriment be supplied in solution. The corporation proposes to grow Italian rye-grass on the English sands by impregnating the sand with London sewage in solution; but Baron Liebig tells the Lord Mayor that the scheme is not feasible.

Correspondence

Leather Belts.

MESSRS. EDITORS:—I notice in your issue of the 3d inst. a few editorial remarks on leather bands, concluding with an invitation to those who possess facts connected with this subject to communicate them. I notice also that these remarks are followed by a more general invitation to write letters, coupled with the assurance that when sent to you in good faith they will be received and placed in such light as to benefit your readers and our fellow-workers. I have collected a few notes on this subject, which I here give:—

The width of a certain belt is 18 inches; speed of same, 1,500 feet per minute; angle of belt with horizon, 45° ; distance between centers of drums, 25 feet; diameter of driving drum, 8 feet; diameter of driven drum, 4 feet. When this belt transmitted 20-horse power it worked quite freely; when the power was increased to 25-horse it was necessary to make the belt quite tight, and when the power was increased to 28-horse it was necessary to apply a tightening pulley, which caused the journals of the driven shaft to "heat."

From the above data I have deduced the following formula, which will serve as a guide for determining the width of belts:—

$$\frac{H \times P \times 3\frac{1}{2}}{D \times \text{small pulley in ft.}} = \text{width of belt in inches.}$$

If we assume this belt to transmit $22\frac{1}{2}$ horse power we shall then have a constant travel of 100 square feet of belt per horse power per minute.

An 8 inch belt running 100 feet per minute will give one horse power. Hence we have

$$B = \frac{P \times 800}{V}$$

$$P = \frac{BV}{800}$$

$$Y = \frac{P \times 800}{B}$$

This rule gives $66\frac{2}{3}$ square feet per minute per horse power.

One hundred square feet of belt per minute per horse power is considered an ample allowance; in many cases one-half will be sufficient.

A 12-inch belt running on a $5\frac{1}{2}$ -foot pulley, at 45 revolutions per minute, will carry away 12 horse power. This rule gives 64 square feet of belt per minute per horse power.

$$W = \frac{350 H P}{D \times \text{rev. per min.}}$$

In which W =width of belt in inches, and D =diameter pulley in feet. This rule gives 91.63 square feet per minute per horse power, and 30 pounds per inch width of belt.

Averaging these rules, we have about 80 square feet of belt per minute per horse power.

Experiments have been made to test the comparative "slipping" tendencies of leather and vulcanized rubber belts, which proved the superior adhesive qualities of the leather, but did not go any farther. It is not adhesion alone we want to prove the better belt; beyond a certain amount it is rather an injury to the belt than an advantage in its use, for "slipping" is to be preferred to abrasion, when rapid destruction of the belt would result from the closeness of its sticking—an infirmity to which rubber belts are liable.

Belts which are repeatedly shifted should be of good leather, as the edges are almost constantly rubbing against the shifting device, and if of rubber they will wear away with great rapidity.

There is a very unsatisfactory incompleteness of the data given in the notice of some experiments; for instance, the belt in rule (1) above; the material of which it is made is not mentioned, nor is a word said on the nature of the surface upon which it runs. The adhesion to wood and to iron are very different and the magnet has much to do with adhesion. And further, it is not stated whether the nominal or actual power of the engine is meant where the term horse-power is used.

It is a fact worthy of record that, under the circumstances named the "leather belt or iron pulley

slipped with 48 lbs.," while "rubber belt on iron pulley slipped with 90 lbs." But of what use is the isolated fact when we do not know whether the leather belt was new or had been sufficiently used and greased to render it pliable and adhesive. Does not velocity introduce new circumstances of slippage and efficiency which trials, at rest, can never show? Practice is inexorable and experiment, *per se*, is not the thing for scientific artisans to base their calculations upon.

I would suggest that every successful transmission of power by belts, where the nature of the case is of sufficient importance to warrant a record, that a complete and faithful record be made and placed in the proper channels of instruction for the benefit of every artisan and engineer.

J. H. COOPER.

Philadelphia, Pa. June 12, 1865.

[We are obliged for this letter and for others on this subject received but not published. The difficulty alluded to in our article of estimating exactly what power is transmitted by a belt is not solved by our correspondent's communication, although he gives so much that is interesting, and is a thinking man. He assumes that the belt (rule 1st,) gives or transmits $22\frac{1}{2}$ H P, but is this an inference or the result of actual experiment, or practice, which is better? A belt transmitting $22\frac{1}{2}$ H P will have to raise 742,500 lbs. at the rate of one foot high in a minute, and that the force exerted is materially changed by the conditions the belt works under is very certain from the data furnished by Mr. Cooper.

A 12-inch belt running on a $5\frac{1}{2}$ -foot pulley at 45 revolutions per minute would be very slack not to transmit more than 12-horse power. We know of an 11-inch belt that daily transmits, from a 4-foot pulley running 60 per minute, the power exerted by an 11-inch cylinder and 30-inch stroke running 45 revolutions per minute with 50 pounds of steam. In this comparison the advantage is with the $5\frac{1}{2}$ -foot pulley, for the speed of the belt over it, in lineal feet, is 780, while the smaller pulley runs 753 feet per minute. The power thus carried off by this belt (vertical) without an idler pulley is, by the rule for estimating the powers of steam engines, 29-horse power.

Let it be understood that we do not criticise our correspondent's letter in a spirit of fault-finding, but with a view to further information in the case.

On page 84, Vol. III., of the SCIENTIFIC AMERICAN, we published some interesting rules and facts relating to the transmission of power by belts, and the opinion is there expressed that but little reliance can be placed on rules in general, for so much depends on the elasticity, length of belt, and velocity of the same, that arbitrary formulæ do not always suit the case. We are not of this opinion now, and see no reason why, when the length and width of the belt is given, we should not have an approximately correct result, with the ordinary tension, that is a stretching that will neither tear out the lacing, or the holes, or heat the shaft, but be sufficient to cause a moderate and proper adhesion. Of course, in this case, common sense must be used to determine what reasonable tension means.

As our correspondent remarks, the experiments with the india-rubber and the leather belts proved nothing. Mere adhesion of two surfaces, or one slipping under a less load than the other, with the same width, is no criterion, for by applying foreign substances, such as rosin or oil and rosin, the adhesion can be greatly increased, and a small belt made for the time to draw as much as one of greater sectional area.

We shall be glad to receive further communications on this subject, and thank Mr. Cooper for his promptness in responding to our request.—Eds.

Mr. George Paradox Hill's Paradoxical Power.

Notice is hereby given that the "Union Engine and Paradoxical Power Wheel" is a device by which motion can be perpetuated with surplus power. The method of this device is to suspend a weight so that its bearing will drive a reel with one half of the force of the weight used. A reversed forced action maintains the suspension and prevents the weight from falling.

Being fully persuaded that the Eternal Source of all good has only granted to me the knowledge of this

invention and not the right of monopoly, I would respectfully request that all who are desirous of obtaining the benefit of the above-named device would investigate the plan and ascertain for themselves the value of its utility. To believe or disbelieve, to accredit or discredit, without the knowledge obtained by investigation is alike erroneous and unjust.

Your servant the inventor,

GEORGE PARADOX HILL.

Davenport, Ill., June 5, 1865.

P. S. The above notice is intended for the benefit of your readers, therefore please publish and oblige an inventor who is struggling for life against the will of popular strife.

G. P. H.

Philosophy of Sleep.

MESSRS. EDITORS:—Although I am a mechanic of nearly three score and ten, and somewhat unused to presenting communications of this description before the public eye, I feel encouraged to do so now in consequence of the terms offered in your late proclamation of amnesty to us of the file and plane, coaxing us to abandon our natural reserve, and become, by our contributions, helpers in forwarding a more perfect organization of society and science. I feel so especially as you promise to make yourselves responsible "that our thoughts shall be clothed in good apparel," before they are allowed to pass the inspection of your more enlightened readers.

My object, however, is not to write a disquisition on the subject indicated above, but rather a confirmation of what has been recently stated in articles by two of your correspondents, the last of which appeared June 10th, page 372, and in which the other is referred to.

The cause of wakefulness when we know that sleep is actually needed—at night or any other time—but, as with Nebuchadnezzar of old, our sleep goes from us, is simply thinking. At such times neither a peaceful conscience nor the rehearsal of that anonymous lullaby from the "New England Primer," "Now I lay me down to sleep, etc.," any number of times will induce that soothing restorer, sleep, to resume its sway over us until something is done to divert our minds from the besetting thought which is so pertinaciously keeping us unrefreshed; and the process of effecting this desirable result is clearly shown by the first writer, alluded to before. I have tried it myself for several years past and still continue the practice—except in meeting—always having found it effectual, without ever experiencing any inconvenience whatever, either physical or mental.

Boston, June 16, 1865.

S. B. S.

[We have had no occasion to alter a line or a word in our correspondent's communication and we hope that other friends will act as promptly and forward us their experience in any branch of the arts.—Eds.]

Water Wheels by Night and Day.

MESSRS. EDITORS:—There is a mystery about a water-power that I cannot solve, nor have I seen any explanation by any scientific writer. Having heard that you answer more questions through your paper than any paper extant, I am prompted to ask you why water has more force on a water wheel at night than in day time? It is more perceptible in low water than high water, but no difference in summer or winter at the same stage of water.

J. H. T.

Cumberland Valley Mills, Pa., May 26, 1865.

[This question was asked us about five years ago, and we replied that, before attempting an explanation, the first point to be determined was whether there was any truth in the statement. After much discussion, we received a communication from a correspondent in East Pepperell, Mass., giving the details of an elaborate series of experiments undertaken by him to test the question, and he found that with the same flow of water the wheel would run no faster at night than in the day time. His communication was published on page 207, Vol. I., New Series.—[Eds.]

A Convention of Inventors.

MESSRS. EDITORS:—It has been a settled conviction with me for many years that the navigation of the air would some day be accomplished by flying machines or ships that would be practical and useful; and I believe that to be the next great work to be done by human invention and skill. I have noticed with

much interest anything pertaining to the subject; and from your article in the *SCIENTIFIC AMERICAN* of June 17, and Mr. Barbour's account of his carbonic acid engine, I think perhaps the time has come when there should be a combined effort made to accomplish so great an object. It is too much of an undertaking for any one to succeed in single-handed; but if all the best inventive genius, mechanical skill and engineering ability in the country will combine and organize a joint stock company for the purpose of experimenting and proving which is the best form of wheel, and testing and bringing together all the best plans for a flying ship, I have no doubt something would be accomplished. But it would be necessary to spend many thousands of dollars in experiments to ascertain the best forms for the machinery and the best motive power before it would be advisable to undertake the construction of a working machine, and by forming a stock company the necessary funds could be raised, and the best skill in the country employed to make the experiments, and finally construct a machine, which cannot be done by any individual alone.

If this plan should appear favorable to you, why not call a meeting in New York of all those interested, and those who believe in aerial navigation, to discuss the subject, and see, as Sam Patch said, "if some things cannot be done as well as others?"

GEORGE J. COLBY.

Waterbury, Vt., June 16, 1865.

[The plan does not appear favorable to us. Joint stock companies may be organized and money collected where there is a reasonable prospect of large dividends, but a joint stock company in a case where there is no possibility of either fame or profit to the individual subscribers must necessarily fail, because it is not in accordance with the constitution of human nature. We can conceive of no scheme more manifestly impracticable than a joint stock company of inventors, as each member would have an exalted idea of his own genius and of the value of his inventions, and a corresponding contempt for the talents and inventions of his associates.—[Eds.]

A New Process for the Extraction of Gold from Auriferous Ores.

MESSESS. EDITORS:—This process is particularly applicable to pyrite and other ores containing gold in small quantities, and has been invented by Messrs. Jackson & Ott, chemists, Raymond street, Brooklyn. The active agent in this process is the hypochlorous acid gas, which they prepare by forcing a stream of chlorine gas through a concentrated solution of sulphate of soda. For the application of the named gas to sulphurous ores, it is necessary that the latter contain a certain amount of sulpho-metals, thus allowing not a complete desulphurization. The gas in contact with the sulpho-metals is undergoing a decomposition, whereby the oxygen is united with the sulphur, transferring it in the highest degree of oxydation, while the chlorine is combined with the gold, forming soluble chloride of gold. From the process of Prof. Plattner in Freiberg (described in *Muspratt*), this method has particularly the advantages—first, that the chlorine is generated in its nascent state, and second, that it prevents any precipitation of gold (equal to a loss of gold), which by the application of chlorine alone will occur when not every trace of sulphur is removed from the ore.

Our process requires, like all others, a complete pulverization, and next a good roasting, if the ore should contain sulphur. In case the ores should contain copper, it would be advisable to submit them to a roasting process, and to extract the formed copper salt by water, and to precipitate the copper by proper means. In both cases the ore is ready for being treated by the hypochlorous acid gas.

The question now arises whether this gas can be produced at a sufficiently cheap rate. In view of the enormous quantities produced for the preparation of bleaching salts, and especially of hypochloride of lime, we can confidently give an affirmative answer. We do not need for our purposes any other apparatus or localities than those required for the manufacture of the before said articles, except a leaden retort, which should be placed between the generator of the chlorine and the buildings for the storage of the ores. This retort is filled with a solution of sulphate of soda or glauher salts, and we thus obtain the hypochlorous acid gas in a free condition.

The generator of the chlorine, in proportion to the impregnating chamber, requires smaller dimensions than those necessary for the manufacture of hypochloride of lime. The impregnating chamber is constructed of silicious sandstone or from bricks in a square form, and represents a room rather more high than wide. It must be coated inside with asphaltum, and boards eight to ten feet long and two feet wide should be fastened horizontally along the large sides, one above the other, allowing spaces of about four inches between them. These boards are designed for receiving the ore. In the middle of the building a small gangway is to be left; two windows allow to watch the operation, and one door affords admission to the chamber. A green color will be observed in the windows when the impregnation is completed, and the door, thus far tightly closed, then may be opened for the exit of the gas and the removal of the ore.

The next operation, i. e., the extraction of the ore, is performed either by centrifugal power or by a hydraulic press and water. In this manner we obtain a very concentrated lye, from which we precipitate the gold either directly by sulphate of iron, or by a treatment with sulpho-hydrogen, and subsequently by sulphate of iron.

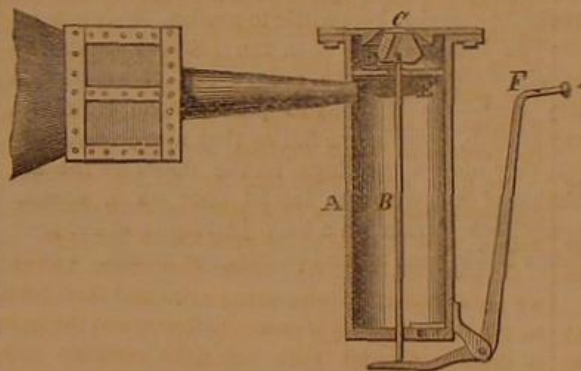
W. A. OTT.

Brooklyn, N. Y.

Improved Tweer for Furnaces.

MESSESS. EDITORS:—I send you a pencil sketch of a tweer which we have been using in our water-wheel works for the past year. I send it to you for the benefit of your readers who use such things.

We have been much perplexed in trying to keep our fires clean while making large welds, especially those on which we had to "sand" in the fire. We have tried almost every imaginable device without effect; when, one day, seeing an old condemned pump cylinder lying beside the smith shop, we conceived the idea of this form of a tweer. We have tested it



thoroughly and find no fault in it. Appended is a description of it.

The cylinder, A, is six inches diameter inside, and 17 inches deep. B is a rod running up through the center, carrying a cone-shaped head, D, on the top. The cap plate has a beveled hole, C, in the center, to receive a cone, D, when forced up to shut off the blast. This cone is made with less taper than the hole, C, so that the dirt and cinders will easily escape, and not lodge on its sides. There is a small hole drilled through the cone to let a stream of air through for light work. The rod, B, has a spider or cross on it to keep the cone in the center. By operating the handle, F, the fire can be cleaned in a moment and the blast regulated as desired.

P. H. WAIT.

Baker's Falls Iron Machine Works, Sandy Hill, N. Y., June 5, 1865.

RECENT AMERICAN PATENTS.

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

Loading and Unloading Device.—This invention relates to a new and useful device for unloading, storing and loading freight, merchandise, etc., and has for its object economy in labor, the saving of time, and a greater facility than usual in removing goods from carts and trucks and the loading or placing of them thereon.

The invention consists in the employment or use of an elevated way or track arranged in such a manner that it may be inclined more or less from a horizontal plane, and using therewith a car with an adjust-

able platform suspended to it, whereby the desired ends are attained. Henry A. Whitney, New York City, is the inventor.

Grain Hulling Machine.—This invention consists in the employment or use of a rotary huller composed of one or more frustrums of cones placed or arranged within a conical shell and corrugated or fluted whereby the hulls or cuticles may be removed from grain very expeditiously and without breaking or crushing the same, as attrition produced by the rubbing of the grains in contact with each other, is depended upon for performing the work, and not the direct contact of moving surfaces with the grain such as corrugated plates and the like, hitherto employed. The invention is applicable to the hulling of various kinds of grain, such as coffee, rice, etc. James H. Thompson, Hoboken, N. J., is the inventor.

Ticket Box.—The object of this invention is to protect railroad companies and others from fraud by the conductors which under the present arrangement are enabled to sell any number of tickets to passengers on the route and put the money in their own pockets without the possibility of being detected.

This difficulty is obviated by the use of the box which forms the subject matter of this present invention. The tickets are made in two sections one to be retained by the passenger and conductor and the other to be used as a check and to be returned with the box to the company. The tickets are enclosed in the box and they are so placed in relation to suitable knives or circular cutters that whenever one of them is withdrawn from the box, that portion which is intended to remain as a check, is cut off and retained in the box, while the other portion is handed to the passenger and afterwards taken back by the conductor. The tickets are also provided with a shoulder which serves to act on the clapper of a bell whenever one of the tickets is withdrawn from the box and thereby the attention of the passenger is called to the fact that the conductor has really taken the ticket from the box and not from any other receptacle. E. Hambur, 18 Beekman street, New York City is the inventor.

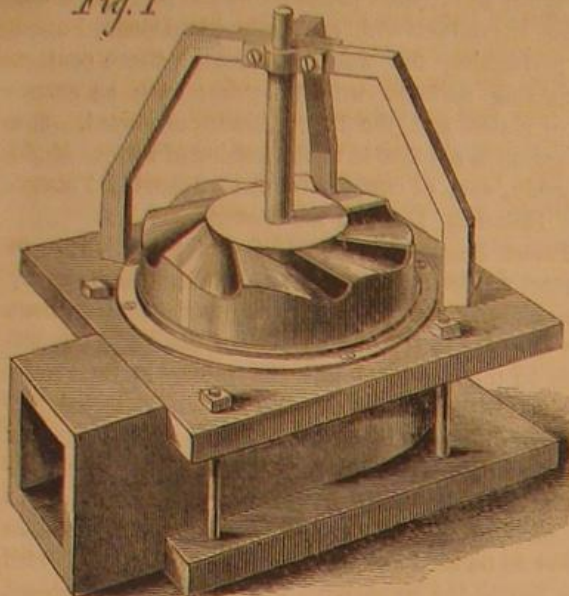
Artificial Leg.—This invention consists first in sinking the part or parts of the thigh socket on which the hip bone rests so as to make it match all the points of such hip bone and to render the operation of fitting the same to the stump easier than with artificial legs of the ordinary construction; second in the application of double stops to the knee joint as well when the leg is in the standing as when it is in a sitting position, said double stops being produced by a stud rising from a horizontal platform below the knee joint and forming the bearing for the fulcrum pin of the same, said stud being brought in contact with the ends of slots in the lower end of the artificial thigh, and the other stops being produced by the shell of the leg itself in both positions in such a manner that the snapping of any part of the knee joint is prevented and a strong and substantial leg is produced. Third in the use of an elastic segment attached to the stud which forms the bearing for the fulcrum pin of the knee joint in combination with a spring fastened at one end to an arm which extends from each stud and at the other to the shell of the artificial thigh near the hough in such a manner, that by the combined action of each elastic segment and spring a soft cushion is produced when the leg is bent, and the operation of straightening the leg is facilitated. Fourth in the peculiar contractions of the ankle joint which is provided with two stops formed by the lower end of the artificial leg in combination with an abutment rising from the sole of the foot near the heel and with a spring extending from each abutment to the lower end of the leg in such a manner that the heel is varied when stepping or springing of the foot, and the motion of a natural foot is imitated. John J. Austin, New York City, is the inventor.

RECENT advices from England mention the death of Sir Joseph Paxton, the architect of the first Exhibition building in London, known as the Crystal Palace. He was employed as gardener to the late Duke of Devonshire, and had charge of the magnificent grounds of Chatsworth. He was at one time a member of the British Parliament, and rendered important services to his country in organizing the working corps of the Crimean army.

Improved Water Wheel.

The patentees and proprietors of this wheel claim that it is one of the most efficient in the market. It is constructed in the most durable manner, of sound material, and is not liable to wear rapidly. It gives out a large percentage of the power of the water, and can be set in position in a short time. These wheels are manufactured of all sizes, and fourteen of

Fig. 1



hollow casting with recesses inside, so placed that the projecting spurs, B, worked by the levers, C, in the box which goes on the gate, D, fit in them, and hold the gate without a possibility of its getting away or sagging down. The section in Fig. 2 shows the shape of the piece on the gate that fits in the box on the post, as also the springs which throw the spurs, B, out. Fig. 3 is a section of the box on the gate through the levers, C, showing the attachment of them to the spurs.

This device is applicable to some window sashes to

Great loss is also incurred by drivers, in cattle badly treated, so that we may reasonably expect their co-operation in any improvement.

An Automatic Well Borer.

Gen. H. Haupt has invented a machine called the "Automatic Well Borer," which consists of a vertical cylinder placed directly over the well and operated by steam, with a hollow piston rod attached to a solid piston, which moves a rope of hemp or wire to which the boring tool is attached. Connected with

Fig. 2

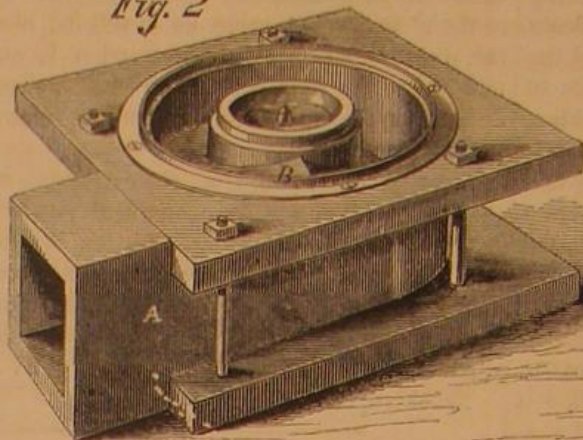
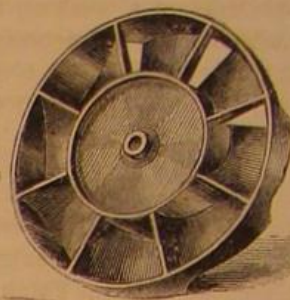


Fig. 3

**SIMONDS'S AND GODFREY'S WATER WHEEL.**

them are now in use in Grands Rapids, Mich., besides in other parts of the country.

The peculiarity of this wheel is, that the water enters at the bottom of it and discharges at the top, and that the buckets are so made as to adapt themselves to the velocity of the current as it impinges on them. The water enters through the scroll, A, and rising the spiral passage, B, strikes with its full force against the lower edge of the buckets, and finally issues through the top of the buckets to the exterior of the wheel.

Fig. 1 is an isolated view of the wheel; Fig. 2 is a view of the case, and Fig. 3 a view of the wheel with the bottom of the buckets exposed, showing their form. The water has free exit at each bucket,

prevent them from being raised from the outside, and is a sure thing for the purpose.

A patent is now pending on it through the Scientific American Patent Agency. For further information address the inventor, John P. Woodcock, No. 224 East Fifty-third street, New York.

A Chance for Inventors.

The *Country Gentleman*, an esteemed agricultural journal, says there is great need of improvement in trucks for carrying beef cattle to market. We quote:—

"The last time we took the railroad—a day intensely warm, even with every mode of ventilation fully open—we chanced to pass a cattle train at a way station, crowded as full as they always are, with but very narrow gratings on the doors for the admission of air, with the fearful odor which accompanies such a train on a long journey, and the poor things inside pent up and panting for breath. Really

this by a very simple method is the means of producing a continuous rotation of the drum upon which the rope is wound. At the same time a self-adjusting automatic feed is produced, regulating the force of the blow. The drum can also be rotated so as to withdraw the tools and return them with great rapidity. A sand pump also possessing an apparatus for its rotation is attached, by which examination of the various strata reached may be made and records kept. The boiler to furnish the necessary steam is provided, and one of the principal points of the machine is in the peculiar form of drill used, which penetrates rapidly, bores a truly circular hole without a reamer, and can be sharpened readily at any time with a hammer.

Principal among the advantages claimed for this machine there is economy in fuel, the direct action of the steam in raising the piston, which, falling by gravity, requires use of steam in one direction only. A

Fig. 1

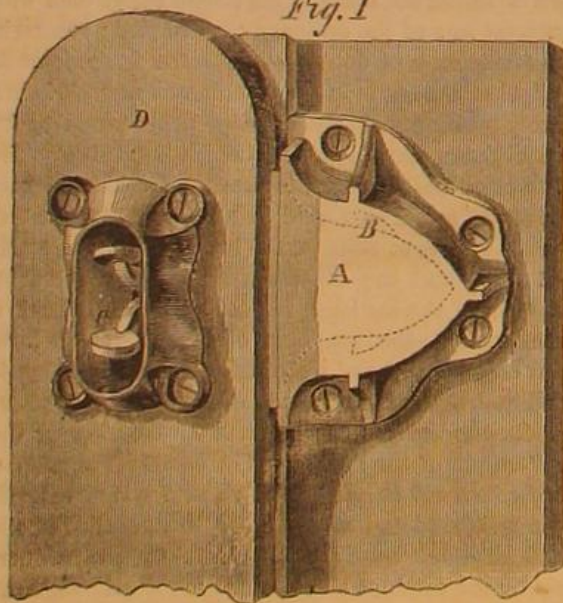
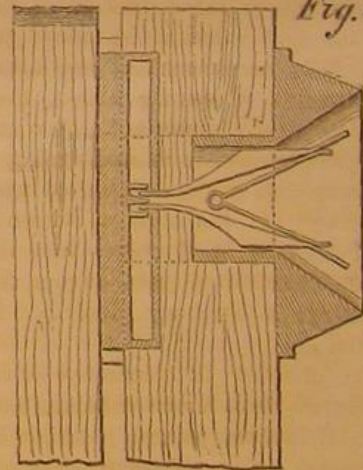


Fig. 2



Fig. 3

**WOODCOCK'S GATE FASTENER.**

and the proprietors say it will run well through tail water. Respecting the performance, one of them—size not specified—grinds 14 bushels of wheat per hour, with 78 inches of water, under 14 feet head. Another wheel grinds 18 bushels per hour with 180 inches of water, under 8 feet head.

This wheel was patented by Simonds and Godfrey, of Grand Rapids, Mich., on Sept. 13, 1864; for further information address them at that place.

Improved Gate Fastener.

In these several engravings we present views of an improved gate fastening which is self-acting. In detail it consists of a series of catches acted on by springs which, on being compressed, release the gate from the fastening. On relaxing the hold the gate fastens itself securely.

Fig. 1 shows a perspective view of the arrangement wherein the box on the gate post, which receives the catch on the gate, is shown by A. This detail is a

something ought to be done to render the transportation of stock in hot weather, less a source of misery to them; not out of mercy alone to the animal whose scanty supply of fetid air must become so intensely sickening, but for the sake of those who are to consume the feverish and unwholesome meat thus tainted more or less completely in every pore. The subject is attracting much attention in Great Britain, where the diseased character so imparted to the flesh has been fully proven. The *Scottish Farmer* gives an engraving of a railroad cattle truck, which is certainly a great improvement. It is open for the admission of air along both sides, just above the head of the cattle, and at a proper height to be within their reach a trough about 10 inches wide and 10 or 12 in depth, extends around the outside of the whole car, to be filled with water for their use at intervals on the journey. This plan has been patented, and the Highland Society has awarded a medal for it to the patentee."

greater number of blows in a given time is also obtained, and by the rotation of the tools in the same direction, a round hole is made, and the wedging of tools prevented. The ability to withdraw and return the tools rapidly renders it possible to bore at a depth of 1,000 feet at the same cost per foot as at a depth of 100.

The objections and delays attendant upon the use of rods, poles or pipes are entirely overcome, and a vast saving in time and money thus made. The expense of the whole apparatus is very moderate, requiring no engine, and costing much less than the pipe drill which requires the use of an engine.

A HISTORIC COW.—Gen. Morgan recently presented to the Soldiers' Home at Washington, a cow that belonged to Gen. Sherman's mess. She left Atlanta Nov. 16, 1864, marched with the army via Savannah, all the way to Washington, traveling a distance of 1,220 miles.

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.

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

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

Contents:

(Illustrations are indicated by an asterisk.)

*Fisher's Ice House.....	1	Recent American Patents.....	5
A Steam Flying Machine.....	1	*Symond's and Godfrey's Wa-	6
The Petroleum Rocks.....	2	ter Wheel.....	6
The Strawberry Harvest.....	2	*Woodcock's Gate Fastener.....	6
A Manufacture of Aniline Dyes.....	3	A Chance for Inventors.....	6
*Broughton's Glass Top Oiler.....	3	An Automatic Well Borer.....	6
A Pickpocket Catcher.....	3	A Historic Cow.....	6
Trial of a New Cannon.....	3	Our Patent System.....	7
New Way of Shaving Notes.....	3	The Journal of Commerce on Fly-	7
Personal.....	3	ing.....	7
Leather Belts.....	3	The Way Wooden Toothpicks	7
Improved Tweezer for Furnaces.....	4	are Made.....	7
Corrosion of Electro-plating Ar-	4	Ice Cream.....	8
ticles.....	4	Revising the Revenue Laws.....	8
Philosophy of Sleep.....	4	An Encouraging Prospect.....	8
Water Wheels by Night and	4	City Directory.....	8
Day.....	4	Facts about Eggs.....	8
A Convention of Inventors.....	5	Patent Claims.....	8, 9, 10, 11
A New Process for the Extrac-	5	Notes and Queries.....	12
tion of Gold from Aurifer-	5	*More's Road Scraper and Gra-	14
ous Ores.....	5	der.....	14
Mr. George Paradox Hill's Par-	5	Science Abroad.....	14
adoxical Power.....	5	Minor's Pocket Lantern.....	14

VOL. XIII. NO. 1...[NEW SERIES.]...Twentieth Year.

NEW YORK, SATURDAY, JULY 1, 1865.

OUR PATENT SYSTEM.

Octavius I. Norris, who signs himself attorney at law, residing at Lancaster, Pa., publishes a letter in the *American Railroad Journal*, wherein he assails the present patent system. With a view to show the groundwork upon which his objections are laid, we extract a few of the leading points embraced in his letter. He begins his essay thus:—"Under the present system of the Patent Office, patents are issued without limit, the patentee is guaranteed the entire monopoly; and being usually an uneducated and poor man, and elated with a prospective fortune or reward, relying with faith upon the wording of his letters patent, he devotes his entire attention and expends his last dollar for the purpose of putting his improvement before the public."

He further says:—"In fact, the Patent Office encourages the genius of our countrymen, promises protection in securing a monopoly, but through a desire to please the applicant, by issuing patents too freely, has brought the public to disregard and treat with contempt its opinions as to the validity of a patent it issues. Patentees decry the way in which they are encouraged by the Patent Office, to exhibit their improvements with an idea that they are to be protected, and are so robbed; while on the other hand the public denounce the patentee as a blackleg, of levying black mail, etc."

He then adds that "No nation has made greater advancement than the United States in the arts, and this is of course from our native talent, which, for what it has [done] and will yet do, demands a better protection and security in reaping a reward for its labor, which in no country has been more denied than with us."

He also says that "a change is demanded by the general public, as patentees, and the public welfare; and with a united action of those who appreciate the necessity of a revision of our Patent laws and the mode of issuing them, this can be effected to the general benefit of all classes, and especially railroad companies, who have, by our present system, both done and received injury."

Mr. Norris suggests nothing by way of amendment, but contents himself with vague generalities, inviting, however, co-operation with a view to operate on the next Congress for a reform. We suggest that if he would better acquaint himself with the existing patent system, which he attempts to cover with reproach, he would not be likely a second time to appear in print so much to his disadvantage.

In the first place, patents are not issued without limit. The intention of our law is to prevent the very thing of which he complains. The Constitution

of our country provides for the protection of inventors and authors for a limited period. In pursuance thereof, Congress has enacted laws prescribing how inventors and authors shall be protected. In the case of inventors, a Commissioner, assisted by a competent board of examiners, are provided, whose duty it is to inquire into all claims that may be presented, and they are in duty bound to reject every claim that is clearly anticipated by another applicant or patentee. This is the constant and daily practice of the Patent Office, and that duty is well performed, as the records of the office fully attest. A few figures, we think, will not only vindicate the Patent Office from the charge that patents are granted "through a desire to please the applicant," but will also knock the writer's "without limit" theory in the head.

For the year ending September, 1863, there were filed 5,133 applications for Letters Patent; of this number 1,246 were, after preliminary examination, rejected. For the year ending September 30, 1864, there were filed 6,740 applications, of which number 1,907 were rejected. This system of previous examination, followed by a corresponding ratio of rejections, has been in vogue for nearly thirty years. The system has not only worked well, but has given very general satisfaction, and yet Mr. Norris has the boldness to declare that patents are issued "without limit." He further declares that "the patentee is guaranteed the entire monopoly." We deny this statement. Neither the Patent Office nor the laws guarantee an entire monopoly. In the first place, the best writers generally agree, that the term "monopoly" does not properly apply to patents. Carpmal, in his excellent treatise on "the Law of Patents," says—"It is evident that a grant of a patent for an invention is the very opposite of a monopoly; for a patent to be valid must be for a new invention, consequently no persons, by such grant, are restrained from any freedom they had before." This point, however, we need not now discuss. The Patent Office, having patiently and carefully examined the applicant's claims, issues its authorized Letters Patent, if the specific device claimed appears to be novel. The Letters Patent so issued are not a legal guarantee of entire monopoly. The law, it is true, provides protection against infringers, but it devolves upon the patentee to defend its own rights and privileges. If his invention should prove, upon legal investigation, not to have been new at the time the patent was granted, the patentee has no guaranteed monopoly, and cannot restrain the public from a free use of the invention.

We do not undertake to say that all patents are properly granted, but we do not hesitate to say, as the result of our own experience, that more errors are committed in refusing than in the granting of patents. The examiners are liable, like other men, to commit errors, and we think it would puzzle the writer under review, to find out perfection anywhere in the management of human affairs.

The writer admits that no nation has made greater progress in the arts than in the United States. This progress, which is manifested throughout the whole range of our mechanical industry, is due chiefly to the liberal spirit of our patent system and to the liberal policy which has prevailed in our courts of justice, as applied to patents, and yet the writer declares that the protection to our native talent, has been denied more than in any other country. This statement is positively absurd. No other country on earth has extended so much protection to inventors as our own. In Great Britain patents are granted to the inventor and also to the introducer of an invention. In France no oath of invention being required, patents can be obtained by any one who applies for them, though it is but just to say that the French law reserves the prior right to the first discoverer. In Belgium the law is of similar import.

Without entering into a discussion of the glaring defects of the European patent system, it seems to us that Mr. Norris, who proclaims himself as having had much experience in patent-law matters, must have some special end to serve when he seeks to rally, with others, railroad companies—who have never manifested a willingness to pay patentees—to undertake to break up our present system of granting patents. The arguments he employs are not creditable to his legal knowledge of the subject whereof he undertakes to write.

THE "JOURNAL OF COMMERCE" ON FLYING.

In the discussion of Payne's light, water gas, carbonic engines, the monitors, and in several other controversies, the SCIENTIFIC AMERICAN has stood alone against nearly all the daily press of the city, and in every case the result has confirmed the correctness of our position. These repeated defeats seem so to have disturbed a portion of our contemporaries that they are puzzled how to deal with us. Sometimes, however, they appropriate our ideas, and then the ingenuity they exert to avoid giving us credit, and the blunders into which it leads them, are amusing. In the *Journal of Commerce*, of June 19th, the leading editorial is headed, "Men as Birds," and it contains this paragraph:—

"While these revolutionary experiments in locomotion are going on here, the British aeronauts are not idle. At a recent meeting of the British Polytechnic Association, a Mr. Barbour stated that by using compressed carbonic acid gas, he had obtained one and a half horse power from an iron engine which weighed with all its auxiliary apparatus only 450 lbs. An engine of aluminum would weigh only one-third as much. The gas reservoir was strong enough to bear 5,000 lbs. to the inch, and the gas that could be forced into it would suffice to drive the engine an hour and twenty minutes. Mr. Barbour proposes to use such an engine in propelling an air ship by revolving spiral fans, upon the plan of the one building at Hoboken, and at once gets rid of all the difficulties resulting from a heavy steam engine or hot air engine, furnaces, etc. His scheme was looked upon not unfavorably by some of the English scientific journals."

Our readers do not need to be told that these facts, estimates and suggestions are taken from a recent editorial in the SCIENTIFIC AMERICAN; but we will inform the *Journal of Commerce* that the Polytechnic Association before which Mr. Barbour described his engine was the Polytechnic Association of the American Institute of this city, and whether the scheme was looked upon favorably or otherwise by some of the English scientific journals could not possibly have been known here on the 19th of June, as there had not then been time for a reply to be received since the number of our paper containing the first account of the matter crossed the Atlantic.

THE WAY WOODEN TOOTHPICKS ARE MADE.

Perhaps in all the arts there is no other machine that multiplies the product of labor to a greater extent than the simple little machine recently invented by J. C. Brown, of Brooklyn, Long Island, for making wooden toothpicks and splints for lighting lamps, for matches, for baskets, and for some forty other purposes. A block of wood is placed in the machine and the splints pour out in a constant stream, or cataract, like the pouring of corn from a half bushel.

This machine is as simple as it is effectual, it being nothing more than an ordinary lathe for turning wood, with a little addition. The trunk of a whitewood tree is sawed into blocks of a length equal to the length of the toothpicks or splints, and is centered in the lathe. The turning tool is a long, stiff chisel, extending the whole length of the block or more, set vertically with its edge on a level with the centers, and fitted to slide back and forth horizontally, and to be fed forward by a worm, which is turned by the machine. Upon the opposite side of the block is a roller of the same length as the block, with a series of blades secured to its surface, the spaces between the blades being equal to the width of the splints. For lamplighters the blades are set parallel to each other, but for toothpicks they are set at a small angle so as to cut the picks of the proper taper, the narrow ends alternating with the broad, and thus using up all the wood.

The block is first turned off smooth by the straight blade, and then the cutter, with the radial blades is brought forward against the opposite side, and thrown into gear, when it feeds forward as the wood is cut away. The radial blades cut shallow gashes into the block to a depth just equal to the thickness of the splints, and then as the block revolves the splints are shaved off by the straight chisel. One machine will make 20,000 splints a minute.

REDUCTION IN TERMS.

With a view to encourage the formation of "Clubs" for the ensuing volume of the SCIENTIFIC AMERICAN, we offer to take subscriptions in Clubs of ten or more at \$2 50 per annum. We trust that our friends will set themselves to work to get up Clubs at the rate here proposed.

ICE CREAM.

A correspondent asks how to make ice cream. We will tell him. A pint and a half of milk and half a pint of cream, scalded together; three eggs whipped to a stiff froth, and stirred in rapidly, and sweetened to taste; flavor this mixture with any thing preferred—peach water, bitter almond (which is nearly the same), vanilla, or lemon. Pour it in a freezer, and keep the same going continually until wanted.

A frozen custard can be made by adding corn-starch, but this is not genuine ice cream, and tastes "floury," compared with the real article.

The great secret in making fine cream is to freeze it properly and quickly. Crystallization, or the act of freezing, is a great separator, and when two substances, such as cream and milk, are mixed, slow congelation separates the watery portions from the other parts, and causes the little pieces of ice, common in poorly-made ice cream. Quickly-frozen cream has a smooth continuity, if we may use such a term, greatly admired. It is easy to make a dish of cream for ordinary use by taking a three-quart pail and setting it in a small wash tub, surrounded with ice and salt, but the article so made will be very different from the buttery and even mass frozen in the proper apparatus.

REVISING THE REVENUE LAWS.

A commission of three gentlemen, authorized by a law of Congress enacted last winter, is in session in the Custom House in this city, to inquire into the sources of national revenue and the best method of collecting the same. The appointments were made by the Secretary of the Treasury and consist of Messrs. David A. Wells, of Troy, Stephen Caldwell, of Philadelphia, and S. S. Hays, of Chicago. E. B. Elliott, of Boston, has received the appointment of secretary to the commission.

The various sources from whence the Government derives its internal revenue will be carefully examined into by the commission, with a view to recommend such changes to the next Congress as will tend to establish a more satisfactory and equitable system of national taxation.

With such men in the commission as Mr. Wells, long known as editor of the "Annual of Scientific Discovery," author of "Our Burden and our Strength," and many other useful works, we are sure much good will result from the investigation they will make. The commission is empowered to send for persons and papers and take testimony.

AN ENCOURAGING PROSPECT.

The American Institute has decided to hold its annual fair this fall, as usual, and means to make it very different from the exhibitions in former years. We are assured by the committee that no pains will be spared to make this fair a great success. "It is to be a mechanical fair," said a member to us, "and all the old ladies' bedquilts are to be excluded." We trust also that the wonderful compounds "which stimulate a growth of hair on the baldest head," will also be omitted and the space usually occupied by them filled with something more interesting to the public, and more valuable to the arts. There are to be machines of all kinds in full operation and ample space will be allotted to exhibit them to the best advantage. The fair will be open from September 15th to October 19th, or about four weeks, and will be held at the corner of 14th street and 6th Avenue. There is ample material in this country to make this fair a great success, and with the inducements held out by the Institute, we have no doubt that it will be. All communications in regard to space should be sent to S. D. Tillman, Esq., agent of the American Institute. We have no further information to give of any nature whatever.

CITY DIRECTORY.

Trow's New York City Directory, for the year ending May 1st, 1866, is issued. It is a work of 1300 pages; 1070 being devoted to an alphabetical list of the names of the business men and heads of families of New York, 170 to advertisements, and 60 to lists of the streets, churches, banks, societies, city officers, and other things convenient for reference. This is

the 79th volume, and contains 166,144 names, 13,592 more than the volume for last year. It is printed in clear type, on smooth paper and is just what a directory of this city ought to be.

Facts About Eggs.

Eggs differ a good deal in weight. This difference is to be found not only in the eggs of different breeds or races of fowls, where it might be expected, but often, also, in the eggs of the same individuals, both among hens and the smaller and wild birds.

Barley is said to increase the proportion of the yellow of the egg, and rye is said to favor the development of the white.

Eggs lose a slight portion of their weight when left to themselves; the contents becoming dried up gradually and reduced, so that there is left a solid residuum withdrawn towards the small end of the egg, the opposite end being filled with air. Eggs which weighed two and a half ounces when fresh, weighed but a very small fraction over an ounce at the end of two years. During incubation the diminution or weight is pretty rapid.

It is thought by naturalists that the eggs of domestic hens of the present day are, on an average, very nearly a third larger and heavier than those of the hens of the ancients.

The proportions of the yolk to the white of the egg are very nearly the same in each of the different races, but in proportion as the egg diminishes in size, does the relative proportion of the white to the yellow of the egg diminish; that is, small eggs have more yellow than large ones in proportion to their size, but the weight of their shell is also greater in proportion.

Eggs which contain the largest yolk or yellow, like those of the Brahma and Cochinchina hens, produce the largest chickens.

The period of laying is ordinarily about five months in the year. The Asiatic fowls will often begin to lay somewhat earlier than other breeds, but they usually stop earlier.

The latest expression we have from the poultry breeders of France in regard to the comparative merits of the Asiatic breeds and their own, is that the former as layers, as sitters, as nurses and as table birds, are inferior to the native French fowl; that it would be a mistake to substitute the one for the other; that the crosses take from the French races more advantages than they confer upon them, and that it is most useful for them to return to the indigenous races, and spend their care and their experiments in improving them by better keeping, by better selections, and by crossing them among themselves.—*Massachusetts Ploverman.*

CABBAGES.—One of the greatest difficulties encountered in raising cabbages, is the ravages of the cut-worm. We have completely outwitted them for two or three years past, in a very simple manner. We take pieces of newspaper six inches square, tear a slit in one side to the center and insert the plant. Bring the slit edges together, and place a little earth or a pebble on the corners, and the work is done. A platform of paper is formed around the plant through which the worm cannot penetrate. We did not lose more than two or three plants from that cause the last two years. We always think it a great point gained when an effectual safeguard can be obtained against the ravages of insects, and we regard this as one of the discoveries of the age.—*Maine Farmer.*

A RAILWAY TRAIN STRUCK BY LIGHTNING.—The express train from Berlin, that arrived at 7 P. M. on the 23d of May at Dortmund, was struck by lightning in the neighborhood of Gutersloh. The metallic signal line fixed on the top of the carriages, and extending the whole length of the train, served as conductor of the electric fluid, which injured one of the stokers so severely that his limbs were paralyzed, and some fears were at first entertained for his life.—*London Engineer.*

THE DESTRUCTION OF THE BEET ROOT.—The *Fas de Calais* Society of Agriculture offer a prize of 100f. for the best paper on the worms and insects that attack the beet root, and the means of preserving the latter from their depredations.

The work of stretching the wires for the telegraph by Behring's Straits has been commenced.



ISSUED FROM THE UNITED STATES PATENT-OFFICE
FOR THE WEEK ENDING JUNE 20, 1865.

Reported Officially for the Scientific American.

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

48,249.—Constructing Gun Barrels.—Ethan Allen Worcester, Mass.:

I claim splitting a twisted rod through the center, and bringing what was the inside of the rod on the outside of the barrel, substantially as specified and for the purpose set forth.

48,250.—Car Spring.—T. F. Allyn, Canandaigua, N. Y. Antedated March 28, 1865:

I claim the construction of a metallic car spring with square or rectangular plates, B, curved diagonally, and fastened together alternately at the corners with the rivets, d, substantially as described in my specification, and for the purpose set forth.

48,251.—Artificial Leg.—John J. Austin, New York City:

I claim, First, Sinking the edge of the thigh socket to fit to the os-innominate, substantially as and for the purpose set forth.

Second, The double stops of the knee joint produced by the stud, c, the edges, e, f, of the slot, e', and the end, g, h, of the thigh, B, and leg, C, substantially as and for the purpose described.

Third, The combination of the elastic segment, k, and spring, i, with the stud, c, and with the knee joint, substantially as and for the purpose specified.

Fourth, The two stops, n, o, and abutment, p, in combination with the spring, g, in the ankle joint, constructed and operating substantially as and for the purpose set forth.

48,252.—Coal Stove.—Robert Bailey, Cleveland, Ohio:

I claim, First, So constructing the fire box that the fuel is consumed just in the rear of the same, when said chamber is arranged in relation to the ash-pit, F', air chamber, F, and damper, L' and H' substantially as set forth.

Second, I claim arranging the fire box, E, in front of the stove, in combination with the hot air chamber, F, the draft pipe, J, and diving flue, a, as and for the purpose set forth.

48,253.—Stove Pipe Water Heater.—John Baumeister, Detroit, Mich.:

I claim a stove pipe water heater above set forth, constructed substantially as and for the purpose above described.

[This invention consists in a novel construction and arrangement of part of a stove pipe, whereby it is formed into a heating drum, whose shape is such as enables it to embrace a movable water vessel, wherein water can be heated by means of the heat of the products of combustion and hot air which pass through the stove pipe.]

48,254.—Regulator for the Wicks of Lanterns.—Henry W. Bleyer, Buffalo, N. Y.:

I claim the rod, E, provided with an oblong slot, c, and fitted on a pin, a, or arranged in any suitable way so as to have a requisite degree of longitudinal play or adjustment, in combination with the toothed wheel, D, on shaft, C, all arranged substantially as and for the purpose specified.

[This invention relates to a new and improved means for regulating the wicks of lamps for lanterns, whereby the wicks may be raised and lowered without removing the lamp from the lantern and with the greatest facility.]

48,255.—Means for Manufacturing Baskets.—Ernst Bredt, New York City:

I claim a basket formed by pressure between heated dies, of a sheet of material suitably prepared with sizing, stiffening or moisture, substantially as specified.

48,256.—Apparatus for Testing Milk.—Chas. S. Brown, New York City:

I claim, in combination with the test tubes, a permanent or movable scale to measure and compare the depth of cream or other matter in each tube with that in the other tubes, substantially as described.

48,257.—Calipers.—Clarence E. Brown, Florence, Mass.:

First, I claim attaching a movable scale to a calipers, substantially as and for the purpose above described.

Second, I also claim constructing a registering calipers, so as to be self-adjusting, by means of its index and a pin upon the movable scale, substantially as above described.

[This invention consists in making a self-adjusting, self-registering calipers. Its points project toward each other from the ends of its legs, and the line of their projection is in the arc of a circle drawn from the center of the calipers, so that the wear of the points does not shorten the radius. A scale for indicating the measurement is attached to the body of the instrument, and it is made movable therein, so as to enable one to adjust it to a new position as the points of the legs wear away.]

48,258.—Device for Boring and Excavating Coal.—Andrew Buchanan, Brooklyn, N. Y. Antedated June 15, 1865:

I claim, First, The longitudinally-adjustable revolving cutter bar, D, in combination with the self-feeding truck, A, constructed and operating substantially as set forth.

Second, The use of sectional cutters, E, in combination with the revolving cutter bar, D, and truck, A, constructed and operating substantially as and for the purpose described.

[This invention consists in the employment or use of a revolving longitudinally-adjustable cutter, in combination with a truck, to which feed motion is imparted by the same power which is applied to impart motion to the cutter bar, in such a manner that by the action of the cutters inserted in said cutter bar a narrow ditch of any desired length and of suitable depth can be cut in an embankment of coal, limestone, or other similar material in a horizontal or inclined direction, and the labor of excavating coal or other material is considerably reduced. The cutters are arranged in sections, which are secured to the bar in equal lines, so that the material to be excavated has a chance to clear itself, and the action of the cutters will not produce an injurious strain on the cutter bar or other parts of the apparatus.]

48,259.—Lathe Chuck.—S. B. Burritt, New York City:

I claim the combination of the radially movable clamps, H, I,

having dovetail tongues of double reversed inclination on their outer edges, the rings, F and G, having right and left hand male screws upon their ex-ribs, and inclined grooves in their interiors, and the loose sleeve, B, having right and left hand female screw threads in its interior, the whole arranged and applied in relation to each other and to the hub, A, or body of the chuck, and operating substantially as herein specified.

48,260.—Torpedo Ram.—Elijah R. Chamberlain, Sharonville, Ohio. Antedated June 10, 1865:

First, I claim the frame, B B' B'', constructed substantially as described, adapted to permit torpedoes to be expelled from the interior of the vessel below the water line, or to hold them at its mouth, and receive and effectually withstand the force which is applied to the torpedo on being driven into an enemy's vessel.

Second, I claim in combination with the above, I claim the piston, G G', operated by the chains, F F', or other suitable means, and employed to expel the torpedoes through the opening, B3, or in connection with the block, H, to retain the torpedo in its operating position when the same is to be driven into an opposing body.

Third, I claim the ropes, C, and the hooks, C, in combination with the pulleys, C2, and their shifting levers, E E', the whole being arranged to operate substantially in the manner and for the purpose specified.

Fourth, in combination with the aforesaid, B B' B'', I claim the gate, I, operating as herein described to close the opening, B'', when said opening is not occupied by a torpedo or the expelling piston.

48,261.—Baling Press.—Frederick F. Cornell, Jr., New York City:

I claim, First, Connecting the levers, D, to the sliding slides, E, and follower, B, by means of the staples or eyes, b b, and fulcrum pin, d, and rods, e e, or their equivalents, substantially as herein described.

Second, The pawls, H, arranged so as to hold the beater in place, to serve as a head block for the press.

Third, The racks, I, and slides, P, in combination with the pawls, H, as and for the purpose specified.

Fourth, The standards, F F', and cross beam, G, in combination with the rod, h, and pawls, H, arranged to operate substantially as described.

Fifth, The detent rod, f, in combination with the projection, f, and standards, F F', substantially as and for the purpose hereinbefore described.

Sixth, The cam, J, in combination with the traveling slide, E, and post, A, substantially as and for the purpose herein specified.

48,262.—Wheat Drill.—Jacob B. Crowell, Greencastle, Pa.:

First, I claim the use of the above-described eccentric pin for supporting the wheel, E, and throwing the same out of gear and into gear, substantially as set forth.

Second, The above-described arrangement of the three gear wheels, C E and K, with the stationary hopper, substantially as described.

Third, The combination of the gear wheel, E, with the eccentric pin and arm, O, when operated simultaneously with the elevation or depression of the boots, as described.

Fourth, I claim a feed slide, when cast or made in two pieces or sections locked or coupled together and operated as one slide, substantially as described.

48,263.—Washing Machine.—Erastus Douglass, Lowell, Mass.:

I claim the combination of the cross piece or block, B, the tube, A, and the beater, C, as and for the purpose herein specified.

48,264.—Shutter Hinge.—Simon Dunn, Allegheny City, Pa.:

I claim making on each end of the knuckle of the female part of the hinge two or more planes, corresponding to two or more around the pin of the male part of the hinge, substantially as herein described and for the purpose set forth.

48,265.—Apparatus for Distilling Petroleum.—A. D. Breunel, Baltimore, Md.:

I claim the use of boiling water inside the retort or still to vaporize the material known as petroleum or rock oil, substantially in the manner and for the purposes herein before shown and described.

48,266.—Boot Heel.—Edward Dunbar, Buffalo, N. Y.:

I claim a metallic holding plate, A, having an inner dovetail groove for receiving and holding the elastic tread piece, B, so that the tread piece will be firmly held in the groove by its expansive force without other fastening, for the purposes and substantially as described.

48,267.—Umbrella.—John S. Fee, Felicity, Ohio:

I claim an umbrella whose web or covering is composed of a single piece of india-rubber, substantially as set forth.

48,268.—Process for Preparing Coffee.—L. D. Gale, Washington, D. C. Antedated June 12, 1865:

I claim separating the aroma or volatile oil of coffee from the watery vapor, substantially in the manner and for the purpose herein set forth.

I also claim the recombination of the aroma with the soluble non-volatile parts of the coffee, preparatory to making the same into a solid cake, substantially in the manner and for the purpose set forth.

I also claim a dense and solid cake coffee, that can be handled by itself like cakes of chocolate or sticks of candy without the aid and expense of boxes or cans, which are indispensable in all that class of preparations called coffee paste and coffee extract.

48,269.—Seeding Machine and Cultivator.—Thomas A. Galt, Sterling, Ill.:

I claim the method of operating the slide, D, through the medium of the rack, I, toothed segment, j, and gearing, n o, in combination with the sliding plate, F, which is moved upon the slide, D, by means of the rack, f, and toothed segment, g, the whole arranged as described and represented.

48,270.—Head Rest for Railroad Car Seat.—Nelson Gates, Middletown, Ohio:

I claim, First, The spring head rest, constructed, arranged and applied to use in the manner and for the purpose substantially as described.

I also claim the spring head rest, constructed as described, in combination with the fastening by which it may be attached to the car, substantially as and for the purpose set forth.

48,271.—Cultivator.—Edward S. Gillies, Albany, Wis.:

I claim the attaching of harrows and plows, either or both, to the frame of a cultivator, by means of pendant rods, E, provided with springs, F, and connecting the heads of the harrows and plows to springs, I, attached to shafts, J, at the front part of frame, A, in the manner substantially as and for the purpose set forth.

[This invention relates to a new and improved cultivator for general use, and it consists in a novel arrangement of various plow and guards, whereby the implement may be adapted to various kinds of work.]

48,272.—Chair.—John Habermehl, Wheeling, W. Va.:

I claim the arrangement of the seat of a chair, sofa, etc., herein described, the same consisting in hanging it by standards on its upper side to and upon its rear legs, in combination with so inserting the front legs within the seat that the seat can freely play up and down on the same, and yet not be disengaged therefrom, substantially as and for the purposes specified.

[This invention relates to the manner of connecting the seat of a chair to its legs, whereby it may be readily tipped or inclined in a backward direction, to suit the wishes of the person occupying it.]

48,273.—Beer Faucet.—Albert Hallowell, Lowell, Mass.:

I claim, First, The faucet connection, B, as made with the two screws, N and P, or their equivalents, provided with the valve and its seat, arranged substantially as specified.

Second, I also claim the said faucet connection, B, as made with the head, o, combined with the screws, n and p, and the valve and its seat, as arranged as described.

Third, I also claim the said connection as made with the perforated guard or strain, r, the valve and seat and the screws, arranged as specified.

Fourth, I also claim the faucet, constructed with the screw, a, and the projection, c, as arranged, with the connection, B, provided with a valve arranged with it as specified.

Fifth, I also claim the combination of the connection, B, provided with a valve, and made with screws, n and p, as described, with the faucet constructed with the screw, a, and the projection, c, the whole being substantially as and for the purpose specified.

48,274.—Ticket Box.—E. Hamburgh, New York City:

The use of a box provided with suitable cutters, and with or with-

out a bell, in combination with tickets, formed substantially in the manner herein described, or in any other equivalent manner, so that by the act of withdrawing the ticket from the box, a portion of said ticket is retained, and serves as a check for the ticket, as herein set forth.

48,275.—Snap Hook.—Edward Hamilton, Chicago, Ill.:

I claim, First, The cylinder, D, when attached to the eye or swivel of a snap hook, and fitted to receive a shank collar or slide and spring.

Second, The shoulder or stop, b, in combination with the collar, E. Third, The collar, E, when applied to a snap hook, and has its inner end rest or a spring and its outer end arrested by a stop.

Fourth, The combination of the collar, E, spring, a, and stop, b, with the hook, A.

Fifth, The combination of the cylinder, D, collar, E, spring, a, and stop, b, with the hook, A, arm, B, and eye, O.

Sixth, The combination and arrangement of the collar, E, spring, a, and the incline of the end of the arm, B, whereby I am enabled to close the hook by simple pressure on the arm, B. Each of said parts and combinations being constructed and arranged substantially as and for the purposes set forth and specified.

48,276.—Mercurial Heater.—Thos. C. Hargrave and Kendall W. King, Boston, Mass.:

We claim, First, The continuous or endless pipe, B, constructed and filled, or partially filled, with mercury, substantially as described and to the effect stated.

Second, The combination with the pipe, B, containing mercury of the lamp, D, or other heating appliance, substantially as and to the effect set forth.

48,277.—Churn.—Geo. Hart, Atwater, Ohio:

I claim the guide, H, straps, m m', and lever, L, in combination with the pulley, P, and beater, P, when arranged and operating as and for the purpose set forth.

48,278.—Churn.—Edward F. Holloway, Knightstown, Ind.:

I claim the disks, B and C, when constructed and arranged as shown, at the bottom of vessel, A, and operating substantially in the manner described.

48,279.—Band Cutter for Thrashing Machine.—W. Upton Hoover, Macomb, Ill.:

I claim, First, The combination of the rotary cutter, B, and spout, C, constructed and operating as and for the purpose set forth.

Second, The reversible platform, E, and hinge bar, D, in combination with spout, C, arranged to operate as and for the purpose herein described.

Third, I also claim the combination and arrangement of shaft, F, provided with pulleys, f, and wheels, c, with the transverse shafts, provided with the wheels, d, and pulleys, h, for the purpose of driving the cutter, B, as set forth.

48,280.—Band-cutting Machine.—W. Upton Hoover, Macomb, Ill.:

I claim, First, The reciprocating band cutter, a, arranged and operating substantially as set forth.

Second, In combination with the cutter, a, I claim the feed rollers, C and C', constructed and operating substantially as shown and described.

Third, I claim the vibrating shaker, E, when used as shown, for the purpose of feeding the grain into the thrasher.

Fourth, I claim the combination and arrangement of shaft, F, provided with the crank, h, gear wheels, l l, cam, p, or its equivalent, and wheels, m and m', as and for the purpose set forth.

Fifth, I claim the adjustable bearings, d and d', provided with the racks, g and g', in combination with the wheels, f, for the purpose of adjusting the rollers, C and C', as herein described.

48,281.—Cultivator.—B. Holtz and Wm. Enoch, Springfield, Ohio:

We claim, First, Connecting the drag bars, E E, to a single point on the main frame by the draught rods, G G, substantially as described.

Second, In combination with the draught rods, G G, the traveler rod, a, substantially as described.

Third, We claim imparting a lateral motion to the rear end of the plow beams by means of the two single levers or rods, O and K, arranged and operating as described.

Fourth, We claim pivoting the lever, K, upon the self-adjusting pivot, L, in the manner shown, for the purpose of permitting said lever to be moved both vertically and laterally, and thus perform the operation of moving the plows without the use of more than one lever, K, and with but a single pivot for said lever.

Fifth, Connecting the drag bars, in front by the stretcher, F, provided with pivot screws and set screws, as described.

Sixth, The combination and arrangement of rods, G, drag bars, F, posts, H, foot rests, J, levers, K and O, ring, k, and joint, L M, as shown and described.

48,282.—Windlass.—Peter H. Jackson, New York City:

I claim, First, The bolt, l, actuated by the cam or eccentric, 3, for connecting or disconnecting the chain wheel, h, from the wheel, f, as specified.

Second, I claim the strap, k, blocks, t and d, in combination with the cam, n, substantially as specified.

Third, I claim the wheel, f, provided with handspike sockets, 2, in combination with the chain wheel, h, and the bolt, l, or its equivalent, for connecting or disconnecting the wheels, f and h, as set forth.

Fourth, I claim the levers, q and pawls, r, fitted as specified, in combination with the ratchet wheel, f, and chain wheel, h, as set forth.

48,283.—Wire-pointing Machine.—C. Jillson, Worcester, Mass.:

I claim, First, The combination of the cutter stand, H I, with the hinged platform, G, and table, A, substantially as and for the purposes described.

Second, The elastic band or spring, u, in combination with the sliding block, Q, and supporting eye, t, substantially as and for the purposes specified.

Third, The combination of the hinged platform, G, cutter stand, H I, and side pattern, R, substantially as and for the purposes specified.

48,284.—Mode of Roasting, Desulphurizing and Degrading Ores of Gold, Silver, Etc.—Algermon K. Johnston, New York City:

I claim the treatment of sulphurets, arsenures and phosphides of iron, copper, nickel or lead containing any of the precious metals, with and by steam with or without the presence of atmospheric air, for the purpose of freeing such ores from sulphur, arsenic and phosphorus, and preparing the precious metal for amalgamation or other subsequent treatment.

48,285.—Apparatus for Distilling Oil.—James J. Johnston, Allegheny City, Pa.:

I claim, First, Distilling oil or other liquids by means of a still, condenser and receiving vessel, from which air is exhausted, so that the distilling process is carried on under a partial vacuum, substantially as herein described and set forth.

Second, The arrangement of the vessel, a, furnace, b, condenser, k, vessel, l, and receiving vessel, m, furnished with tube, x, scale, g, valves, 7 and 8, and rack, n, the whole being constructed, arranged and operating substantially in the manner herein described and for the purpose set forth.

48,286.—Steam Furnace Grate.—Edward H. Jones, West Albany, N. Y.:

I claim, First, A series of grates, when cast in the form herein described, and operated in sets of two or more.

Second, In combination with the action of the grate independently by means of the levers, C C', and the arms, F F', the use of the oxygen distributors, D D', substantially as shown, for the purpose of producing more perfect combustion.

48,287.—Revolving Fire-arm.—B. F. Joslyn, Stonington, Conn. Antedated June 14, 1865:

I claim the frame, with its two projections, a and a', and their dovetailed recesses in combination with the enlargement, b, of the barrel, and its dovetailed projections, x and x', the several parts being arranged and adapted to each other, as set forth.

48,288.—Breech-loading Fire-arm.—B. F. Joslyn, Stonington, Conn.:

I claim, First, The lever, G, and the spring pin, n, or its equivalent, in combination with the breech-piece, D, and its recess, g, the whole being arranged and operating substantially as herein set forth.

Second, The supplementary hammer, E, combined and arranged to move with the breech-piece, D, and to operate on the cartridge, substantially as described.

48,289.—Wood Base-burning Stone.—John W. Lane, Newton, N. J.:

I claim, First, The employment of the fire-box or chamber, C, containing the oven and vertical grate, F, in the rear and lower part of the partition wall or plate, L, and also containing the opening or space, O, in the front, and at or near the lower end of the wall or plate, W, in the manner and for the purposes substantially as herein described and set forth.

Second, I also claim the combination of the vertical grate, F, with the opening or space, O, at the bottom of the vertical partition, plate, W, in the manner substantially as and for the purposes herein set forth.

Third, I also claim the damper, a, in combination with the intermediate flue or space, H, and fire chamber, C, in the manner and for the purposes substantially as herein described and set forth.

48,290.—Intagliotype Plate.—Edwin B. Larchar, New York City. Antedated April 5, 1865:

I claim, First, The metallic plate with the hardened coating of oxide upon it, made substantially in the manner described, as a new article of manufacture.

Second, The use of the oleaginous ink or pigment, in drawing a design on the surface of the oxide, so as to protect the parts drawn upon from being coated by the coating solution afterward applied.

48,291.—Self-regulating Damper.—Chas. H. Lavis, Philadelphia, Pa. Antedated March 15, 1865:

I claim the drum, A, the damper, B, the rod, C, the screw, D, and the balance, E, constructed and operated with reference to each other, and for the purpose and in the manner as herein shown and described.

48,292.—Gate Latch.—Joseph Leonard, Wilmington, Ohio:

I claim the two latches, B B', connected by a cord or chain, C, and applied to the gate, A, as shown in connection with the two notched plates, F F', attached to the post, F, and having with respect to each other their lower upper edges, f, at opposite sides of their notches, e, substantially as and for the purpose herein set forth.

48,293.—Coal and Ash Sifter.—Sebens C. Maine, Boston, Mass.:

I claim the flanges or strips, e, in combination with the cylinder, B, operating substantially as set forth, for the purpose specified.

I also claim the cylinder, B, provided with flanges, e, in combination with the box, A, hopper, G, and receptacle, E, arranged and operating substantially as set forth.

48,294.—Mechanical Movement.—Elisha Matteson, South Brooklyn, N. Y.:

I claim, First, The employment of an inclined disk, D and C', in conjunction with a rolling weight, E, which is connected to a driving shaft in such manner that a rotary motion will be communicated to this shaft by oscillating said disk, substantially as described.

Second, The application of arms, g g', and a pitman, J, to the inclined disk, D, substantially as described.

Third, The combination of the flanged inclined disk, D, roller, M shafts, P G, and a contrivance applied to said disk for oscillating it, substantially as described.

Fourth, Supporting the inclined disk, D, upon a gimbal joint at its center, and upon a base ring or its equivalent at or near its circumference, in combination with a rolling pendant weight, E, substantially as described.

48,295.—Hair Brush.—John Mayer, Philadelphia, Pa.:

I claim a hair brush having a tubular handle, provided with any suitable pomade, and constructed so as to operate substantially in the manner and for the purpose described.

48,296.—Measuring Faucet.—Thomas McGirr, Richmond, Ind., assignor to himself and Nicholas R. Nixon:

I claim the combination and arrangement of the float, K, stem, J, scale, I, finger, L, all substantially as shown and described.

48,297.—Door Bolt.—M. McGonnigle, Allegheny City, Pa.:

I claim the use of two screws and knobs, in combination with two cams and one spring bolt, constructed, arranged and operating substantially as herein described and for the purpose set forth.

Second, The arrangement of the plate, X, in the end of the case, A, in connection with the thumb screw, 4, opening, 3, and stem, as herein described and for the purpose set forth.

48,298.—Grubbing Machine.—Charles R. Moffett, Philadelphia, Pa.:

I claim the lever, A, with its curved end and prongs or teeth, e, combined with the toothed plate, K, as and for the purpose described.

48,299.—Ash-pan Drawer and Lifter.—James Morrison, Jr., Troy, N. Y.:

First, I claim the employment and combination of the lifting device, Q, with the said ash pan or box, P, or any equivalents therefor, in the manner and for the purposes substantially as herein described and set forth.

Second, I also claim the lifting device, Q, constructed in the manner and for the purposes substantially as herein described and set forth.

48,300.—Bottle Stopper.—E. D. Moyer, Philadelphia, Pa.:

I claim the bottle stopper, described and shown, the same consisting of the cap, A, the elastic water-proof filling, a', and the swinging spring frame, B, the whole being constructed, arranged and combined together so as to operate, when applied to the mouth and neck of a bottle, substantially as described, for the purposes specified.

48,301.—Rock Drill.—Gregory Mulhaupt, Buffalo, N. Y.:

First, I claim the combination of the drill stock, B, with a vertically reciprocating frame or cross-head, C, the upward motion of which is produced by the action of the pinion, E, upon the rack, F, or other equivalent means, and the downward motion thereof by gravity, in the manner and for the purposes substantially as described.

Second, The combination of the cam, I, clutch, K, pawl, E, and rack, F, arranged and operated as described, to produce the reciprocating motion of cross-head, C, for the purposes set forth.

Third, Giving an intermittent rotary motion to the drill stock, B, by the upward motion of the cross-head acting on the ratchet wheel, G', through the medium of the cam wedge, J, rock shaft arms, J' J3, and pawl, G, in the manner substantially as described.

48,302.—Portable Kettle Furnace.—John Murdock, South Carver, Mass.:

I claim combining with the fire-place, kettle and surrounding cylinder, the two rings, termed the lower and upper rings, to form the two series of the spaces around the kettle, the lower ring having a flue space through it at one end of the fire-place, and the upper ring a like flue space above the opposite end of the fire-place, and apertures governed by a damper over the flue opening in the lower ring, substantially as and for the purpose specified.

I also claim making the cylinder which surrounds the kettle in two parts, the upper part to receive and support the flange of the kettle, and the lower part with an inward projecting flange to form the upper ring, in combination with the ring on which the lower part of the cylinder rests, and which forms what is termed the lower ring, as and for the purpose specified.

48,303.—Manufacture of Gunpowder.—Francis G. Murray, Washington, D. C.:

I claim the employment of the with a described material, compounded as and for the purpose specified.

48,304.—Weeding Hoe.—John Naugle, Mooresville, Ind.:

I claim the construction, arrangement and combination of the different parts of the hoe, substantially as described.

Second, The method herein described of fastening the hoe to the shank, as set forth.

48,305.—Knife-polisher.—Jesse Palmer, Cleveland, Ohio:

I claim a knife-polisher, constructed and operating as herein described.

48,306.—Tobacco Dryer.—W. H. Pease, Dayton, Ohio:

I claim the arrangement of the endless belts, D D, in connection with the tubes or pipes, E, the whole being used and operating as and for the purpose specified.

48,307.—Halter Clasp.—J. Harden Plumstead, Lynn, Mass.:

I claim the ring, A, as constructed in combination with the clasps, B B, constructed, arranged and operating as described, and for the purposes set forth.

48,308.—Musketo Bar or Tent.—Amos W. Price, Adrian, Mich.:

I claim the combination and arrangement of the shaft, a, the slide, e, the braces, b, the arms, c, the joints, d, the connecting plates,

g, the folding in the manner shown, with the netting, f, as and for the purpose specified.

48,309.—Fence Gate.—Fitch Raymond and August Miller, Cleveland, Ohio:

We claim the arm, F or J, in combination with the gate, A, cord, f, and weight, g, when combined and operating substantially as and for the purpose set forth.

48,310.—Carriage.—Elisha Robbins, Worcester, Mass.:

I claim the application of the thills, or their equivalent, to the axle by hangers or a cranked shaft, as described, and so as to bear against the wagon body, under circumstances and for the purpose substantially as described.

And I also claim the combination of the conical rollers, F G, with their thills, their hangers and the carriage body, arranged and applied together substantially as and so as to operate as described.

48,311.—Mode of Preparing Roofing Material.—Alfred Robinson, New York City:

I claim the method of coating a sheet or sheets of felt or other material to form a roofing fabric with asphalt or other material in a soft or plastic state, applied directly to such fabric in the manner specified.

48,312.—Machine for Cutting Stalks.—John B. Ryder, Wapello, Ind.:

I claim the long journals, B B, the extra wheels, A A, the broad springs, C C, with their sickle-shaped hooks, the adjustable cross bar, D and E, when these several parts are arranged and combined with the main roller, armed with cutters; the whole operating conjointly as and for the purpose specified.

48,313.—Connecting Thills to Carriages.—Blaney E. Sampson, Boston, Mass.:

I claim the application of the thills to the arms or journals of an axle by means substantially as described, whereby they may be supported by and turn on such arms while in use.

48,314.—Manufacture of Oil Cloth.—George Sampson, Manchester, Me.:

I claim a composition made of glue, gum, or vegetable sizing thickened with clay, whiting, ochre, or other earths, for filling or leveling up the surface of the cloth to prepare it for painting or printing.

I also claim mixing clay largely with the oil paint for coating or painting cloths in the manufacture of painted floor cloths.

48,315.—Truck for Palling Stones.—Gilbert L. Sheldon, Hartsville, Mass.:

I claim the combination of the secondary truck, A', and wheel B' with the truck, A, frame, K, windlass, I, sheave, L, and chains, M N, constructed and operating substantially as and for the purpose described.

48,316.—Machine for Cutting and Reducing Vegetables.—Thomas J. Sloane, New York City:

I claim the combination of the series of square or shear-edge cutters on the shaft with the series of square or shear-edged cutters in the case, arranged and operating substantially as herein described.

I also claim sustaining the outer ends of the cutters on the shaft by the rings of the case, in combination with the sustaining of the inner ends of the cutters of the case by the rings on the shaft, substantially as and for the purpose described.

I also claim connecting the cutters with the shaft and with the case, by having the cutters attached each separately by a dovetail or equivalent joint to a ring, and the rings to the shaft and case, substantially as described, to facilitate sharpening and other repairs.

48,317.—Pier for Bridges.—Erastus W. Smith, New York City:

First, I claim the employment of calcined plaster, or equivalent expansive material, in stopping the bottom of hollow piers or shells for submarine masonry, substantially in the manner and for the purpose herein set forth.

Second, I claim stopping the bottom of such shells by grouting or flowing the calcined plaster, or analogous semi-fluid material into interstices in previously laid stone, substantially in the manner and for the purpose herein set forth.

48,318.—Measuring Faucets.—Joseph Nottingham Smith, Jersey City, N. J.:

I claim introducing the liquid to be measured into the faucet behind a valve plunger, through which it is transmitted in the backward stroke thereof, and by which it is forced out from the faucet in the forward stroke, substantially as and for the purposes herein set forth.

I also claim the outlet valve, U, kept closed by a spring, in combination with the valve plunger of a measuring faucet, substantially as and for the purpose herein specified.

I also claim actuating the plunger by a handle, G, or its equivalent, through the means of a gear wheel, L, and two equal sized pinions, M M, gearing respectively into the plunger racks, N N, arranged and operating substantially as and for the purpose herein specified.

I also claim the adjustable stop, K, on the handle, G, and stationary pins or projections, Y Y, in combination with a measuring faucet for gauging the amount of liquid drawn by rock movement of the handle.

I also claim the registering dial, H, and index, b, arranged in combination with the actuating handle so as to indicate and register the whole amount of liquid drawn from the cask or vessel, substantially as herein specified.

I also claim the combination and arrangement of the plunger in relation to the operation of its valve and packing, substantially as and for the purposes herein specified.

I also claim, in combination with a measuring and registering faucet, lining the body of the faucet with tin, brass, or other suitable soft metal or alloy, backed by a cement of hydraulic lime, plaster of Paris, or equivalent substance, so that the lining may be removed and replaced when desired, substantially as herein specified.

48,319.—Mode of Packing Grindstones.—Frank M. Stearns, Beria, Ohio:

I claim the rods, A and B, in combination with the end boards or heads, C C, in the manner described and for the purpose set forth.

48,320.—Tobacco Pipe.—John D. Stewart, Baltimore, Md.:

I claim constructing the hinged cover of a tobacco pipe of an inner disk, b, and a bulging outer portion, a, when the said cover contains within the same a spring, d, connected with a rod, g, of a follower or tobacco presser, c, all arranged and operating substantially as herein set forth.

48,321.—Steam Engine.—O. M. Stillman, Westerley, R. I.:

First, I claim the jacket, E, and cylinder, G, constructed and arranged as described, in combination with the superheater, C, through which the steam passes on its way to the jacket, substantially as and for the purpose herein set forth.

Second, I claim the within described arrangement of the steam jacket, E, and cylinder, G, whereby the steam is compelled to flow uniformly, or nearly so, over the cylindrical surface and through one or both heads of the cylinder, in the manner and for the purpose substantially as herein set forth.

Third, I claim the within described arrangement of the super heater, C, the automatic regulator, N, and its connections, the steam jacket, E, and the cylinder, G, so as to operate together, in the manner and for the purpose substantially as herein set forth.

Fourth, I claim the incombustible clothing, K, the jacket, E, cylinder, G, and superheater, C, arranged to operate together substantially in the manner and for the purpose herein set forth.

48,322.—Gate.—William Tallman, Manteno, Ill.:

I claim the combination of the gate, A, constructed as above set forth, and resting at one end on a roller, with posts, B B', set in relation to each other as shown, and operating as described.

48,323.—Paint for the Bottoms of Ships.—James Gamage Tarr and Augustus Henry Wonson, Gloucester, Mass.:

We claim an improved composition, formed essentially as set forth and for the purpose specified.

48,324.—Cultivator.—H. M. Teasdale, Dansville, N. Y.:

First, I claim the arrangement of the inclined wings, E' E', with the double plow, E, and the beams, D D, in the manner and for the purpose described.

Second, The construction of the point represented in Figs. 4 and 5, in combination with the parts, E b d, substantially as and for the purpose herein described.

48,325.—Cloth Registering Attachment for Looms.—C. C. Temple, Saco, Me.:

I claim the registering mechanism herein described, consisting of the wheel, b, provided with projections to seize the fabric, worm

wheels, d h and i, endless screws, e k and g, and disks, j f and n, substantially as and for the purposes herein set forth.

[The object of this invention is to control the operatives employed in factories where cloths and other textile fabrics are produced, and prevent them from taking away feloniously certain portions of such fabrics.]

48,326.—Grain Huller.—James H. Thompson, Hoboken, N. J.:

I claim the combination of the inverted, fluted, cone frustrums, D, conical case, B, and lateral projections or prominences, e e c, all constructed and arranged and operating substantially as specified.

48,327.—Joint of Folding Rules.—Justus A. Traut, New Britain, Conn.:

I claim the slit, C, in the center piece, a', of the joint, a, for the purpose of receiving a device for producing tension or rigidity, substantially as and for the purpose described.

Second, I claim the employment of a metal piece, d, or its equivalent placed in the slits of the joint, a, substantially as and for the purpose described.

48,328.—Composition for Stiffening Hat Bodies.—T. Trowbridge, Danbury, Conn.:

I claim the within described composition made of the ingredients specified, substantially as set forth.

[The principal object of this improvement is to provide a stiffening composition for hat brims, and analogous articles, which shall quickly set or become stiff, after it is applied, and thus render the hat brim rigid. The improvement is also applicable to many other useful purposes.]

48,329.—Grain and Grass Seed Separator.—James B. Wallace, Franklin, Ohio:

I claim the employment or use of a series of screws connected together as shown and suspended within a suitable framing on a square shaft which is supported by adjustable bearings or blocks, E E, all arranged to operate in the manner substantially as and for the purpose herein set forth.

[This invention consists in the employment or use of a series of screws connected together and arranged within a frame, in such a manner that grass seed and other foreign substances may be separated from grain and the grass seed also separated from the worthless foreign substances.]

48,330.—Device for Unloading or Storing Freight.—Henry A. Whitney, Brooklyn, N. Y.:

First, I claim the elevated ways, A A, arranged in the manner shown, to admit of being adjusted in an inclined position for the movement of the car or truck, B, on the ways for the purpose specified.

Second, In combination with the above I claim the suspended hoisting device, G H J, with the platform, I, attached.

48,331.—Steam Pressure Gage.—James P. Wigal, Neago, Ill.:

I claim the coiled auger-shaped tube, B, in combination with the plug, A, arm, d, segment, f, pinion, h, and index, i, constructed and operating substantially as and for the purpose set forth.

[The operation of this steam gage is based on the property of a flat coiled tube, whereby the same when closed at one end and charged with fluid under pressure, will slightly uncoil and as soon as the pressure on the fluid ceases the tube returns to its original position. By attaching to the closed end of the coiled tube a long arm which connects by means of a toothed segment and pinions with a central arbor carrying an index hand the slight motion which said tube assumes when exposed to the action of fluid under pressure, is multiplied to produce the required motion of the index hand and a scale is obtained on the dial plate sufficiently open to distinguish slight changes in the pressure of the fluid.]

48,332.—Haming Mills.—Warren Wright, Springfield, Ohio:

First, In combination with diaphragms, G, the series of screws, H, formed so as to be cast in entire cylinders having the longitudinal slits, h, from their lower to near their upper margins, substantially as set forth.

Second, The series of symmetrical equal annular and two parted diaphragms G' G', capable of transposition and reversal, substantially as and for the purpose set forth.

Third, The provision of the lip, g' or lips g and g', at the interior margin of the annular diaphragms G G', for the purpose explained.

Fourth, The enclosing case composed of a series of entire cylindrical screens, H' H' and marginally grooved annular diaphragms, G' G', as represented.

Fifth, In the described combination with the series of diaphragms, G' G', having equal central apertures, I claim the floating suction heater, L, M, substantially as set forth.

Sixth, The arrangement of diaphragms, G' G', having equal central apertures in combination with the flaring and vertically adjustable suction heater, L M, substantially as set forth.

48,333.—Fire Escape.—Robert Wyatt, Brooklyn, N. Y.:

First, The combination of the vertical slotted tube, A A A, the bar, g, and the hinged rounds, h h, substantially as herein described the whole forming a folding fire escape ladder.

Second, The bar, D, catch, f, and cap, C, in combination with each other and with the slotted tube A A A, bar, g, and hinged rounds, h h, substantially as and for the purpose herein specified.

48,334.—Raising and Lowering Signal Lamps.—Thomas G. Crosby (assignor to George H. Strong and M. H. Crosby) Buffalo, N. Y.:

I claim the rods or slides, A B, or their equivalent in combination with the rope or cord, M, the pulley, I, or its equivalent and the frame, J K, for holding the lamp when constructed to operate as herein substantially set forth and described.

48,335.—Harvesting Machine.—J. L. Fountain (assignor to himself and A. Fountain) New Milford, Ill.:

First, I claim the arrangement of the link, g, arms, e' and f, link, i and p, in combination with the piece, E, of the mowing frame, and guides, d d and b, substantially as and for the purpose described.

Second, I claim the rod, n, and lever, h', in combination with the lever, n', pulley N, and belt, l, as and for the purpose set forth.

Third, I claim the adjustable arm, J, and guides, J', in combination with the pulley lever n', and shoe as and for the purposes described.

Fourth, I claim the peculiar arrangement of the pulleys, G, h' g' and I, in combination with the reel standard, F, piece, F', when operating conjointly as and for the purpose set forth.

48,336.—Tackle Hook.—Russell Frisbie (assignor to Ira K. and Elmore Penfield) Middletown, Conn.:

I claim a strap which swivels on the shank of a tackle hook and is made in two parts that are hinged together in combination with a spring bolt, constructed and operating substantially as and for the purpose set forth.

[This invention consists in a strap which swivels on the shank of a tackle hook and which is made in two parts united by a pivot in combination with a spring bolt which locks into a notch on the tip of the hook in such a manner that when the strap is locked to the tip, the hook is effectually closed and prevented from unhooking spontaneously and by pressing back the bolt the strap can be readily unhooked and turned up so as to open the hook at any moment. Furthermore by the use of this strap the hook is prevented from straightening out and it is capable of sustaining a much greater strain than it would without the strap.]

48,337.—Cartridge Retractor for Breech-loading Firearms.—Joshua Gray, Medford, Mass., assignor to himself, E. H. Eldredge, of Boston, Mass., and S. S. Bucklin, Providence, R. I.:

First, I claim the cartridge extractor, C, provided with the slot, f,

in combination with the guide and expeller, B, substantially as and for the purpose described.

Second, The sliding breechpin, D, extractor, C, and guide and expeller, B, when constructed, combined and operating substantially as described.

48,338.—Hand Stamp.—Thomas S. Hudson and Anthony Hardy (assignor to Thomas S. Hudson) Cambridge, Mass.:

First, We claim the combination of the endless chain of types and its carrying mechanism with the plunger.

Second, We claim the combination of the endless chain of types and its carrying mechanism with the plunger and the chase, the whole being arranged together as specified.

Third, We also claim the combination of the endless chain of types and its carrying mechanism with the chase, the plunger and printing ribbon arranged as specified.

Fourth, We also claim the combination of the type chamber, d, in the neck, c, of the frame with the endless chain of type, its carrying mechanism, the chase and the plunger arranged to operate as described.

Fifth, We also claim the combination of one or more elastic cushions or masses of vulcanized india rubber, s s, with the frame and plunger of the press such cushion or cushions being arranged on the bottom of the said frame and for the purpose as explained.

We also claim the combination of the catch wheel, o, and spring catch, p, with the endless type chain its sprocket wheels, the chase and the bed arranged so as to cooperate as specified.

48,339.—Device for releasing Screw Engines, Etc.—Antonia Kieffer (assignor to himself and James Kennedy) Buffalo, N. Y.:

I claim the counterbalanced pawl, D, provided with a pawl rod, F, in combination with the toothed wheel, B, and prying off lever, C, for the purposes and substantially as described.

48,340.—Argand Gas Burner.—Charles H. Johnson (assignor to himself and Eugene Woodman) Boston, Mass.:

I claim the arrangement and combination of the foraminous partition, e, with the tip, b, its chamber, a, and the conduits leading into and out of such chamber.

I also claim the combination of the tip, b, with the groove, f, in its upper surface or end or with the said groove, f, in its upper surface or end and also with another groove, g, arranged in its lower surface or end.

I also claim the tip as made with each of its jet holes countersunk at either or both of its extremities, and for the purpose specified.

I also claim the tip, as made with a groove, f, in its upper surface or end, and with each of its jet holes countersunk at its upper end.

I also claim the tip as made with a groove, f, in its upper surface or end, and with each of its jet holes countersunk at both of its extremities.

48,341.—Bottle Stopper.—Wilhelm Kloeene (assignor to himself and G. Hubner), New York City:

I claim a bottle stopper, composed of a plug, A, spring valve, B, and elastic tube, C, substantially as herein set forth.

[This invention relates to a bottle stopper, composed of a plug of wood or other suitable material, perforated through its longitudinal center, in combination with a cone valve secured to a stem, which passes through the hole in the plug, and with its elastic tube applied to the outside of said plug in such a manner that when the plug with the elastic tube is inserted in the neck of a bottle containing liquid under pressure, the pressure of the gases in the liquid forces the cone valve up into the elastic tube, and expands the same, causing it to close tight against the inner surface of the neck.]

48,342.—Sectional Folding Boats.—Joseph H. Laning and Veron Fletcher, Philadelphia, Pa., assignors to Veron Fletcher. Antedated June 15, 1865:

We claim the peculiar manner of constructing boats of movable and adjustable sections, so connected with hinges, part thereof affixed on the inside of the boat, and part thereof on the outside, so as to move in harmony with each other, whereby the boat can be opened and closed at will.

We also claim the combination of hinges, vulcanized india-rubber tubing, and movable and adjustable sections, for the purpose of as hereinbefore more fully set forth, and substantially as described in both clauses.

48,343.—Machine for Boring Artesian Wells.—Thomas J. Lovegrove, Philadelphia, Pa., assignor to himself and Henry Baldwin, Jr.:

I claim, First, Vibrating the mechanism which supports, raises, lowers, feeds and rotates the drill directly over the hole, so as to dispense with a derrick.

Second, Rotating the drill automatically by mechanism actuated by the vibration of the parts which sustain it, substantially in the manner described.

Third, A mechanism which automatically and simultaneously vibrates, feeds and rotates the drill.

Fourth, Connecting one end of a walking beam or vibrating lever to the motor, and the other to the drill, by mechanism which gives the drill an intermittent axial rotation.

Fifth, Combining with a walking beam or vibrating lever a mechanism actuated by the reciprocation of the beam intermittently to rotate the drill, and a mechanism similarly actuated for raising and lowering and feeding the drill.

Sixth, Combining with a vibrating mechanism which supports and rotates the drill, a mechanism independent of the vibrations of the beam, to raise or lower the drill.

Seventh, Controlling the feed of the drill by the differential movement of the rotating and lowering mechanism.

Eighth, A drill-rope spool rotating both on a vertical and a horizontal axis, and having a vertical reciprocation.

Ninth, Making the fulcrum of the walking beam the axis of motion, upon which the mechanism is supported for rotating the drill automatically, and raising and lowering it, substantially in the manner described, for the purposes set forth.

48,344.—Steam Engine Governor.—Thomas J. Lovegrove (assignor to himself and Henry Baldwin, Jr.), Philadelphia, Pa.:

I claim, First, The employment of the single closed chamber in a governor to contain crude mercury to control the engine, substantially as described.

Second, Supporting a valve stem in a single closed chamber upon crude mercury, so that the valve shall close when the mercury is at rest in the chamber, and open when the mercury is diffused by centrifugal motion over the chamber and float, substantially in the manner described.

Third, The revolving closed chamber to contain mercury, combined with a float, to be operated by the mercury, substantially in the manner and for the purpose set forth.

Fourth, The combination of the sleeve, E, the revolving chamber, H, the float, J, and the valve stem, L, substantially in the manner and for the purposes set forth.

48,345.—Sewing Machine.—John McClosky (assignor to himself and Samuel B. Ballou), New York City:

I claim the hook, A, constructed and applied to operate substantially as herein described, in combination with the rotating hook, C, bobbin, B, and needle, for the purpose herein set forth.

48,346.—Bit Stock.—Milton V. Nobles, Rochester, N. Y., assignor to himself and John C. Nobles, Rushford, N. Y.:

I claim the combination of the uncut or solid socket with the split ferrule, ring and catch, by which the bit or other tool may be firmly held in the stock, and readily released therefrom, substantially as described.

48,347.—Paper-making Machine.—James Scanlan (assignor to himself, S. J. Stine and George Ross), Lebanon, Pa.:

I claim, First, The conching roller, A, with its lever attachment, S S' R, in combination with the Fourdrinier wire cloth apron, U, situated and operating in the manner and for the purpose specified.

Second, I claim the third felt, in combination with the wash box, L, its washers, V, racks, N, and rollers, 1 2 3 4 5 6 7 8 9 and 10, arranged and operating substantially as set forth.

I claim also the polishing roller, I, in the second press, in combination with the press rollers, G H.

I claim the combination of the Fourdrinier machine for making paper boards out of straw, soughum or other material, in combination with my third felt and felt-washer arrangement, as described.

48,348.—Machinery for Oiling Wool.—John Shlim, Ley-
erlington, Pa., assignor to himself, Geo. S. Harwood
and Geo. H. Quiney:

First, In wool-oiling machinery, I claim the combination of the
bed, a, and grooved roller, b, revolving inside of the tank, as and for
the purpose described above.

Second, I claim an endless cloth of wire, or a pressure roller cov-
ered with wire, mounted just above the feed cloth, to receive the oil
after being discharged from the tank, and convey it to the wool on
the feed cloth, as above described.

48,349.—Saw-mill.—Wm. A. Wright and James Moly-
neux, Bordentown, N. J., assignors to the Borden-
town Mach. Co.:

We claim, First, The frame, E, its teeth, a, the worm, b, saw frame,
G, pitman, f, driving shaft, H, crank, h, the whole being arranged for
joint action, and in respect to the stationary frame, as and for the
purpose herein set forth.

Second, The movable table, I, with its roller, K, in combination
with the movable frames, E and G.

Third, The roller, k, its ratchet wheel, the plate, L, and pawls, m,
and wheel, h, or its equivalent, the whole being arranged and oper-
ating substantially as and for the purpose herein set forth.

48,350.—Apparatus for Deadenening Sound.—Francis
Fearon, London, Eng.:

I claim the exclusive use of an apparatus for softening or deaden-
ing sound, by means of pressure on the tragus of each ear, substan-
tially as herein described and illustrated by the drawing.

48,351.—Apparatus for Oiling Wool, Etc.—Martyn J.
Roberts, Pendarren House, Crickhowell, South
Wales, Eng. Patented in Belgium Oct. 29, 1863:

I claim, First, A reservoir, in combination with revolving blades
and a trough or gutter, the three being constructed and operated
substantially as described.

Second, In combination with a perforated revolving disk or sprin-
kler, a tube or passage way leading to the disk, a gutter supplying
liquid to the passage way and revolving blades for raising liquid into
the gutter, all these parts being and acting in combination as de-
scribed.

Third, A revolving sprinkler disk, in combination with a cover
and a slotted pan, I claim a tube and a reservoir provided with a par-
tition, as described, these parts being constructed and operating in
combination, substantially as set forth.

And, last, I claim, in combination the following parts, when con-
structed and operating substantially as set forth, viz: 1st, A reser-
voir, provided with a gutter and a partition; 2d, revolving blades;
3d, a revolving sprinkler supplied by the gutter; 4th, a roof and a
slotted pan, and 5th, a tube extending from the pan to the reservoir.

48,352.—Apparatus for Impregnating the Air of Rooms
with Antiseptic Vapors.—Antoine Joseph Sax, Paris,
France:

I claim an apparatus composed of the reservoir, A, and movable
and adjustable impregnator, B, substantially as herein described, for
the purpose of impregnating the air of rooms, hospitals and other
buildings with the vapor of antiseptic substances, as herein de-
scribed.

REISSUES.

1,999.—Shears.—Joel Bryant, Brooklyn, N. Y. Patented
Sept. 22, 1863. Antedated June 29, 1863:

I claim the construction and exclusive use of shears and scissors
(Figs. 1, 2, 3, 4 and 5), whose blades are secured, and whose rivets, R,
are so set as to cause the edges of the said blades, B, to meet and
close below the line, R, of their rivets, substantially as herein de-
scribed and for the purposes set forth in this specification.

2,000.—Gas and other Retorts.—John Chilcott, Brook-
lyn, N. Y. Patented Jan. 17, 1865. Antedated Jan.
6, 1865:

I claim, First, Surrounding one or more gas or other retorts with
a continuous system of flues, E, E, through which the flame and
gaseous products from the furnace circulate back and forth several
times along and once all around the retort or retorts, substantially
as and for the purpose herein set forth.

Second, The jacket or casing, C, divided longitudinally into two
parts, and having the flue partitions attached to its interior, so as to
be detachable from the retort, substantially as and for the purpose
herein specified.

2,001.—Brewer's Boiler.—Adolph Hammer, New York
City. Patented Aug. 11, 1867:

First, I claim arranging the steam pipe in boiling apparatus in two
or more distinct and separate parts or series, each of which can be
turned up or rotated, substantially as and for the purpose set forth.

Second, Rotating the parts or sections of a steam pipe in a boiling
apparatus upon an axis at or near the center of the tub, substan-
tially as and for the purpose specified.

2,002.—Mash Tun.—Adolph Hammer, New York City.
Patented Jan. 9, 1865:

First, I claim the application and use of the upper rake, con-
structed substantially as described, when combined with a mash tun,
so as to be rotated in opposite or in the same direction to that of the
usual rake, substantially as and for the purpose set forth.

Second, Making the rake teeth of the tun inclined, substantially
as and for the purpose described.

Third, Curving the teeth of the rake of a mash tun, substantially
in the manner and for the purpose specified.

Fourth, The use of inclined curved teeth in the rake of a mash
tun, substantially as and for the purpose set forth.

2,003.—Hoisting Machine.—Wm. Miller, Cincinnati,
Ohio. Patented May 12, 1863:

First, I claim combining with the platform of a hoisting machine
or elevator, a worm wheel, J, gearing with a corresponding worm
rack, D, substantially as set forth.

Second, In combination with the described or equivalent actu-
ating mechanism, H, I, J, and platform, B, I claim the arrangement of
the worm racks, D, D, and worm wheels, J, J, the whole being com-
bined and operating substantially as set forth.

2,004.—Street Washer.—Joshua Regester, Baltimore,
Md. Patented July 23, 1861:

First, I claim so applying a stop cock within a metallic case that
the cock and case are united together, and the cock and its key rod
or discharge pipe supported permanently in position within the case,
substantially as described.

Second, A stop cock for street washers, having an upper and a
lower support, which serve to sustain and center the cock and key
rod or discharge pipe, applied therein to turn the water on and off,
substantially as described.

2,005.—Enema Syringe.—Francis B. Richardson, Bos-
ton, Mass. Patented March 5, 1861:

I claim so forming the connection between the bulb and its flexible
tube that the bulb can be used separately with a jet pipe, as well as
with its flexible tube, thus adapting the syringe to all the various
operations for which it may be required, as described.

2,006.—Button.—Charles Smart, New York City, as-
signee by mesne assignments of Geo. A. Meackam.
Patented Jan. 10, 1860:

First, I claim a button revolving, or its shank or stem, by means
of devices, substantially as hereinbefore set forth.

Second, I also claim the teeth, a, arranged at the base of the
shank, A, substantially as and for the purpose hereinbefore set
forth.

2,007.—Harvester.—Wm. Cogswell and Wm. H. W.
Cushman, Ottawa, Ill., assignees by mesne assign-
ments of Wm. H. and Ira Cogswell, Jr. Patented
Dec. 6, 1859:

We claim the combination with the pinion, I, rotating in a fixed
bearing in the frame, and a driving wheel, provided with gearing,
G and H, we claim the hand lever, F, and eccentric journal D,
adapted to move the driving wheel forward and backward, so as to
bring either of the said gears, G or H, into engagement with the
said pinion, or equidistant from it, and out of gear, substantially as
described.

2,008.—Machine for Finishing Nuts.—Frank P. Pfeleghar
and Wm. Scollhorn, New Haven, Conn. Patented
Oct. 25, 1864:

First, The combination of reamer, D, punch or punches, E, mill-
ing tool, F, and tap or taps, G, constructed to operate substantially

as specified, whether arranged in the order described or not, when
the said combination exists in an organized machine, which receiv-
ing a blank metal nut finishes it complete while passing through the
said organized machine.

Second, The use of milling tools, F F', arranged substantially as
herein specified, for the purpose of finishing the faces of a nut.

Third, The steps, e, in the channel, C, arranged substantially as
and for the purpose set forth.

Fourth, The reversing gear, I, J, clutch, K, and switch lever, L,
or their equivalent arrangement, in combination with the wheels,
b F3 h, which impart motion to the various tools, in the manner and
for the purpose substantially as herein specified.

Fifth, The adjustable shoulders, 11', applied in combination with
the switch lever, L', and with the reversing gear, substantially as
and for the purpose herein described.

Sixth, The automatically reciprocating rod, p, and finger bar, g,
applied in combination with the channel, C, and tools, D E F F' F'
G G', in the manner and for the purpose substantially as described.

Seventh, The arm, p3, and inclined plane, r, in combination with
the reciprocating rod, p, finger bar, g, and channel, C, constructed
and operating substantially as and for the purpose set forth.

2,009.—Clover and Grass Seed Harvester.—William N.
Whiteley, Jr., Springfield, Ohio, assignor to Thomas
S. Steadman, Murray, N. Y. Patented May 23, 1864.
Reissued June 19, 1860:

I claim, First, The combination of the holding plate, c, or its
equivalent, with the shaft of the driving cog wheel's pinion, and
that end of the coupling arm or supplementary frame, G, or its
equivalent, which is hung and vibrated on said shaft.

Second, The combination or arrangement of the following ele-
ments in a harvester, viz: a frame or box, having the cutting ap-
paratus connected to and drawn forward by it; the shaft of the
main driving cog wheel's pinion, also connected to it, and about at
right angles to its forward movement; a coupling arm or supple-
mentary frame, or its equivalent, having one end hung and vibrated
on said pinion shaft, and near the other end connected to the axle
of the main driving cog wheel, and a holding device whereby the
attendant can have the inner end of the cutting apparatus held at
different heights in respect to the axle of the main driving cog wheel.

Third, Connecting the main bearing and driving wheel of a har-
vester with the frame to which the cutting apparatus is attached, in
such a manner that the attendant can, while riding on the machine,
vary the height of the inner end of the cutting apparatus, while the
outer end of said apparatus remains unchanged, substantially as
described.

Fourth, The combination of the retaining and guiding arc, g2, or
its equivalent, with the axle end of the coupling arm or supplemen-
tary frame, H, or its equivalent, the outer end of a harvester's cut-
ting apparatus, and the wheel that carries this outer end or is near-
est to it.

Fifth, The combination of the axles, f and d, the wheels, C and D,
the projecting ends of the shaft of the main driving cog wheel's
pinion, the frame or box carrying this shaft, the coupling arms or
supplementary frames, G and H, the holding plates, c, c, and the re-
taining and guiding arcs, g and g2, or their equivalents.

Sixth, The combination or arrangement of the following parts or
elements in a harvester:—A frame or box which carries the shaft of
the cutters' main driving cog wheel's pinion; a coupling arm or
supplementary frame, having the axle of the said cog wheel con-
nected to it at or near its outer end, and the inner end hung upon
said pinion shaft; a holding device, by which it is properly held in
that place; a guiding and retaining arc attached to the main frame
of the machine, and maintaining the supplementary frame or coup-
pling arm in place; cutters driven by a crank motion, and an automa-
tic rake, which, as well as the cutters, receives its motion through
the main driving cog wheel's pinion shaft.

Seventh, Connecting the axle of the cutter's first driving cog
wheel and said wheel's pinion shaft by the coupling arm or supple-
mentary frame, G, or an equivalent thereof, which has one end
hung on said pinion shaft, and therefore holds the said cog wheel's
axle always at the same distance therefrom, so that the connection
of the said cog wheel and its pinion will always remain the same.

Eighth, The combination of the retaining and guiding arc, g, or
its equivalent, with the main frame or box of a harvester, to which
the cutting apparatus is secured, and the axle end of the coupling
arm or supplementary frame, G, or its equivalent, which has the
other end hung on the pinion shaft connected to the main frame
about parallel with the axle of the cutter's ground and driving
wheel, so that the said axle and pinion shaft are always at the same
distance apart, and substantially parallel, and the axle end of said
coupling arm free to rise and fall, vibrating on said pinion shaft,
while the machine is in motion.

DESIGN.

2,101.—Stove.—David Hathaway (assignor to Fuller
Warren & Co.), Troy, N. Y.



PATENTS GRANTED FOR SEVENTEEN YEARS.

MUNN & COMPANY,

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

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

Yours very truly,

CHAS. MASON.

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

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

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, dur-
ing the time of my holding the office of Commissioner of Patents, a
very large proportion of the business of inventors before the Patent
Office was transacted through your agency; and that I have ever
found you faithful and devoted to the interests of your clients, as well
as eminently qualified to perform the duties of Patent Attorneys with
skill and accuracy.

Very respectfully, your obedient servant,

Wm. D. Bishop.

THE EXAMINATION OF INVENTIONS.

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

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon
examining an invention does not extend to a search at the Patent
Office, to see if a like invention has been presented there; but is an
opinion based upon what knowledge they may acquire of a similar

invention from the records in their Home Office. But for a fee of \$5,
accompanied with a model, or drawing and description, they have a
special search made at the United States Patent Office, and a report
setting forth the prospects of obtaining a patent, &c., made up and
mailed to the inventor, with a pamphlet, giving instructions for
further proceedings. These preliminary examinations are made
through the Branch Office of Messrs. MUNN & CO., corner of F
and Seventh streets, Washington, by experienced and competent per-
sons. Many thousands of such examinations have been made through
this office, and it is a very wise course for every inventor to pursue.
Address MUNN & CO., No. 37 Park Row, New York.

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

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

CAVEATS.

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

HOW TO MAKE AN APPLICATION FOR A PATENT.

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

REJECTED APPLICATIONS.

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

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

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

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

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

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to
the sale and transfer of patents, MESSRS. MUNN & CO. are at all times
ready to make examinations as to titles, ownership, or assignments
of patents. Fees moderate.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and
manufacturers, carefully prepared and placed upon the records at
the Patent Office. Address MUNN & CO., at the Scientific American
Patent Agency, No. 37 Park Row, New York.

FOREIGN PATENTS.

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

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

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

INVITATION TO INVENTORS.

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

EXTENSION OF PATENTS.

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

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

UNCLAIMED MODELS.

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

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

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



J. W. P., of Mich.—We do not know where you can obtain a windmill capable of doing the work you desire. If any of our readers can furnish a good wind power we think it would pay them to advertise it in the SCIENTIFIC AMERICAN.

R. J. W., of Mo.—The ear pieces to assist in hearing were at one time sold in this city, but we do not think they were as good as the common ear trumpet.

F. L. H., of Mass.—Telegraph wires have been tapped during the war, by cutting the wire and connecting one of the cut ends to one end of the helix of an electro-magnet and the other to the opposite end of the helix. Then when the current is closed the armature will be attracted, and when it is broken the armature will be released, the same as at any of the telegraph stations.

P. A. H., of Ill.—You may filter the water for your cistern by running it into a long trough and laying in the trough a drain pipe so arranged that the water must pass through its walls. Or you may make a filter by boring numerous holes in the bottom of a hoghead, covering the bottom with flannel, and filling in sand to the depth of a foot or two.

E. G. S., of Pa.—No person has a right to make a patented invention for his own use without the inventor's consent. The present volume closes on the first of July. We can furnish early in July a few of the present volume bound.

A. E. T., of Ohio.—India-rubber bottle stoppers are in use to some extent. We have often seen them.

A. H., of Pa.—We have never seen a passenger indicator constructed like the one shown in your sketch and should think it could be patented.

H. H., of D. C.—The muscular power of a man is equal to one-eighth of a horse power, and we have no doubt that an engine of one-eighth horse power might be constructed to weigh not more than 150 lbs.

F. H., of N. Y.—We think the collapsing tubes such as are used by artists, are made in France, and are not patented in this country.

P. P. H., of Conn.—It is doubtless the molasses in your smoking tobacco which makes it continually damp. Molasses is hygroscopic or has the property of attracting moisture from the atmosphere; it is often employed in curing tobacco.

L. T., of N. Y.—We know of no exhaustive, recent work on the steam engine. Locomotives have been very fully treated by both Clark and Colburn, and perhaps you might find what you want in "King's Notes on the Steam Engine."

W. R., of N. Y.—Zinc is very volatile, and has a strong affinity for oxygen, especially at high temperatures; if therefore molten zinc is exposed to the air in an open vessel it rapidly wastes by two processes—by evaporation and oxidation, hence the necessity of covering the surface by a protecting stratum of some other substance.

P. D., of N. Y.—We enjoyed reading your letter heartily, but cannot publish it for the reason that [personal and private] disagreements are of no interest to the general public. We shall publish your engraving very soon. The engine makes a handsome appearance and we hope it will be successful.

Romanus, of Ohio.—The melting point of copper is stated at 2143° Fah., and of silver at 1873°, but there is no instrument for measuring these high temperatures which is universally regarded as trustworthy. You had better buy a crucible than attempt to make one.

J. C. S., of N. H.—In regard to the sale of your planetary discoveries we cannot offer any advice. It is a business in which we are not engaged.

H. A. S., of Me.—We cannot instruct you by a receipt how to enamel cloth. You must learn the art by practice.

H. C. S., of Ind.—India-rubber cement is what you require. See directions for making it in our last volume.

L. W. W., of Ill.—For the price of Roper's air engine, address Crosby, Butterfield & Haven, 22 Dey street, New York.

J. E. B., of N. Y.—We published a very full description of the new Atlantic telegraph cable in our last volume.

E. W. C., of Ohio.—The best method of making wood soft and limber is to heat it in a close vessel by means of steam. Prepared in this way timbers a foot square may be bent in short curves at right angles.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona-fide acknowledgement of our reception of their funds.

Back Numbers and Volumes of the "Scientific American."

VOLUMES IV., VII., XI. AND XII. (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., VIII., IX. and X., are out of print and cannot be supplied.

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.

E. HAMBURGER, INVENTOR, RESPECTFULLY INFORMS his brother inventors that he has opened an establishment for the purpose of negotiating or transacting business for inventors living in this city or elsewhere. He will buy or sell their patents, or will introduce and manufacture their articles in any way they may desire. Models for patents made. Several patents and working models on hand. Full particulars will be given on calling or addressing: HAMBURGER & JOSH. No. 18 Beekman street, New York City.

NOTICE TO CHURCHES AND SCHOOLS—BELLS within the reach of all. The Amalgam Bell, well known throughout the United States as "the cheapest and best." Price reduced to 20 cents per pound and warranted. Send for descriptive circular to the manufacturer. JOHN B. ROBINSON, No. 16 Dey street, New York.

WATER POWER—AT N. FALLS, N. Y., FOR 50 Mills.—Now ready for sale, a lease, at half price of Patterson Power Leases. Renewable every 20 years for ever. Apply at No. 23 Courtlandt street, New York to HORACE H. DAY. 1 8

HARTMANN & LAIST, CINCINNATI, OHIO; MANUFACTURERS of Glycerin Acetic Acid, Grape Sugar and Sirup. 1 25

SPOKE LATHES (BLANCHARD'S) OF AN IMPROVED Pattern, made by J. GLEASON, No. 1,090 Germantown avenue, Philadelphia, Pa. 1 4

TO MANUFACTURERS AND EXPORTERS.—ALL articles of American manufacture which are exported to foreign countries are entitled to a drawback equivalent to the amount of tax paid at the time of manufacture under the Internal Revenue Law. We offer our services to secure the refunding of this amount, and will cheerfully furnish all necessary information. MERCHANT, OAKLEY & CO., Custom-house and Internal Revenue Brokers, No. 71 Broadway, Room No. 55. 1 8

PORTABLE STEAM ENGINES.—THESE WORKS have lately increased their facilities for the manufacture of their popular engines. Prices reduced to a peace standard. Fourteen feet and more of heating surface given to the nominal horsepower. Delivery to the Oil Regions by part navigation much prompter and cheaper than from more eastern points per railroad. Send for circular before buying. F. W. M. RAEDER, Ames Iron Works, Oswego, N. Y. 1 12

CHUCKS.—FAIRMAN BROS., WEST STAFFORD, Conn., manufacturers of Scroll Chucks, 3, 4, 5, 9, 12, 15, 18, 21, and 24 inches diameter. Also Independent Jaw Chucks, 9, 12, 15, 18, and 24 inches in diameter, that will chuck full size. Repairing promptly attended to. Orders solicited. 1 4

MAPS, PLANS, MECHANICAL DRAWINGS, ETC., made with accuracy and dispatch by CHAS. HERBERT, No. 104 Broadway. 1 4

MECHANICAL DRAUGHTSMAN, FAMILIAR WITH Isometric Perspective, wanted. Address G. H. KNIGHT, Box 541, Cincinnati, Ohio. 1 4

AGENTS WANTED IN ALL THE STATES TO SELL the best self-feeding Hand and Power Metal Drilling Machine ever offered to the public. Illustrated in the SCIENTIFIC AMERICAN, Vol. 12, No. 14 (new series). By the use of this drill time is saved and hard work made easy. Adapted to all branches. Call and examine them or send for a circular. Manufactured by LYON & ISAACS, No. 9 Jane st., N. Y. Office No. 25 Cedar st., N. Y. 1 4

AGENTS WANTED—TO SELL AND APPLY MINER'S Patent Window-fastener and Sash-supporter. The best in use. Easily adapted to any window. Apply to HUNT & VAN DE MARK, No. 229 Pearl st., N. Y. 1 4

MACHINE BELTING, ALL SIZES, ON HAND, OF superior Oak tanned Leather Belting, and for sale at reduced prices. ALBERT POTTS, cor. Third and William sts., Phila. 1 3

NEW BOILER WORKS—LEHIGH BOILER WORKS, Allentown, Pa.—For the Manufacture of Boiler and Sheet-iron work of all descriptions, such as Locomotive, Flue, Tubular and Cylindrical Boilers, Locomotive Tanks, Water Tanks, Steam and Blast Pipes, Chimneys, Etc. Also repairing of all kinds attended to with dispatch. All work done at these works is warranted to be of good material and well made. Part of the firm being Machinists, we are prepared to do out-door machine work, such as setting up engines and boilers, with steam and water pipes, and repairing generally. NOBLE, RHODA & CO. 1 8

SKETCH OF A GOOD INVENTION WILL BE sent to any person who will pay expenses for an equal interest in the patent. Address (with stamp) SMALL USEFUL ARTICLE, Monongahela City, Pa. 1 4

TO RAILROADS AND MACHINISTS WANTING GOOD TOOLS.—For sale for immediate delivery three 36-in. Lathes, 18-ft. Shears; 1 Planer, 24 in. square, 6 ft. long; 1 Bolt-cutter. We have under way 2 Planers, 22-in. sq., 9 feet long, and 4 8-ft Shapers. E. & A. BETTS, Wilmington, Del. 1 4

GREEN MOUNTAIN TURBINE WATER WHEEL.—Those who wish to get a cheap, powerful, quick-running wheel under low falls apply to J. W. TRUAX, Fairfax, Vermont. 1 4

PATENT PORTABLE MUSKETO BAR, FOR TRAVELERS, Tourists, Sportsmen, Hiving Bees and Fishing. A perfect safeguard against all annoying insects. Sent free of postage by remitting \$1.25. A liberal discount made for the trade. Also state Rights for sale. Address JOHN ZENGELER, P. O. Box 2,682, Chicago, Ill. 1 4

FOR SALE—ONE 26-IN. FARRER PLANER AND Matcher, \$60; one Double Surface, \$4.50; one small Planer and Matcher, \$4.50; one hub Mordising Machine \$2.50. Address E. C. TAINTER, Worcester, Mass. 1 2

TRUE'S POTATO PLANTER DOES THE WORK OF 12 men. Rights for sale. J. L. TRUE, Garland, Maine. 25 10

THE MOST VALUABLE MACHINE FOR BUILDERS

Sash and Door, Waived and Straight, Molding and Piano Manufacturers, complete for all kinds of irregular and straight work in wood, hard or soft, superior to all others, having the capacity of twenty good mechanics, called the Variety Molding Machine. We own nine patents, covering the valuable inventions for machines with upright mandrels. Have them manufactured in one place only for the United States and Europe, viz.: at Plass Iron Works, No. 119 East Twenty-ninth street, New York. We hear there are parties manufacturing machines infringing on some one or more of our patents. We caution the public from purchasing such infringements. Our patents secure to us the machine with either iron or wooden table, through which are two upright mandrels, having cutters in each head held by a screw nut; also, combination collars, saving 75 per cent in cutters, feed table to plane and cut, iron outside the cutters, preventing wood from taking undue hold. Also guards acting as plane stocks, making it safe for a boy to run.

Agents solicited. Please send for circular giving full description. Information or orders for machine may be addressed COMBINATION MOLDING AND PLANING MACHINE COMPANY, New York City. 25 4

DUSSAUCE'S TANNING, CURRRYING AND LEATHER DRESSING.—Just Published.—A New and Complete Treatise on the Arts of Tanning, Currying and Leather-dressing, comprising all the new discoveries and improvements made in France, Great Britain and the United States. Edited from notes and documents of Messrs. Salleron, Grouville, Dabal, Desables, Dabarreau, Payen, Rene, De Fontanelle, Malepeyre, Etc. By Prof. H. DUS-SAUCE, Chemist. Illustrated by 212 wood engravings. In 1 vol., 8vo., 700 pages. Price \$10.

Also recently published:—Elements of Chemistry, by M. V. Regnault. 2 vols., 8vo., nearly 1,500 pages, 700 engravings, \$10.

Hilmi's Tin, Sheet-iron and Copper-plate Worker; illustrated by 100 engravings, 12mo., \$2.50.

Buckmaster's Elements of Mechanical Physics, 12mo., \$2.

Burgh's Practical Rules for the Proportions of Land and Marine Engines, 12mo., \$2.

Weatherly's Art of Boiling Sugar, Crystallizing, Lozenge-making, Compt, Gum Goods, Etc., 12mo., \$2.

Byrne's Practical Metal-worker's Assistant; 692 illustrations 8vo., \$7.

Wye Williams on Heat and Steam; illustrated, 8vo., \$3.50.

The Theory and Practice of the Art of Weaving by Hand and Power, by John Watson; completely illustrated, 8vo., \$5.

The Marine Steam Engine, by Main & Brown; illustrated, 8vo., \$5.

Questions on Subjects connected with the Marine Steam Engine, by Main & Brown, 12mo., \$1.50.

The Indicator and Dynamometer, by Main & Brown; 8vo., \$1.50.

A Complete Treatise on Perfumery; containing Notices of the Raw Material used in the Art, and the best formulae. According to the most approved methods followed in France, England and the United States. By M. P. Pradal, Perfumer Chemist, and M. F. Malepeyre. Translated from the French, with extensive additions, by Prof. H. Dussauce; 8vo., \$6.

Practical Treatise on Matches, Gun Cotton, Colored Fires, and Fulminating Powders, by Prof. H. Dussauce; 12mo., \$3.

A Complete Treatise on the Art of Dyeing Cotton and Wool, as practised in Paris, Rouen, Mulhausen and Germany. From the French of M. Louis Ulrich, a Practical Dyer in the principal Manufactories of Paris, Rouen, Mulhausen, Etc., to which are added the most important Recipes for Dyeing Wool as practised in the Manufacture Imperiale des Gobelins, Paris, by Prof. H. Dussauce; 12mo., \$3.

Coloring Matter derived from Coal Tar, with their practical application to Dyeing, by Prof. H. Dussauce; 12mo., \$2.50.

Blue and Carmine of Indigo, by Prof. H. Dussauce; 12mo., \$2.50.

The Practical Draughtsman's Book of Industrial Design; 55 steel plates, 4vo., \$10.

Campin's Practical Mechanical Engineering; illustrated by numerous large plates and wood engravings; 8vo., \$6.

A Manual of Social Science, condensed from Cary's Principle of Social Science; 12mo., \$2.25.

Any of the above books will be sent by mail free of postage at publication price. HENRY CAREY BAIRD, Industrial Publisher, No. 406 Walnut street, Philadelphia.

VULCAN WORKS, BALTIMORE.—THIS WELL-known establishment is offered for sale, or would be leased for a term of years, with the privilege of purchasing within a stated period. It is complete in all its departments, embracing Iron and Brass Foundries, Blacksmith, Machine, Boiler, Pattern and Carpenter Shops, Coppermith, Etc. The tools and machinery, with powerful cranes and twisting apparatus, are many of them of recent construction, and all in complete order for the manufacture of Marine Engines of the heaviest class, and all other descriptions of machinery. The situation in close proximity to the water, and near the business portion of the city, is unrivalled. The reopening of trade with the South will in a short time bring a full supply of orders from that direction, and the establishment has always commanded a fair portion of Government work and of the local trade. For further particulars address H. R. HAZLEHURST, Vulcan Works, Baltimore. 1 6

INGERSOLL'S IMPROVED HAY AND COTTON PRESSES.—We make three classes of presses. First—HAND POWERS.

A cheap and exceedingly economical press for farm and plantation use; are very compact, easily handled, and readily put together for use, and possess superior advantages for shipping.

Second—HORSE POWERS. These have met with much favor, and are highly commended wherever used.

Third—SCREW PRESSES. These find large sale in foreign markets. It is a complete and superior machine for packing Cotton, Wool, Hides, Hair, Hemp, Etc. Also a very popular, light and cheap machine for Sawing Down Trees. Weight of machine less than 25 pounds, and price \$25. State Rights of this machine for sale and rich bargains offered.

Please write for catalogue and further information to INGERSOLL & DOUGHERTY, Green Point, Kings Co., N. Y. 1 12

TO SOAP MANUFACTURERS.—PROF. H. DUS-SAUCE, Chemist, is now ready to give information on the fabrication of every kind of Soap, viz.: Hard, Castile, Soft, Fancy, Family, Transparent, Silicated, Etc. Recipes to prepare every kind of Lye, Plans of Factories, Drawings of Apparatus. Analysis and Essays of Lyes, Oils, Soaps, Etc. Address New Lebanon, N. Y. 1 4

FOR SALE.—A SCREW-CUTTING LATHE; WILL cut every variety of thread used on steam, gas, water pipe and fittings; both right and left hand. BULLARD & PARSONS, Hartford, Conn. 1 2

WOODWORTH PLANERS—IRON FRAMES TO Plane 18 to 24 inches wide, at \$120 to \$150. For sale by S. C. HILL, No. 12 Platt street, New York. 1 4

SMALL BEAM ENGINE.—I WILL SELL A BEAUTIFUL 2-horse beam engine, suitable for a small boat or light business, for \$170 cash. Said engine is entirely new, and was made at odd times by a man "for the fun of the thing." The engine is complete, with feed pump, etc. No answers unaccompanied by stamp for return post noticed. EGBERT P. WATSON, Box 773, N. Y. 25

WORRALL'S PATENT CHUCKS FOR SCREW MACHINE and Holding Wire Drills and other articles.—The cheapest and best chuck for drills in use, 1 1/2 inch in diameter, holding any size from 1/8 up to 1/2 inch. Perfectly true and reliable! Address THOS. H. WORRALL, Lawrence, Mass. 25 8

INVENTORS' EMPORIUM, NO. 37 PARK ROW, N. Y.—New and useful inventions manufactured, introduced and sold on commission. Agents wanted. [240] RICE & CO.

ELIZABETHPORT AND WEEHAWKEN WATER FRONTS AND FACTORY LOTS for all kinds of Manufacturers and Mechanics. The best locations near New York for sale cheap and on terms to suit. Apply to WM. W. NILES, No. 8 Wall street, or AUGUSTUS WHITLOCK, No. 117 Wall street. 1 4

MASON'S PATENT FRICTION CLUTCHES, FOR connecting and disconnecting Shafting. Also for Starting Gears and all heavy machinery without sudden shock, are manufactured by VOLNEY W. MASON, Providence, R. I. 25 5

FOR SALE.—ENGINES, BOILERS, SHAFTING, Pulleys, Hangers, Rubber Machinery, and Machinery of all descriptions, at DAVIS'S MACHINERY YARD, Nos. 122 and 124 Hudson street, near the ferry, Jersey City. Factories of all descriptions bought and sold for cash. Castings furnished at 10 per cent less than New York prices, and delivered. 25 3*

THE AMERICAN PEAT COMPANY, OF BOSTON, invite examination of their works at Lexington, Mass., and are prepared to sell rights and furnish machinery for the production of purified and condensed Peat Fuel, superior for many purposes to the best anthracite coal. LEAVITT & HUNNEWELL, Agents, No. 4 Congress street, Boston, Mass. 24 3*

FACTS ABOUT PEAT AS AN ARTICLE OF FUEL, where found, methods of preparation, its uses and value; 120 pages, octavo; price, \$1. For sale as above, and mailed to any address on receipt of the price. 24 3*

MILL STONE DRESSING DIAMONDS SET IN Patent Protector and Guide.—Sold 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. 24 12

MACHINISTS' TOOLS, ENGINE LATHES, HAND Lathes, Planers, Upright Drills, Etc., of best material, and superior workmanship, manufactured and for sale by WM. M. HAWES & CO., Fall River, Mass. 24 9*

FOR SALE—THE ENTIRE RIGHT OR STATE Rights of my Patent Brass Turning Cleaning Machine. It will clean from 300 to 600 pounds of dirty turnings per day. Address J. JONSON, No. 75 N. Howard street, Baltimore, Md. 25 4*

A GOOD CHANCE.—GEO. BINNS, MANUFACTUR- ING Chemist, No. 7 Gold street, N. Y., will sell at half price all the New and Improved Apparatus for making Sulphate Ammonia. Also, for sale, 2,000 barrels of Ammoniated Lime, for manure, at \$1 25 per barrel. 24 4*

PATENT HORSE-POWERS—ADAPTED TO COTTON GINS, Thrashing Machines, Farm Mills, Etc. Portable, easy-working, and proved durable by long use. For Circulars or machines address CRESSON, HUBBARD & SMITH, Philadelphia. 24 6*

DAVID LAKE'S FLY-TRAP—ILLUSTRATED IN THE SCIENTIFIC AMERICAN of June 10, 1865. Sent by express on the receipt of \$4. DAVID LAKE, Smith's Landing, N. J. 24 10*

QUARTERMASTER GENERAL'S OFFICE, WASHINGTON, D. C., May 28, 1865. **NOTICE—SALE OF ARMY MULES.—MANY THOU-** SANDS OF MULES are being disposed of at Public Sale, at Washington.

The sales will continue until the number of animals is reduced in proportion to the reduction of the armies, now going on rapidly. There are in the armies of the Potomac, of the Tennessee, and of Georgia, probably Four Thousand of the Finest Six-month Teams in the World.

Many of them were bought in the beginning of the war, as young mules, accompanied the armies in all their marches and camps, and are thoroughly broken, hardened by exercise, gentle and familiar, from being so long surrounded by the soldiers.

The whole South is stripped of farming stock, and the North also has suffered from the drain of animals, taken to supply the armies. These animals are sold at Public Auction; they will not bring anything like their true value, and such opportunities for farmers to get working animals to stock their farms, and for drovers and dealers in stock to make good speculations, by purchasing them and disposing of them in the South, will never occur again.

M. C. MEIGS, Quartermaster General, Brevet Major-General. 24 3

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., West Meriden, Conn. 23 25*

TO MACHINISTS AND ENGINEERS.—FOR SALE— Gear calculating Rules, correctly graduated for 2,000 different gears, giving the number of cogs directly opposite their outside diameters, with allowances made for pitch lines. Warranted. Sent, with directions, \$5, or \$5 50 sent by mail, post-paid. Give plain directions, and address CHARLES B. LONG, Patentee, Worcester, Mass. 24 5*

PLATINA—WHOLESALE AND RETAIL—FOR ALL purposes. H. M. RAYNOR, Importer, No. 748 Broadway, New York. Platinum Scrap of any sort purchased. 23 4*

SOLID EMERY WHEELS, SILICATE OR VULCAN- ITE, of every size, promptly made or shipped from stock. N. Y. EMERY WHEEL CO., No. 94 Beekman street, New York. 23 4*

TO GAS COMPANIES.—FOR SALE AT THE ISLAND Works of the Gas Co., Washington, D. C. 1 Retort House, roof frame of iron, 141 feet long, 55 feet wide, with the slate attached. All the iron work belonging to 28 benches, of 3 retorts each. 4 Washers, 18 inches diameter. 4 Purifiers of wrought iron, 5 ft. by 11 ft., with lids, etc. 25-inch Slide Valves. 15-foot Station Meter, together with sundry connections, the whole forming a complete Gas Station, in good order.

For examination apply to GEO. A. McILHENNY, Engineer of Gas Works, Washington, D. C. For purchasing apply to B. H. BARTOL, Philadelphia. 23 XIIII*

STEAM ENGINES—WITH LINK MOTION, VARIA- BLE automatic cut-off, of the most approved construction; Mill Gearing, Shafting, Hanger, Etc. Address M. & T. SAULT, New Haven, Conn. 1 25*

FOR SALE—TWO ROLL STANDS, IN PERFECT order; bed 50 by 19 inches, with one pair Cast-steel Rolls, 5 in. diameter, 8 in. long, and two pairs Chilled Rolls, same size. 23 4*

TO RENT OR LEASE—SECOND, THIRD AND Fourth Floors and Attic in Stone Millin Ansonia, Conn.; size, 100 by 45 feet, with power. Apply to OSBORNE & CHEESMAN, Ansonia, Conn. 23 4*

GILBERT'S PATENT COAL AND ASH SIFTER—A new and useful invention, of which a portion of the State Rights are for sale. Address EMERY & HUTCHINSON, Manufacturers, No. 57 Canton street, Boston, Mass. 22 10*

PARTIES WANTING IRON CASTINGS OF ANY DE- Scription may do well by calling on or addressing HORTON & MABIE, Mowing Machine Works, Peckskill, N. Y. 23 4*

BOLTS, NUTS, WASHERS, SET SCREWS, COACH Screws and Machine Screws, constantly on hand for sale by LEACH BROTHERS, No. 56 Liberty street, New York. 21 12*

TRIP HAMMERS. Parties using or intending to erect Trip Hammers are invited to call and examine the Hotchkiss Patent Atmospheric Hammer, made by CHARLES MERRILL & SONS, No. 536 Grand street, New York. They are run by a belt; occupy 25 by 4 feet space; strike 200 to 400 blows per minute, according to size, and the hammer running in slides, each blow is square and in the same place. The work can be done under them more rapidly than under a drop, and for swaging it is unequalled. They are very simple in their construction, under perfect control, and require much less power than any other hammer. Send for a circular illustrating the hammer, which gives full particulars. 1 11*

THEYSON & OGG, NO. 39 GREENE STREET, NEAR Grand, Machinists, Brass Finishers and Model Makers, Experimental Machinery, Indicators, Registers and Steam Gages of every kind accurately and promptly made. 1 8*

SCREWS.—COMSTOCK, LYON & CO., OFFICE NO. 74 Beekman street, N. Y., manufacture Turned Machine Screws (a superior article to a headed screw), of all sizes under 1/2 inch in diameter, 3 inches long. Also Steel, Iron and Brass Screws for Guns, Pistols, Instruments, Trusses, Artificial Limbs, Etc., of the finest quality, to order. 1 11*

FOR DANIELS AND WOODWORTH PLANERS AND other Wood-working Machinery, with the latest improvements, address the manufacturers, RICHARDSON, MERIAM & CO., Worcester, Mass. 22 6*

GRINDSTONES OF THE BEST QUALITY MANU- factured for Mechanics, Railroad Shops, Manufacturers and the trade. Address orders to F. M. STEARNS & CO., Berea, Cuyahoga Co., Ohio. 1 7*

MACHINISTS' SUPPLIES, OF ALL DESCRIPTIONS, on hand for sale by LEACH BROS., 86 Liberty st., N. Y. 21 12*

SPOKE AND HANDLE MACHINERY.—THOSE DE- Siring to purchase the best machine in the United States for making Spokes, Yankee Ax Handles, Plow Handles, and irregular forms generally, should send for cut and description to E. K. WISELL, Manufacturer and Patentee, at Warren, Ohio. 21 8*

CLARK'S PATENT FERRULES FOR LEAKY BOILER TUBES.—Illustrated No. 9, Vol. XII., SCIENTIFIC AMERICAN. 23 8*

THE UNION MOLDING MACHINE—BEST IN USE—For circulars address H. A. LEE, patentee, Worcester, Mass. 20 10*

PATENT EXCHANGE, NO. 229 BROADWAY, NEW YORK.—Patents and manufactured articles introduced and sold on commission. (229) THOMAS G. ORWIG & CO. 23 10*

ESTABLISHED 1826.—WORLD'S FAIR AND AMER- ICAN Institute Prize Medal Turning Lathes for Foot and Steam Power, manufactured by JAMES STEWARTSON, No. 232 Canal street, New York. Amateur's Turning Lathes made to order. 23 10*

STEAM ENGINE FOR SALE.—A 35-HORSE POWER Stationary Engine, second hand but good as new, and in perfect running order. Address L. N. KEYES, Worcester, Mass. 23 5*

DAMPER REGULATORS—GUARANTEED TO EF- FECT 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. 117 Broadway, New York. 23 10*

CHEAP SOAP.—SAPONIFIER OR CONCENTRATED LYE.—The Ready Family Soap-maker. Soap for three cents per pound. See SCIENTIFIC AMERICAN March 18, 1865. Caution—Original, Genuine and Patented article is put up in one-pound iron cans all others being counterfeit. Manufactured by PENNSYLVANIA SALT MANUFACTURING CO., Office Pitt street and Duquesne way, Pittsburgh, Pa. 19 15*

\$125 A MONTH!—AGENTS WANTED EVERY- where to introduce the improved Shaw & Clark Family Sewing Machine, the only low-price machine in the country which is licensed by Grover & Baker, Wheeler & Wilson, Howe, Singer & Co., and Bachelder. All other machines now sold for less than forty dollars each are infringements, and the seller and user are liable to fine and imprisonment. Salary and expenses, or large commission, allowed. Illustrated circulars sent free. Address SHAW & CLARK, Biddeford, Maine. 20 13*

\$70 A MONTH!—I WANT AGENTS EVERY- where. At \$70 a Month, expenses paid, to sell Fifteen Articles the best selling ever offered. Full particulars free. Address OTIS T. GAREY, Biddeford, Maine. 20 13*

GROVER & BAKER'S HIGHEST PREMIUM ELAS- TIC Stitch Sewing Machines, 495 Broadway, New York. 1 11*

DUTCHER'S PATENT LOOM TEMPLES, THOMP- son's Patent Oil Cans, Robbin's Patent Shuttle Guards, to prevent shuttles flying out. Address E. D. & G. DRAPEL, Hopedale, Mass. 17 10*

W. H. VAN GIESON, SUCCESSOR TO THE WAT- ERBURY MACHINE CO., builder of every description of Machinery and Machinists' Tools, Pin and Hook and Eye Machines, Metallic Cartridge Machinery, Double and Single-acting Power Presses, Foot Presses, Etc., of new and improved patterns. Inventors' Ideas carried out (when so requested) in the most private and confidential manner. Shop near the Depot, Waterbury, Conn. Terms Cash on delivery. 17 12*

NEW STEAM ENGINE FOR SALE.—250 H. P., HOR- ZONTAL; cylinder 6 feet stroke, 30 inch diameter. Built at the Burdon Iron Works, Brooklyn, N. Y., where it may be seen. Apply to A. & P. ROBERTS & CO., Philadelphia, Pa., WILLIAM LILLY, Mauch Chunk, Pa., THOMAS BARBER, Allentown, Pa., or HUBBARD & WHITTAKER, Brooklyn, N. Y. 15 12*

2,000 BOLTS PER DAY CAN BE MADE ON 10 PATENT MACHINES. Also Rivets and Spikes of all kinds. HARDWAY & SONS, Philadelphia, Pa. 1 11*

REFERENCES. Chouteau, Harrison & Valle, Laclede Rolling Mill. Collins & Holliday, Broadway Foundry. Marshall & Co., Western Foundry. John McCarty, Bogy Mill Mill. 1 11*

ENGINEERING SCHOOL, FRANKLIN, DEL. CO., N. Y., has full means for instruction in Mathematics, Drawing, Mechanics, Physics, Chemistry, and all applications, with full sets Eng. Instruments, Chem. Apparatus, Etc. \$185 pays Board and Tuition one year. G. W. JONES, A. M., Prin. Vol. XII 16 20*

TWIST DRILLS—A FULL ASSORTMENT, OF ALL Sizes, Stub's Wire and Machinists' Drills, on hand for sale by LEACH BROTHERS, No. 56 Liberty street, New York. 20 12*

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, No. 13 East Seventh street, Cincinnati. 11 XII 25*

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. 6dtt

A MESSIEURS LES INVENTEURS.—AVIS IMPORT- ANT Les inventeurs non familiers avec la langue Anglaise, et qui préfèrent leur communiquer leurs inventions en Français, peuvent nous adresser 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. 1 11*

DES PERE FIRE CLAY COMPANY, ST. LOUIS, MISSOURI. Are prepared to furnish at short notice any amount of their Fire Clay, which has been tried by Glass Manufacturers East and West, and pronounced by them to be a No. 1 article for making Glass Pots, Retorts, Crucibles, Fire Brick, Furnace Linings, and any work that requires a prolonged and intense heat. This Clay has been analyzed by Dr. Theodore Weiss, a celebrated chemist of St. Louis; also, by Dr. Charles A. Seely, a well-known chemist of New York City, and their separate reports, which are given below, show the clay to be equal to the celebrated Stourbridge or German Clays:—

St. Louis, April 21, 1865. Messrs. J. L. SMITH & Co.—Gentlemen:—The Clay which you gave me from the Des Pere Clay Pits, for analysis, contained, in 100 parts, as follows:—

DES PERE CLAY.	I also give analysis of the STOURBRIDGE CLAY.
Silica..... 69.45	Silica..... 68.99
Iron Oxide..... 2.10	Iron Oxide..... 2.70
Alumina..... 18.50	Alumina..... 19.05
Magnesia..... a trace	Magnesia..... a trace.
Water..... 8.75	Water..... 6.8
Lime..... 1.10	Lime..... 1.1
100.00	100.00

Yours, truly, (Signed) Dr. THEODORE WEISS, Assayist and Analytic Chemist.

No. 244 CANAL ST., NEW YORK CITY, Jan. 20, 1865. Messrs. J. L. SMITH & Co., St. Louis, Mo.—Gentlemen:—I find the Sample of Clay furnished by you from the Des Pere Clay Pits, to be of the best quality of Fire Clay. The practical tests, as well as the chemical analysis I have made of it, show it to be an article which may successfully compete with those Clays which have heretofore been imported. I believe it to be suitable for all kinds of Pottery, Crucibles, Retorts, Glass Pots, etc., which are intended to withstand the action of an intense or prolonged heat. Yours truly, (Signed) CHARLES A. SEELY, Chemist.

The following parties have used our Des Pere Clay, and send us written testimony of the satisfaction it has given:—O'Hara Glass Company, Pittsburgh; Park Brothers, Pittsburgh; Wm. McCully & Co., Pittsburgh; Osterling, Henderson & Co., Wheeling, Va.; Hobbs Brockmeyer & Co., Wheeling Va.

We shall be pleased to forward circular with further information also sample of clay, to any one sending us their address.

JOSEPH L. SMITH & CO., Owners of Des Pere Fire Clay Pits. H. T. MALCOMSON, Agent for Eastern States, No. 40 Murray street, New York. 23 4*

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. 111

THE BISHOP GUTTA-PERCHA COMPANY, EXCLU- SIVE 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. SAM'L C. BISHOP, General Agent. 20 12*

OIL! OIL! OIL For Railroads, Steamers, and for machinery and Burning PEASE'S Improved Engine Oil, 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. 111

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

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. HOATLEY & CO., Lawrence, Mass. 1 11*

NEEDLES.—SAND'S NEEDLE CO., MANUFAC- TURERS of Machine Spring Needles. These needles are made by patented machinery, and consequently we claim a uniformity of spring which cannot be obtained in the ordinary way of making. Address, with two samples inclosed, SAND'S NEEDLE COMPANY, Laconia, N. H. 1 11*

\$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. 1 11*

CAN I OBTAIN A PATENT?—FOR ADVICE AND instructions address MUNN & CO., No. 37 Park Row, New York, for TWENTY YEARS Attorneys for American and Foreign Patents. Caveats and Patents quickly prepared. THE SCIENTIFIC AMERICAN \$3 a year. 20,000 Patent Cases have been prepared by M. & Co. 1 11*

REYNOLDS' TURBINE WATER WHEELS.—COM- PETENT men are employed to measure streams, make plans, and put in flumes, wheels, and gearing. TALLCOT & UNDERHILL, No. 170 Broadway, New York. 1 XII 15*

HOLSKE & KNEELAND, MODEL MAKERS, PAT- ENT Office Models, Working Models and Experimental Machinery, made to order at 525 Water street, near Jefferson street New York. Refer to Munn & Co., SCIENTIFIC AMERICAN Office. 111

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

Zur Beachtung für deutsche Erfinder. Die Unterschieden haben eine Entscheidung, die Erfinder des Verbalten angibt, um sich ihre Patente zu sichern, herbeizuführen, und veröffentlichen solche gratis an die Erfinder.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Erfindungen in der deutschen Sprache machen. Stützen von Erfindungen mit kurzen, deutlich gezeichneten Beschreibungen belieben man zu adressieren an

Munn & Co., 37 Park Row, New-York. Auf der Office wird deutsch gesprochen. Dasselbe ist zu haben:

Die Patent-Besche der Vereinigten Staaten, nach den Regeln und der Geschäftsordnung der Patent-Office und Anweisungen für den Erfinder, um sich Patente zu sichern, in den Vereinigten Staaten sowohl als in Europa. Ferner Beschreibungen der Patent-Gesetze fremder Länder und darauf bezügliche Nachrichten; ebenfalls nützliche Hülfe für Erfinder und solche, welche Patente zu erhalten wünschen. Preis 20 Cts. per Dutz. 25 Cts.

Improved Road Scraper and Grader.

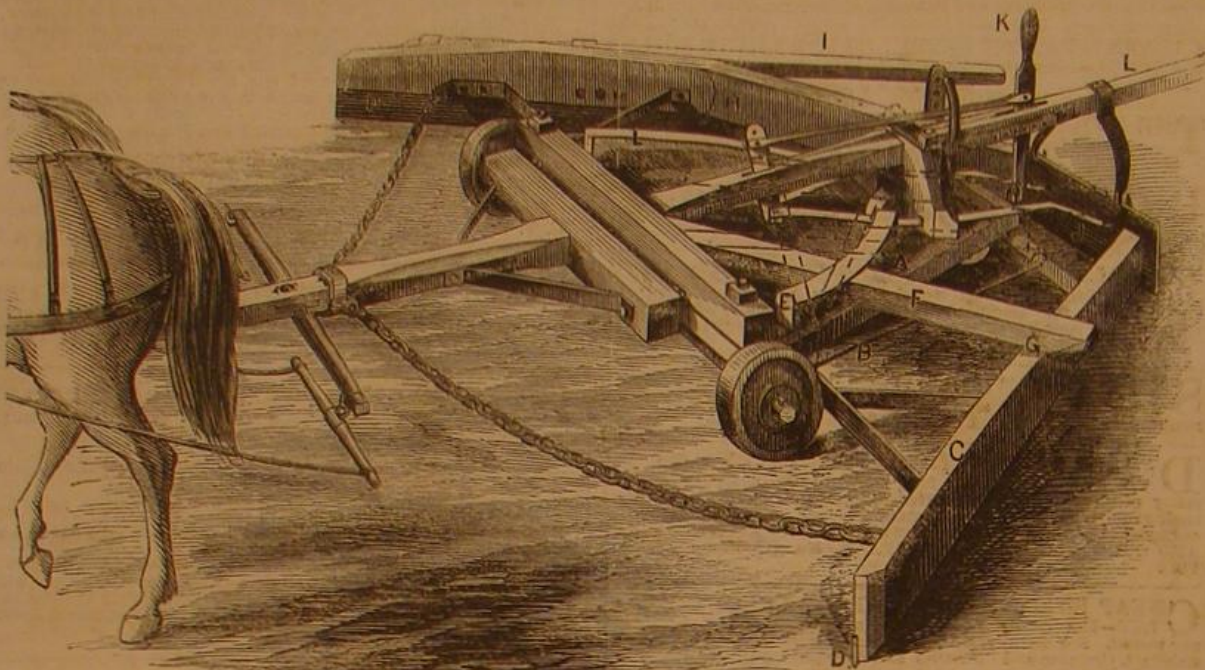
Turnpike roads present an animated appearance in the spring when men and teams turn out to repair the damage done by frost and thaw. For many years the only reliance and the most serviceable implement in use for this purpose, has been the common scraper or scoop, to which horses are attached. This being held by main strength against the soil, scoops up great loads of earth which are afterward dumped by turning the whole concern upside down at the proper time—certainly a rude and clumsy device. It is not only inefficient, but very hard to use, as the aching hands and back of many a farmer can testify, who works out his tax, as many do, on the road.

The machine herewith illustrated is a vast improvement on the old-fashioned scraper, since it leaves the

This scraper was patented on July 5, 1864, through the Scientific American Patent Agency, by Edward H. More, of Moresville, Delaware Co., N. Y.; address him at that place for further information.

Science Abroad.

Some interesting papers have been recently read before the French Academy. Among them is one by M. Becquerel, senior, on "Forests, and their influence on Climate." The first part of the memoir reviews the *deforesting* effect of civilization, whilst the second part examines the influence of forests upon climate. The influence which they possess is extremely complex, depending on—1, the size of the forests; 2, the height of the trees and their nature, whether deciduous or not; 3, the power of evapora-

**MORE'S ROAD SCRAPER AND GRADER.**

road smooth and even, and can be worked with great ease and celerity. It takes the dirt from both sides of the road, where it is not wanted and heaps it in the middle where it is, and is provided with various attachments to perform the work properly.

In the engraving, A is a triangular frame supported by two wheels forward, and one in the center behind. This frame has two stout rods, B, which serve as hinges for the scrapers, C. The scrapers are strong pieces of plank, shod with steel, D, and fitted with braces on which they turn like a door when desired. To the frame, A, are attached guards, E, under which are bars, F. These bars are jointed at one end to the frame, so that they can be swung out over the scrapers to keep them down, as at G. One of the scrapers is jointed on the middle, as at H, and is furnished with a lever, I, by which it can be lifted, so that its bottom, where it touches the road, is arched in form; thus allowing a ridge to be left on the road at any point independent of the dirt thrown up at the middle. This is sometimes necessary on account of the bad nature of the highway. To fill up holes and ruts there is a door, J, at the back of the machine, which is worked by the lever, K, when the dirt thrown to the center by the scrapers has to be deposited. The whole hinder end can be raised by the bar, L, when any considerable object is met, which cannot be passed over otherwise.

If it is required to use one side of the machine (one scraper only), this can be done, and the other one turned up over the main frame, as shown by the dotted lines. When this occurs there would be a tendency on the part of the machine to slew around sideways, unless some means were adopted to prevent it. A rudder or share is, therefore, provided below the frame, to enter the ground near the center of the draft, and thus steady it when working as described. When proceeding to and from the field, both scrapers are turned up out of the way over the frame.

It sweeps over a space of 11 feet in width with both scrapers down, and 5 feet with one down; and can be worked from five to ten miles per day according to the condition of the road. The weight on the scraper can be regulated at will, even when working, and the machines can be made in any style to suit any roads.

tion from their leaves; 4, the property which they possess in common with other bodies of heating or chilling the air; 5, the nature and physical state of the ground and of the subsoil. This last division is one of the most important, as it affects the supply and distribution of streams. In plates annexed to this paper, M. Becquerel has graphically shown the population from 1801 to 1861, and the amount of wood and charcoal consumed in Paris from 1800 to 1864. Great Britain, the author remarks, has only two per cent of forest land, Spain three per cent., whilst France has 16.7 per cent. He states in conclusion, that the climate of a country can be improved by cultivating the land, draining marshy districts, and planting trees on mountains and on all ground not used for agricultural purposes. The subject is one of interest in this country, where from our constant destruction of wood, we are changing seriously the climate, and lessening the steady supply of water in our rivers.

Also one by M. Pelouze, on "The Action of Metalloids on Glass, and the Presence of Alkaline Sulphates in Glass." The author finds that—1. All commercial glass contains sulphates. 2. Glass made from materials not containing sulphates is not colored by carbon, boron, etc. 3. Sulphur and sulphurous minerals impart a yellow color to pure glass. 4. The color produced in glass by metalloids is entirely due to their reducing power.

Miners' Pocket Lantern.

The popularity of any useful invention is strikingly shown in this article, for we notice it for sale generally at the street stands and by peddlers, and we judge that it is meeting with great favor. Messrs. Campbell & Smith, of Middletown, Conn., write us that they are the sole agents of this lantern, and that all orders must be addressed to them. Hunt & Co., are the agents for New York city only.

SPRUCE BEER.—Water 10 gallons; sugar 10 lbs.; essence of spruce $\frac{1}{4}$ lbs.; yeast $\frac{1}{2}$ pint. Dissolve the sugar and essence of spruce in the water, previously warmed; then allow it to cool a little, and add the yeast as in making ginger-beer; bottle immediately in half-pint bottles.

TO
INVENTORS, MECHANICS, AGRICULTURALISTS,
THE ANNUAL
PROSPECTUS.
OF THE
Scientific American.

THE CHEAPEST AND BEST;
MECHANICAL JOURNAL IN THE WORLD,
A NEW VOLUME OF WHICH COMMENCED
JULY 1, 1865.

This valuable journal has been published nineteen years, and during all that time it has been the firm and steady advocate of the interests of the Inventor, Mechanic, Manufacturer and Farmer and the faithful chronicler of the

PROGRESS OF ART, SCIENCE AND INDUSTRY

The **SCIENTIFIC AMERICAN** is the largest, the only reliable, and most widely-circulated journal of the kind now published in the United States. It has witnessed the beginning and growth of nearly all the great inventions and discoveries of the day, most of which have been illustrated and described in its columns. It also contains a **WEEKLY OFFICIAL LIST OF ALL THE PATENT CLAIMS**, a feature of great value to all Inventors and Patentees. In the

MECHANICAL DEPARTMENT

a full account of all improvements in machinery will be given. Also, practical articles upon the various Tools used in Workshops and Manufactories.

STEAM AND MECHANICAL ENGINEERING

will continue to receive careful attention, and all experiments and practical results will be fully recorded.

WOOLEN, COTTON AND OTHER MANUFACTURING INTERESTS will have special attention. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Mechanics' Tools, Electric, Chemical and Mathematical Apparatus, Wood and Lumber machines, Hydraulics, Pumps, Water Wheels, etc.

HOUSEHOLD AND FARM IMPLEMENTS,

this latter department being very full and of great value to Farmers and Gardeners; articles embracing every department of Popular Science, which everybody can understand.

PATENT LAW DECISIONS AND DISCUSSIONS

will, as heretofore, form a prominent feature. Owing to the very large experience of the publishers, Messrs. MUNN & Co., as **SOLICITORS OF PATENTS**, this department of the paper will possess great interest to **PATENTEEs AND INVENTORs**.

The Publishers feel warranted in saying that no other journal now published contains an equal amount of useful information while it is their aim to present all subjects in the most popular and attractive manner.

NUMEROUS SPLENDID ENGRAVINGS

of all the latest and best inventions of the day. This feature of the journal is worthy of special notice. Every number contains from five to ten *original engravings* of mechanical inventions, relating to every department of the arts. These engravings are executed by artists specially employed on the paper, and are universally acknowledged to be superior to anything of the kind produced in this country.

TERMS OF SUBSCRIPTION.

Per annum.....	\$3 00
Six months.....	1 50
Four months.....	1 00

To clubs of ten or more the subscription price is \$2 50 per annum.

This year's number contains several hundred superb engravings, also, reliable practical recipes, useful in every shop and household. Two volumes each year, 416 pages—total, 832 pages. **SPECIMEN COPIES SENT FREE.** Address,

MUNN & CO., Publishers,

No. 37 Park Row, New York City.

PATENT AGENCY OFFICE.

MESSRS. MUNN & CO. have been engaged in soliciting American and Foreign Patents for the past eighteen years. Inventors who wish to consult with them about the novelty of their inventions are invited to send forward a sketch and description. If they wish to put their applications into Munn & Co.'s hands for prosecution they will please observe the following rules:—

Make a substantial model, not over one foot in size. When finished, put your name upon it, then pack it carefully in a box, upon which mark our address; prepay charges, and forward it by express. Send full description of your invention, either in box with model, or by mail; and at the same time forward \$16, first patent fee and stamp taxes. As soon as practicable after the model and funds reach us, we proceed to prepare the drawings, petition, oath and specification, and forward the latter for signature and oath.

Read the following testimonial from the Hon. Joseph Holt, formerly Commissioner of Patents, afterwards Secretary of War, and now Judge Advocate General of the Army of the United States:—

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant, J. HOLT.

For further particulars see advertisement inside, or send for Pamphlet of Instruction. Address **MUNN & CO.,**

No. 37 Park Row, New York City.

FROM THE STEAM PRESS OF JOHN A. GRAY & GREEN

Scientific American.

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

Vol. XIII—No. 2.
(NEW SERIES.)

NEW YORK, JULY 8, 1865.

\$3 PER ANNUM
IN ADVANCE.

Improved Self-setting Trap.

The value of the fur trade on this continent is enormous and annually increasing. If trapping animals was reduced to something like certainty, the yield of "pelts" would be very much enlarged. In the engravings published herewith, we have shown a new self-acting trap for catching animals. That is to say, when one animal is caught he immediately sets the trap again; so that "one more unfortunate" is in a short time brought to share his captivity.

The sagacious fox seen in the back ground peering into the depths of the trap—the marten looking up to it with awe, and the fitch on the tree inspecting the already-caged individual below him, will soon, individually and collectively, be brought to join him, for with animals as with human nature, curiosity is a predominant trait.

In this trap the animal gains an entrance by leaping up on the edge of the trap, at A. The interior looks so inviting that he incontinently jumps in. Therein lies his error, for in alighting the animal strikes the triangle, B, which is merely a treadle hinged so as to trip the catch, C, which holds the cover, D, up; the cover then falls and shuts him out from the world forever. All is darkness inside, save at one point where a little light shows through. To the entrapped animal this light appears a way of safety to some favored spot, and he therefore noses his way into the promised land through the door, E. This door is connected with a series of catches, F, on the side, that liberate the trap door, D, and cause it to rise again, and thus set the trap for another animal. The weight, G, holds the trap door, D, by the aid of the escapement wheel, so that it cannot be raised from the inside. As the animals pass through the door, E, they emerge into a large well-lighted apartment, H, which is covered with wire net, and they can there roam round and bite each other at pleasure.

At the side of the trap there is another door, I, through which the prey can be removed at any time. Animals caught alive in traps are much more valuable for their fur than when maimed or shot outright.

This is an exceedingly useful and efficient trap, for by the aid of it numbers of animals can be caught at once without the formality of setting the trap for each one, and the trapper may leave it for days and be certain, when he visits it, of finding a goodly company assembled.

This invention was patented Dec. 27, 1864, through

the Scientific American Patent Agency, by J. M. Flautt. For further information address him at Reedsbury, Wis.

Cuban Machine Agency.

Our readers will see by our advertising columns that Mr. E. K. Dod has opened an agency in Havana. The reputation of Mr. Dod and his family as mechan-

One-horse Mowing Machines.

A farmer of experience, Mr. J. I. Southwick, of Erie Co., N. Y., writes to the *Country Gentleman* as follows, upon the subject of a one-horse mower:—

"Having seen several inquiries for the notices of one-horse mowing machines, and having to look for a long time, I think I had better give a little account of my examination. First was Stoddard's; second, Kirby's; third, Howard's, then Wood's—all of which were nearly equal to their recommendations, and would do more than I wanted.

"Now, in my view, a one-horse mower should be a one-wheeled machine—as decidedly as a two-horse mower should have two driving wheels—for the reason that each driving wheel must be sufficiently heavy to operate the knife separately;—hence one is sufficient for one. The finger should be on a line with the driving wheel, and the thills far enough to the right so that it will rather haul to the left—that is, supposing the cutters to be to the right—and the knife sections not over three inches wide, for the width of section governs the length of crank, and the length of crank governs the draft per inch of swath. The driving wheel should be sufficiently concave to carry the main heft of the machinery. All this I have not seen in one machine. However, I got one of Howard's No. 1, and took it to a blacksmith's shop, and had the cutter bar cut down to two feet and nine inches; and now, with a small pony, can

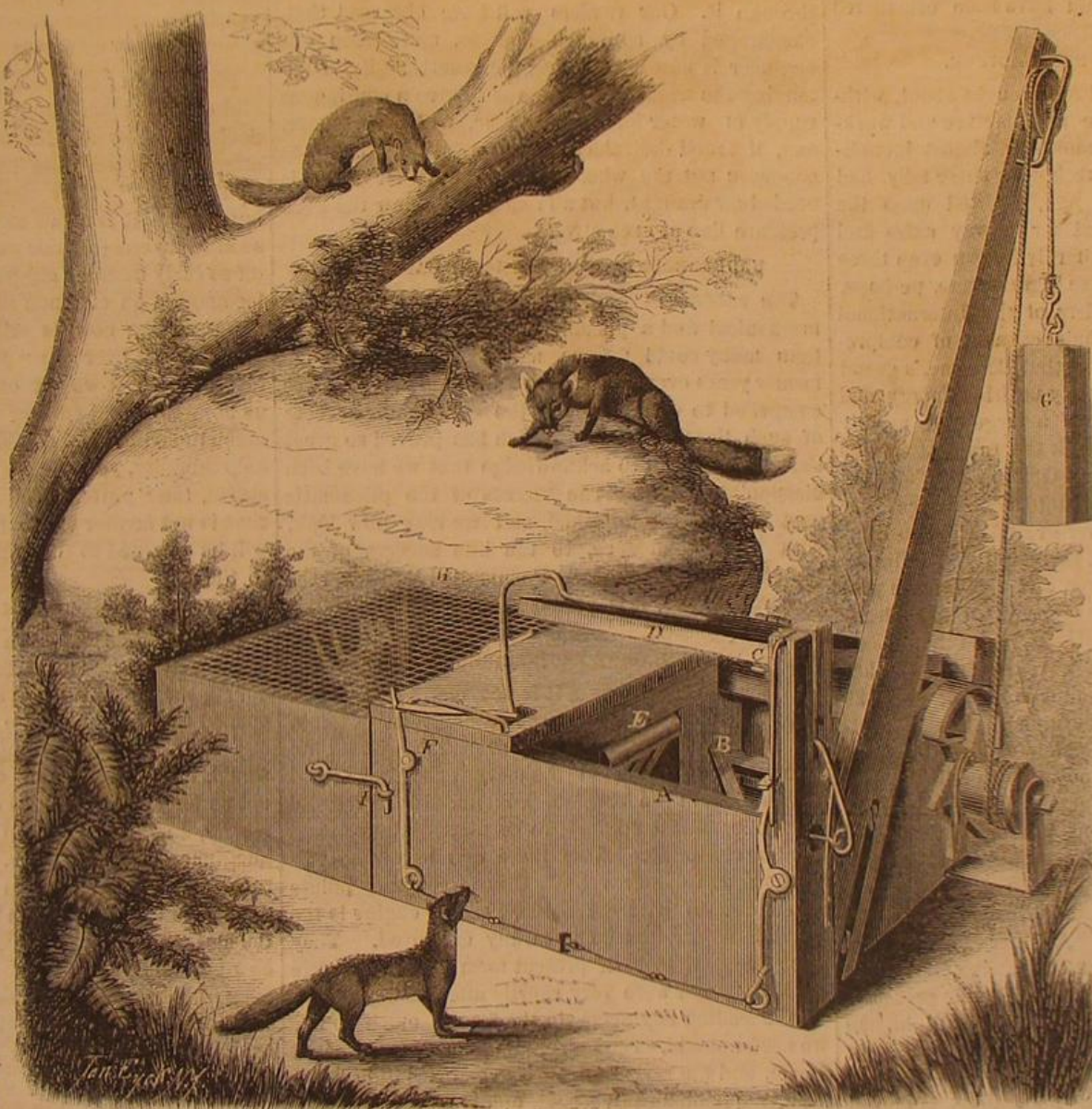
cut half an acre per hour easily."

Unparalleled Success.

The correspondent of the associated daily press notices the fact that, during the third week in June 184 patents were granted by the Patent Office. Of this very large number it appears that 84 cases were prepared and prosecuted through the Scientific American Patent Agency. This fact is doubtless a fair exhibit of the proportion of patent business transacted at this office, and also of the great success of this world-renowned Agency.

REDUCTION IN TERMS.

With a view to encourage the formation of "Clubs" for the ensuing volume of the *SCIENTIFIC AMERICAN*, we offer to take subscriptions in Clubs of ten or more at \$2 50 per annum. We trust that our friends will set themselves to work to get up Clubs at the rate here proposed.



FLAUTT'S SELF-SETTING TRAP.

ics and mathematicians is historic. His father was the originator of the enterprise, and builder of the machinery of the *Savannah*, the first steamer which crossed the Atlantic. The much-lamented Professor Dod, of Princeton, was a brother. Mr. E. K. Dod was one of the earliest locomotive builders in this country, and went to Cuba to organize the Havana railroad. We understand that reverse of fortune has made it necessary for him to return to active business, and we wish him all success.

J. A. Miller's Drying Kiln.

This valuable improvement, patented in 1864, is now coming into extensive use. For drying grain, corn, malt, flour, fruits, herbs, wool, paper, cloth, and all kinds of substances, it has no superior. It is said that with one of these improved kilns, two thousand bushels of grain can be thoroughly dried and cleaned with half a ton of coal, in one hour, without hand labor. Further information can be had at 200 Broadway, New York.

THE GREAT IMPROVEMENTS OF THE PAST NINE YEARS.

The London *Engineer* has a long article showing the fallacy of engineers and experts in condemning new improvements. The article consists in a summary of recent improvements which were pronounced impracticable by the engineering profession when they were first proposed, but which are now in successful operation. We make the following extracts:—

IRON PLATE BRIDGES.

How reasonable it appeared to many, at one time—less than twenty years ago—that plate iron bridges would crumple up like pasteboard or leather. Possibly there may be those, here and there, who remain still unconvinced, just as there are those who still refuse to believe in the strength and staunchness of iron ships. How many engineers there were who could not admit that cylinder foundations could be got in by simple atmospheric pressure; and there were others recently, who doubted that a disc pile could ever reach a strong footing in sand by pumping a stream of water through it and out at the bottom. How confidently, too, do engineers now employ concrete in numberless situations where once only stone and deep piling would have been considered secure.

IRON AND STEEL MANUFACTURE.

The changes which have been brought about, within the past few years, in the manufacture and working of iron and steel, are something almost incredible. It would have been reckoned sheer folly had engineers, even ten years ago, counted upon the general introduction of steel for railway axles and tyres; and steel rails were hardly known even three years ago. Krupp's immense ingots were, perhaps, amongst the greatest wonders of the International Exhibition—at least to minds capable of comprehending them; but it is likely that Bessemer's grand discovery—already brought by untiring energy and ready ingenuity to the rank of a large and rapidly growing manufacture, will work the greatest change in our applications of iron. Opinion has already been turned by it from unbelief into a confidence surer than any admiration however great. Even in iron-making by other processes, including the ordinary course of puddling, re-heating, and rolling, the progress in respect of the magnitude of the pieces wrought has been very great. It would have been seriously doubted, five or six years ago, whether armour plates a foot thick, and weighing each 20 tons, could ever be made. McHaffie's malleable castings up to two or three tons weight represent a great step also beyond anything known two or three years ago. This branch of manufacture has been greatly promoted by the improvement in crucibles, those of plumbago now withstanding sometimes a week's work in malleable iron making, and from sixty to ninety rounds in other casting where one or two, or three, was once thought very fair. Another extraordinary stride in metal working is that of drawing steel tubes from ingots in the cold state, by hydraulic pressure. We know more than one engineer who, until he had actually seen this done, refused to believe that it was even possible. The working of Siemens' regenerative furnaces, although easily understood, is almost as wonderful. It needs no strong prediction to declare that the means which give such a perfect control of temperature, without diluting the flame with uncombined oxygen, and which afford so great an economy of fuel, must come into very general use.

RAILWAYS.

To go on with inventions in connection with railways:—Who, upon learning the construction of the Injector, would have foreseen that it would work at all? Going a little further back, Eugene Bourdon's discovery, in his workshop, that a coiled still-worm tended to straighten itself under pressure, led to an invention which has conferred great benefits upon locomotive practice, by increasing the security of working and economising fuel. How much complication was removed from locomotive pistons by the introduction of Mr. Ramsbottom's slight and wiry rings, which it was believed by many would scratch the cylinders (and at first they occasionally did), and never remain tight? Messrs. Millar and Wakefield's steam-packed pistons embody an equally neat idea, but this idea—although we believe it was really

adopted in practice by Spiller, of Battersea, twenty years ago—was once pronounced absurd by more than one engineer. Then there are Mr. Adams' radial bores which have attained to a thoroughly established success in the face of much and generally expressed doubt. The spring seated tyres, by the same gentleman, have by far outworn tyres set in the ordinary manner, and it is clear that what saves tyres must save the rails. We do not know that there is any "if" in the way of the success of the spring tyres, but even if they have not yet wrought a general change in the opinions of practical men, they have certainly attained a measure of success which, at one time, many would not have been willing to admit as possible. Another successful application which, until the success had been proved, many engineers would have rather ridiculed than doubted, is that of Mr. Ramsbottom's water troughs for "picking up" water into tenders in rapid motion. It is a great deal to have proved that no real difficulty has been found from dust or dirt in the water, and that during the first winter of its trial the trough failed once only from freezing up, and then only in consequence of the water being allowed to stand in it without the disturbance due to a current running through it. Our readers will have observed that, encouraged by so much success, more than one engineer is now considering the practicability of extending the water troughs, so as to give a continuous supply of water for any distance, without a tender, and, if found desirable, as upon trial it might be, to condense not the whole of the steam, for a part is needed for draught, but all remaining below the back pressure line at each stroke.

UNDERGROUND AND PNEUMATIC RAILWAYS.

The success of underground railways, both in a mechanical and a pecuniary point of view, is more than many could foresee, and our own columns of former years even testify that we then found ourselves compelled to doubt at least the commercial success of such lines—a success which has proved so great that we are glad to acknowledge that we have been disappointed by it. The success of the pneumatic post is already established, and we may now look, with some confidence, to the like success of the Waterloo and Whitehall Pneumatic Railway, the works of which, it is promised, will be finished in a year.

MARINE ENGINEERING.

In marine engineering, it is not many years since there was great unbelief in the economy, and even in the admissibility of the screw propeller. Less than three years ago, some of the cleverest engineers and shipbuilders in the kingdom pronounced twin screws, with independent engines, to be disadvantageous, if not impracticable. Now there can hardly be two opinions as to their value. One of the best points in connection with the modern screw engine is the wood bearings now so generally employed. They were designed in their present form by Mr. George D. Kittoe, and were very shortly afterwards adopted by the leading engineers, in the face of much doubt, we need not add. The re-introduction of super-heated steam, and the revival of surface condensation, have greatly qualified engineering opinion also. The use of marine governors, now so general, is in strong contrast with the once-prevailing belief in their utter uselessness. In nearly all these instances our readers will see that we are keeping within a very recent period of time, seldom extending so far back as the memorable week in January, 1856, when *THE ENGINEER*, fresh from our printers, first met the smile of public approval. We can write with confidence, now, of the ascertained advantages of invention which then were either unknown, or pining in the cold shade of unbelief. Belief was then unprofessional—unbelief, professional.

STEAM FIRE ENGINES.

How many engineers a few—a very few—years ago believed in steam fire-engines? The late Mr. Braidwood, who, of all men, one would suppose, was the best qualified to judge, refused to countenance them until years after they had taken their place in the established brigades of American cities. Captain Shaw has encouraged them, and the result is that they have been greatly improved, and now even surpass the best American steam fire-engines. They are now thought indispensable to the protection of Lon-

don, as, indeed, of any city or town of sufficient size to maintain them.

TURBINES AND CENTRIFUGAL PUMPS.

It was not many years ago when English engineers thought a turbine a toy, and a centrifugal pump an ingenious puzzle in central forces—an hydraulic teetotum for the edification of the disciples of science who throng the Polytechnic. Yet both the turbine and the centrifugal pump are now known to utilise from 70 to 80 per cent (and sometimes more) of the power applied to them; and this is more than can be said of the old lumbering water-wheels, or of other than the best made pumps.

MACHINE-PRESSED BRICKS.

What may be said of the now acknowledged value of machine-made bricks, of water-pressure engines, and of the simple and beautiful "disintegrator," now used by the artificial manure manufacturers? A few years ago there was nothing like the good old hand moulds for the wretchedest bricks; water-pressure engines, although anybody might have invented them, were not believed in; and the "disintegrator" was rather a curious example of a Catherine wheel revolving within a scintillating and bristling radiance of superphosphates than a useful and acknowledged invention.

STEAM PLOWING.

Nine years ago the late Mr. John Fowler first exhibited his steam plough at the Royal Agricultural Society's show at Chester. For five or six years afterwards it was doubted whether steam ploughs would "pay." Now they are made and worked by hundreds. It is a sad recollection that he, who did so much to conquer this success, should have been cut off so early from the enjoyment of his triumph. Steam locomotion on common roads, although a recognised practicability now, is still hanging fire, but is has gained much over the "practical" habit of unbelief, whereby it was at one time pooh-poohed. Let us hope that coal-cutting machines will gain even as much in commercial confidence. They must, we can't help thinking, yet take the place of those subterranean slaves, the "putters and sinkers," and we hope the time is not further off than that when all town sewage will be returned to the land, instead of being cast into the sea.

GAS MAKING.

The gas engineers have learned much within a few years, and this amounts to a modification of opinion among them. It is now years ago since Mr. Grafton opened the way to the use of clay retorts by employing an exhaustor, a thing which no gas company would, if they could, now dispense with. But it was not so long ago when gas engineers were shy of clay retorts, and had a series of objections—many of them imaginary—against them. They could not, they thought, get so much gas from a ton of coal in clay retorts as they could from iron, and then, it was said the clays required more coke. But an iron retort is now becoming as much of a curiosity as was the jaw bone—famous two or three years ago—of Abbeville. See, too, how the gas engineers have taken to iron oxides for purification and to the sulphuric acid treatment for ammonia.

It impoverished the gas, they said, and they still believe, justly no doubt, that it has entailed upon them the plague of naphthaline. We wish one reform in gas works, and in spite of hostile opinion it will, like every other sensible and proper thing, yet prevail. That is, apparatus for charging and drawing the retorts, so as to dispense with the pachydermatous salamanders now employed at that task.

GUNS AND LOCKS.

The introduction of what Dr. Ure very properly termed automatic machinery in the making of guns and of locks, uprooted a world of trade prejudice, and overcame something even of professional misgiving. It is not so long since there were many to doubt "whether, on the whole, such machinery could be made to compete successfully with hand labor, taking all the requirements of these trades into due account." But there is no room for doubt under these heads now. It has been somewhat the same with wood-working machinery.

COTTON MACHINERY.

The cotton manufacture has seen successful changes, also, in the machinery not long ago em-

ployed. Self-stripping cards are common now where, ten years ago, both breakers and finishers were always stripped by hand. Messrs. Hetherington's self-acting mule, too, has hardly one-half the parts, if indeed as many, as were originally embodied in Richard Roberts' great invention. Cotton spinners are notoriously jealous of revolutionary mechanical devices, yet the old mules are being superseded. A great change, too, has been wrought by the Blackburn "slasher," which, within a small space, does almost ten-fold the work of the old dressing frames. Mr. Bullough's and Mr. Taylor's inventions, too, are working their way into the weaving sheds of Lancashire. The beautiful operation of "gassing," the yarn—an invention of the late Mr. Samuel Hall, of surface condensing notoriety—is almost too old to be instanced in this list, but, palpable as were the advantages, there were prejudices to be overcome.

BREWING.

The brewers were resolute in their opposition to any invasion of the mysteries of their craft. They knew that many a vat of ale had gone off in a thunderstorm, and they argued that the damage was due to electricity, and galvanism, they thought, must be the twin sister of the subtle fluid. So they would not permit of any conjunction of iron and brass in the fermenting tuns or in the cleansing rounds. Nothing but gun metal pumps and wooden vessels would answer. It is odd that they even permitted iron hoops upon kilderkins and barrels intended to be tapped with brass cocks. It was nothing that more than one chemist had passed currents of electricity through barrels of beer, and, although he might have decomposed a little of the generous liquid, it was none the worse for the experiment. Now the brewers have mashing machines, attenuators, cast iron boiling backs, and even slate fermenting squares—yes, *slate*. And there are centrifugal pumps and india rubber hose, yeast presses, and one or two enterprising brewers have tried hop digesters, hop separators, and spent hop presses—with what result we will not undertake to say; but it is evident that the brewers, interested, like other people, in making money, are no longer jealous of anything that promises a real improvement. So it is with the sugar refiners, and so also with the millers. But for a few formidable patents in their way, the latter would all be using decorticators, ventilated millstones, and stive rooms, and grinding, perhaps, twelve or fifteen bushels of wheat per pair of stones per hour.

It is in the success of what was at first believed to be doubtful or impracticable, that engineers gain confidence, and although the fact remains that many so-called inventions are really impracticable, or useless from other reasons, it does not the less follow that many new things which men of narrow views and scanty knowledge may believe to be impracticable, are nevertheless but waiting their time of success.

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:—

Composition for Enameling Metal, Wood and other Surfaces.—This invention relates to a composition, the chief ingredients of which are carbonate of lime and silicic acid, together with such other chemicals which assist in the formation of an insoluble silicate, in such manner that by the application of said ingredients to metal, stone, or other surfaces, an enamel is formed which is capable of resisting the influence of heat and of water, oils and most acids. By the addition of some substance containing iron, such as brown stone, copperas, etc., the composition above named forms an intimate combination with the wood fiber, and in this state it is particularly fit as a lining for barrels and other vessels intended to contain petroleum and other penetrating liquids. Ludwig Held, of Harlem, N. Y., is the inventor.

Device for Converting Motion.—This invention consists in the employment of a toothed segment which gears into a stationary toothed rack, and connects at its center with the piston rod of a steam cylinder or with another equivalent part of a motor or other machine, whereas an arm extending from said segment beyond its center, connects by means of a

pitman with the fly-wheel or other equivalent device, secured to the shaft, to which a rotary motion is to be imparted in such a manner that the reciprocating motion of the piston rod, or other equivalent part, is converted into a rotary motion of the fly-wheel shaft by the combined action of the toothed segment rack and pitman, and the full power exerted by the said piston rod, or other equivalent device, is transmitted to the fly-wheel shaft without loss. F. Brewer, of Collinsville, Ill., is the inventor.

Machine for Turning Tool Handles.—This invention relates to a machine in which the blocks are placed into a V-shaped trough, from which they are taken up automatically one after the other by two sets of centers. One set of centers form the shafts of drums or pulleys, to which a revolving motion is imparted by a belt or by a friction wheel, or by both combined, and the other set of centers is arranged in a revolving head, and to each center a longitudinally sliding motion is imparted at the proper intervals by a cam in a forward direction and backward by a spring, in such a manner that the spurs on the revolving centers are driven into the block and the latter compelled to revolve with said centers. The trough containing the block is adjustable so that its position can be regulated to suit the thickness of the blocks, and it follows the revolving heads which carry the centers, for a short distance, until the block is firmly held between said centers in the desired position. The cutters are all stationary, the shaping cutters being secured in a segmental frame, and the cutting-off tool in a recess cut for that purpose in the frame. The shaping cutters are removable, so that they can be easily taken off and replaced by others, so that they can be sharpened and re-adjusted without difficulty. H. K. Jones, Kensington, Conn., is the inventor.

Brick Machine.—This invention relates to certain improvements in that class of brick presses in which the clay is tempered by a series of knives secured in a revolving shaft, and afterwards discharged on a grate which forms the bottom of a box in which the plunger moves. By the action of the plunger the clay is forced through the grates into the molds which are fed to the machine through a lateral opening and brought under the grate by the action of a pusher working on a roller platform and operated by a suitable lever arrangement. The invention consists in a peculiar mechanism for operating the plunger and the gate, which cuts off or opens the communication between the box for tempering the clay and the press box. This mechanism is so constructed that it occasions the least possible loss by friction, and that the motion of the plunger can be regulated according to the thickness of the bricks to be made. The press box is provided with a slide through which stones or other impurities can be made to discharge from the press box at any moment. The pusher, which serves to bring the molds under the grate, is operated by a hand lever secured to a rock shaft. From this rock shaft extend two arms which connect by suitable links with the pusher, in such a manner that by imparting to the rock shaft an oscillating motion, the pusher is moved back and forth on the roller platform, and the molds are carried in the desired position under the grate. Henry Martin, of Springfield, Mass., is the inventor.

Wheat Drill.—This invention relates to an improved machine for drilling in wheat and other grain, designed more especially for sowing wheat; it has for its object the depositing of the wheat in the earth in such a manner as to prevent the frost from throwing it out and also in arranging the several furrow cutters and their concomitant parts in such a manner that each will have a play or action independent of the other, so that they may conform perfectly to the inequalities of surface over which they may pass; and further, in attaching the draught pole to the frame of the machine by a joint to admit of the ready turning of the same, as well as freeing the furrow cutters from grass, weeds and other trash that is liable to clog or choke them. William Rice, Concord, Ill., is the inventor.

Sleeping Car.—The object of this invention is to produce a sleeping car which shall be well ventilated, each berth being supplied, it desirable, with independent appliances for that purpose. It consists in an improved sleeping car which embodies several new features, among which are a complete privacy

and isolation of the several berths; also giving each berth an elastic support independent of the spring of the car body or of its trucks; also preserving the berths from the shocks of violent jars in horizontal directions, and also from noises which naturally result from such shocks; also, a peculiar construction and arrangement of the standards and other parts which pertain to the berths, whereby the standard can be removed, and the berths themselves be nested together, the result being that the interior of the car is then left entirely free and unobstructed throughout its whole area, so that all its seats can be used by passengers in the ordinary way; also other features hereinafter set forth. C. T. Harvey, No. 171 Broadway, New York, is the inventor.

Manufacturing Items.

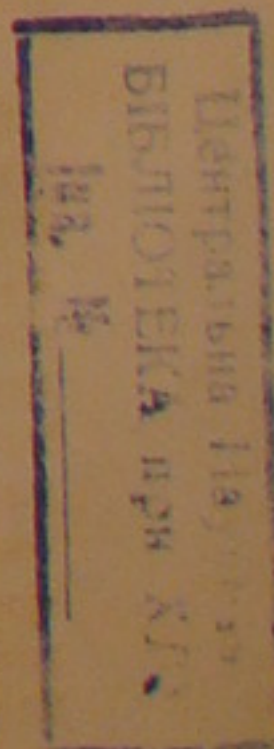
Bridgeport, Conn., is rapidly becoming an important center of manufacturing operations. Having railroad and water communication with New York and other important seacoast and inland towns, it offers peculiar facilities for the establishment of almost every branch of manufacturing enterprise. Here are located the extensive works of the Wheeler & Wilson Sewing Machine Company, whose famous sewing machine is justly appreciated the world over. Elias Howe, Jr., the original inventor of the sewing machine, has recently erected one of the finest establishments in New England for the manufacture of his sewing machine, which has already gained a wide reputation, being adapted to perform all the heavier kinds of work required in harness, shoe and tailoring operations. The Simpson Water-proof Cloth Company are carrying on extensive works for the production of an excellent water-proof fabric for outer garments, which has been much used in the army. A thin coating of rubber is laid upon sheets of cotton cloth, and then faced with woolen flock, giving to the fabric a finish almost equal to the finest broadcloth. The article is superior to anything of the kind hitherto sold in the market. We understand that the company is about to enlarge its works. Hotchkiss & Co. have recently erected an extensive manufactory for certain kind of hardware. This firm also furnished to the Government during the war large quantities of the well-known Hotchkiss shell. The American Water-proof Company is about putting in operation large works for making water-proof goods. The extensive carriage factories of Wood Brothers, of No. 596 Broadway, are also located at Bridgeport. This firm has the deserved reputation of making the finest carriages in the country. Messrs. Wilmot & Kissam are now erecting a large brass mill which will soon be in operation. The Mallory Hat Company is also a new concern recently started in Bridgeport. This company is manufacturing large quantities of hats, the rims of which are supported by thin steel rings or bands, which keeps the rim always in shape, and without increasing the weight over the ordinary hat. There are several other smaller establishments located at this point which we cannot now notice.

THE "SCIENTIFIC AMERICAN."—The next issue of this widely circulated paper begins a new volume. It is undoubtedly the best conducted paper of its class in this or any other country. Mechanics will here find matter to interest and profit them, every week; the student, the chemist, the workingman, the philosopher—all seek its handsome pages for information on an endless variety of topics. It is generally acknowledged to be the "best popular expositor of the arts and sciences now extant."—*Hartford Times*.

THERE was lately shipped to the Charlestown Navy Yard, an oak log fifty-nine feet long and averaging thirty-six inches square. It contained five hundred and thirty-one solid feet of sound wood, and material for 6272 feet of inch plank. It weighed eighteen tons, and was brought from Ohio in a raft of timber via the Erie Canal.

A SOLDIER train which passed through Sunbury Pa., last Wednesday, was composed of 77 cars, 68 of which contained men, and 6, horses. There were 2,955 men on board the train, which was nearly half a mile long and drawn by a single engine.

H. M. WOODWARD, of St. Louis, writes us that he heard the great explosion at Mobile at a distance of more than one hundred miles.



THE BEST WAY TO MAKE BRASS TUBES.

On the afternoon of Friday, June 16th, a number of stockholders of the Columbian Metal Works, and other gentlemen who thought of taking stock, met at the depot of the Harlem railroad, by invitation of the directors, for the purpose of visiting the manufactory. Arrangements had been made for a special train, and in a half hour's pleasant ride the party were taken to the works, which are situated in Westchester county, on the East River, very near the dock that was prepared for the Great Eastern when it was supposed she would approach New York through Long Island Sound. Within the spacious building was a long table nicely spread with wines and refreshments, which had been ordered from the famous keeper of restaurants, Delmonico, and some of his stylish waiters, in white vests and dress coats, were in attendance.

The process of making the tubes was first exhibited. They are cast in lengths of three or four feet, and drawn down on a mandrel through a die. The construction of the die constitutes the peculiarity of this manufacture; it is made of a dozen steel rollers or wheels, about half an inch thick and four inches in diameter, hung upon strong axles and set with their planes radiating from a common center, with their peripheries slightly grooved, so as to form of the space between them a round hole. Thus the metal in place of being scraped down as in the solid or "dead" die, is subjected during its passage to a rolling action. The inventor claims that while the action of the dead die is to impart a fibrous structure to the metal, and diminish its transverse strength, the rolling action of this die preserves the homogenous character of the metal, and secures its equal strength in all directions.

The gentlemen of the party commenced their observations by a general inspection of the works, which are of remarkable simplicity, solidity, and thoroughness in their construction. The machinery is of the most massive character; it is propelled by a beautiful condensing beam engine of 300 horse power, which is driven by the waste heat from the melting and annealing furnaces, all the apparatus is conveniently arranged, and ample room is provided for conducting the operations with ease and facility.

The several processes of the manufacture were then shown, beginning with the melting of the metal. The molds are of iron, the two halves being held together by strong wrought iron rings. The core is made of gas pipe three-fourths of an inch in diameter, punched full of holes, wrapped with a small band of straw, and covered with molding sand. The brass is melted in plumbago crucibles holding about six quarts each. A pot was raised from the furnace by three men, by means of long tongs fitted to grasp it securely; it was of a glowing red color, and white fumes of zinc were playing in flames and rolling in volumes from the surface of the molten metal. The molds were set upright, and the red hot brass was poured into one after another until three of them were filled from a single pot. The rings were immediately removed and the molds were opened in order that they might be heated as little as possible from the hot brass within.

As soon as the tubes were sufficiently cooled, they were taken to the dies to be drawn down. There are 8 sets of dies, permitting the drawing of 8 tubes at a time. Each die is placed in the middle of a pair of planed iron ways, which extend 12 feet on each side, allowing tubes of this length to be drawn. Between the ways on each side is an endless iron chain, the upper section of each chain moving in a direction from the die, and blocks of cast iron, fitted to slide upon the ways, are provided with jaws for holding either end of the mandrel, and with strong keys by which they may be locked to any link of the chains. One end of the mandrel is tapered and has a head for the hold of the jaw. The tube was thoroughly greased with tallow, and the mandrel with sperm oil. Then the tube was slipped upon the taper end of the mandrel, this was passed through the die into the jaws of the sliding block, and the key was dropped, locking the block to the moving chain. The whole power of the engine being upon this chain, the mandrel, with the tube upon it, was slowly drawn through the die, the rollers of which pressed and elongated the tube, and its rear end was seen crawling along the mandrel.

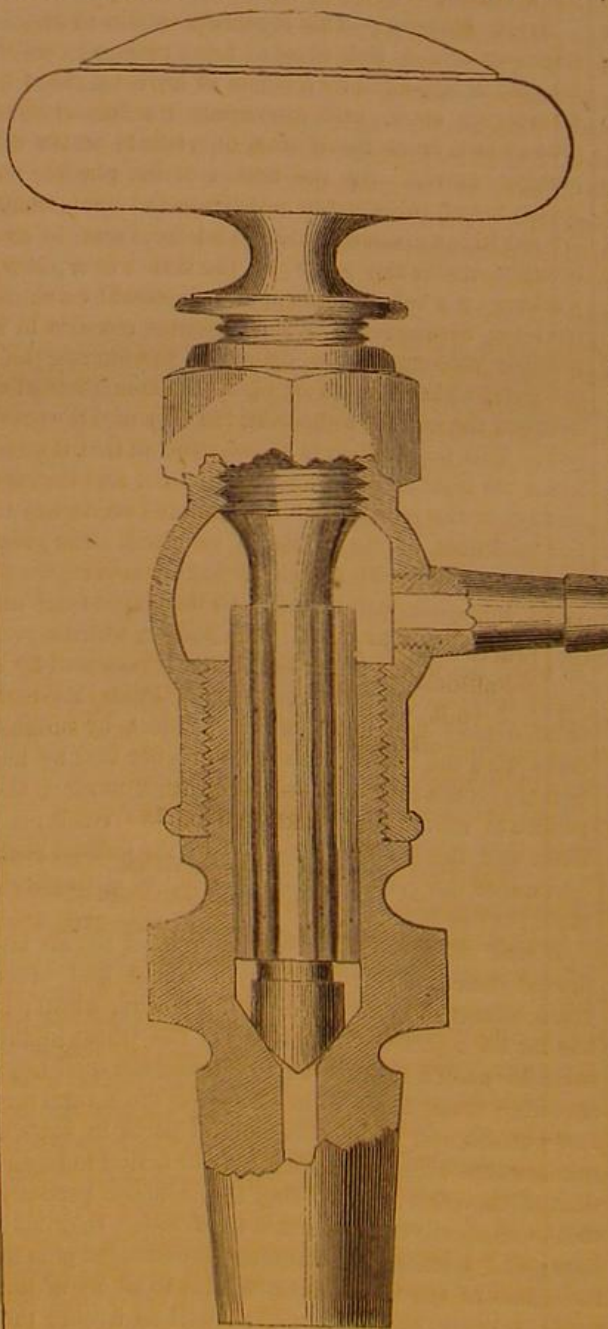
After the passage the tube fitted so closely upon the mandrel that the power of the engine was required to draw it off, and it was for this service that the chain moving in the opposite direction had been provided. The small end of the mandrel was unlocked from its chain, a stationary jaw fitting closely around it at the rear end of the tube was closed, and the key was dropped, locking the opposite end of the mandrel to its chain. The mandrel was thus slowly drawn from out the tube.

A portion of the invention consists in a very ingenious device for loosening the tube on the mandrel. In the passage through the die slight ridges are raised between the rollers on the exterior surface of the tube, and a second series of rollers are provided to roll down these ridges, without, it is said, elongating the tube, but simply pressing the metal of the tube and thus enlarging its diameter.

After the exhibition of the manufacture, Mr. Pirson stated that the machinery was invented and had been constructed by Mr. Wm. T. Brooks, originally of Medford, Mass.; that a company had been formed with a capital of \$500,000, that the works and patent would be put in at \$320,000, and \$180,000 more was wanted in cash for working capital. Of this \$180,000, \$80,000 had already been taken, leaving \$100,000 which was still offered. He said that the brass manufacture had been very profitable, the stock of the Scoville company being worth now 900 per cent premium. Several gentlemen present then put down their names on the stock book, \$33,000 being taken on the spot.

BROUGHTON'S GAGE COCK.

This engraving represents a new gage cock which is conveniently constructed to admit of being ground



when leaky without taking it off the boiler. Appended is the inventor's description:—

"The attention of engine builders, boiler makers, engineers, and others using steam boilers, is invited to the above gage cock, as possessing the features of simplicity, and a facility of being reground at any time, without being removed from the pipes or boiler, not found in any other gage cock now in use. Fig. 1 is a representation—partly in section—of the im-

provement. It will be seen that the shank is made to screw into the boiler in the ordinary manner, but the globe or body of the cock is detachable from the shank, a screw joint which connects the shank and body together, being made about midway in the length of the cock. The shank is chambered or bored out in a cylindrical form, at the bottom of which is the ordinary valve seat. The valve or stem screws into the nozzle or front of the cock in the ordinary manner, but is elongated, and extends forward and through the cylindrical chamber of the shank to meet the valve seat at its bottom. The diameter of the central stem is less than that of the chamber in the shank, and four radial wings are cast upon it. These wings extend outwards, and correspond in diameter to the bore of the shank, and form a guide and support to the valve stem when the body of the cock has been unscrewed and the valve replaced in the chamber for regrinding. Thus, to regrind this cock and put it in order when leaky, the body is unscrewed and taken off, leaving the shank in the pipe or boiler. The valve is then replaced in the shank and is free to rotate; the wings on the stem forming a perfect guide and support, and keeping it perpendicular to its seat. The valve is rotated by the handle, thus dispensing with the use of screw drivers or other tools, and the operation is so simple, and can be so easily and quickly performed, that parties using them need never be troubled or annoyed by leakage. These gage cocks are made of the best steam metal, and have mahogany handles attached to the stem in a substantial manner. They are simple and not liable to get out of order, and may be reground any number of times without being removed from the boiler; consequently they are durable. They can be reground easier and quicker than any other gage cock."

Patent now pending. Manufactured by Broughton & Oakman, 41 Center street, near Duane, New York

ANOTHER PNEUMATIC RAILWAY IN LONDON.

The *Mechanics' Magazine* has a long article on the Whitehall railway, from which we take the following extracts:—

It is an old notion, and by no means an erroneous one, that the power acquired by atmospheric pressure would realise greater safety, economy, and expedition than that obtained by the ordinary locomotive. The trial of the system of atmospheric propulsion for fourteen years in the line from Paris to St. Germain, bears witness to the absolute security attending its adoption. We have also had practical experience in this direction on some of our own lines. But the system has failed, and this has been due to the imperfect manner in which it has been carried out. Notwithstanding all that was done to develop the principle, it had to be abandoned, not from any inherent fault or fundamental error in the principle itself, but because the details of its application were not sufficiently mastered to render it a practical success. To ensure the effectual working of the atmospheric system, tunnels and a piston carriage must be substituted for the old arrangement of tube and traveling piston; such a system of working, for instance, as that in operation on the experimental line at the Crystal Palace. Here a power has been developed by which trains have ascended inclines inaccessible to the ordinary locomotive. This result is obtained from the pneumatic system, which differs materially from the former atmospheric system. By the new method, the train is wholly within the tunnel or tube, by which arrangement all the difficulties attendant upon working the continuous valve are entirely overcome. Leakage is thereby avoided, and a considerable further advantage is obtained in working at reduced pressures, and with proportionate economy. With the old arrangement a pressure ranging from 120 to 160 ounces per square inch was required to move the train, but under the new conditions a pressure of not more than 3 or 4 ounces per square inch is all that is necessary. In the Crystal Palace tube the train is moved through a tunnel having an area 80 or 90 square feet, at the rate of 30 or 40 miles per hour, by a pressure of only $2\frac{1}{2}$ ounces on the square inch. This propulsion is simply due to the pressure of the air behind the train, so that, in effect, the pneumatic system is but a modified application of the process of sailing to railway trains. The

practical utility of this system has been proved not only by the successful working of the trial passenger railway at Sydenham, but also by that of the Pneumatic Despatch Company. It is now to be further tested on a practical working scale, upon a railway about to be made from the Waterloo station across, or rather through, the bed of the Thames to Charing-cross. The bill for this line has not yet been obtained, it is true, but it has passed the House of Commons, and is unopposed in the Lords, so that for all practical purposes it may be acted upon as though it had received the royal assent.

The importance of this system of working railways, and the novel position of the line, justify somewhat more than a passing glance at the engineering arrangements, which will be carried out under the direction of Mr. T. W. Rammell, engineer to the Pneumatic Despatch Company, and with whom Sir Charles Fox and Son are joint engineers. The new system affords great facility for communication under water. Taking advantage of this, it is proposed to lay a line of tube in the bed of the Thames so as to unite the north and south sides of the river, between the two points embracing the important localities of the Charing-cross and the South-western railway stations. According to the Parliamentary plans the line will commence in Great Scotland Yard, where there will be an open station, the level of rails being here about 16 ft. below surface. It will be carried thence by a brickwork tunnel under the Thames Embankment to the river, which at this point is about 1,000 ft. wide. Here the line will be continued by water-tight wrought-iron tube, about 18 ft. in diameter, which will be made of $\frac{3}{4}$ -in. plate, and girt at about every 36 ft. with a deep wrought-iron rib, to which will be connected lighter longitudinal ribs, also of wrought iron. The tube will be further surrounded by light ribs of T or L iron, placed immediately between the larger encircling ribs, the whole forming a stiff network to strengthen and stay the tube. The outer surface of the tube will be coated to the thickness of 18 in. with concrete, for the purpose of adding weight to the tube. By this plan it will be brought to about the specific gravity of the surrounding water, and the ironwork will also be protected. The bed of the river will be divided into four spans, of 250 ft. each, by means of three sunk cylinder piers; there will also be two abutment piers. These piers will carry the tube, which is about to be manufactured in four lengths of 250 ft. each. A perfectly practical and satisfactory arrangement has been made for connecting the ends of the tubes, which will be tied down to the piers. Messrs. Samuda have undertaken the manufacture of the tube, and to Messrs. Brassey have been entrusted the laying and other incidental works. From the abutment pier on the Lambeth side the line will be continued in brickwork under College street and Vine street, to a station convenient for the York road and Waterloo station traffic. The gradients fall from either station to the centre of the river, at which point the line is level for a short distance; the steepest gradient will be about 1 in 30.

It will be seen that the line is intended for local traffic only, and it is proposed, upon the success of the first section being established, to extend the line on the one hand to the Tottenham-court road, and on the other to the Elephant and Castle. This will add tenfold to the value of the line, by bringing it into close communication with the Metropolitan Underground Railway at one end, and the Metropolitan Extension of the London, Chatham and Dover Railway at the other. The engine-house will adjoin the station at the Waterloo end, where will be placed the pumping engine for working the line. Although only one main tube is to be used, arrangements have been made by which three trains will be kept working at once. One will be at each station unloading or loading, whilst the third is traversing the line, the time of transit occupying only about a minute and a half. By means of two branch tubes from the main tube to the engine, trains will be driven by pressure to Whitehall, and drawn from thence by exhaustion. The carriages will, of course, be properly lighted and comfortably fitted similarly to those on the Metropolitan Railway. It is reckoned that about thirty trains per hour will be run, and from calculations based upon well-ascertained data, there appears to be every probability that the undertaking

will prove a commercial as well as an engineering success.

It cannot be questioned that the pneumatic system possesses many advantages over the locomotive system which specially recommend its adoption on the Waterloo and Whitehall Railway. If this line proves a success, and at present there appears no reason why it should not, the system will, doubtless, receive a very widely-extended application. It presents economical features both in construction and working, not obtainable by any other plan. The diameter of the pneumatic tube being less than that of a railway tunnel, the lines can be constructed with greater expedition and at a less cost. The heavy expenses attending the acquirement of property are greatly reduced if not entirely avoided. In the case of the Whitehall line the construction will not involve the demolition of a single dwelling house, the entire line passing under streets and open spaces. The working of the system, too, is comparatively noiseless; this, and the freedom from vibration, recommend its use where a locomotive line would be prohibited. The dead weight and encumbrance of the engine and tender are at once got rid of, and the service thus rendered more prompt, and better adapted to the exigencies of a short local traffic. All the dangers attending the locomotive system arising from breaking down, collision, or explosion, are necessarily absent; trains can neither leave the rails, nor meet within the tube. The system also complies with the condition laid down as those under which alone tunnel lines ought to be worked. It is unattended by the objectionable compound of stifling and humid vapours, which Mr. Fowler's best precautions cannot entirely prevent on the Metropolitan Railway. Not only is the generation of gases avoided, but the tunnel is completely ventilated by the continuous draught of air through it. The motive power being stationary, the working expenses and cost of maintenance of the line will be very much less than under the ordinary system; the wear and tear of rolling stock may likewise be reduced to a minimum.

The facility with which steep gradients and sharp curves can be worked is evidenced by the Crystal Palace tube, which is constructed with a gradient of 1 in 15 and curves of 8 chains radius; on the Whitehall line the worst gradient is about 1 in 30. Such, then, are the leading advantages of the pneumatic system, the working of which is about to receive practical illustration in a position where there are doubtless thousands daily, who would much prefer being whisked across in a minute and a half, for a penny or twopence—which we believe are the proposed fares—to making a long detour over either of the bridges. Deducting the halfpenny toll payable on Waterloo and Hungerford bridges practically reduces the fares to a halfpenny and three halfpence respectively. Although the engineering details have been well digested and worked out, and every care has been taken to perfect the arrangements, it may be found advisable to vary or alter these as the work of practical construction proceeds under these novel conditions. But the principle will remain the same, and to it we look with considerable hope for the future working of short lines for local traffic in the metropolis.

FARMERS' CLUB.

The Farmers' Club of the American Institute held its regular weekly meeting at its Room at the Cooper Institute on Tuesday afternoon, June 27th, the President, N. C. Ely, Esq., in the chair.

SEVENTEEN-YEAR LOCUST.

Dr. Trimble presented a box of locusts received from a correspondent of the club residing in Cayuga county, and stated that it was the seventeen-year locusts of that locality. Each species or variety of these remarkable insects is confined to one locality. They come out of the ground once in seventeen years, and live above ground about three weeks. During all this time the males are singing, or rather drumming with their wings, and the concert of such hosts makes a sound that can be heard a long distance; people have said that they have heard it two miles. In South America there is a locust whose note is so loud that a single individual can be heard a mile. The females during this time are laying their eggs in the branches of trees. Dr. Trimble exhibited some twigs which were filled with the eggs. A longitudi-

nal slit is cut in the branch, and at the bottom of this a transverse section is laboriously sawed to receive the eggs in a compact row, standing on their ends like a row of ninepins. In about two months they hatch, when the worms fall to the earth and immediately crawl into the earth, where they live and grow for seventeen years, subsisting on the roots of trees, grass and other plants. In 1860, when they prevailed in New Jersey, the speaker hatched a number of eggs under a glass receiver, the lower part of which was filled with earth and supplied with grass roots. The larvæ immediately crawled into the earth and attached themselves to the grass roots; if the grass was pulled up, the worms were drawn out also, clinging to the roots. Dr. Trimble said that he had dug into the ground and found the worms with the proboscis inserted in the root of a tree, sucking the sap. The moisture from the body of the worm had formed a casing in the clay, which it was necessary to break open in order to find the worm.

Mr. Williams:—Do the locusts eat anything in their winged state?

Dr. Trimble:—They do not. They have no organs for eating. The locusts mentioned in Scripture as being so destructive were a different insect from the one that we call the locust. Perhaps they were some species of grasshopper.

Mr. Bergen:—Is the August locust the same as the 17-year locust?

Dr. Trimble:—It has never been ascertained whether the August locust requires 17 years for its growth in the larva state or not. The insects come up irregularly, and the time required for the development of an individual is unknown.

Mr. Williams:—Do I understand Dr. Trimble to say that the 17-year locust is hatched only in trees, and goes into the ground directly beneath the trees? I have seen them coming out of the ground in multitudes in grass land where there were no trees.

Dr. Trimble:—But are you sure there were no trees in that place 17 years before?

Mr. Williams:—That might have been.

LADY BUGS.

Mr. Bergen:—Dr. Trimble has stated here a good many times that lady bugs do no damage. Now, with all his superior knowledge of insects, I can correct him on that point. I sent one hundred and ten bushels of squashes to Fulton market day before yesterday; I have for several years raised large quantities of squashes and pumpkins, and my vines have been extensively eaten by lady bugs.

Dr. Trimble:—There is an embarrassment in discussing this subject with men until they begin to know something about it. The trouble with Mr. Bergen is that he does not know a lady bug from a squash bug. Lady bugs do not eat any vegetable substance whatever; they live wholly upon other insects and their eggs.

A Singular Statement.

It is stated in California papers that neither gold, silver, copper or any other mineral of value which has been found in that state, was discovered by a scientific geologist, though many of them had traveled over the ground where they were afterwards obtained. Neither have scientific men ever been useful in discovering large deposits of these articles.

[This paragraph has a slight disadvantage, which detracts from its value—it is untrue. The existence of gold in California was pointed out by Prof. Dana, who was attached to Wilkes's Exploring Expedition, long before it was known to the world. Dr. Charles Jackson, of Boston, discovered one of the finest emery beds in the world in Massachusetts, and it is certainly 30 years ago since Prof. Hildreth called attention to the existence of oil in Ohio.—Eds.]

NOVEL INVENTIONS.—Patents have been obtained in France for an instrument to indicate the existence of minerals or springs of water in land:—for raising a ship into the air, and steering it there:—for applying steam to children's toys:—for heating and lighting apartments with the same apparatus;—for a mode of lining letter envelopes with silk:—and for a cane which you can put in your pocket and transform into a seat at will.

It is estimated that there are fifty thousand persons in the Southern States who are excluded under the amnesty proclamation of the President.

Holes & Queries

H. L. A., of Ill.—The most exhaustive work on chemistry is that of Gmelin, published by the Cavendish Society, in 16 volumes, at \$5 per volume. Booth's Encyclopedia of Chemistry is an excellent work, but the various chemical manufactures are treated more at length by Muspratt. For a methodical treatment of the subject from a scientific point of view, we know of no work superior to Gregory's. Miller's is more recent, but only the first volume of that—Chemical Physics—has yet been republished in this country. The best work on the microscope is Carpenter's, but we know of no special treatise on the solar microscope. James Green, No. 175 Grand street, manufactures philosophical instruments.

C. A. C., of Cal.—The latest and fullest investigations in relation to tapeworms were made by Dr. D. F. Weinland, who has dissected more than 5,000 animals in the prosecution of his inquiries. The leading facts ascertained by him were given in full on page 103, Vol. 7, (new series), SCIENTIFIC AMERICAN. He describes two hundred species of tapeworms, five of them being found in man, though only two of these five are at all common. He considers pomogranate bark the most efficient remedy.

W. A., of N. S.—Horn is softened by heat. For pressing and molding the temperature of boiling water is sufficient, but for welding scraps into a common mass a higher heat is requisite. With care, horn may be exposed for a short time to the temperature of melted lead without injury.

A. H., of Pa.—We fail to discover any patentable novelty in your reclining chair, and cannot advise you to apply for a patent.

R. N. B., of N. H.—It is the duty of every patentee to stamp the date of the patent upon the article vended in the market. Failing so to mark the article no damage can be recovered from an infringer, except on proof that he was notified of such infringement, and continued after such notice to make or vend the article patented.

M. D. A., of N. Y.—Your device for running cars on the track after they have been thrown off strikes us as novel and useful. Such apparatus would save much time and property.

H. W. S., of U. S. N.—Your plan for applying rubber gummets to condenser tubes is the same as that being practised in the use of Sewell & Cameron's condenser.

J. S. W., of West Va.—The stem of your valve was doubtless driven into the heater by water pressure. When the water from the heater ran into the pump, as it naturally did, it forced the bottom valve up and the broken stem fell down the pipe. The return stroke of the pump caused the water to surge back and forth in the pipe, which, by degrees, carried the stem into the heater. This is the only explanation we can offer.

T. W. B., of Ohio.—We are much obliged for your article on the "Circumference of the Ellipse," but we find it too entirely mathematical to suit our readers.

R. H. L., of C. W.—In order to take out a patent on the same terms as a citizen you must reside in the States one year next preceding your application, and in the mean time have made oath of your intention to become a citizen. An inventor must in all cases make application for the patent, but he can by assignment transfer it so that the patent may issue to the assignee.

E. H., of Ohio.—If we should satisfy ourselves that you had succeeded in squaring the circle, and that you could demonstrate it by a simple diagram, we should be pleased to publish the demonstration, but we do not believe that you can satisfy us of this.

L. L. V., of C. E.—We do not know of any iron firm who would be likely to buy your limonite ore; but if you should make its existence generally known to iron manufacturers you might find a purchaser.

J. S., of N. J.—We know of no better treatise on acoustics than that contained in Sullivan's First Principles of Philosophy.

M. K., of Mo.—The explanation of the "curious clock," puzzle which you send us is precisely the same as that which we gave when we published the description of the clock. We are pleased to see our supposition confirmed on so unquestionable authority.

D. B., of Mass.—A soft transparent varnish may be made of Canada balsam, and a harder one of bleached gum shellac.

J. L. B., of Pa.—If you have a patent for your invention parties cannot use it without infringing your rights. You can sue infringers in the United States District Courts.

E. K., of Pa.—If the blotting sand about which you inquire is attracted by a magnet, you may consider it magnetic oxide of iron. All the blotting sand that we ever saw was of this substance.

O. P. H., of N. H.—At the time of our latest information John C. Fremont, of this city, was president of the Pacific Railroad.

E. P. R., of Miss.—We do not know of any work that will learn a man to run a stationary engine other than hard work; books cannot teach engine driving. A treatise on the indicator can be had of H. C. Baird, Esq. & Co., No. 406, Walnut street, Philadelphia.

D. S., of N. Y.—We thank you for your good opinion of our paper. Engineers are now licensed in this city or are obliged to pay five dollars to some one for a certificate which is probably what the law means.

T. W., of N. Y.—We have an impression that the term "eddy force," is employed by the spirit rappers; some of those people have an office on the south side of Canal street just east of Broadway.

Correspondence

Tempering Mill Picks.

MESSRS. EDITORS:—Will you be so obliging as to publish what you know about tempering mill picks. But I suppose it is kept a secret by mechanics, and when they profess to give a receipt keep the main or principle item back, unless they can obtain a handsome reward. Respectfully,

N. D.

Fleming, Mich., June 19, 1865.

[Steel is hardened by being heated to a cherry red and plunged in cold water. Then the temper is drawn by warming the metal; the more it is warmed the softer and less brittle it becomes. The neatest way to temper the point of a pick or chisel, is to harden the end only, and allow it to be re-warmed by the heat remaining in the mass of the tool. As soon as the point assumes the right color, the whole tool is plunged again in water to prevent the temper from being reduced too low. Butts gives the following table of the colors and corresponding temperatures for the temper of various tools:—

A very pale straw.....	430°—Lancets.
Straw.....	450°—Razors.
Darker straw.....	470°—Penknives.
Yellow.....	490°—Scissors.
Brown yellow.....	500°—Hatchets.
Slightly tinged purple.....	520°—Saws.
Purple.....	530°—Hammers.
Dark purple.....	550°—
Blue.....	570°—
Dark blue.....	600°—Soft, for saws.

Proportion of the Weight to the Wings of Birds.

MESSRS. EDITORS:—In looking over some back numbers of the SCIENTIFIC AMERICAN, I found a communication (which I did not notice at the time of its publication) from a Mr. Gillespie, on the subject of the flight of birds, flying machines, etc., which I think contains an error and which might have a tendency to mislead persons unacquainted with the subject, and a desire to correct the error is my apology for troubling you with this notice. Mr. Gillespie says an eagle will spread about one square foot of wing for every four or five pounds of its weight. Now if he means to convey the idea, as the statement would imply, that the weight of the eagle is from four to five pounds for each foot of wing that it spreads, he makes a great mistake, and to satisfy you of it I will state a few facts that have come under my observation. In the summer of 1826 I lived in Ohio, some two miles from the shore of Lake Erie. In the fore part of the summer I frequently observed a pair of eagles carrying food to their young, and one day I took my rifle and went into the woods in search of them. The result was that I shot from the tops of some lofty pines an old and two young ones. They were of the kind that I suppose is called the bald eagle, that is the old ones were white, head and tail, but the young ones were a dark iron grey, with no white on them. The young ones were full grown, even larger than the old one that I killed. They were rare game for me and therefore I took particular note of their weight and dimensions. The old bird measured 6 feet, 8 inches from tip to tip of the wings and weighed 8½ pounds. The smallest young one measured 7 feet and weighed 9½ pounds, while the largest young one measured 7 feet 4 inches, and weighed 10½ pounds. The breadth of the wing of the largest bird was 16 inches, and from the best estimate that I can make from recollection of the shape of the wing the bird must have spread in its natural flight from 6½ to 6¾ feet of wing. Now 6½ feet and 10½ pounds gives one pound and from 10 to 11 oz. to the square foot of wing. It may be possible that such a bird could carry a weight in addition to its own sufficient to make from 4 to 5 pounds to the square foot, but I think if it did it would be with the greatest exertion and only in a short and down hill flight.

The crow and several kinds of hawks I have ever considered a pest to the farmer and therefore you will not think it strange if I say that with the aid of powder, lead, and traps I destroyed a great number of them in my younger days, and have weighed and

measured many specimens of them and I do not recollect an instance where they varied 2 oz. from 1½ pounds to the foot of wing; even since I first read Mr. Gillespie's statement I have weighed and measured a large specimen of the crow and it did not vary an ounce from 1½ pounds to the foot of wing. With the small-winged birds I have had less experience, but I do not believe that any species can be found that make any pretensions to rise in their flight that carry more than 2½ pounds to the foot in their natural flight. I have never seen a turkey buzzard except on the wing, but I have been told by those who have examined them, that they were very light in proportion to their wings and from their appearance I have no doubt of the truth of it.

I wish that Mr. Gillespie or some other person might succeed in making a practical flying machine, but I shall have little hope of their success unless they make a different calculation on the weight that birds carry.

JOHN PARTRIDGE.

Pittsfield, Mass., June 10, 1865.

A Leaden Ball Sustained by a Steam Jet.

MESSRS. EDITORS:—About a year ago, while attempting to find the force with which a jet of steam issued from a small orifice, I had occasion to place a small leaden bullet over it, which was cupped for its reception. As I gradually turned on the steam imagine my astonishment at finding that the ball, instead of being thrown on one side, as I expected, was actually suspended about 12 inches above the orifice, oscillating for a few seconds in a vertical direction, and having at the same time a wonderfully rapid rotary motion about its vertical diameter. After repeated trials I found this latter motion to be always in the direction of the hands of a watch—the eye being above the ball. It could be raised or lowered, by increasing or diminishing the amount of escaping steam. On being pushed a little without the axis of the jet, it would immediately return to its former position. I have been entirely unable to explain either the rotary motion or the force which kept the ball in the axis of the jet. The fact may be an old story to the readers of the SCIENTIFIC AMERICAN, but to me it is certainly new. Will some one favor me with an explanation?

C. H. A.

Fulton, Mo., June 13, 1865.

[A common ornament of water fountains is a ball sustained in this way by the jet of water. The cause of its being held within the jet has been the subject of much discussion. If any of our readers can give a clear explanation we should be pleased to receive it.—Eds.]

Corrosion of Electro-plated Articles.

MESSRS. EDITORS:—I have made articles for my family use of real silver and german silver, heavily electro-plated with fine silver. My object of writing you is to inquire why it is that the plated articles should tarnish so much quicker than the real silver ones. I have thoroughly investigated this subject, and have not been able to come to a satisfactory result. I placed an article of silver and one of plated on a high shelf, where any gases would ascend, and the silver one remains as it was when put there, but the plated one turned almost black in a few days. By answering the above through your journal you will much oblige an old subscriber.

CHAS. A. GARDINER.

New York, June 10, 1865.

[The trouble doubtless arises from the imperfect cleaning of the electro-plated articles. It is well known that the solution adheres to the metal, and cannot be removed by mere washing. The remedy is to scour and burnish the surface thoroughly.—Eds.]

Telegraphing in Bad Weather.

MESSRS. EDITORS:—I would like to make an inquiry or two through your valuable paper in reference to circumstances of every day occurrence on telegraph lines. Every operator must have observed that on rainy days offices near the middle of the line, with main battery at each end, have a great deal of trouble to "adjust" high enough to get offices at extremities of the line, and still be low enough for offices nearer the center of the line. In other words, the current of electricity seems to be more powerful at the ends of the line. Now can this be so while we both are supplied from the ends of the line? And why is it that on such days magnets that ordinarily work well, when adjusted for offices near by (adjusted

low) will not work at all from extremities, but appear to be fixed.

As these are questions that must occur to every inexperienced operator I would respectfully request a reply through your paper, which might call out other ideas of interest.

TELEGRAPH OPERATOR.

Ionia, Mich., June 14, 1865.

[The difficulty of telegraphing in bad weather results from extraneous currents which prevent a complete discharge of the magnetism on the breaking of the circuit. This makes it necessary to increase the tension of the spring in order to draw the armature away from the magnet, and then to enable the magnet to overcome this increased tension, it is necessary to set the armature nearer to it, making a shorter vibration; this is called adjusting "fine," or "high." The generating of extraneous currents in damp weather is involved in mystery, but it seems reasonable that the nearer to the magnet the circuit is broken, the less would the influence of these currents be felt.—Eds.]

Cartridges in Cold Weather.

MESSRS. EDITORS:—Some weeks since I saw in your paper a letter from Mr. Cleveland stating that metallic cartridges were liable to miss fire in cold weather. I have had a great experience in firing these cartridges for many years and at all seasons and I never noticed anything which gave me cause to suppose that the temperature had any effect upon them to impair their reliability. I inclose you herewith a copy of a report of some experiments made at the National Armory, Springfield, also a copy of account of trials made by C. D. Leet, Esq., Metallic Cartridge Manufacturer, Springfield, Mass.; both these series of experiments have been made since the publication of Mr. Cleveland's letter.

C. M. Spencer.

Boston, Mass., June 28, 1865.

* MR. LEET'S EXPERIMENTS.—I took eighty-four cartridges and buried them in ice at least two feet from outside of box and allowed them to remain forty-eight hours. I then took them out and fired seven rounds, every one fired; in a half hour fired seven more, no miss; I then put part of them in the sun, south side, very warm, and allowed them to remain some three hours; seven rounds of these fired and no miss; during this time I had fired most of the others and still could not get a miss-fire, and thought this a fair test. Our Government Inspector has fired cartridges during all the past winter every day but Sundays and he has taken them from the magazine as needed, some days when they were like so much ice, and his experience is that the weather has nothing to do with it; the quality of fulminate or the manner of putting in has more to do with a miss-fire than the weather.

C. D. LEET.

Springfield, Mass., June 21, 1865.

[The report of Major Laidley is an elaborate table of the trial of 512 cartridges, which had been exposed to temperatures ranging from 2° below zero to 30° above, and it concludes with this certificate:—"There was not a cartridge in all of the above trials which did not go. I could not see the difference between those that had been in the freezer the greatest length of time and those that had not been in at all.—Eds.]

Why Coal-mining Machines are not Used.

MESSRS. EDITORS:—I notice in your paper of the 10th inst., a copy of a resolution offered at the "Iron and Steel Association," to encourage the invention of coal-mining machinery. We might have had more than one coal-mining machine in Pittsburg, but for the opposition of coal dealers and producers; they opposed the introduction of mining coal by machinery on the following grounds:—The first effect would be to stop strikes among miners. You will say that is a strange reason, but the explanation is this; when the miners ask one cent per bushel more for digging, the dealer added two cents per bushel to the consumer, so that you will see very clearly the object in opposing the introduction of coal-mining machinery. This, if not the expressed, is the implied reason for not encouraging the introduction of coal-mining machinery in this city.

W. D. R.

Pittsburg, June 12, 1865.

Trials of a Patentee.

MESSRS. EDITORS:—I have read with interest the letter from A. C. T. of May 12, 1865, under the above

caption, on page 356 of present volume SCIENTIFIC AMERICAN. He is not alone, I assure you. I have had considerable experience in that way myself. Neither is Galesburg, Ill., the only place where patent thieves reside; your own city, New York, is full of them. The dodge of obtaining a power of attorney did not work in my case, yet it was urged very strongly. I have tried several of them who were highly recommended as honest, high-minded men, but alas it was not so with those with whom I have had to do. I therefore warn all patentees to beware of patent agencies, patent exchanges, etc., for the sale of patent rights. Should I be so fortunate as to receive another patent, I shall publish it for sale in the SCIENTIFIC AMERICAN, have it illustrated besides, as any sensible man would do. I regret not having my patents illustrated, as you advised me; it would have been hundreds, perhaps thousands, of dollars in my pocket had I done so. Bought wit is the best sometimes.

J. T.

Madison, Ind., June 21, 1865.

More Than Satisfied.

MESSRS. MUNN & Co.:—I have to-day received "letters patent" for my improvement in boots and shoes. Please accept my thanks for your care and skill, which has brought to a successful issue your application on my behalf. My friends remark the dispatch with which this has been done. When I know of a friend having business at the Patent Office, I shall consider I am consulting his interest by pointing out to him the advantages of your Agency, and I am sure it must be a source of professional pride to you to have your clients say they are more than satisfied. Yours, very respectfully,

EDWIN CHESTERMAN.

Roxbury, Mass., June 30, 1865.

Russia.

Bayard Taylor contributes, in the *Atlantic Monthly* an interesting sketch of "Winter Life in St. Petersburg."

A RUSSIAN DAY.

"For darkness, rather than cold, is the characteristic of the St. Petersburg winter. The temperature, which at Montreal or St. Paul would not be thought remarkably low, seems to be more severely felt here, owing to the absence of pure daylight. Although both Lake Ladoga and the Gulf of Finland are frozen, the air always retains a damp, raw, penetrating quality, and the snow is more frequently sticky and clammy than dry and crystalline. Few, indeed, are the days which are not cheerless and depressing. In December, when the sky is overcast for weeks together, the sun, rising after nine o'clock, and sliding along just above the horizon, enables you to dispense with lamplight somewhere between ten and eleven; but by two in the afternoon you must call for lights again. Even when a clear day comes, the yellow, level sunshine is a combination of sunrise and sunset, and neither tempers the air nor mitigates the general expression of gloom, almost of despair, upon the face of nature.

"The preparations for the season, of course, have been made long before. In most houses the double windows are allowed to remain through the summer, but they must be carefully examined, the layer of cotton between them, at the bottom, replenished, a small vessel of salt added to absorb the moisture and prevent it from freezing on the panes, and strips of paper pasted over every possible crack. The outer doors are covered with wadded leather, overlapping the frames on all sides. The habitations being thus almost hermetically sealed, they are easily warmed by the huge porcelain stoves, which retain warmth so tenaciously that one fire per day is sufficient for the most sensitive constitutions. In my own room, I found that one armful of birch-wood reduced to coal, every alternate morning, created a steady temperature of sixty-four degrees. Although the rooms are always spacious, and arranged in suites of from three to a dozen, according to the extent and splendor of the residence, the atmosphere soon becomes close."

A RIDE ON AN ICE HILL.

The ice hills erected in the Russian cities for purposes of amusement have often been described; but the sensations of an ice ride have seldom been more vividly narrated than in these words:

"I engaged one of the *mujiks* in attendance to

pilot me on my first voyage. The man having taken his position well forward on the little sled, I knelt upon the rear end, where there was barely space enough for my knees, placed my hands upon his shoulders, and awaited the results. He shoved the sled with his hands, very gently and carefully, to the brink of the icy sleep; then there was a moment's adjustment, then a poise, then sinking of the heart, cessation of breath, giddy roaring and whistling of the air, and I found myself scudding along the level with the speed of an express train. I never happened to fall out of a fourth-story window, but I immediately understood the sensations of the unfortunate persons who do. It was so frightful that I shuddered when we reached the end of the course and the man coolly began ascending the steps of the opposite hill, with the sled under his arm. But my companions were waiting to see me return, so I mounted after him, knelt again, and held my breath. This time, knowing what was coming, I caught a glimpse of our descent, and found that only the first plunge from the brink was threatening. The lower part of the curve, which is nearly a parabolic line, is more gradual, and the seeming headlong fall does not last more than the tenth part of a second. The sensation, nevertheless, is very powerful, having all the attraction, without the reality, of danger.

CANDLES.

"Although the streets of St. Petersburg are lighted with gas, the palaces and private residences are still illuminated only with wax candles. Gas is considered plebeian, but it has probably also been found to be disagreeable in the close air of the hermetically sealed departments. Candles are used in such profusion that I am told thirty thousand are required to light up an Imperial ball. The quadruple rows of columns which support the Hall of St. George are spirally entwined, with garlands of wax-lights, and immense chandeliers are suspended from the ceiling. The wicks of each column are connected with threads dipped in some inflammable mixture, and each thread being kindled at the bottom at the same instant, the light is carried in a few seconds to every candle in the hall. This instantaneous kindling of so many thousand wicks has a magical effect."

A New Blow Pipe.

A novel blow pipe is thus described in a foreign journal:—

Hendy's blow pipe is an instrument which combines simplicity and efficiency in a great degree; it consists of an ordinary blow pipe nozzle, supplied from an India rubber reservoir. The main portion of the blow pipe is made with a joint, at which a valve is placed, which is opened when the operator blows, and closed immediately when he ceases. By this arrangement the little bag or bladder is readily filled at a single breath, and with very little exertion. When so filled a continuous current of air is forced from the nozzle of the pipe by the mere contractive force of the gutta percha. The force is uniform until the air is nearly exhausted. The current may be easily varied or entirely cut off by gently pressing the fingers upon the neck of the bladder above the nipple to which it is attached. Mr. Hendy has recently made a further improvement by attaching a rubber hose between the mouth piece and the pipe, enabling the blower to change his position without disturbing the direction of the current on the object upon which it is turned.

Great Profits from Chemical Refuse.

Mr. Joseph Jones of Widnes, England, writes to the *London Mining Journal* as follows: Vat and black ash waste, owing to its large quantities, has caused chemical masters to incur expense to remove it from their premises, for want of room to put it in. It is composed of sulphide of calcium, sulphate of lime, etc., with about 10 per cent of sulphur. The sulphur is precipitated by muriatic acid, aided by an oxidizing process (such as "steam," by the action of the sun, etc.) There is no doubt of the fertilizing effect of sulphur upon the soil. The remaining part of the waste is further decomposed by acid of nitre (nitrate of soda). There are other fertilizing effects of muriatic acid upon black ash waste; 600 tons of muriatic acid are thrown away weekly from some chemical works, which manufacture salt cake, etc.

Improved Railroad Chair.

All persons who travel on railroads have noticed concussions at times, more or less violent according to the velocity of the train. These blows are caused by the wheels striking the ends of the rails. The latter are set one quarter of an inch apart, to allow for the expansion of the line in hot weather, and the ends raise up, thus affording the wheel an opportunity to strike them. The object of the chair here shown is to hold the rails in position and keep the heads or ends always on the same plane, so that whatever distance apart, the line will be uninterrupted and without a break from end to end.

The engravings explain themselves so thoroughly

ber, C, of the crank-pin wheel at the supply hole, A, until it is half filled or until it runs out from the discharge hole, B. The supply hole, A, is then closed with a pin, leaving the chamber quite tight except the discharge. When the machine is in motion the oil is kept by centrifugal force against the outer part of the chamber, C, but whenever a corner is turned or the motion stopped, a small supply, but enough to lubricate and prevent heating without wasting the oil, falls into and passes through the discharge hole to the pin. Fig. 3 shows an oil reservoir or chamber, E, with a hollow stem in the center communicating with the journal, H. This stem is closed by a poppet valve, F, which, by the jolting of

iron developer with fogging. In this respect, as well as in the color which it gives to the image, it resembles pyrogallie acid.

There is also something in the consistency of the solution which renders it very pleasant to work with. While the viscosity of the gelatine is quite gone, there is a certain oiliness in the liquid which makes it cling to the plate, and flow evenly over it. It seems, too, to be more independent in this respect of the condition of the nitrate bath as respects alcohol than an ordinary iron developer; and the absence of tendency to fog renders it allowable to simply add nitrate solution where redevelopment is required.

It thus becomes practicable to quite dispense en-

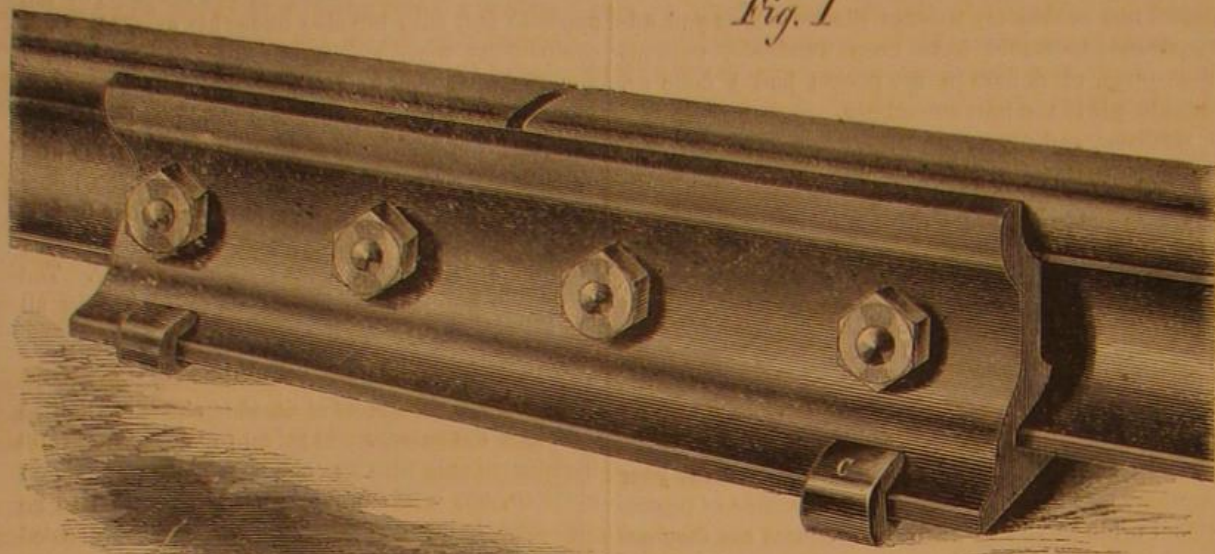


Fig. 1

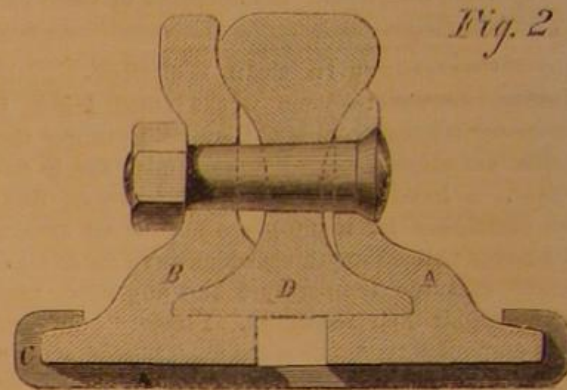


Fig. 2

JONES'S RAILROAD CHAIR.

that further comment seems superfluous, all parts being clearly illustrated. It will be seen that the chair is made in two parts, A and B, and that the ends of them are united by links, C. The base of one half the chair sits on the foot of the rail at D, and holds it down while the sides are held by bolts and nuts, the bolt holes being made oval to allow the rail to expand.

By this method of constructing a chair, rails can be used much longer, in fact until they are worn out and will not require to have the ends dressed while the face of the rail remains sound.

the machine, is thrown up enough to receive small portions of the dashing-about oil on its shank, and this drips down upon the journal. The chamber is closed with a stopper, G. With these contrivances it is claimed that a man may keep his mowing machine constantly at work for half a day without once stopping to oil up, thus saving at least 10 per cent of the time required for work.

Besides these self-oiling arrangements the "American Mower" combines more advantageous points than any other we know. Whether these "points" will prove as efficient as the inventor claims, is yet

tirely with pyrogallie redevelopment, except in those rare cases where an extremely thick deposit is wanted. In such cases pyrogallie acid can scarcely be replaced, except indeed by gallic acid, which I have used in the accidental absence of pyrogallie. Mixed with nitrate of silver in solution and acetic acid, it presently assumes a purplish-inky color, but remains clear and redevelops very well.

Whenever a new developer is recommended, it becomes a matter of interest to know whether the negatives taken with it will be permanent. There is nothing in this developer which would tend to a

FIG. 1.

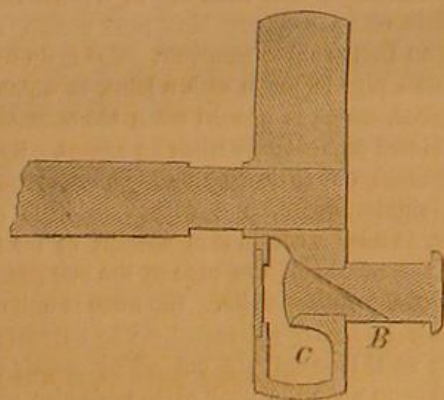


FIG. 2.

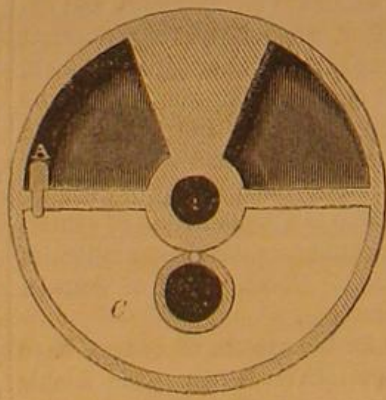
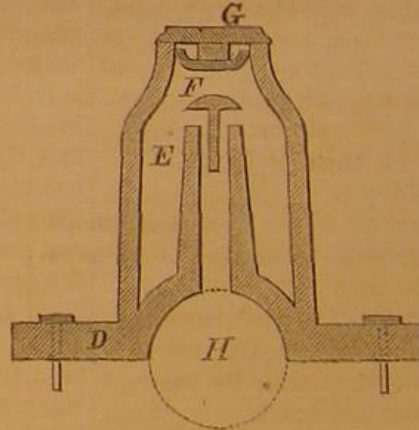


FIG. 3.

**VAN ANDEN'S AMERICAN MOWER.**

The expense of repairs to rolling stock will also be reduced from the absence of violent blows which, if they do not break the axles outright, are the source of much unnecessary outlay. This rail and chair will render traveling much easier to the public, since a smooth and noiseless transit is at all times preferable to a jolting one.

A patent was procured on this chair by J. H. Jones, through the Scientific American Patent Agency, on March 14, 1865. For further information address the patentee at Ironton, Ohio.

The "American Mower."

The accompanying engravings represent one of the marked peculiarities of the "American Mower," recently patented by William Van Anden, of Poughkeepsie, N. Y., through the Scientific American Patent Agency. Figs. 1 and 2 represent the self-lubricating crank pin, and Fig. 3 the self-oiling journal cap—each of the engravings showing sections of the parts represented. Oil is introduced into the cham-

ber, C, of the crank-pin wheel at the supply hole, A, until it is half filled or until it runs out from the discharge hole, B. The supply hole, A, is then closed with a pin, leaving the chamber quite tight except the discharge. When the machine is in motion the oil is kept by centrifugal force against the outer part of the chamber, C, but whenever a corner is turned or the motion stopped, a small supply, but enough to lubricate and prevent heating without wasting the oil, falls into and passes through the discharge hole to the pin. Fig. 3 shows an oil reservoir or chamber, E, with a hollow stem in the center communicating with the journal, H. This stem is closed by a poppet valve, F, which, by the jolting of

A New Developer for Photographic Negatives.

Add an ounce of sulphuric acid to three ounces of water, and set aside to cool. Then add to this liquid an ounce of good gelatine; let it swell and dissolve, placing it for that purpose in a slightly warm place, not exceeding blood heat, for twenty-four hours. Then add iron filings in excess, avoiding all application of heat; let it stand for several days. Finally add a little acetate of soda as before; filter, and dilute to fifteen ounces.

It is very curious to observe the power which the gelatine exerts as a restraining influence. This developer contains a very large quantity of sulphate of iron, much more so than is usually employed in a developer, and yet it stands in need of no free acid to check it; and the restraining is so effectual that it may be kept on the plate twice as long as a common

contrary supposition, and some negatives which I developed with it nearly a year ago are in perfect order. Since that time I have had it in use, and would not be without it. It brings out the halftones and details in the shadows very agreeably, and tends to yield soft and pleasant prints.

As respects its keeping properties, I think it can be relied on for two months, which is ample time. I have some now which is full six months old, and which still develops well, but not, I think, quite so well as the fresh.

I would especially warn those who may prepare this developer for themselves to apply heat only as directed in the formula, and not to any greater extent or degree.—Mr. Carey Lea, in *British Journal of Photography*.

DR. B. HOWARD, formerly Assistant Surgeon U. S. A., now in England, has brought to the notice of Earl Grey his improved ambulance lately used in our army, which has received the approval of the highest officials of the English War Department.

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.

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

Contents:

(Illustrations are indicated by an asterisk.)

*Flaut's Self-setting Trap.....	15	Telegraphing in Bad Weather..	20
Cuban Machine Agency.....	15	Cartridges in Cold Weather..	21
J. A. Miller's Drying Kiln.....	15	Why Coal-mining Machines	21
One-horse Mowing Machine.....	15	are not Used.....	21
Unparalleled Success.....	15	Trials of a Patente.....	21
The Great Improvements of the	15	More than Satisfied.....	21
Past Nine Years.....	15	Russia.....	21
The Best Way to Make Brass	15	A New Blow-pipe.....	21
Recent American Patents.....	17	Great Profits from Chemical	21
Manufacturing Items.....	17	Refuse.....	21
Tubes.....	18	*Jones's Railroad Chair.....	22
*Broughton's Gage Cock.....	18	*Van Anden's American Mower	22
Another Pneumatic Railway in	18	A New Developer for Photo-	22
London.....	18	graphic Negatives.....	22
Farmers' Club.....	19	The Lost Arts.....	23
A Singular Statement.....	19	Action of Fluxes.....	23
Notes and Queries.....	20	Special Notices.....	23
Tempering Mill Picks.....	20	Market for the Month.....	23
Proportion of the Weight to the	20	Patent Claims.....	24, 25, 26, 27
Wings of Birds.....	20	*Chapman's Self-feeding	24
A Leaden Ball Sustained by a	20	Ratchet Wheel.....	30
Steam Jet.....	20	*Tarbox's Double-faced S'ad	30
Corrosion of Electro-plated	20	Iron.....	30
Articles.....	20		

VOL. XIII. NO. 2...[NEW SERIES.]...Twentieth Year.

NEW YORK, SATURDAY, JULY 8, 1865.

THE LOST ARTS.

Because certain moldy and ill-smelling mummies have been resurrected from the Pyramids of Egypt and found covered with fine linen—because the tombs wherein they have lain for centuries are covered with caricatures of beasts, birds and fishes—because uncouth and ungainly ornaments of gold are found deposited in such tombs—divers persons wander off into extravagant praises of the lost arts, of the subtle and ingenious artisans who lived thousands of years ago, ignoring the wonders of to-day and the skill of their own countrymen.

If the mummies be an evidence of the taste of the ancients, the less said the better. Ugly in their lives, embalmed they are not improved, and the scarabeus or beetle with which persons of high rank were ornamented is suggestive of another more unpleasant insect quite familiar to housekeepers. Even the pyramids from whence these musty relics of the past are exhumed, might have been built in half the time by modern artificers, with brown stone fronts, if desirable, and slated with alternate rows of purple and green tiles. What a waste of Egyptian time and money they represent!

So also with that Sphinx which glowers at Ethiopia from its seat in the sand, as if suffering from the recollection of some overpowering wrong. If it be a lost art to construct such hideous monstrosities as these, let us congratulate ourselves that the world has grown wiser and better with the lapse of centuries.

Herculaneum and Pompeii, unearthed from the ashes of Vesuvius, show little or no trace of the arts which have been lost. A few bronze lamps of uncouth shapes, some pottery remarkable for its curious decoration, some tiles and frescoes of unquestionable character and tendency—these are some relics of the state of the arts among that people at the time they were overwhelmed.

In Morocco and in Spain, ruins tumbling into decay, courts wherein fountains tinkled through the night atmosphere heavy with the scents of orange grooves, tessellated pavements, and columns fretted with intricate designs, are the only signs, the only evidence to build on that the arts ever existed. Arts, not in the sense of gingerbread finery and gilding, but arts by which whole villages earned bread for their families in the sweat of their faces.

In Egypt at this day—land of the pyramids, of the ruined cities, of the crypts wherein musty princes molder into powder—the wretched native cracks his wheat in a stone mortar, or, worse, in a rag bruised between two stones. In Italy and in Imperial Rome—famous, in centuries long since transpired, for all that wealth could procure—the beggars chatter impor-

tunately at every step, and the fields are as barren and infertile as they were hundreds of years ago.

It is not on the wide Campagna that the modern reaper or a Yankee mower gets an opportunity to exhibit its qualities. It is not on the slopes at the foot of the Alps that the soil is turned up to the sun by cultivators and corn plows. No! mechanism is tabooed! The arts have no chance, and the way of centuries is the way of to-day.

Though the existence of oil lakes was known to the ancients, no use was made of them. Fish oil gave forth its feeble glimmer in their lamps for years, and the solar radiance of kerosene was strange to domestic circles. In like manner the want of knowledge of natural products, of the infinite combinations they are capable of, of the use they may be put to, were almost unknown to the ancients—utterly so, compared to the knowledge of the present day.

There was, indeed, no lack of sensuous decoration for palaces, there was no want of stimulants, no absence of anything that appealed to the grosser nature of man in those ancient days, but the artisans were familiar with only the rudest of mechanical contrivances.

No hundred thousand spindles whirled in cotton factories from morning till night, no engines moved swiftly and noiselessly, no railroads clasped the land in their embrace. The earth bore in its bosom then, as now, copper and iron, but for want of artisans, for want of the skill and cunning to work it, little benefit accrued to the possessors thereof. Brass could be put to no better use than making a huge image to straddle the strait at Rhodes.

In the ancient days lived Praxelites, Phidias and Apelles, sculptors of rare talent, who cut from the silent marble statues that seemed instinct with life; but these, however they may have appealed to the taste of men at that time, never helped the poor to a decent living, put no garments on the naked, nor built up towns and cities as does the machinery of to-day.

For all that cultivates society, for all that tends to make mankind refined, intellectual and human, we have the fullest respect and appreciation, but we despise that affectation which accords to barbarians, or nations semi-civilized, more culture, more genius and more mechanical skill than we possess at the present time. The world moves forward, not backward, and the generations of to-day are wiser than those which are not, ever were. The arts, in a generic sense, are not those delicate refinements of painting and music by which, white-handed and gifted sons of genius get a living, but they are those stern, hard realities in life which, by the practice of them, turns the intractable iron stone into ductile metal, which level the fens, which turn the wilderness into cities, which open up lands unknown to the pent-up thousands of old countries.

These are the arts and this is the period in which they flourish.

ACTION OF FLUXES.

A flux is a substance which will dissolve a metallic oxide, and will not dissolve the simple metal. Fluxes are employed in two operations.

If a quantity of shot and salt be mixed together in a bowl, the shot will remain scattered through the mixture separate from each other, but if the salt is dissolved by the addition of a sufficient quantity of water, the shot will all collect together at the bottom of the bowl. In the same way, when iron is reduced from the ore in a smelting furnace, it is in small globules or masses, that are held separate from each other and supported by a mass of silica and other infusible substances, which were mingled with the ore. If we bring lime in contact with the silica, the two combine together and become glass, which is melted by the heat of the furnace, and thus allows the small masses of molten iron to sink down through it to the bottom of the furnace. This is the use of a flux in reducing metals.

The other operation in which fluxes are employed is the welding or joining of two metals, or two pieces of metal, together. In this case the flux is employed to dissolve the thin coating of oxide from the surface of one or both metals, in order that they may come into actual contact. Iron has a very strong affinity for oxygen, especially at high temperatures. If two pieces of iron are heated for welding, as they are taken from the fire into the atmosphere, they imme-

diately become coated with a thin film of oxide of iron, which prevents them from welding together; but if a little borax is sprinkled over the ends to be joined, it dissolves this film of oxide, which in the liquid state is squeezed out under the action of the hammer, and the surfaces of pure metal are brought in contact.

This article was suggested by the process of tinning copper sheets which was witnessed at John Trageser's Steam Copper Works, at No. 60 Greene street, in this city. A sheet of copper was first pickled for about two hours in a bath of dilute sulphuric acid, and was then placed on the level surface of a mass of brickwork, in the middle of which was a neat little charcoal fire. The workman pushed the sheet over the fire, and then placed upon its upper surface a small plate of block tin, which was soon melted. As the tin was about to melt, the workman dusted the surface of the copper with sal ammoniac, to remove any film of oxide of copper either remaining from the action of the pickle, or which might have formed after the sheet was taken from the bath.

In none of the cases does the flux act to melt the metal at any lower temperature, or to render it more fluid, but it permits the metal to flow more freely by removing obstructions from its path.

SPECIAL NOTICES.

Elijah Whiten, of Hingham, Mass., has petitioned for the extension of a patent granted to him on the 30th of September, 1851, for an improvement in sawing volutes.

Parties wishing to oppose the above extension must appear and show cause on the 11th day of September next, at 12 o'clock, M., when the petition will be heard.

Jacob Sendeff of Philadelphia, Pa., has petitioned for the extension of a patent granted to him on the 13th of January, 1852, for an improvement in metallic heddles.

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

Robert Marcher, West Farms, N. Y., has petitioned for the extension of a patent granted to him on the 21st day of October, 1851, and reissued March 15, 1859, for an improvement in machinery for enameling moldings, etc.

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

Mary Manny, executrix of the estate of John H. Manny, deceased, of Rockford, Ill., has petitioned for the extension of a patent granted to him on the 23d of September, 1851, and reissued on the 22d of December, 1854, for an improvement in harvesters. (Five cases.)

Parties wishing to oppose the above extensions must appear and show cause on the 23d of September next, at 12 o'clock, M., when the petition will be heard.

MARKET FOR THE MONTH.

The fluctuations in gold and other values during the last month have been less than usual, and less than can be generally expected, so long as our currency remains in its present inflated condition. The dry-goods trade has been active, and stocks are sold out more closely perhaps than ever before. It will be seen by the annexed list that prices of staples were pretty near the same at the beginning and end of June:

	Price May 31.	Price June 28.
Coal (Anth.) 2,000 lb.....	\$9 00	\$8 50 @10 00
Coffee (Java) 100 lb.....	33 @ 36	24 @ 25
Copper (Am. Ingot) 100 lb.....	30	29 @ 30
Cotton (middling) 100 lb.....	51	50
Flour (State) 100 bbl.....	\$5 85 @ 6 05	\$5 20 @ 6 15
Wheat 100 bush.....	1 90 @ 2 20	1 70 @ 2 15
Hay 100 lb.....	1 00	1 00
Hemp (Am. dres'd) 100 lb.....	260 00 @270 00	260 00 @270 00
Hides (city slaughter) 100 lb.....	8 @ 9 1/2	7 1/2 @ 9
India-rubber 100 lb.....	46 @ 75	47 @ 70
Lead (Am.) 100 lb.....	8 25 @ 8 50	9 75 @10 00
Nails 100 lb.....	5 50 @ 5 75	5 00 @ 5 25
Petroleum (crude) 100 gal.....	35 1/2 @ 36	35 1/2
Beef (mess) 100 bbl.....	\$10 00 @18 00	10 00 @16 00
Saltpeter 100 lb.....	25	24
Sugar (Am. cast) 100 lb.....	21 @ 22	13 @ 22
Sugar (brown) 100 lb.....	9 1/2 @ 15	9 1/2 @ 15 1/2
Wool (American Saxony fleece)		
100 lb.....	75 @ 77	75 @ 77
Zinc 100 lb.....	12 @ 12 1/2	12 @ 12 1/2
Gold.....	1 37	1 39
Interest (loans on call).....	6 @ 7	4 @ 5



Patent Claims
ISSUED FROM THE UNITED STATES PATENT-OFFICE
FOR THE WEEK ENDING JUNE 27, 1865.
Reported Officially for the Scientific American.

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

48,353.—Stop Washer for Nuts.—H. N. Armstrong, Erie, Pa.:

I claim cutting the edges of the fixed washer and turning up the corners thus formed to hold the nut from being forced back on its thread.

48,354.—Device for Removing Lamp Chimneys.—Geo. Asmus, Houghton, Mich.:

I claim as a new article of manufacture, a lamp chimney holder, made substantially as herein described.

This invention relates to a very useful and novel chimney holder, or lamps, with which the chimney can be readily removed from the lamp when in a heated state, without burning the fingers.

48,355.—Furnace for Boiling Iron.—Christopher D. Baker, Wheeling, West Va.:

I claim, first, placing the iron chamber in the described position relatively to the exit flue for the purpose described.

Second, I claim shelving upwardly the margin of the floor of the chamber in the manner and for the purpose set forth.

Third, I claim shelving outwardly the "chill," or wall of the iron chamber for the purpose described.

Fourth, I claim making the throat or regulating point at the entrance of the neck, so as to limit the reverberation to the chamber itself.

Fifth, I claim making the lower end of the stack flue inclined, and as such leading towards the flue which connects to the iron chamber, so as to favor the discharge of detritus collecting in the flues, into the said chamber.

[This invention consists in an improved construction of the chill or iron bed, in a peculiar method of locating the chimney aperture relatively to the iron chamber and in an improved structure of exit flue. The improvements insure the more economical working of the iron both in respect to coal saved and in the actual effective influence on the iron itself.]

48,356.—Clasp for Holding Neckties and Shirt Collars together.—Wm. S. Barnes, Watertown, N. Y.:

I claim as a new article of manufacture a clasp for holding the necktie in place on the collar, substantially as described.

[This invention consists in the production of a neat little device, made of gold, silver, or other metal or material, intended for holding a gentleman's or lady's necktie or scarf in proper place on the collar, and it serves as a new article of ornament for both ladies and gentlemen.]

48,357.—Hat.—John P. Beatty, Norwalk, Conn.:

I claim as a new article of manufacture, a hat composed chiefly of straw, and provided with a supplementary brim of enameled paper, made and applied as and for the purposes herein specified.

[This invention consists in the application to the brim of a hat of a supplementary brim of a peculiar character, whereby it is strengthened and made more durable, and also improved in appearance.]

48,358.—Cultivator.—John T. Bever, Bethel, Ill.:

First, I claim the lever handles, H, containing uprights, d d, with cross bars, X X, made in solid framing to vibrate upon pivot, P, in combination with beam or tongue, A, and clevis, N.

Second, I also claim the arrangement of the elevating clevis, N, clevis guide, o, clevis or notches, r r, and corresponding notches, s s, as and for the purposes herein specified.

48,359.—Paper Collar.—G. F. Brigelow, Chicago, Ill.:

I claim a turn-down paper collar, made from two or more pieces, one or both of which are made of enameled card board or any other material, substantially the same for the purpose, constructed and operating substantially as described.

48,360.—Device for Converting Motion.—F. Brewer, Collinsville, Ill.:

I claim the employment or use of a toothed segment gearing into a stationary toothed rack, in combination with the piston rod of an engine or other equivalent part, and with the pitman shaft to which a rotary motion is to be imparted, all constructed and operating substantially as and for the purpose set forth.

48,361.—Apparatus for Tanning.—O. H. Brewer, Shannon, Ill., and Wm. Wimer, Freeport, Ill.:

We claim the herein-described apparatus, consisting of the vat, A, chamber, B, pipes, E G H, and valve, F, when these several parts are combined, arranged and operated as and for the purpose herein specified.

48,362.—Rotary Steam Engine.—Harrison T. Briggs, South Bend, Ind.:

I claim the arrangement of the ingress and egress pipes, L M N O, with reference to the valves, I K, and the adjustable partition, D, and central wheel, G, substantially as herein set forth.

48,363.—Binding Attachment to Harvesters.—Robert D. Brown, Covington, Ind.:

First, I claim the baiting board, I, operated as described, for cutting up that end of the sheaf.

Second, The cradle, constructed and operated as described, that is to say, consisting of the stationary part, J, and the double blinged movable part, K, which is raised by means of the cam, K, and jointed side, L M N, substantially as described.

Third, The arrangement of the spring or springs, J', on the inside of the cradle, for the purpose of adjusting its capacity to varying sizes of sheaves, when said spring is employed for opening the said cradle, substantially as described.

Fourth, The combination of the non-rotating gripping fingers, P P, and the rotating gripping jaws, Q O, whereby one end of the band is twisted around the other in the manner described.

Fifth, The combination of the sliding mandrel, t, and head, R, with the rotary sleeve, Q, furnished respectively with the toothed gripping fingers, r P, and gripping jaws, Q O, which, by the protrusion or withdrawal of the mandrel are caused to open and shut in the manner described.

Sixth, The method described of producing the intermittent revolution of the sleeve; that is to say, I claim the combination of the wheel, V, with its pin, v, and the wheel, Y, with its teeth, y, and the sleeve pinion, A, which secures one complete revolution of the sleeve, s, to a revolution of the wheel, V, but periodically and then at a speed commensurate with the delay due to its intermittent functions.

Seventh, I claim the combination of the pivoted post, a, carrying the pins, d d, or analogous holding devices with the pinion sleeve, e b, carrying a tucking hand, c, so that after advancing to the point where the tuck is to be made, the said sleeve shall be rotated by a

rack or other device, which is brought to engage therewith, and the hand caused to push the twist or knot under the hand.

Eighth, Pushing the knot under the hand by means of a device, which is independent of the shear-holding and twisting devices, and which is advanced for that purpose, in connection with a holder, without rotating until it reaches the desired point, when it is caused to rotate to push the knot under the hand, while the latter is restrained by the holder from lateral displacement.

48,364.—Attaching Trace to Whiffletree.—Ezra Calderwood, Portland, Maine:

I claim the sliding bars, B B, provided with the pendent lips, e' e', to receive pins or rods, a a, at the ends of the whiffletree, in connection with the sliding slotted plate, C, operated by a lever, E, all being arranged and applied substantially in the manner as and for the purpose specified.

[The object of this invention is to obtain a means for attaching traces to whiffletrees, whereby the horse, in case of necessity, as for instance in running away, may be instantly disconnected, and many accidents, which now occur from that and similar causes, be avoided.]

48,365.—Method of Treating Tan-bark.—James M. Callier, Salem, Mass.:

I claim the process hereinbefore described of producing a solid extract from tan-bark, by steam ng, leaching, and subsequent evaporation in vacuo.

[The object of this invention is to assist the tanning of skins of all kinds by facilitating the production of tanning compounds from the various barks commonly employed for tanning purposes. The extract of tannin is first made from the bark, and then evaporated by means of a vacuum apparatus, so as to produce a solid product of tannin. Tanning liquids of any desired strength are made by dissolving the product in water. This process avoids the oxidation of the tannin, and is said to produce a solid extract of much value.]

48,366.—Tremolo Attachment.—R. W. Carpenter, New York City:

I claim the application of means to the instrument, by which the air may be agitated to produce a tremulous note, substantially as described.

48,367.—Process for Distilling Petroleum.—Robert A. Chesebrough, New York City:

I claim the combination of bone dust, pulverized oyster shells and cotton cloth, for purifying, filtering and deodorizing petroleum, naphtha and heavy oil, as herein described.

48,368.—Boot and Shoe.—Edwin Chesterman, Roxbury, Mass.:

I claim a boot or shoe made as herein described as a new article of manufacture.

[The object of this invention is to produce a boot or shoe which has all the advantages of india-rubber and leather combined without the objections of either. It is strong, firm, durable, impervious to water, and perfectly dry.]

48,369.—Cloth-guide for Sewing Machine.—Geo. F. Clemons, Springfield, Mass.:

I claim the spring, E, or its equivalent, when applied to a sewing machine, substantially in the manner and for the purpose described.

48,370.—Anchor.—Geo. Coffin, Jamaica Plains, Mass.:

First, I claim the form of the anchor stock herein described, consisting in making its end of a hook shape, with inclined or rounding sides, and with flanged or inclined side edges, either when combined together in one and the same stock, or when used separately, substantially as and for the purposes specified.

Second, Making the end of the shank to which the stock of the anchor is secured, in a forked shape, fastened to and within the stock by means of pins or their equivalents, substantially as described and for the purpose specified.

Third, Hanging the shackle ring to which the anchor is hung to and within the stock of the anchor, by means of a connecting band, arranged and operating as described and for the purpose set forth.

[This invention relates to a novel formation of the anchor stock, and in the mode of connecting it with the shank, whereby many important advantages are obtained, and the efficiency of the anchor much increased.]

48,371.—Arrow Projectile for Ordnance.—Wm. Cousins, New York City:

I claim the combination of the elongated projectile, D E F, and guides, B C, constructed and operating in the manner and for the purpose specified.

[This invention consists in a new projectile, formed of a blade or cutter connected to a ball, whose diameter should be equal to the bore of the ordnance from which it is to be fired, and which is caused to move in a plane level throughout its whole flight.]

48,372.—Artificial South Coal.—Richard Covert, Brooklyn, N. Y.:

I claim as a new article of manufacture the artificial lump coal, consisting of coal dust, gas, tar, pitch or artificial asphaltum, and dead or heavy oil mixed by heat and stirring, and aggregated by pressure, as hereinbefore described.

48,373.—Carriage Knob.—R. P. Cowles, New Haven, Conn.:

I claim the herein-described knob as a new article of manufacture.

48,374.—Pen and Pencil Case.—F. W. Cox, Brooklyn, N. Y.:

First, I claim extending the longitudinally revolving revolving pencil tube, b, throughout the entire length of the case, A, substantially as described, so that long leads can be inserted, and at the same time the tip can be fetched in.

Second, The circular groove, s, in the tube, b, in combination with the pin, j, substantially as herein set forth, so that sufficient hold for the said pin is obtained without the necessity of a cap over the tube, e, and at the same time the pencil tube, b, is prevented from moving in a longitudinal direction.

Third, The collar, o, applied in combination with the tube, f, and shell, h, substantially as and for the purpose specified.

Fourth, The reserve lead chamber, p, extending partially or wholly around the tube, b, and from end to end of the shell, h, as shown and described.

[The object of this invention is to produce a pencil case which is capable of carrying a long lead, and to fetch the point in, and which is provided with a case to carry some reserve leads of the full length, provided the pencil case is not used in combination with a pen. When the pen is applied the reserve lead case is arranged by the same and cannot be used for carrying lead.]

48,375.—Washing Machine.—John Danner, Canton, Ohio:

I claim a roll or cylinder for washing machines, the perimeter of which is covered with india-rubber rings, so as to make a washing or rubbing surface, substantially as herein described and represented.

48,376.—Saw.—Alfred Dawes, Waltham, Mass.:

I claim attaching a saw blade to and within its frame by means of the screw shafts, i and g, handles, l, and thumb nuts, n, or their equivalents, arranged and operating together substantially as herein described and for the purposes specified.

[This invention consists in attaching a saw blade to its frame in such a manner that it can be turned in any direction desired, and tightened or loosened at pleasure.]

48,377.—Bung for Barrels and Other Vessels.—Austin G. Day, Seymour, Conn.:

I claim providing in the bung or stopper or other part of a cask or other vessel for the transportation or storage of petroleum or other liquids in which vapors or gases are naturally generated a valve which operates automatically, substantially as and for the purpose herein described.

48,378.—Deep Well Pump.—Nehemiah Dodge, New York City:

I claim the slip joint of the lower part of the barrel, in combina-

tion with a hollow piston rod, made in the manner and for the purposes herein described.

Second, I also claim the making of the contact part of the valve and valve seat of the section of a sphere, in combination with the cylindrical concave of the under surface of said valve, substantially in the manner and for the purposes set forth.

Third, I also claim, in combination with said valve, hinge pin, substantially in the manner and for the purpose set forth, so that the bearing of the pin against the cylindrical concave of the pump shall hold it firmly in its place.

48,379.—Hydro-Carbon Burner for Cooking and Heating.—H. W. Dopp, Buffalo, N. Y.:

I claim needle point A', in combination with spindle, A2, perforated plate, C, crank pin, sliding block and slot, substantially as shown and described.

Second, I claim the commingling tube, C, in combination with perforated plate, C, arranged and operating substantially in the manner described.

Third, I claim the mode of connecting the retort, B, with reservoir, E, for the purpose described.

Fourth, I claim the application of reservoir, E, for the collection of the residue of hydro-carbon liquids.

Fifth, I claim the use of water or other liquid of suitable specific gravity for the purpose described, but only in connection with hydro-carbon stoves for cooking and heating purposes.

Sixth, I claim the safety valve, i, for the purpose set forth.

Seventh, I claim the draw-off faucet, g2, in combination with reservoir, E, for the purpose herein set forth.

Eighth, I claim supplying vapor to two or more acro-vapor burners by a generating apparatus.

Ninth, I claim the retort, B, and feed tube, F, when constructed as and for the purpose set forth.

Tenth, I claim the use of a pipe or tube in connection with a chimney or other apertures for the removal of noxious gases obtained from hydro-carbon liquid, the pendent of combustion, as described and set forth.

48,380.—Sad Iron Heater.—H. W. Dopp, Buffalo, N. Y.:

I claim the acro gas burner, B and B', as constructed and for the purpose described.

I claim the regulating screw, A1, in combination with commingling tube, B1, substantially as and for the purpose described.

I claim the s o., or its equivalent, in the upper part of said iron, for the purpose set forth.

48,381.—Wagon.—James Dowd, Boston, Mass.:

I claim the combination of the oil-holding channel, f, with the tubular pivot, d, and step, e, applied to the rocker plates, and the transom bolt, as specified.

Also the combination of the slider, L, with the spring and wagon, body or truck, in manner and so as to operate substantially as described.

Also the combination and arrangement of the auxiliary or tie bars, c c, with the truck, F, and the springs, H H; and their sliders I I, applied thereto substantially as explained.

48,382.—Mode of Reclaiming Marsh and Swamp.—Spencer B. Driggs, New York City:

I claim the construction of a wall impervious to water for the reclamation of swamp or marsh lands on the shores or banks of the sea, bays, lakes, rivers, creeks, or other waters, by the insertion into ground, at a suitable distance from the margin of the shore or bank, of a series of iron plates, with water-tight joints, extending to a suitable height above the surface of the ground to shut out the ordinary tidal or other flood, substantially as herein specified.

48,383.—Nut Machine.—George Dunham, Unionville, Conn.:

I claim the sliding plate, o, operated by the plate, d, with its inclined edges, for razing the width of the bar just before the blank is cut therefrom, substantially as described.

Second, I claim the combination of the conical shape recess, Q, with the spring or yielding table, P, substantially as and for the purpose described.

Third, I claim the employment of the lifting holders, S S', substantially in the manner and for the purpose described.

Fourth, I claim the clearer bar, a, for holding, clearing and carrying the nut from one point to another, substantially as described.

I claim forming a screw upon the upper end of the punch, k, in combination with the threaded socket, l, substantially as described.

48,384.—Hat.—Robert Dunlap, New York City:

As a new article of manufacture, I claim a head covering with its side made of two thicknesses of woven or knitted material, formed upon a block and cemented to ether with gutta percha or india rubber by the aid of wet heat, as herein specified.

[This invention consists in a novel construction of hats and caps wherein the crown of a hat and the body of a cap are severally made of an outer cloth and an inner cloth, united together after they are formed by means of gutta percha or its equivalent.]

48,385.—Manufacture of Printers' Ink.—George Duryee, New York City:

First, The improved ink prepared of the materials and in the manner substantially as herein set forth and described.

Second, I claim as a basis for the manufacture o, various kinds of printers' ink the material derived from the residue of petroleum, and herein designated as petroleline wax, the same to be used substantially as set forth.

48,386.—Carriage Top.—Joseph Enders, Louisville, Ky.:

First, The pillars, E, and open rings, F, or their equivalents, formed by the rear ends of the rail, B, in combination with braces, I, lazy back, D, and top, C, constructed and operating substantially as and for the purpose set forth.

Second, The hooks, d, and catches, e, in combination with the rail, B, and straps, J, secured to the seat, A, substantially as and for the purpose specified.

[An engraving and description of this invention has been published on page , Vol. XII, New Series, SCIENTIFIC AMERICAN.]

48,387.—Plow.—Valentine Felkner, Cannel, Me.:

I claim elbow, C, upright, D, and lever elbow, b, combined and arranged to operate substantially as and for the purpose set forth.

I further claim rod, G, lever, H, truck, g, and adjustable collar, j, when arranged and combined to operate substantially as described, whereby the depth of the furrow is not only controlled but the direction of movement of the truck, g, always corresponds to the line of draft.

I further claim the arrangement of the plow holder, as constructed of parts, C D B and b, attached to plow, A, with plow governor, G H g and j, operating as described and for the purposes set forth.

I also claim the combination of two plows in one gang, when combined and arranged to operate substantially as and for the purposes specified.

48,388.—Boring Artesian Wells.—W. A. Fisher, Lower Merion, Pa.:

I claim, first, The drill, B, composed of two or more detachable sections, each having a cutting edge, and the whole being arranged and secured together by the within described devices, or their equivalents, substantially as and for the purposes specified.

Second, A drill, with a central straight cutting edge, x, and a curved cutting edge, y, at each side of the same, arranged in respect to each other as described.

Third, The tube, D, combined with the casing, A, drill, B, and its valve, substantially as and for the purpose specified.

Fourth, The case, A, its cross piece, F, and drill, B, in combination with the sliding rod, F, and its plate, h, all being arranged and operating substantially as and for the purpose described.

48,389.—Postage and Revenue Stamp.—Samuel Ward Francis, New York City:

I claim incorporating with or applying on to stamps, either before or partially before and partially after being used, ingredients such as will chemically combine to produce a dark color or stain under the action of moisture, substantially as and for the purpose set forth.

48,390.—Puddling Furnaces.—William and John Groves, Providence, R. I.:

We claim the employment or use of fire chambers on opposite sides of the body of the furnace, substantially as specified.

48,391.—Apparatus for Carbureting Air.—Frederick Hainsworth, Chicago, Ill.:

First, I claim the combination and arrangement of the regulating cock, M, provided with a diagonal series of perforations, c, with the dial and pointer, as and for the purposes herein specified and shown.

Second, I claim the peculiar arrangement of the vertical porous partitions, B, with the ducts, b, leading from the pipe, C, operating as specified and described.

Third, I claim, in combination with the carburetor, A, the employment of the fan, H, and regulating cock, M, with the dial and pointer, arranged and operating as described.

48,392.—Broom Head.—Caleb C. Hand, Cincinnati, Ohio:
I claim the parts, A B E F G H J and K, in the described combination, for the purpose set forth.

48,393.—Sleeping Car.—Charles Thompson Harvey, New York City:
I claim, First, The adjustable standards, D, whether solid or hollow, either surrounded by, or, if hollow, inclosing within, spiral or other form of springs, combined with the berth of a sleeping car, in the manner and for the purpose herein set forth.

Second, The combination of the air tube, G, tube, h, flexible tubes, H, and air valves, I, when used in connection with the berth of a sleeping car, for the purposes of ventilation, in the manner and for the purposes herein described.

Third, I also claim suspending and nesting the berths upon the upper sockets, or upon the parts which constitute the upper portions of the standard of the berths when the berths are out of use, substantially as described.

Fourth, I also claim supporting the berths upon adjustable elastic bearings, when in use as shown at D, in Fig. 2, substantially as described.

Fifth, I also claim preventing and controlling violent oscillations and noise from the movements of the berths on their standards and sockets by means of elastic diaphragms or rings, when combined with the bottom of the berth, substantially as described.

Sixth, I also claim applying elastic curtains to adjacent berths, so that the same will yield and conform to the motion of the supporting springs thereof, so as to isolate the berths from the common passage-way and from each other, substantially as described.

48,394.—Gold Beating Machine.—Matthew Hastings, Philadelphia, Pa.:
I claim, First, The employment for beating gold of a vertically-guided hammer, which is raised and permitted to fall with uniform force by the mechanism herein described, or the equivalent to the same.

Second, The shaft, K, with its arms, L, the rock frame, H, and cam, P, the whole being arranged for joint action on the rod, F, substantially as and for the purpose herein set forth.

48,395.—Machine for Cutting Paper into Sheets.—Jonathan Hatch, South Windham, Conn.:
I claim the crank, L, slotted lever, E, slide, D, band, C, clutch, A3, pulley, A4, lever, H, and cam, F, in combination with each other and with the feed rolls of a paper-cutting machine, substantially as and for the purpose herein specified.

48,396.—Manufacture of Malt Sirup.—Thomas Hawks Rochester, N. Y.:
I claim the method and process of producing a sirup of sugar from malt and meal of Indian corn, substantially as herein described.

I also claim as a new product a sirup of sugar produced from malt and the meal of Indian corn, without any separation of the fecula thereof, substantially as herein set forth.

48,397.—Sorghum Evaporator.—Samuel Heaton, Kingston, Iowa:
I claim, First, The levers, E E, constructed in the manner and for the purposes specified, substantially as set forth.

Second, The cross bar, D, constructed in the manner and for the purposes specified, substantially as described.

Third, The swinging hooks, G, constructed in the manner and for the purposes specified, substantially as described.

Fourth, In combination with an evaporator, the levers, E E, the cross bars, D, and the hooks, G, constructed and operated substantially as and for the purposes herein specified.

48,398.—Composition for Lining Barrels.—Ludwig Heid, Harlem, N. Y.:
I claim, First, The within described composition when the same is applied in combination with carbonate of lime, substantially as and for the purpose set forth.

Second, The within described composition when applied in combination with carbonate of lime and graphite brown spar, copperas, or other material containing iron particularly as a lining for barrels or other vessel.

48,399.—Fruit Jar.—Robert Homingray, Cincinnati, Ohio:
I claim the peculiar form of the neck of the jar from the spiral shoulders gradually contracting to the top, as herein shown and described.

48,400.—Railroad Frog.—Gibbons G. Hickman, Downingtown, Penn.:
I claim the rail, B, applied and secured in such a manner as to be caused to assume its normal position by the influence of gravity after it has been moved by the wheels of a passing train and also adapted to be retained in position by the pressure of the wheels when the latter are running upon it, substantially as herein described and represented.

48,401.—Pump.—Benjamin S. Hill, New York City:
I claim, First, The cylinder having openings, f, f, combined with the piston, P, and arranged in relation to the discharge pipe, H, substantially as and for the purpose herein specified.

Second, The combination of the discharge pipe, H, with the piston by means of the cap, G, of the cylinder, C, and the pipe, F, the latter pipe serving also as a means of securing the cap, G, tightly to the cylinder, C, and of forcing an air-tight chamber, e, within the said cylinder, all substantially as herein specified.

Third, The combination and arrangement of the piston, P, cylinder, C, chamber, E, and discharge pipe, H, substantially as herein specified.

48,402.—Washing Machine.—W. R. Hill, Detroit, Mich.:
I claim the lower disk, fastened and constructed as described, and acting as a washboard and a filter.

Second, The combination of the central part, stepped into the stud as described, and having the two shoulders which act respectively upon the washboard disk and the rubber disk, to maintain them in their relative positions.

[This invention relates to a washing apparatus of very simple construction, which is adapted to be placed within a common tub of any size, therein to perform its work.]

48,403.—Straw Cutter.—Edward F. Holloway, Kngstown, Ind.:
I claim the combination and arrangement of the knife, F, shaft, C, coiled spring, S, collar, I, metal iron, B, box, A, fly wheel, G, and guard, P, substantially as shown and described.

48,404.—Ambulance.—Benjamin Howard, New York City:
I claim the combination of transverse seats and sliding litters or beds resting on a frame placed within the body of the vehicle, supported and balanced by counterpoise springs within the body of the vehicle. This, I claim, together with the compartment for the beds beneath the main floor of the body of the vehicle, in which the litters or beds may be placed for convenience, when not in use, as in the manner described above.

48,405.—Beverage.—A. C. Howell, Vienna, N. J.:
I claim the drink composed of the material and prepared in the manner substantially as herein described.

48,406.—Extracting Turpentine and other Products from Resinous Wood.—Duane Hull, Newburgh, N. Y.:
I claim the distillation of pine or other resinous wood for the purpose of obtaining spirits of turpentine or other products, under reduced pressure, or pressure less than the atmosphere, substantially as herein set forth and described.

48,407.—Self-closing Cock.—Nathaniel Jenkins, Boston, Mass.:
I claim, First, The screw follower, H, in combination with the valve of a self-closing faucet, substantially as set forth and for the purpose described.

Second, The combination of the swivel, P, screw follower, H, valve, K, and spring, O, substantially as and for the purpose described.

48,408.—Electro-phonetic Telegraph.—Royal E. House, Binghamton, N. Y. Patented in England July 21, 1864:
First, I claim in combination a magnetized needle or helix, and an adjustable torsion suspension apparatus existing both above and

below the needle the combination being substantially such as is described.

Second, The combination with a magnetized needle suspended by torsion wire or thread, I claim limiters for limiting its motion and which give sounds when struck by the needle, the combination being substantially such as described, and in combination with these a gong or bell, substantially as specified.

Third, I claim in combination with a torsion suspended magnetized needle a knife edge applied to the needle and acting substantially as set forth, and also in combination with a magnetized needle, a knife edge and limiters, arranged with reference to the needle, substantially as described.

Fourth, I claim a suspension torsion apparatus consisting of wires or threads attached to collars or rings as described in combination with a magnetized needle supported in the collars, substantially as described, and also a magnetized needle in combination with a torsion suspension apparatus both ends of which can be adjusted as set forth and also a magnetized needle, in combination with a torsion suspension apparatus both ends of which can be adjusted at once by reason of being geared together, both these combinations being substantially as set forth, and also in combination with a magnetized needle an adjustable torsion suspension apparatus extending both above and below the needle and having one thread or wire attached to a weight, substantially as described so as to compensate for the varying length of the wire.

Fifth, I claim a magnetized needle in combination with limiters, and a gong or bell and concentrating cone and in combination with these an outer cone all these parts being substantially such as set forth; and also a sounding apparatus consisting of a bell and a trunked concentric cone arranged with reference to each other as described and in combination with such an apparatus an outer concentrating cone arranged with reference to a ball and interior cone, as described.

Sixth, I claim sections of a helix composed of members connected to and insulated from each other, substantially as set forth.

Seventh, I claim a helix made up of sections of varying diameter insulated from each other as described.

Eighth, I claim a helix made up of sections connected to and insulated from each other as set forth.

Ninth, I claim a helix made up of sections composed of members when both the members and the sections are connected to and insulated from each other, substantially as set forth.

Tenth, I claim a helix made of decreasing area to the ends as described, and also a divided helix or helix made in two parts, so that one part may readily be moved away from the other and also a divided helix in combination with a divided case, all substantially as specified.

Eleventh, I claim apparatus substantially such as is described for registering the power or force of reaction in combination with a telegraph line and a signalizer whereby the locality of excessive leakage may be determined as described.

Twelfth, I claim a helix making part of a signalizer in combination with branch lines, and ends of a main line capable of being advanced toward and drawn away from each other, the combination being as described.

Thirteenth, I claim a helix making part of a signalizer in combination with branch lines and ends of a main line capable of being operated as described and with tubes containing liquid as described whereby varying amounts of currents of electricity may be caused to pass through a helix, substantially in the manner and for the purposes specified.

Fourteenth, I claim in combination a helix making part of a signalizer, branch lines or conducting wire, an electric adjuster located between the points where the branch wires are connected to the main wire, and a key or circuit breaker also located between the points where the branch wires are connected to the main line and operating when open to send the whole current through the helix.

Fifteenth, I claim a helix making part of a signalizer and united to a main line by branch lines or wires, substantially as described in combination with an electric adjuster in connection with or making part of a main line and located between the points where the branch lines are connected with the main line as described whereby the relative proportions of electricity passing through the adjuster and the helix may be governed and regulated as described.

Sixteenth, I claim a helix of a signalizer in combination with a line by means of a tube an adjustable severed wire as described when the wire is provided with a register or index as set forth whereby the condition of a helix or of the batteries that work the line may be tested in the manner specified.

Seventeenth, I claim an apparatus substantially such as is described whereby the apparatus for adjusting torsion, and the apparatus for adjusting the relative position of the ends of a main line may be put in operation at the same time, substantially as set forth.

Eighteenth, I claim in combination with a line a series of helices differing in size at each station thereof and proportioned each to the other in proportion to the length of line between each helix and the most distant extremity thereof, the combination being substantially as set forth.

Nineteenth, I claim the new telegraphic signalizer herein described composed of a helix, a torsion, suspended magnetized needle, limiters and a bell and concentrating apparatus, all substantially such as herein before specified.

Twentieth, I claim in combination with a helix, making part of a signalizer and connected to a line by branch wires a key or commutator located in the line and capable of breaking the current through both the main line and the branch wires the combination being substantially such as described.

And finally, in combination with an ordinary protector such as is described applied to the ordinary wire of a line, I claim a protector such as is specified applied to a fine wire inserted in and making part of the main line for the purposes specified.

48,409.—Lathe for Turning Tool Handles.—H. K. Jones, Kensington, Conn.:
I claim, First, The spindle, f, provided with spurs, and arranged in a revolving head, b, e, and operating in combination with the longitudinally sliding centers, k, in the revolving drum, E, substantially as and for the purpose set forth.

Second, Giving to the spur centers a sun and planet motion by means substantially such as herein described, for the purpose set forth.

Third, Giving to the centers, k, an automatic reciprocating motion by means of a spring and cam or other equivalent means, substantially as and for the purpose specified.

Fourth, The pins, t, and hook, s, applied in combination with the trough, F, and centers, k, substantially in the manner and for the purpose specified.

Fifth, The use of stationary cutters, G I, in combination with the centers, f, k, arranged in revolving heads, substantially as and for the purpose set forth.

48,410.—Carpet Fastener.—J. O. Jones, Boston, Mass.:
I claim the application and arrangement of the above-described apparatus, substantially in manner and to operate as before described.

48,411.—Tea Kettle.—Anthony Kipp, Brooklyn, N. Y.:
I claim the tea kettle above described, the lower half of the kettle, including the spout, being made of copper, and the upper part above the spout and line, C, being made of tin, as a new article of manufacture.

[This invention has for its object an improvement in tea kettles, meaning thereby those covered vessels used for boiling water which have sunken bottoms that fit in boiler holes of stoves and flanges, and which have spouts for pouring water thereinto.]

48,412.—Hat Frame.—Albert Komp, New York City:
I claim a hat frame composed of a series of arched stays, B, radiating from a common center, and fastened to a ring, A, substantially as set forth.

[This invention consists of a hat frame, composed of a series of arched stays rising from a ridge, made of curved metal wire in such a manner that a light, cheap and durable article is produced which, when covered, produces a hat of superior beauty.]

48,413.—Process for Making Beer.—Ernst J. Krause, Lancaster, Pa.:
I claim the mode of manipulating or process for making bottom fermenting beer, as herein set forth and distinctly specified.

48,414.—Hoisting and Lowering Apparatus.—Isaac J. Lancaster, Vancouver, W. T.:
I claim the employment in connection with a ratchet wheel and windlass of pawls, D D', springs, G G', a retainer, H, and lever, E, the whole being arranged and operating substantially in the manner and for the purpose set forth.

48,415.—Breeching Hook.—Joseph H. Littlefield, Cambridge, Mass.:
I claim the hook, A, with its swell, D, and slot, I, the standard, B, with its tongue or continuation, C, and the spring, F, all constructed, arranged and combined substantially as described and for the purposes set forth.

48,416.—Whiffletree.—Joseph H. Littlefield, Cambridge, Mass.:
I claim the combination of the ferrule, B, having its guard, h, and socket, k, the hook, C, having its lever, l, spindle, j and pin, p, the spring, D, and the cord and chain, F and E, or their equivalent, all arranged substantially as described and for the purposes set forth.

48,417.—Apparatus for Attaching Mourning Badge to Hat.—Thomas H. Lowerre, New York City:
I claim the implement herein described for securing bombazine to hats.

[This invention relates to a novel and useful tool for securing mourning badges to and around hats, by the use of which it is accomplished with great facility and ease, and without injuring the hat in the least degree.]

48,418.—Valve Gear of Steam Engine.—J. W. Maloy, Boston, Mass. Antedated June 9, 1865:
I claim actuating the link that forms the communication between the eccentric rod and sliding-valve rod, by means of an auxiliary steam cylinder and piston, when supplied with steam by the movement of the regulator rod, as set forth.

48,419.—Brick Machine.—Henry Martin, Springfield, Mass.:
I claim, First, The slotted levers, 12 12, and cogwheel, 11, or their equivalents, in combination with the gate, f, plunger, d, mixing box, A, and press box, C, constructing and operating substantially as and for the purpose set forth.

Second, The adjustable tapering slide, 14, in combination with the lever, 12, pins, 13, or its equivalent, and plungers, d, constructed and operating substantially as and for the purpose set forth.

Third, The rising and falling slide or gate, m, in combination with the press box, C, constructed and operating substantially as and for the purpose specified.

Fourth, The pusher, E, arms, f, and rock shaft, e, in combination with the roller platform, D, and with the mold constructed and operating substantially as and for the purpose set forth.

48,420.—Bracket.—Maurice H. Matsinger, Philadelphia, Pa.:
I claim the plate, A, with its sockets, c and c', the whole being constructed and adapted for the reception of a rod or staff, substantially as described.

48,421.—Faucet.—John Matthews, Jr., New York City:
First, In combination with a flexible lining tube, C, applied within the passage of a cock or faucet, I claim a stopper, the operation of which is so controlled by a spring, as to compress and close the said tube, C, automatically, substantially as herein specified.

Second, I claim the combination of the flexible lining tube, C, stopper, D d d', fixed diaphragm, a, spring, E, and cap, F, the whole applied in relation to each other, and to a cock or faucet, to operate substantially as herein specified.

48,422.—Instrument for Opening Bottles.—John Matthews, Jr., New York City:
I claim, First, An instrument for opening and holding open the inwardly closing stopper of a bottle, consisting of an internally operating device for pressing back the stopper from its seat, and an attached externally operating means of holding the said internally operating device in position, to keep the stopper open, substantially as and for the purpose herein specified.

Second, The combination of the collar, A, tube or hollow hub, C, elastic packing ring, D, and spring clasp or clips, B B, substantially as and for the purpose herein specified.

48,423.—Breech-loading Fire-arm.—Edward Maynard, Washington, D. C.:
I claim the combination of the retaining spring, S, with the plunger, B, in the hinged block of a breech-loading musket or other fire-arm, when the said spring is contained in a hole extending from the under side of the breech block to the aperture in which the plungers work, substantially in the manner and for the purpose herein set forth.

48,424.—Molding Machine.—Josiah F. Melcher, Bloomington, Ill.:
I claim, First, Forcing a stream of water through or upon the articles to be washed simultaneously with the operation of the plunger, and in a contrary direction to the movement of the plunger, by means substantially as described.

The valves, b, h, and chamber, D, in combination with a perforated washboard, C, and a plunger, G, substantially as described.

Third, The combination of a reciprocating plunger, G, a water passage, D, and a perforated washboard, C, substantially as described.

48,425.—Grate.—James Miller, St. Louis, Mo.:
I claim the combination and arrangement of the horizontal tubular or hollow grate bars, b b, with the lateral chambers, A, A, substantially in the manner and for the purpose herein set forth.

48,426.—Automatic Stop Motion for Steam Engines.—Alexander Nadow, Springfield, Mass.:
I claim the rod, b, in combination with the fly wheel, A, and suitable mechanism for closing the valve, substantially as described.

48,427.—Bung for Barrels.—C. A. Neuhaus, New York City:
I claim a bung provided with a tubular plug, c, spring valve, d, and lever, B, substantially as and for the purpose set forth.

[This invention consists in a bung provided with a cone valve, the seat of which is in a tube screwed in the bung, in combination with a spring, which has a tendency to keep the valve tight in its seat, and with a lever, by means of which the valve can be opened in such a manner that whenever it is desired to draw some of the contents of a barrel the requisite supply of air can be admitted simply by depressing the lever, and as soon as the lever is released the valve closes hermetically, and the gaseous constituents of the contents of the barrel are not allowed to escape.]

48,428.—Wood Turning Lathes.—G. H. Ober, Newburgh, Ohio:
I claim, First, The rack, L, stop, r, and shaft, E, in combination with the lever, r, catch, j, screw, g', and adjustable carriage, G or H, substantially as and for the purpose set forth.

Second, I claim the special arrangement of the spring, I, clutch, c', and shifter, T, in combination with the shaft, E, and adjustable carriages, G or H, as herein described, for the purposes set forth.

48,429.—Ash Sifter.—John H. O'Neill, Pittsburgh, Pa.:
I claim as an improved article of manufacture the ash sifter constructed with its entire side and bottom of wire cloth, and provided with feet, b b b, and handles, c, all as herein described and for the purposes set forth.

[This invention relates to a new and improved ash sifter, constructed of wire cloth and in the form of a pan, so that it may be fitted under the grate of a fireplace and receive the ashes and cinders from the former, the ashes being allowed to pass through the sifter, while the cinders are retained within or upon it.]

48,430.—Three Way Cock.—F. S. Pease, Buffalo, N. Y.:
I claim the rotary valve, K, with the through port, M, rotating in a casing provided with parts which connect on one side with the chamber of condensed air, A, with the vacuum chamber, A, and with the exhaust opening, E, and on the other side with corresponding opposite ports, which connect with the well pipe, I, all substantially as and for the purpose described.

48,431.—Gas Fitter's Clamp.—John Pease, Camden, N. J.:
I claim as an improved article of manufacture a gas fitter's clamp, made substantially as herein shown and described.

[This invention relates to the construction of gas or steam fitters' pipe clamps in such a manner that the pipe inserted therein can be brought to the most convenient position for operating upon it, while at the same time it is firmly gripped and held.]

48,432.—Grain Drill.—Warden P. Penn, Jacob Geiss and Jacob Brosins, Belleville, Ill.:
We claim the arrangement consisting of the slide, C, fixed plates, d, with cheek pieces, c2, and movable plates, d1 d2, in combination with the hopper, all constructed and arranged in the manner and for the purpose described.

Second, The construction of the agitator slide with double beveled projections, *a*, *e*, and clearing pins, *e*2, in combination with the divisions, *a*, *a*, vibrating hangers, *D*3, and seed-distributing devices shown, substantially as and for the purposes set forth.

Third, The long cut-off plate, *d*2, arranged with the plates, *d*, *d*1, and slide, *C*, and connected with the drill teeth by means of the pivoted vibrating bar, *E*, and claims, *g*, and operated by a handle, *E*, all in the manner and for the purpose described.

Fourth, The slotted hinge braces, *b*, applied to the drill tooth, *G*, and its bar, *H*, in the manner and for the purpose described.

Fifth, The pendulum stand board, *J*, arranged substantially as described, upon a seed drill, for the purpose set forth.

48,433.—Seed Drill.—W. B. Porter, Farmer City, Mo.: I claim the combination with the furrow openers, *G*, and wheels, *H*, provided with beveled edges of the rollers, *D*, substantially as and for the purposes herein described.

48,434.—Broom Head.—Thomas H. Powers, Milwaukee, Wis.: I claim forming the edge of the conical or other suitable socket plate, in and by which the upper portion of the broom corn is held of a flange shape, substantially as herein described and for the purpose specified.

I also claim the D-shaped nut, having its edges serrated or toothed, and arranged substantially as set forth and for the purpose specified. [This invention relates to the manner of securing broom corn to the handle of the broom, whereby it is held with great tightness and security, the advantages of which are manifest.]

48,435.—Apparatus for Distilling Petroleum.—Elijah Freeman Prentiss and Robert Adam Robertson, Philadelphia, Pa.: We claim, First, The employment of the bent vapor, steam and air pipes, *a* and *c*, arranged, constructed and operating substantially as shown and described.

Second, Constructing the column so as to have a space, *I*, unobstructed with pipes for the free boiling of the oil, substantially as shown and described.

Third, Constructing the column, so that the head, *K*, shall form a part thereof, the same being arranged, constructed and operating in the manner and for the purpose substantially as shown and described.

Fourth, The slotted pipe or trough, *L*, in combination with the column, whereby the cooler oil is fed in and distributed equally over the pipes, arranged and constructed substantially as shown and described.

48,436.—Apparatus for Distilling and Rectifying Whisky.—Elijah Freeman Prentiss and Robert Adam Robertson, Philadelphia, Pa.: We claim, First, The employment of chamber, *A*, constructed substantially as described, and having a separate regulator, so that the said chamber can be maintained at any desired temperature lower than that of chamber 2, for the purpose of more effectually dehydrating the alcohol.

Second, The employment of boxes, *R*1 *R*2, etc., attached to the upper shelves in chamber 4, in the manner and for the purpose substantially as described.

Third, The trough, *e*, in combination with the pipe, *e*, and chamber, *A*, arranged, constructed and operating substantially as described.

48,437.—Melodeon.—Peter J. Peretz, Milwaukee, Wis.: First, I claim the arrangement of closing and operating the reeds at *F* and *H* by means of shutters, *J* and *G*, and operated by arms, *d* and *b*, fast to a shaft, *K*, when arranged and operating in the manner substantially as described.

Second, I claim operating the shaft, *K*, by means of a lever, *f*, acted upon by the said knee of the player in such a manner as to open either one set of reeds or both sets, as may be desired, substantially as set forth.

48,438.—Process for Refining Metal.—John Ramdohr, Virginia City, Nevada: I claim the within described process of refining the amalgam of gold and silver, commonly known as crude bullion, said process consisting of three subsequent manipulations, substantially such as set forth.

[Gold and silver amalgam, such as is commonly called crude bullion, contains principally gold, silver, copper, zinc and iron, and the object of this invention is to separate the base metals from the gold and silver.]

48,439.—Artificial Fuel.—Henry Redlich, Chicago, Ill.: I claim the within described combination of the ingredients above specified, and mixed together, substantially in the manner and about in the proportion set forth.

[This invention relates to an improved method of aggregating coal dust, or waste coal, and also sawdust and other similar combustibles, by mixing them with a certain percentage of cow manure, with or without blood, and compressing the mixture so as to drive out all moisture, and to produce cakes of the required form and consistency.]

48,440.—Substitute for Artificial Hands.—John Reichenbach, Pittsburgh, Pa.: I claim the use of a pair of pincers, constructed substantially as described, attached to a case to be worn over the stump of the arm which has lost the natural hand, and operated by means of a cord attached to the arm above the elbow, as a substitute for an artificial hand.

Also, the combination of the pincers and hook, constructed substantially as described for the purposes hereinbefore set forth.

48,441.—Wheat Drill.—William Rice, Concord, Ill.: I claim the combination of the frame, *A*, pivoted frames, *E*, *E*, wheels, *B*, *G*, and furrow cutters, *H*, all constructed and arranged to operate as specified.

48,442.—Washing Machine.—M. A. Richardson, Sherman, N. Y.: I claim, First, The adjustable apron, *I*, in combination with the elastic spring, *K*, and the wooden springs, *G*, *G*, constructed and operated in the manner and for the purposes specified, substantially as set forth.

Second, In combination with a washing machine constructed with two adjustable aprons, which are connected by an elastic spring and a series of rollers resting upon wooden springs, as represented, the clothes box, *M*, constructed and operated in the manner and for the purposes specified, substantially as set forth.

48,443.—Binnacle.—E. S. Ritchie, Brooklyn, N. Y.: I claim the combination of one or two lenticular prisms or the equivalent or equivalents thereof with a binnacle and its lamp, substantially in the manner and for the purpose of illuminating the compass, or part of the same and a part of the compass box, as specified.

I also claim the binnacle lamp as made with a recess in its side to cause it to rest on the bottom of the lamp chamber and fit around the prism case, as specified.

I also claim the combination as well as the arrangement of the prism case, *D*, and the light-discharging passage or mouth, *E*, with the binnacle chamber and the lamp chamber, as specified.

I also claim the combination of the movable shutter or screen, *O*, and its operative mechanism with the lamp, the lenticular prism, and its case, and the lamp and binnacle chambers arranged substantially as described.

48,444.—Carriage Spring.—Andrew J. Ritter, Rahway, N. J.: I claim the double side spars, *A* *A*, or their equivalent, in combination with the thorough braces, *K*, *K*, cross bars, *I*, *I*, axle, *c*, and axle bars, *F*, *F*, for the purpose herein set forth and specified.

48,445.—Cultivator.—Cyrus Roberts, Three Rivers, Mich.: I claim, First, The combination of the plow beams with the flaps and stay rods, substantially in the manner described for the purpose set forth.

Second, The combination of the frame, the movable driver's seat, and the plows, substantially as and for the purpose described.

Third, The combination of the adjustable driver's seat and hand lever with the adjustable link-rod, *s*, as and for the purpose described.

Fourth, The combination of the frame, the driver's seat and the plows with the rear flap and stay rods, substantially as described, whereby the device can exert its whole weight in raising the plows, as set forth.

Fifth, The combination of the frame and driver's seat with the shifting plows and elbow levers when arranged and operating as described.

Sixth, The combination of the plow beam, and stay rod with the hinged socket and wooden pin, when arranged and operating as described, for the purpose set forth.

48,446.—Water Door for Furnaces.—Joseph Rogers, Nashua, N. H.: I claim as an improved article of manufacture a door for furnaces provided with internal tubes to form a water-passage through them, substantially as and for the purpose herein set forth.

48,447.—Jack for Holding Shoes.—John Ross, Philadelphia, Pa.: I claim, First, The combination of the pin rack and pawl and sliding block and pad arranged substantially as set forth and described.

Second, The combination of the swivel, *G*, plate, *M*, and base, *L*, arranged and used substantially as drawn and described.

Third, The combination of the swivel, *G*, joint, *J*, and rotating bearing, *K*, when arranged, substantially as set forth and described.

48,448.—Heel Shave.—John Ross, Philadelphia, Pa.: I claim the adjustable blade combined with the adjustable guard of heel shaving tools when constructed and operating substantially in the manner herein before set forth and specified.

48,449.—Churn.—J. F. Sanborn, Hardwick, Vt.: I claim, First, The arrangement of revolving staves or beaters which are adapted for producing butter from cream, and then working the butter, in conjunction with the obliquely ribbed cone, substantially as described.

Second, The combination of the long and short beaters or staves, *d* and *e*, which are grooved and ribbed, with the oblique ribs, *b*, *b*, and plain portions of the churn bottom, substantially in the manner and for the purpose described.

Third, The arrangement of the ribs, *h*, *h*, upon the surface of the concave bottom of the churn box, so that these ribs all incline toward the center of the bottom of the box and toward one end thereof, substantially as described.

48,450.—Kerosene Oil Burner.—Hugh and James Sangster, Buffalo, N. Y.: I claim, First, Constructing the spring, *E*, so that it connects the burner to the collar, *B*, by pressing it down into said collar, and turning it around until it springs over either corner, *J* or *J*1, into the notch, *K*, thus bringing the spring under the lower edge of the collar.

Second, In so constructing the lower part, *A*, of the collar, *B*, that when the burner is turned, so that the spring passes the corner, *J*, it is forced into the case, *A*, and allows the burner to be drawn out easily.

48,451.—Meat Chopping Machine.—George W. Sargent and Plumer H. Chesley, Chelsea, Mass.: We claim the arrangement of the crank shaft, *a*, the application of the chambers, *n*, on the knife rods, *b*, the diagonal position of the knives, and the operation of the satchet in the manner and for the purpose as described.

48,452.—Steam Cock.—James B. Sargent and Francis W. Towne, Fitchburg, Mass.: We claim as our invention an improved steam cock made as described, viz., not only with the lifting screws, arranged with or applied to the stem of the valve and the cap, *B*, as set forth but with the valve stem provided with a key socket, *k*, to receive the key head, *l*, as specified.

We also claim the combination and arrangement of the wooden annul, *r*, *s*, and the flange, *q*, with the stem, *C*, the chambered cap, *B*, and its screw cap nut, *E*.

We also claim the combination of the auxiliary guide, *g*, and the socketed projection, *h*, with the case, *A*, the valve, *f*, and its lifting screws and key, *C*, arranged with respect to it as described.

48,453.—Mode of Renewing the Surface of Printer's Rolls.—Charles Sentell, Waterloo, N. Y.: I claim removing the hardened surface of printer's rolls, and re-coating the same, by placing them in the mould, *C*, and turning the melted material around them substantially as herein set forth.

48,454.—Ruler.—S. L. Simpson, New York, N. Y.: I claim the spring stop, *d*, applied in combination with a ruler *A*, substantially as and for the purpose set forth.

48,455.—Grate for Steam Boiler Furnaces.—George L. Smith, Brooklyn, N. Y.: First, I claim a grate surface formed of a series of sections upon which the fuel is placed in combination with a series of disconnected supports or trusses and traverse bearers, substantially in the manner and for the purposes herein set forth.

Second, A grate divided into sections by longitudinal and traverse divisions in combination with a series of disconnected supports or trusses and traverse bearers and a grate surface substantially as and for the purposes described.

Third, The combination of disconnected supports or trusses with taper upper edges, traverse bearers and a grate surface, substantially as and for the purposes set forth.

Fourth, Trusses or supports for a grate surface made free from the grate surface and from the traverse bearers, substantially as and for the purposes set forth.

Fifth, So arranging the sections and the trusses or supports of a sectional grate, that each section will be supported and balanced, substantially in the manner described.

48,456.—Cooling Air in Buildings and Chambers.—Dan. E. Somes, Washington, D. C.: I claim, First, Constructing submarine buildings, tanks or chambers, substantially as described and for the purposes set forth.

Second, Ventilating submarine buildings, tanks or chambers, substantially as described and for the purposes set forth.

Third, Cooling air by means and for the purposes herein set forth.

Fourth, Cooling tanks and their contents in the manner herein specified.

Fifth, Constructing and ventilating buildings, chambers or tanks below the surface of the earth, for the purpose and in the manner herein set forth.

48,457.—Cooling and Ventilating Ships and other Vessels.—Daniel E. Somes, Washington, D. C.: I claim, First, Constructing canal boats and other vessels, with tubes or air ducts extending below the deck, and in a diagonal position with it.

Second, Air ducts made in a funnel form, and used substantially as described.

Third, Using water pipes or channels, substantially as and for the purpose set forth.

Fourth, Using water pipes and air tubes in combination, substantially as set forth and described.

Fifth, Increasing water pipes and conducting off water from condensed air, substantially as set forth.

48,458.—Washing Machine.—Le Roy S. Starrett, Newburyport, Mass.: I claim the washing machine herein described, consisting of the seed box, *P*, false bottom, *Q*, springs, *R*, plunger, *O*, adjustable rod, *M*, walking beam, *H*, crank, *F*, pitman, *I*, tubes, *J*, *K*, pawl, *N*, and ratchet wheel, *L*, all arranged to operate as specified.

[This invention relates to a new and improved clothes washing machine, of that class in which all up and down ascender is employed, and it consists in a novel means for operating the plunger, whereby an up and down, and also a rotary motion is communicated to the same, and the invention also consists in the employment or use of a yielding perforated partition plate in the suds-box, whereby the cleansing or washing operation is greatly facilitated.]

48,459.—Fulminate Gas Lighter.—Henry B. Stockwell, Brooklyn, N. Y. Antedated June 17, 1865. First, So applying a fulminate and a hammer or its equivalent, in combination with each other and with a gas burner, as to produce the ignition of the gas issuing from the burner by the action of the hammer, or its equivalent on the fulminate, substantially as herein described.

Second, So combining the stop cock which admits the supply of gas to the burner, with the hammer or its equivalent, as to produce the action of the latter by the act of opening the former to turn on the gas, substantially as herein set forth.

Third, The hollow plunger or hammer, *D*, rod, *q*, and cap, *t*, combined with each other and with the stop cock and burner, and operating substantially as herein specified.

Fourth, One or more cavities, *l*, in the plug of the stop cock operating in relation to a passage, *f*, containing the fulminate, and

passage, *e*, containing the plunger or hammer, *D*, substantially as and for the purpose herein described.

48,460.—Fulminating Compound.—Henry B. Stockwell, Brooklyn, N. Y. Antedated June 17, 1865. I claim the fulminate compound, composed of materials herein specified, in about the proportions herein set forth.

48,461.—Street Lamp.—James Stratton, Brooklyn, N. Y.: I claim the two reflectors, *B*, *D*, with vitreous, corrugated surfaces, in combination with the street lamp, *A*, *C*, *E*, all constructed, arranged and operating as and for the purposes specified.

48,462.—Carbine Socket.—John S. P. Taylor, Oxford, Ohio: I claim a carbine socket formed of alternate layers of cloth and India rubber, or their equivalents, substantially as described and to the effect set forth, as a new article of manufacture.

48,463.—Spring Catch for Window Sash.—William Toghach, New York, N. Y.: I claim the arrangement in or upon a window sash in combination therewith and with the arms, *c* and *d*, of an angular lever, *A*, of a spring actuated window catch (*B*), and a hinged lever and window knob (*a*), as described, in such a manner as that pressure exerted upon the knob to raise the sash will also disengage the fastenings, all substantially in the manner herein set forth.

48,464.—Device for Preventing Snow Drifts on Railroad Tracks.—L. D. Walrad, Sycamore, Ill.: I claim the employment or use of inclined planes, placed at the side of and in a relative position with the track to operate in the manner substantially as and for the purpose set forth.

Second, I also claim the manner, substantially as shown and described, of constructing the inclined planes so that they may be adjustable, as and for the purposes specified.

[The object of this invention is to obtain a means whereby snow will be prevented from drifting and accumulating on railroads, where the latter are by the side of hills, or have an elevation on one side of them.]

48,465.—Machine for Putting Head Filling on Trunk Nails.—Zachariah Walsh, Newark, N. J.: I claim, First, The employment or use of a rotating wheel, *A*, provided with recesses to receive a series of dies, *J*, in which the paste boards, *D*, and plates, *C*, are deposited, in connection with a punch, *G*, and a nail-driving mechanism for pressing or passing the nails through the pasteboards and plates, substantially as and for the purpose herein set forth.

Second, The rotating notched wheel, *L*, encompassed partially by the strap, *S*, in connection with the jaws *y* and *y*1, for the purpose of presenting the nails properly to the punch, *G*, and the pasteboards and plates in the dies, *J*, substantially as described.

Third, The parallel bars, *p* and *p*1, in combination with the hopper, *H*, wheel, *L*, and spouts, *J* and *J*1, for the purpose of presenting the nails to the wheel, *L*, substantially as set forth.

Fourth, The perforated tubes, *N* and *N*1, to receive the sheet-metal plates, *C*, arranged in the machine substantially as shown, so as to be movable and placed alternately in positions for being filled and discharged, as herein described.

Fifth, The employment or use of an air pump, *W*, in connection with a lifter, *X*, arranged as shown, or in any equivalent way, for the purpose of taking the plates, *C*, from the tube, *N* or *N*1, and depositing them in the dies, *J*, of the wheel, *A*, as set forth.

Sixth, The spring, *n*, at the upper end of the tubes, *N* and *N*1, in connection with the pressure lever, *L*, and the slide, *M*, or its equivalent, arranged substantially as shown, for the purpose of liberating the upper plate in said tubes, and admitting of the discharge of the same at the proper time, substantially as described.

Seventh, The rod, *S*, fitted in the tube, *N* or *N*1, and operated upon by the weight, *V*, in combination with the spring, *n*, pressure lever, *L*, and the slide, *M*, or its equivalent, for the purpose specified.

Eighth, The catch, *X*1, arranged with the rod, *V*1, of the lever, *U*1, substantially as shown, in combination with the pivoted plate, *e*1, provided with the arm or bar, *g*1, connected with the catch, *X*1, by the links, *h*1, for the purpose of constituting a means for the several stop mechanisms herein described, to act upon the lever, *U*1, and clutch, *I*, as set forth.

Ninth, The rods, *E*1 and *F*1, passing through the arm, *g*1, and provided with the collars and springs, as shown, and arranged with the pivoted plate, *e*1, and the arm, *g*1, of slide, *Z*, to operate or act upon the latter, so as to stop the machine when necessary, as herein described.

Tenth, The rod, *E*1, passing through the pivoted plate, *e*1, and provided with the collar, *h*1, in connection with the lever, *D*1, and rod, *C*1, connected with the arm, *g*1, all arranged substantially as shown, to form a stop mechanism for the nail-discharging device, as set forth.

Eleventh, The lever, *R*1, with pendant pivoted bar, *Q*1, provided with the shoulders, *d*1, in connection with the projection, *e*1, on the slide, *Z*, the lever, *R*1, being placed relatively with the plate, *e*1, and all arranged as shown, to serve as a stop mechanism for the wheel, *L*, as described.

Twelfth, The lever, *X*1, connected with the lever or bar, *Z*1, by the link, *Y*1, in connection with the spring, *C*1, and the cam, *A*1, on the shaft, *G*1, all arranged as shown, for discharging the nails from the wheel, *L*.

Thirteenth, The bent or curved bar, *Y*1, spring, *e*1, and the arm, *g*1, of slide, *Z*, for operating the lever, *X*1, or moving it from over the tube, *N* or *N*1, to a proper position over the wheel, *A*1, and back again over the tube, *N* or *N*1, for the purpose specified.

Fourteenth, The plunger rod, *r*, and spring, *o*, in connection with the lateral projection, *p*, an arm, *g*1, for ejecting the plates, *C*, from the cylinder, *q*, for the lifter, as set forth.

Fifteenth, The rod, *T*, attached to the arm or operate or plate, *k*, of the rod, *S*, and provided with an upper beveled end, *t*, in combination with the fixed plate, *t*1, and catch, *X*1, all arranged substantially as shown, to form a stop mechanism in connection with the discharging of the plates, *C*, from the tube, *N* or *N*1, substantially as described.

[This invention relates to a new and useful machine for putting the pieces of pasteboard on trunk and similar nails, and which form the principle portion of the filling for the enlarged heads of said nails.]

48,466.—Girdle for Roller.—Hervey Waters, Northbridge, Mass.: I claim a self-adjusting roller guide, constructed to operate substantially as set forth.

48,467.—Mode of Driving Machinery.—Walter S. Wells, New York City, and S. B. Wells, Middleburgh, N. Y.: We claim the employment, in combination with a motive spring and the system of gearing, a governor and friction-controlling and regulating device, substantially as and for the purposes hereinbefore set forth.

48,468.—Stave Machine.—P. Werum, Berlin, Ohio: I claim the sliding frame, *B*, the adjustable saw frames, *C* *C* *E*, the adjustable rest, *G*, and arch, *L*, the catch, *J*, fingers, *g*, *g*, and curved lever, *n*, when these several parts are arranged so as to operate as and for the purpose set forth.

48,469.—Churn.—Isaiah M. West, Wilmington, Ohio: I claim the combination pin, *D*, in the lever slot, *e*, and dasher rod, *e*, with the spring catch, *f*, for the purposes herein specified.

I also claim the construction of the dasher, *C*, with the vertical perforated sides, *h*, *h*, close rim, *g*, and close sewing lids, *G*, *G*, substantially as and for the purposes herein set forth.

48,470.—Railroad Switch.—Wm. Wharton, Jr., Philadelphia, Pa.: I claim the combination of the permanent rails, *A* *A*1, of the main track the permanent rails, *B* and *B*1, of the turn out, and the rails, *D* and *D*1, comprising the movable switch, and forming continuous portions of the permanent rails of the said turn out, when the rail, *D*, is so inclined that it will raise the wheels on one side of a car above the permanent rail, *A*, of the main track, prior to the wheels being guided laterally by the tapering rail, *D*1, or its equivalent, all substantially as set forth.

48,471.—Printing Fluid.—Edwin Whitefield, Buffalo, N. Y.: I claim a printing fluid, composed and manufactured of the ingredients and applied substantially as herein described.

48,472.—Roller Die.—Geo. W. Wicks, Brooklyn, N. Y.: I claim the combination of the rolls with an adjustable worm shaft arranged substantially as specified and for the purposes set forth.

48,473.—Guard Finger for Reaping Machines.—Andrew Winterburn, Albany, N. Y.: I claim constructing the guard finger or knife guard, *A*, with the

chambers or cavity, B, and casting hard metal in said cavity or chambers, substantially in the manner and for the purpose described.

48,474.—Machine for Punching Leather.—L. H. Wood, Marlboro, Mass.:

I claim, First, Giving a simultaneous lateral motion to the punch carrier, H, and bed, E, substantially as set forth and for the purpose described.

Second, Holding the work by means of the presser, L, during the lateral transitory movement of the punch, substantially as described.

Third, Rendering the punch adjustable so as to punch holes any required distance apart, substantially as described.

48,475.—Locks.—Linus Yale, Jr., Shelburne Falls, Mass.:

I claim, First, The contrivance substantially as described for holding a bolt in place.

Second, The combination of a lock case containing a bolt with a cylindrical chamber containing tumblers, all constructed and arranged with reference to each other, substantially as described, whereby the lock may be made right or left hand, or fitted to either thick or thin doors, the combination being substantially as set forth.

Third, I claim the combination of a cylinder containing tumblers and having a screw cut thereon, with a lock case having a nut attached to or making part thereof, and a screw pin or its equivalent arranged as described, whereby the former may be attached to the case so as to fit doors of different thicknesses, and secured in position by a device which is so arranged as to be acted upon through the bolt hole.

Fourth, I claim notched pin tumblers in combination with a key hole slit narrower than the diameter of the pins, and

I also claim notched containing recesses in combination with a key hole slit narrower than their diameter, the combinations being substantially as described, and operating substantially as set forth.

Fifth, I claim in combination with a cylinder containing a key hole and pin tumbler, a wing or lazy arm, constructed and operating as specified.

48,476.—Reversing the Motion of Screw Tops.—Linus Yale, Jr., Shelburne Falls, Mass.:

I claim the combination of two recessed pulleys with two corresponding decks to clutch therewith, and a line spindle to which the latter are attached, arranged substantially as described, so that the spindle can be clutched to either pulley and made to rotate in accordance with the motions thereof by a force employed to push or to pull said spindle longitudinally in either direction, substantially as described.

48,477.—Vegetable Washer.—F. W. Bacon (assignor to the New York Dedicating Company), New York City:

I claim the hollow perforated shaft, B, receiving water at one end and delivering it in numerous jets or streams from its perforations, in combination with the revolving cylindrical cage and the spiral grate or grates, or their equivalents, arranged between the said shafts and the circumference of the cage, substantially as herein described.

48,478.—Manufacture of Wrought Iron from the Ore.—Horace Boardman (assignor to himself and Kelby, De Mill & Co.), New York City:

I claim, First, The reducing fire, F, combined with the gas chamber, G, and its tuyers substantially as described, for the purpose set forth.

Second, The combination and arrangement of said reducing fire with a reverberatory furnace and baling hearth, in the manner described, so that the escaped combustible gases from the said furnace or hearth, can be used, when ignited by blasts of atmospheric air for oxidizing and smelting the ore in the said reducing fire, as herein set forth.

Third, Subjecting the ore in a reducing fire while mixed or in contact with carbonaceous fuel, to the action of the escaping gases from the fire on the grate, A, the gases being ignited by the introduction of atmospheric air, substantially as herein described.

48,479.—Machine for Perforating Paper for Telegraphs.—Leverett Bradley, Jersey City, N. J., assignor to Marshall Lefferts, New York City:

I claim, First, The punch, C, actuated by the lever, B, and regulated in its movements by the adjustment of the nuts, Q, Q, and shackle, substantially as specified.

Second, I claim a reciprocating punch, in combination with a pair of rollers, for drawing the paper along, and with a ratchet movement actuated by the reciprocation of the punch, substantially as specified.

Third, I claim a spacing lever or levers combined with a pair of rollers for drawing the paper along, and with a device for perforating the paper, substantially as and for the purposes specified.

48,480.—Amalgamating Pan.—Smith W. Bullock, Elizabeth, N. J., assignor to The Bullock Ore-dressing Machine Co.:

First, I claim the arrangement of the shafts of the plate, E, and of the roller, D, in a vertical position, or nearly so, in connection with the pan, B, for the purposes set forth.

Second, I claim the application of the springs to the boxes, I, I, for the purposes described.

Third, I claim the application of gear or blank wheels or of band pulleys to the shafts, C, F and G, and to the pan, B, for the purposes herein set forth.

Fourth, I claim the application of an elastic coating or jacket to the roller, D, in combination with an amalgamated plate of copper or other metal, for the purposes herein set forth, each of the several features being arranged substantially and for the purposes described.

48,481.—Water-proof Soles.—John W. Colburn (assignor to himself and O. F. Case), New Haven, Conn.:

I claim a sole composed of an interior of rubber and a margin of sole leather, cemented together by a vertical butt joint, and of uniform thickness, or nearly so, without an insole, and made substantially as herein described.

48,482.—Snap Hook.—Edward A. Cooper (assignor to himself and J. M. Johnston), Buffalo, N. Y.:

I claim the tapering spring, d, fitting and working in a corresponding groove in the thumb piece, E, and passing through and secured by the mortice, C, and lug, G, substantially as described.

48,483.—Manufacture of Iron.—Alexander H. Everett (assignor to American Car Wheel and Railway Chair Manufacturing Co.), New York City:

I claim, First, The employment of "cryolite," or its component elements, in the melting of cast iron, for the purpose of refining and strengthening the same.

Second, The employment of cryolite or its component elements in the melting of cast iron and wrought iron mixed, thereby producing a metal of great strength and fineness.

Third, The use of cryolite as a purifying agent in the melting of iron.

48,484.—Button Hole.—Henry B. Fairman (assignor to the Metropolitan Collar Company), New York City:

I claim the construction of a button hole with a recess, b, at or near the middle of the length of one side, substantially as and for the purpose herein specified.

48,485.—Apparatus for Puddling Iron.—John Griffiths, Litchurch, England; (assignor to himself and Z. S. Durfee), Pittsburgh, Pa.:

I claim, First, Attaching the job, q, which carries the hanger, r, through the intervention of which motion is communicated from the crank, x, to the rabble or stirring tool, v, in puddling and other operations, to a base or plate, d, which is movable automatically in a horizontal plane substantially as and for the purposes hereinbefore described.

Second, Giving a reciprocating lateral motion in an arc of a circle to the job, q, and consequently to the hanger, r, through the partial rotation of the movable plate, d, produced by means of the curved endless rack, s, and the pointed shaft, o, having on its end a pinion working in said rack, and which carries with it the forked lever, H, substantially as hereinbefore shown.

Third, Controlling the movement of the hanger and rabble by means of a bow, z, proportioned in shape and dimensions to the character and extent of the furnace bottom in which the rabble is to work.

Fourth, Providing the free end of the hanger, r, to which the rabble is attached, with a double fork, or the rabble with double pins at suitable distance apart to compensate for the irregular enlargement of the furnace bottom.

Fifth, Placing the axis around which all the movements of the apparatus are made so far back of the line of the working hole as to produce a leverage in the action of the rabble at certain stages of the operations in order to clean the ends of the furnace.

Sixth, Also communicating the peculiar stirring motion to a stirring tool or rabble in puddling or other operations by loosely attaching the free end of the tool to a hanging rod, to the point of suspension of which a reciprocating motion is given from side to side, while a simultaneous, but more rapid motion is given to the hanging rod or tool holder to and fro, in the direction of the tool, by means of the combination of devices for that purpose, constructed and arranged substantially as hereinbefore described.

48,486.—Stave Machine.—George R. Hay (assignor to himself and J. R. & E. Seeley), Edgarton, Ohio:

I claim the arrangement of the adjustable brackets; H H', with the adjusting screws, rollers, F F', and saw D, operating as and for the purpose set forth.

I claim the carriage, P, gauge, L, cam lever, p', dogs, r, r, and springs, e', when arranged and operating as and for the purpose described.

48,487.—Balling Press.—Horatio F. Hicks (assignor to Hicks Brothers), Grand View, Ind.:

I claim, First, The revolving cage or cam operating to automatically open and close the feed door, and to elevate and depress the packer by a force independent of its gravity substantially as set forth.

Second, The arrangement of nut, D, sill, E, transom, C, collars, F, rings, H H', and rollers, G, for the support and easy operation of the press as set forth.

Third, The provision of the parts 11, 22, 33, 44, 55, 66, or their equivalents for the purpose explained.

48,488.—Numbering and Paging Machine.—George J. Hill, Buffalo, N. Y., assignor to himself and H. G. Linsenring, Philadelphia, Pa.:

I claim, First, The reciprocating crosshead, H, and its system of numbering wheels in combination with the endless apron, I, the whole being arranged for joint action, as set forth for the purpose specified.

Second, The bars, V, and V', adapted to inclined openings in the standards or guide pieces, T, and T', and supported by a spring or springs all substantially set forth as and for the purposes specified.

Third, The hanger S, with its numbering wheels, and the spring 10, or their equivalents for rendering the said numbering wheels self-accommodating to the thickness of the book, the pages of which have to be numbered.

48,489.—L. D. Hoit, Medford, Mass., and Robert Murry, Boston, Mass., assignors to James W. Tufts, Medford, Mass.:

First, The deflector, G, constructed and arranged substantially as set forth, in combination with the chamber, E, or its equivalent, for the purposes described.

Second, The combination of the cone, F, with the cone, G, and nozzle, E, substantially as and for the purpose described.

Third, Providing the cock, C, with two channels, a and b, and so arranging the same that the one may be opened and shut by means of the valve, L, and the other by giving a partial rotation to the cock itself, substantially as and for the purpose described.

48,490.—Machine for Making Paper Boxes.—T. C. Luther (assignor to himself and American Flask and Cap Company), Waterbury, Conn.:

I claim the cutters, H, in combination with the rollers, B, C, arranged to operate in the manner substantially as and for the purpose specified.

48,491.—Damper.—Nathan R. Ramsey (assignor to Daniel Pomroy), Orange, Mass.:

I claim the above described improved heat regulator or damper, or combination and arrangement of the ring, a, and the two series of concave convex bars, b b b d d d, with openings between them, as set forth.

48,492.—Desiccating Kiln.—W. J. Rand, Brooklyn, N. Y., assignor to the New York Desiccating Company, New York:

First, I claim a kiln for desiccating purposes, constructed with two or more desiccating chambers, C, C', one above another, having double or hollow floors, a, c, heated by steam pipes, d, with an air heating or distributing chamber below, from which heated air enters the desiccating chambers by flues, h, h, at the sides or corners thereof, and with a central ventilating shaft communicating with the several chambers, for the escape of the moisture, the whole combined or ranged, and operating substantially as herein specified.

Second, In combination with a kiln having several desiccating floors or chambers arranged one above another, I claim one feeding trunk, F, common to all the chambers, communicating with them by apertures fitted with doors, m, m, hinged at the bottom, and so constructed that when thrown back from the said apertures, they close the feeding trunk below, and from inclined planes down which the substances slide into the desiccating chambers, substantially as herein specified.

48,493.—Printing Press.—James Sangster (assignor to himself, Rockwell, Baker & Hill, and E. B. Sangster), Buffalo, N. Y.:

First, I claim a revolving cylinder having a number of plain surfaces upon its periphery or circumference, for the purpose of recessing the paper or card board to be printed, and resisting the pressure of the type when brought down against it when said cylinder is so constructed as to move and present its plain surfaces one at a time at the proper angle to receive an impression.

Second, I claim the springs, U' and U2, between which the inking roller, S, is suspended for the purposes specified.

Third, I claim, in combination with the revolving cylinder or roller, B, three or more slats such as are shown at F8 F8 and F8, for the purpose of holding the card board or paper in place while being carried under the belts, H3 and H4, and in the position to be printed when formed necessary to feeders lay the cards or tickets in by hand.

Fourth, I also claim, in combination with numbering wheels, a revolving roller in cylinder, upon the periphery or circumference of which the tickets or cards are numbered.

48,494.—Railroad Spike.—William Mount Storm, Harlem, N. Y.; assignor to himself and Chas. J. Ferguson, New York City:

As an improved article of manufacture, I claim a railroad spike made substantially as herein described.

[This invention relates to improvements in railroad spikes, the object of which is to produce a spike that, when driven into the sleeper and brought to its "seat," it shall be so fastened therein that the movement of the cars over the rails will not in the least degree loosen it, the advantages of which are manifest to all.]

48,495.—Grain Elevator.—Francis Taggart, Lewis S. Chichester, and Clark W. Mills (assignors to George H. Nichols), Brooklyn, N. Y. Antedated June 12, 1865.

First, We claim a floating elevator for grain, formed with a deck extending across a space left for the reception of a canal boat or large between two floats, and provided with an elevator or elevators working through such deck for the removal of grain from the said canal boat or large, substantially as specified.

Second, We claim the spout, k, sliding in the trunk, l, in combination with the elevator, d, fitted to be raised or lowered, as and for the purposes specified.

48,496.—Rolling Apparatus.—Edward Wassell (assignor to himself and Archibald McFarland), Pittsburgh, Pa.:

I claim, First, The use, in a series of three high rolls, of one grooved roll and two flanged or tongued rolls, the grooved roll being placed between the other two rolls, substantially as and for the purpose hereinbefore described.

Second, The use of L-shaped guides in combination with the grooved roll in the middle of a series of three high rolls, for the purpose of giving the iron a bearing from the points to the heel of the guide as it passes from between the rolls as well as clearing it from the groove, substantially as hereinbefore described.

48,497.—Metallic Hoop for Barrels, Casks, &c.—Wm. Wilson, Jr. (assignor to himself and Charles Green), Wilmington, Del.:

I claim a corrugated or crimped metallic hoop for casks, barrels, kegs, &c., substantially as herein shown and described.

48,498.—Bench Hooks and Clamps.—E. P. Wood, Lowell, Mass., and A. E. Blood, Lynn, Mass. assignors to Wood, Sherwood & Co., Lowell, Mass.:

We claim the jaws A, B, in combination with the hook, E, and connecting bar, C, substantially as and for the purposes set forth and described. We claim in combination with the jaws, A, B, and hook, E, making the apparatus adjustable for thick or thin material by means of the rack, D,

and pin, C, or equivalents thereof, substantially as and for the purposes set forth and described.

48,499.—Extracting Gold and other Precious Metals from their Ores, etc.—Henry Wurtz (assignor to Wurtz Amalgamating Company), New York City:

I claim, First, The combination with quicksilver, when used for the extraction by amalgamation of metals from their ores or their mixtures with other materials of metallic sodium or metallic potassium or any other highly electro-positive metal equivalent in its action thereto, as above set forth.

Second, In those amalgamations in which amalgamated plates of copper or other metal ore used, the substitutions for the plates of copper or other metal, of coated with quicksilver combined with sodium or other highly electro-positive metal, as above set forth.

Third, The coating of iron, steel, or other metallic surfaces between or under which ores or other materials are crushed with quicksilver combined with sodium or other highly electro-positive metal, as above set forth.

Fourth, The prevention of the granulation or flowing of quicksilver when used in any method of amalgamating ores or other materials by addition thereto of sodium or other highly electro-positive metal, as above set forth.

48,500.—Enamel.—Theodore L. Oest, Berlin, Prussia (assignor to Henry Maurer and Adam Weber, New York City.):

I claim an enamel powder composed of the different parts mentioned and in proportions substantially as specified and set forth.

48,501.—Heating Stoves.—John Crea, Allegheny City, Pa.:

I claim, First, The use of an air-chamber placed at the top of a close stove and having an imperforate top or cover and a perforated bottom when such bottom is so curved substantially as hereinbefore described, so as to form a circular recess for the detention of the gas and smoke.

Second, Also so arranging the perforated air-chamber constructed substantially as hereinbefore described, that its top and sides, or the top alone, shall be parallel, or nearly so, with the top or cover of the stove, and at such a distance therefrom as to leave a narrow passage for the flame.

REISSUES.

2,010.—Step Ladder.—John H. Balsley, Dayton, Ohio Patented Jan. 7, 1862:

I claim, First, The supports, A, A, made of strips, whose ends are connected together, forming between them are elongated ellipses, as and for the purpose specified.

Second, The braces, B, B, in connection with the supports, A, A, and steps, h, h, to give strength laterally, as is specified.

Third, The jointed cross piece, G, and slotted rods, g, g, for adjusting the supports, F, F, laterally, as herein specified.

2,011.—Wheat Drill.—Jacob B. Crowell, Greencastle, Pa. Patented June 23, 1863:

I claim, First, A horizontal rock shaft, provided with stirrers, G, and wipers, D, substantially as set forth.

Second, I claim a horizontal rock shaft, when armed with spikes or stirrers, G', on the upper side of the shaft, substantially as specified.

Third, I claim the horizontal rock shaft, in combination with the curved metallic bottom of the hopper, substantially as described.

Fourth, I claim so arranging and operating a rock shaft that the spikes or stirrers on the upper side of the shaft will prevent the arching of the guano and bring the same down to a point reached by the stirrers on the under side of the rock shaft, and thus agitate and feed down the entire mass of the guano in the hopper, substantially as specified.

2,012.—Combined Measure and Funnel.—Samuel R. Dummer, New York City. Patented April 5, 1864:

I claim as a new article of manufacture a combined vessel and funnel, substantially as and for the purposes specified.

2,013.—Tea and Coffee Pot.—E. B. Manning, Cromwell, Conn.—Patented June 3, 1862:

I claim the herein-described tea or coffee pot, in which the bottom and lower portion of the body is constructed of hard metal, as iron, united to a Britannia body in the manner described, when the said hard metal body and bottom are formed in the manner described, and united to the Britannia bottom a sufficient distance from the bottom to protect the Britannia from the effects of heat or other injury, as and for the purpose specified.

2,014.—Reaping Machine.—C. W. and W. W. Marsh, Clinton, Ill. Patented Aug. 17, 1858. Reissued July 5, 1864:

First, We claim the secondary elevating band of rakes, F, consisting of toothed slats extending across on the under side of a slotted platform, the teeth protruding through the slots, in the manner described, and used in connection with the binder's grain receptacle, I, substantially as and for the purpose set forth.

Second, We claim the loose cover, H, whose upper and lower edges are curved, as described, when used in connection with the steady pins, h h h h, and the secondary band of rakes, as described.

2,015.—Reaping Machine.—C. W. and W. W. Marsh, Clinton, Ill. Patented August 17, 1858. Reissued July 5, 1864:

First, We claim the binder's tables, M, M, when used in connection with the concave, I, or other equivalent grain receptacle, substantially as and for the purpose set forth.

Second, We claim binder's platform, J, when used in connection with tables, M, M, substantially as and for the purpose specified.

Third, We claim the relative arrangement of the several parts of the binding attachment, as shown in figures 2 and 3; a table, M, at each end of the receptacle, I, and platform, J, the binder's stand between said tables, substantially as and for the purpose set forth.

2,016.—Chair Bottom or Back.—Isaac P. Tice, New York City, assignee by mesne assignment of Austin T. Smith. Patented May 25, 1858:

I claim the employment of perforated sheet metal in the bottoms or seats and backs of chairs, and other articles of furniture for sitting and recumbent purposes, substantially as herein described.

2,017.—Harvester of Grain and Grass.—Andrew Whitely, Springfield, Ohio, assignee by mesne assignment of John J. Weeks. Patented September 26, 1854.

I claim, First, Making that portion of the upper part of the guard fingers of a harvester which rests on the finger bar in two parts, one on either side of the lower part, but neither of them over h, or any screw or bolt passing through it and the finger bar, through which it is passed.

Second, The combination of the herein described short cutter and narrow divider and a track clearer with a harvester finger bar, which is connected to the axle of the cutter's driving wheel in such a manner as to rise and fall with the undulations of the ground over which it is drawn, irrespective of the risings and fallings of said axle.

Third, The combination of a revolving track clearer with the outer end of a harvester's finger bar in such a manner as to have no part of the machine between the ground and that part of this track clearer which separates the cut from the uncut grass, neither any part of it between the finger bar, the revolving track clearer, and that part by which it is connected to the finger bar.

Fourth, The combination of a revolving track clearer with the outer end of a harvester's finger bar and a wheel connected therewith in such a manner that the attendant of the machine can, while the machine is in operation, make this wheel carry said end or not as he desires, substantially as shown and desired.

DESIGNS.

2,103.—Coffin Stud.—Daniel A. Clark, Pawtucket, R. I.

2,104.—Coffin Handle.—James S. Ray, East Haddam Conn.

2,105.—Plates of a Stove.—Garrettson Smith and Henry Brown, Philadelphia, Pa., assignors to Raymond Campbell & Co., Middletown, Pa.

2,106.—Panel of a Stove.—Garrettson Smith and Henry Brown, Philadelphia, Pa., assignors to Smith, Wells & Co., Roger's Ford, Pa.



GRANTED
FOR SEVENTEEN YEARS.

MUNN & COMPANY,

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

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

Yours very truly,

CHAS. MASON.

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

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

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

WM. D. BISHOP.

THE EXAMINATION OF INVENTIONS.

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

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

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

The Patent Laws, enacted by Congress on the 2d of March, 1861 are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

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

CAVEATS.

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

HOW TO MAKE AN APPLICATION FOR A PATENT.

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

REJECTED APPLICATIONS.

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

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

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

Patents are now granted for SEVENTEEN years, and the Government

fee required on filing an application for a patent is \$15. Other changes in the fees are also made as follows:—

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

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignment of patents. Fees moderate.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

FOREIGN PATENTS.

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

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

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

INVITATION TO INVENTORS.

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

EXTENSION OF PATENTS.

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

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

UNCLAIMED MODELS.

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

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

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

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.

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.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our receipt on their funds.

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.

STEAM GENERATORS AND ENGINES.—THE AMERICAN Safety Steam Engine Company are manufacturing Brayton's Patent Steam Generators and Engines. There is a saving of 25 per cent in fuel over ordinary engines and boilers and they cost but little to keep them in repair. There is no possibility of exploding the genera or. For particulars and circular address GEO. WOODMAN, Treasurer and Agent, 84 Washington St., Boston. 2 12

PARTIES DESIRING TO CONTRACT FOR THE manufacture of Wood and Iron Work, Agricultural Implements, or any article of machinery, can correspond with J. H. BOSTWICK, R. R. Iron Works, Ithaca, N. Y. 4*

TO MANUFACTURERS AND MERCHANTS!

STUTTGART, CARLSRUHE AND NUREMBERG.

INVITATION.

The Industrial Museum of the Royal Wurtemberg Board of Trade and Commerce at Stuttgart; the Industrial Museum of the Grand Duchy of Baden, at Karlsruhe, and the Industrial Museum of the Town of Nuremberg have made an agreement, according to which they will receive from manufacturers and merchants of all countries objects such as mentioned below, for the purpose of exhibiting the same in turn at each of the three towns named, under conditions, offering great advantages to the contributors.

1. Raw productions, for which new applications have been found in the art and industry.

2. Newly invented or improved tools and machines.

3. Newly invented or improved manufactures, which are not generally known.

Those who are desirous of sending objects for exhibition have to apply to the Boards of one of the institutions mentioned, among the objects to be sent in, and stating at the same time their size, weight and peculiarities, as well as their selling prices, either at the place of manufacture or at the place of exhibition, with indications as to the names of the firms of which the like objects may be ordered, and of the agents charged with the sale of the article to be exhibited.

The reception of goods at each of the three towns named above will begin on the 1st of May, 1865, and the time allowed for each object to remain in the exhibition will be generally four weeks at each town.

On the objects thus to be exhibited labels will be affixed, stating, in case that patents have been obtained on any of them in which countries that have been granted, and statements to the same effect will be made in the weekly papers, published by the Boards of the said institutions.

Manufacturers and merchants desiring to avail themselves of this opportunity of bringing their products in the shortest time to the knowledge of the people of Southern Germany, and of securing by this means a more extensive sale for them are now invited to address themselves to one of the undersigned Boards, who will be happy to communicate to them copies of the printed sketches, containing all the particulars.

The Board of the Royal Wurtemberg Industrial Museum, at Stuttgart. Dr. STUBBEIS.

The Board of the Industrial Museum of the Grand Duchy of Baden, at Karlsruhe. DEITZ.

The Board of the Nuremberg Industrial Museum, at Nuremberg. DR. BEEG.

March, 1865. 2 2m3t

WANTED.—A GOOD BUSINESS MAN, WITH \$25,000 to \$40,000, is invited to join in extending a profitable manufactory. The factory has had five years profitable experience, and its brands are in best repute. It requires no outlay for machinery; this is ample and in order; but the proprietor finds the necessary extension of his production overtaxes his capital and his energies, and he would admit a suitable person to a share in his enterprise. He makes Edge Tools, Tool Handles, Brass Work, and some specialties protected by patents.

His works are eligibly located between New York and Philadelphia, on rail and canal.

References given and required.

Address or call at Room 22, No. 71 Broadway, on Thursday and Friday (July 6th and 7th), between 11 and 3 o'clock. 1

BOILER INCORUSTATIONS. DETROIT, June 29, 1864.

I have tried Mr. A. G. Cross's Anti-Incorustation Mixture, and was happily disappointed in finding that it answered fully the recommendations of the inventor. It is the first article of the kind that I have found effectual in removing scale from boiler flues that have become incased in limy deposit. I am using it on my steam-boilers and in my mill boilers. [x2*] E. B. WARD.

ANDREWS' PATENT OSCILLATING ENGINES.—A Double and Single Engines, from 1/2 to 125-horse power, finished at short notice. These engines leave the shop ready for use, require no special foundation, are compact, light and simple, and economical of power. For descriptive pamphlets and price list address the manufacturers, W. D. ANDREWS & BRO., No. 414 Water street, N. Y. 2 4*tf

ANDREWS' PATENT CENTRIFUGAL PUMPS.—CAPACITY from 30 to 40,000 gallons per minute. For draining and irrigating lands, wrecking coffer dams, condensers, cotton, wool and starch factories, paper mills, tanneries, and all places where a large and constant supply of water is required, these pumps are unequalled. They are compact, require little power, and are not liable to get out of order. For descriptive pamphlet address 2 4*tf WM. D. ANDREWS & BRO., No. 414 Water street, N. Y.

PORTABLE ENGINES, SUITABLE FOR THE OIL regions, from 8 to 30-horse power, with large fire-place, independent steam feed pump, steam gage, and improved water heater. The most complete and best engines in the market. For particulars address WM. D. ANDREWS & BRO., No. 414 Water street, N. Y. 2 4*tf

AGRICULTURAL AND MECHANICAL AGENCY, Hava a.—EZRA K. DOD solicits consignments of and authority to contract for all articles of ready sale in the Cuban market, such as plows and other farm utensils adapted to cane culture, steam engines, boilers and mills, shovels, axes, saws, cane knives, gas fittings, brass and copper seamless pipes, cooking stoves for burning coke, animal coal for refining sugar, illuminating and lubricating oils, &c. Patents will be secured and introduced. References, New York—Messrs. Gebhard & Schuchardt, Moses Tay or Thomas Downing; Philadelphia—Messrs. Merick & Sons; Baltimore—Messrs. G. DeFord & Bros.; Boston—Thos. Oxnard, Esq. 2 4

PARTNER WANTED WITH \$10,000.—ANY PERSON who, for health or pleasure, desires to reside the whole or part of the year in a tropical climate will find this an opportunity such as is seldom met with. Address CUBA, SCIENTIFIC AMERICAN Office. 2 4

FOR SALE—THE PATENT RIGHT OF A DIFFERENTIAL Pulley Block, just issued, for raising heavy weights, whereby a great saving in time and labor is effected. Can be adapted for almost any purpose. For further particulars apply to THOMAS ALLEN, No. 192 Pearl street, or S. VAN HENCK, No. 774 Washington street, N. Y., where model of machine can be seen. 2 2*

WANTED—THE ADDRESS OF THE MANUFACTURER of "Steel Corn Mills," in use in the Southern States. Any one having the information will confer a favor by sending it to H. F. SMITH, Box 1,469, New York. 2 2*

BOILER INCORUSTATIONS EFFECTUALLY PREVENTED by Winans' Powder, 10 years in use. No soda in it, consequently no foaming. H. N. WINANS, No. 11 Wall St. 2 4*

BOUND VOLUMES OF SCIENTIFIC AMERICAN for Sale.—From Vol. 2 to XIV (old series), or from I to XII (new series) complete, in morocco body and tips and marbled edges. Address F. SARGENT, 56 Franklin street, New York City. 2 2*

PATENT PORTABLE MUSKETO BAR, FOR TRAVELERS. Tourists, Sportsmen, Hiving Bees and Fishing. A perfect safeguard against all annoying insects. Sent free of postage by remitting \$1.25. A liberal discount made for the trade. Also state Rights for sale. Address JOHN ZENGELER, P. O. Box 2,682, Chicago, Ill. 1 4*

FOR SALE—ONE 26-IN. FARRER PLANER AND Matcher, \$6; one Double Surfacier, \$4 50; one small Planer and Matcher, \$4 50; one hub Mordising Machine \$2 50. Address E. C. TAINTER, Worcester, Mass. 1 2

TRUE'S POTATO PLANTER DOES THE WORK OF 12 men. Rights for sale. J. L. TRUE, Garland, Maine. 25 10*

THE MOST VALUABLE MACHINE FOR BUILDERS
and Carpenters, Furniture, Carriage, Agricultural Implement, Sash and Door, Waived and Straight, Molding and Piano Manufacturers, complete for all kinds of irregular and straight work in wood, hard or soft, superior to all others, having the capacity of twenty good mechanics, called the Variety Molding Machine. We own nine patents, covering the valuable inventions for machines with upright mandrels. Have them manufactured in one place only for the United States and Europe, viz.: at Plass Iron Works, No. 110 East Twenty-ninth street, New York. We hear there are parties manufacturing machines infringing on some one or more of our patents. We caution the public from purchasing such infringements. Our patents secure to us the machine with either iron or wooden table, through which are two upright mandrels, having cutters in each head held by a screw nut; also, combination collars, saving 75 per cent in cutters, feed table to plane and cut, iron outside the cutters, preventing wood from taking undue hold. Also guards acting as plane stocks, making it safe for a boy to run.
Agents solicited. Please send for circular giving full description. Information or orders for machine may be addressed COMBINATION MOLDING AND PLANING MACHINE COMPANY, New York City.

VULCAN WORKS, BALTIMORE.—THIS WELL-
known establishment is offered for sale, or would be leased for term of years, with the privilege of purchasing within a stated period. It is complete in all its departments, embracing Iron and Brass Foundries, Blacksmith, Machine, Boiler, Pattern and Carpenter Shops, Copper-smith, Etc. The tools and machinery, with powerful cranes and twisting apparatus, are many of them of recent construction, and all in complete order for the manufacture of Marine Engines of the heaviest class, and all other descriptions of machinery. The situation in close proximity to the water, and near the business portion of the city, is unrivalled. The reopening of trade with the South will in a short time bring a full supply of orders from that direction, and the establishment has always commanded a fair portion of Government work and of the local trade. For further particulars address
H. R. HAZLEHURST,
Vulcan Works, Baltimore.

FOR SALE.—A SCREW-CUTTING LATHE; WILL
cut every variety of thread used on steam, gas, water pipe and fittings; both right and left hand. BULLARD & PARSONS, Hartford, Conn.

SMALL BEAM ENGINE.—I WILL SELL A BEAU-
tiful 2-horse beam engine, suitable for a small boat or light business, for \$170 cash. Said engine is entirely new, and was made at odd times by a man "for the fun of the thing." The engine is complete, with feed pump, etc. No answers unaccompanied by stamp for return post noticed.
EGBERT P. WATSON,
Box 773, N. Y.

WORRALL'S PATENT CHUCKS FOR SCREW MA-
chine and Holding Wire Drills and other articles.—The cheapest and best chuck for drills in use. 1 1/2 inch in diameter, no ding any size from 1/4 up to 1/2 inch. Perfectly true and reliable. Address THOS. H. WORRALL, Lawrence, Mass.

INVENTORS' EMPORIUM, NO. 37 PARK ROW, N. Y.
—New and useful inventions manufactured, introduced and sold on commission. Agents wanted. RICE & CO.

MASON'S PATENT FRICTION CLUTCHES, FOR
connecting and disconnecting shafting. Also for Starting Gears and all heavy machinery without sudden shock, are manufactured by VOLNEY W. MASON, Providence, R. I.

WATER POWER.—AT N. FALLS, N. Y., FOR 50
Mills.—Now ready, for sale, a lease, at half price of Patterson Power Leases. Renewable every 20 years for ever. Apply at No. 23 Courtland street, N. Y. to HORACE H. DAY.

HARTMANN & LAIST, CINCINNATI, OHIO; MANU-
facturers of Glycerin Acetic Acid, Grape Sugar and Syrup. 1 26

SPOKE LATHES (BLANCHARD'S) OF AN IMPROVED
Pattern, made by J. GLEASON, No. 1,030 Germantown avenue, Philadelphia, Pa.

TO MANUFACTURERS AND EXPORTERS.—ALL
articles of American manufacture which are exported to foreign countries are entitled to a drawback equivalent to the amount of tax paid at the time of manufacture under the Internal Revenue Law. We offer our services to secure the refunding of this amount, and will cheerfully furnish all necessary information. MERCHANT, OAKLEY CO., Custom-house and Internal Revenue Brokers, No. 71 Broadway, Room No. 55.

PORTABLE STEAM ENGINES.—THESE WORKS
have lately increased their facilities for the manufacture of their popular engines. Prices reduced to a peace standard. Fourteen feet and more of heating surface given to the nominal horsepower. Delivery to the Oil Regions by part navigation much prompter and cheaper than from more eastern points per railroad. Send for circular before buying.
F. W. M. RAEDER,
Ames Iron Works, Oswego, N. Y.

MECHANICAL DRAUGHTSMAN, FAMILIAR WITH
Isometric Perspective, wanted. Address G. H. KNIGHT, Box 541, Cincinnati, Ohio.

MACHINE BELTING, ALL SIZES, ON HAND, OF
superior Oak tanned Leather Belting, and for sale at reduced prices. ALBERT POTTS, cor. Third and William sts., Phila.

NEW BOILER WORKS.—LEHIGH BOILER WORKS,
Allentown, Pa.—For the Manufacture of Boiler and Sheet-iron work of all descriptions, such as Locomotive, Flue, Tubular and Cylindrical Boilers, Locomotive Tanks, Water Tanks, Steam and Blast Pipes, Chimneys, Etc. Also repairing of all kinds attended to with dispatch. All work done at these works is warranted to be of good material and well made. Part of the firm being Machinists, we are prepared to do out-door machine work, such as setting up engines and boilers, with steam and water pipes, and repairing energetically.
NOBLE RHODA & CO.

FOR SALE.—ENGINES, BOILERS, SHAFTING,
Pulleys, Hangers, Rubber Machinery, and Machinery of all descriptions at DAVIS'S MACHINERY YARD, Nos. 122 and 124 Hudson street, near the ferry, Jersey City. Factories of all descriptions bought and sold for cash. Castings furnished at 10 per cent less than New York prices, and delivered.

MILL STONE DRESSING DIAMONDS SET IN
Patent Protector and Guide.—Sold 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.

MACHINISTS' TOOLS, ENGINE LATHES, HAND
Lathes, Planers, Upright Drills, Etc., of best material, and superior workmanship, manufactured and for sale by WM. M. HAWES & CO., Pa 1 River, Mass.

FOR SALE.—THE ENTIRE RIGHT OR STATE
Rights of my Patent Brass Turning Cleaning Machine. It will clean from 300 to 600 pounds of dirty turnings per day.
J. JOHNSON,
No. 75 N. Howard street, Baltimore, Md.

A GOOD CHANCE.—GEO. BINNS, MANUFACTUR-
ing Chemist, No. 7 Gold street, N. Y., will sell at half price all the New and Improved Apparatus for making Sulphate ammonia. Also, for sale, 2,000 barrels of Ammoniated Lime, for manure, at \$1 25 per barrel.

PATENT HORSE-POWERS.—ADAPTED TO COTTON
GINS, Thrashing Machines, Farm Mills, Etc. Portable, easy-working, and proved durable by long use. For Circulars or machines address CRESSON, HUBBARD & SMITH, Philadelphia.

TO GAS COMPANIES.—FOR SALE AT THE ISLAND
Works of the Gas Co., Washington, D. C. 1 Retort House, roof frame of iron, 141 feet long, 54 feet wide, with the slate attached. All the iron work belonging to 23 benches, of 3 retorts each. 4 Washers, 18 inches diameter. 4 Purifiers of wrought iron, 5 ft. by 11 ft., with lids, etc. 2 1/2-inch Slide Valves. 15-foot Station Meter, together with sundry connections, the whole forming a complete Gas Station, in good order.
For examination apply to GEO. A. McILHENNY, Engineer of Gas Works, Washington, D. C.
For purchasing apply to B. H. BARTOL, Philadelphia.

TO MACHINISTS AND ENGINEERS.—FOR SALE—
Gear calculating Rules, correctly graduated for 2,000 different gears, giving the number of cogs directly opposite their outside diameters, with allowances made for pitch lines. Warranted. Sent, with directions, \$5, or \$5 50 sent by mail, post-paid. Give plain directions, and address
CHARLES B. LONG, Patentee,
24 5th Worcester, Mass.

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.,
23 2nd West Meriden, Conn.

STEAM ENGINES.—WITH LINK MOTION, VARIA-
BLE automatic cut-off, of the most approved construction; Mill Gearing, Shaiting, Hanger, Etc. Address
M. & T. SAULT,
1 26th New Haven, Conn.

GILBERT'S PATENT COAL AND ASH SIFTER—A
new and useful invention, of which a portion of the State Right is for sale. Address EMERY & HUTCHINSON, Manufacturers, No. 57 Canton street, Boston, Mass.

BOLTS, NUTS, WASHERS, SET SCREWS, COACH
Screws and Machine Screws, constantly on hand for sale by LEACH BROTHERS, No. 86 Liberty street, New York.

D. LAKE'S FLY-TRAP.—ILLUSTRATED IN THE
SCIENTIFIC AMERICAN of June 10, 1865. Sent by express on the receipt of \$4. 1/2 DAVID LAKE, Smith's Landing, N. J.

TRIP HAMMERS.
Parties using or intending to erect Trip Hammers are invited to call and examine the Hotchkiss Patent Atmospheric Hammer, made by CHARLES MERRILL & SONS, No. 556 Grand street, New York. They are run by a belt; occupy 2 1/2 by 4 feet space; strike 200 to 400 blows per minute, according to size, and the hammer running in slides, each blow is square and in the same place. Die work can be done under them more rapidly than under a drop, and for swaging it is unequaled. They are very simple in their construction, under perfect control, and require much less power than any other hammer. Send for a circular illustrating the hammer, which gives full particulars.

THEYSON & OGG, NO. 39 GREENE STREET, NEAR
Grand, Machinists, Brass Finishers and Model Makers, Experimental Machinery, Indicators, Registers and Steam Gages of every kind accurately and promptly made.

SCREWS.—COMSTOCK, LYON & CO., OFFICE NO.
74 Beekman street, N. Y., manufacture Turned Machine Screws (a superior article to a headed screw), of all sizes under 1/2 inch in diameter, 3 inches long. Also Steel, Iron and Brass Screws for Guns, Pistols, Instruments, Trusses, Artificial Limbs, Etc., of the finest quality, to order.

FOR DANIELS AND WOODWORTH PLANERS AND
other Wood-working Machinery, with the latest improvements, address the manufacturers, RICHARDSON, MERIAM & CO., Worcester, Mass.

GRINDSTONES OF THE BEST QUALITY MANU-
factured for Mechanics, Railroad Shops, Manufacturers and the trade. Address orders to
F. M. STEARNS & CO.,
1 7th Berea, Cuyahoga Co., Ohio.

MACHINISTS' SUPPLIES, OF ALL DESCRIPTIONS,
on hand for sale by LEACH BROS., 86 Liberty st., N. Y.

SPOKE AND HANDLE MACHINERY.—THOSE DE-
siring to purchase the best machine in the United States for making Spokes, Yankee Ax Handles, Flow Handles, and irregular forms generally, should send for cut and description to E. K. WISELL, Manufacturer and Patentee, at Warren, Ohio.

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

THE UNION MOLDING MACHINE—BEST IN USE
—For circulars address H. A. LEE, patentee, Worcester, Mass.

PATENT EXCHANGE, NO 229 BROADWAY, NEW
YORK.—Patents and manufactured articles introduced and sold on commission.
THOMAS G. ORWIG & CO.

2,000 BOLTS PER DAY CAN BE MADE ON
of all kinds
HARDWAY & SONS,
Philadelphia, Pa.
REFERENCES:
Chouteau, Harrison & Valle, Laclede Rolling Mill.
Collins & Holliday, Broadway Foundry.
Marshall & Co., Western Foundry.
John McGarry, Bogy Nail Mill.

ENGINEERING SCHOOL, FRANKLIN, DEL. CO.,
N. Y., has full means for instruction in Mathematics, Drawing, Mechanics, Physics, Chemistry, and all applications, with full sets Eng. Instruments, Chem. Apparatus, Etc. \$185 pays Board and Tuition one year. G. W. JONES, A. M., Prin. Vol. XII 16 20

GROVER & BAKER'S HIGHEST PREMIUM ELAS-
TIC Sitch Sewing Machines, 495 Broadway, New York.

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,
No. 13 East Seventh street, Cincinnati.

FOR SALE.—ONE SINGLE AND ONE DOUBLE
Circular Saw-mill (in the West). One new 40 H. P. Steam Engine, in New York State. One large and several small Engine Lathes. Address E. C. TAINTE, Worcester, Mass.

GALVANIZED IRON.—GALVANIZING DONE WITH
despatch and castings furnished if desired, either Malleable or Gray Iron. Address WILCOX & HALL, Middletown, Conn.
Vol. XI. 23 26 600

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.

MESSIEURS LES INVENTEURS.—AVIS IMPORT-
ANT Les inventeurs non familiers avec la langue Anglaise, et qui préféraient nous communiquer leurs inventions en Français, peuvent nous adresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confiance.
Scientific American office No. 37 Park Row, New York.

THE BISHOP GUTTA-PERCHA COMPANY, EXCLU-
SIVE 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 8 feet, 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.

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. 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.

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.

STEAM ENGINE FOR SALE.—A 35-HORSE POWER
Stationary Engine, second hand but good as new, and in perfect running order. Address I. N. KEYES, Worcester, Mass.

TWIST DRILLS.—A FULL ASSORTMENT, OF ALL
Sizes, Stubbs Wire and Machinists' Drills, on hand for sale by LEACH BROTHERS, No. 86 Liberty street, New York.

DAMPER REGULATORS.—GUARANTEED TO EF-
fect 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 diagrams or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York.

CHEAP SOAP.—SAPONIFIER OR CONCENTRATED
LYE.—The Ready Family Soap-maker. Soap for three cents per pound. See SCIENTIFIC AMERICAN March 18, 1865. Caution—Origin 1. Genuine and Patented article is put up in one-pound iron cans all others being counterfeit. Manufactured by PENNSYLVANIA ALUMINUM MANUFACTURING CO., Office Pitt street and Duquesne way, Pittsburgh, Pa.

\$125 A MONTH!—AGENTS WANTED EVERY-
where to introduce the improved Shaw & Clark Family Sewing Machine, the only low-price machine in the country which is licensed by Grover & Baker, Wheeler & Wilson, Howe, Singer & Co., and Bachelder. All other machines now sold for less than forty dollars each are infringements, and the seller and user are liable to fine and imprisonment. Salary and expenses, or large commission, allowed. Illustrated circulars sent free. Address SHAW & CLARK, Biddeford, Maine.

\$70 A MONTH!—I WANT AGENTS EVERY-
WHERE, at \$70 a Month, expenses paid, to sell Fifteen Articles the best selling ever offered. Full particulars free. Address OTIS T. GAREY, Biddeford, Maine.

ESTABLISHED 1826.—WORLD'S FAIR AND AMER-
ICAN Institute Prize Medal Turning Lathes for Foot and Steam Power, manufactured by JAMES STEWARTSON, No. 222 Canal street, New York. Amateur's Turning Lathes made to order.

W. H. VAN GIESON, SUCCESSOR TO THE WAT-
ERBURY MACHINE CO., builder of every description of Machinery and Machinists' Tools. Pin and Hook and Eye Machines, Metallic Cartridge Machinery, Double and Single-acting Power Presses, Foot Presses, Etc., of new and improved Patterns. Inventors' ideas carried out (when so requested) in the most private and confidential manner. Shop near the Depot, Waterbury, Conn. Terms Cash on delivery.

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

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. HOAP, Lawrence, Mass.

NEEDLES.—SAND'S NEEDLE CO., MANUFAC-
TURERS of Machine Spring Needles. These needles are made by patented machinery, and consequently we claim a uniformity of spring which cannot be obtained in the ordinary way of making. Address, with two samples inclosed, SAND'S NEEDLE COMPANY, Laconia, N. H.

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

CAN I OBTAIN A PATENT?—FOR ADVICE AND
Instructions address MUNN & CO., No. 37 Park Row, New York, for TWENTY YEARS Attorneys for American and Foreign Patents. Caveats and Patents quickly prepared. The SCIENTIFIC AMERICAN \$3 a year. 30,000 Patent Cases have been prepared by M. & Co.

REYNOLDS' TURBINE WATER WHEELS.—COM-
PLETE men are employed to measure streams, make plans, and put in flumes, wheels, and gearing. TALLCOT & UNDERHILL, No. 170 Broadway, New York.

HOLSKE & KNEELAND, MODEL MAKERS. PAT-
ENT Office Models, Working Models and Experimental Machinery, made to order at 525 Water street, near Jefferson street New York. Refer to MUNN & CO., SCIENTIFIC AMERICAN Office.

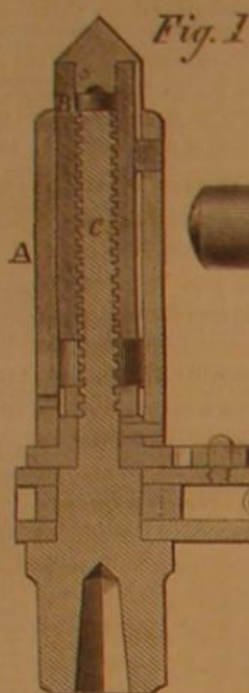
Zur Beachtung für deutsche Erfinder.
Die Untzeichneten haben eine Anstalt, die Erfindern das Verbalten angibt, um sich ihre Patente zu sichern, herauszugeben, und veröffentlichen solche gratis an vielen Orten.
Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Stiffen von Erfindungen mit kurzen, deutlichen gezeichneten Beschreibungen beliebe man zu adressiren an
Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.
Telegraph ist zu haben.

Die Patent-Befehle der Vereinigten Staaten,
nebst den Regeln und der Geschäftsordnung der Patent-Office und Anweisungen für den Erfinder, um sich Patente zu sichern, in den Vereinigten Staaten sowohl als in Europa. Neuer Ausgabe und den Patent-Befehlen fremder Länder und darauf bezügliche Nachschüsse; ebenfalls nützliche Winke für Erfinder und solche, welche Patente ihren Werken zu verschaffen wollen.
Preis 20 Cts., per Post 25 Cts.

Improved Self-feeding Ratchet Wrench.

The great demand for ratchet drills of late has caused much activity in this branch of business, and efforts have been made to render these tools as complete as possible. Every machinist or other mechanic who has occasion to use these tools knows that it is very troublesome to feed up continually, and that an efficient device to do this is very desirable. We publish herewith an engraving of an improved ratchet wrench for this purpose, which is thus described by the inventor:—

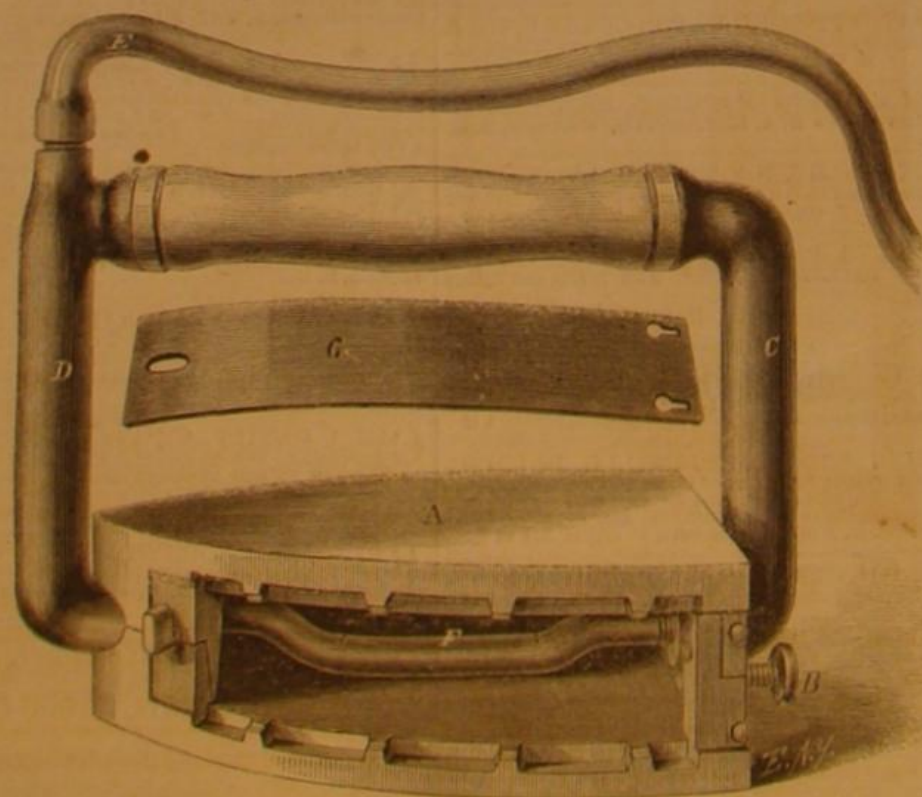
**CHAPMAN'S SELF-FEEDING RATCHET WRENCH.**

"The advantages claimed for this drill are quite obvious. By its self-feeding arrangement a great saving in time is secured, at least one-third. By the perfect regularity in feed thus secured, the drills are not liable to break, which is frequently a source of trouble with ratchet wrenches. It is manufactured of the very best materials and in the most workmanlike manner. In using this wrench one-third of the stroke gives the required feed, or by taking short strokes the sleeve can be revolved completely round without turning the drill, as the ratchet has a greater number of teeth in the feed gear than in the ratchet gear. The hole in the sleeve, A, is for running the nut, B, down on the feed gear after it has been fed out; the nut moves out and in by means of a screw, C, fitted with a spline and feather, E, attached to the nut and

This is a convenient and strongly made wrench and was patented by J. C. Chapman, May 3, 1864. Address J. J. Walworth & Co. for further information 18 to 24 Devonshire street, Boston, Mass.

Double-faced Sad Iron.

In China, clothes are ironed by men in a novel manner. Filling the mouth with water they squirt it through the teeth over the garments and then push a pan, filled with hot coals, over the moistened surface. This is rather primitive, and is open to some objections. In the accompanying engraving we pub-

Fig. 2**TARBOX'S DOUBLE-FACED SAD IRON.**

sleeve (Fig. 2). Should the ratchet feed too fast the feed pawl, D, can be thrown out, or any required feed can be obtained by rotating the handle. Place the thumb of the left hand upon the pawl, press down the spring so that the pawl will not come in contact with the ratchet gear. By this method the handle will turn without turning the drill socket, while the feed pawl and gear will turn the sleeve from one tooth to any number of teeth."

lish an illustration of a new sad iron, which is a labor and fuel-saving device, inasmuch as it obviates the necessity of a stove for heating the irons, dispenses with walking back and forth to the same, and last, but not least, preserves the face of the iron intact or uninjured. This is important to those who are fond of glossy linen—for the polish, remarkable in new shirts, etc., is put on by a burnished iron and hard pressure, not by chemical preparations or mixtures, as most people suppose. With common starch, "elbow grease," and a polished iron, linen can be superbly finished.

In detail this affair consists of an iron, A, having two polished surfaces, top and bottom; both of these are used in turn, and the top is heated while the bottom is in use. When the bottom surface is too cold

with it while the saving in labor and fuel would also be considerable.

It was patented on May 19, 1863, by J. L. Tarbox. For further information address the patentee at Wyoming, Pa.

TO
INVENTORS, MECHANICS, AGRICULTURALISTS,
THE ANNUAL
PROSPECTUS.
OF THE
Scientific American.
THE CHEAPEST AND BEST
MECHANICAL JOURNAL IN THE WORLD,
A NEW VOLUME OF WHICH COMMENCED
JULY 1, 1865.

This valuable journal has been published nineteen years, and during all that time it has been the firm and steady advocate of the interests of the Inventor, Mechanic, Manufacturer and Farmer and the faithful chronicler of the

PROGRESS OF ART, SCIENCE AND INDUSTRY

The SCIENTIFIC AMERICAN is the largest, the only reliable, and most widely-circulated journal of the kind now published in the United States. It has witnessed the beginning and growth of nearly all the great inventions and discoveries of the day, most of which have been illustrated and described in its columns. It also contains a WEEKLY OFFICIAL LIST OF ALL THE PATENT CLAIMS, a feature of great value to all Inventors and Patentees. In the

WOOLEN, COTTON AND OTHER MANUFACTURING INTERESTS will have special attention. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Mechanics' Tools, Electric, Chemical and Mathematical Apparatus, Wood and Lumber machines, Hydraulics, Pumps, Water Wheels, etc.

MECHANICAL DEPARTMENT

A full account of all improvements in machinery will be given. Also, practical articles upon the various Tools used in Workshops and Manufactories.

STEAM AND MECHANICAL ENGINEERING

will continue to receive careful attention, and all experiments and practical results will be fully recorded.

PATENT LAW DECISIONS AND DISCUSSIONS

will, as heretofore, form a prominent feature. Owing to the very large experience of the publishers, Messrs. MUNN & CO., as SOLICITORS OF PATENTS, this department of the paper will possess great interest to PATENTERS AND INVENTORS.

The Publishers feel warranted in saying that no other journal now published contains an equal amount of useful information while it is their aim to present all subjects in the most popular and attractive manner.

NUMEROUS SPLENDID ENGRAVINGS

of all the latest and best inventions of the day. This feature of the journal is worthy of special notice. Every number contains from five to ten original engravings of mechanical inventions, relating to every department of the arts. These engravings are executed by artists specially employed on the paper, and are universally acknowledged to be superior to anything of the kind produced in this country.

TERMS OF SUBSCRIPTION.

Per annum.....	\$3 00
Six months.....	1 50
Four months.....	1 00

To clubs of ten or more the subscription price is \$2 50 per annum. This year's number contains several hundred superb engravings, also, reliable practical recipes, useful in every shop and household. Two volumes each year, 416 pages—total, 832 pages. SPECIMEN COPIES SENT FREE. Address,

MUNN & CO., Publishers,

No. 37 Park Row, New York City.

PATENT AGENCY OFFICE.

MESSRS. MUNN & CO. have been engaged in soliciting American and Foreign Patents for the past eighteen years. Inventors who wish to consult with them about the novelty of their inventions are invited to send forward a sketch and description. If they wish to put their applications into Munn & Co.'s hands for prosecution they will please observe the following rules:—

Make a substantial model, not over one foot in size. When finished, put your name upon it, then pack it carefully in a box, upon which mark our address; prepay charges, and forward it by express. Send full description of your invention, either in box with model, or by mail; and at the same time forward \$16, first patent fee and stamp taxes. As soon as practicable after the model and funds reach us, we proceed to prepare the drawings, petition, oath and specification and forward the latter for signature and oath.

Read the following testimonial from the Hon. Joseph Holt, formerly Commissioner of Patents, afterwards Secretary of War, and now Judge Advocate General of the Army of the United States:—

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

For further particulars see advertisement inside, or send for Pamphlet of Instruction. Address

MUNN & CO.,

No. 37 Park Row, New York City.

FROM THE STEAM PRESS OF JOHN A. GRAY & GREEN

Scientific American.

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

Vol. XIII—No. 3.
(NEW SERIES.)

NEW YORK, JULY 15, 1865.

\$3 PER ANNUM
IN ADVANCE.

Improved Hominy Mill.

This mill is intended to crack or break corn for hominy, and differs from most mills for that purpose constructed heretofore. The object is to reduce the corn evenly, or divide it properly, so that it shall be all of one size, free from small grains or fine flour, which are likely to breed worms and turn sour.

In some hominy mills it is customary to cause the corn to flow continuously through the cracking apparatus, and it is asserted that this is an inefficient

hopper, is then acted on by these teeth and thoroughly reduced. In the process, any fine flour or smaller grains than the regular size, falls through the slots, E, Fig. 2, into any receptacle placed to catch it.

After the corn has been thoroughly broken to the proper size it is dropped into the conveyer, G, which is a quick-pitched screw. This conveyer being set in motion by the gears, H, slowly moves the grain forward into the screen, I, below where it is properly bolted and rendered fit for market.

hammers have been made, but none have yet reached the size of the one now in process of erection at the Bolton Iron and Steel Works. This hammer is being made by Messrs. Nasmyth and Company, of Patricroft, and is of gigantic proportions, and will strike a blow equal to 75 tons. This of course will require an immense anvil block, and the process of casting one for it, weighing 200 tons, on Wednesday last, was a work of unusual interest. The iron was smelted in two large patent upper tweeker cupola furnaces, 24 feet in height and 7 feet in diameter. The molten metal was run into the molding in a constant stream, supplied alternately from each furnace. The process occupied ten hours. The metal was kept in a state of fusion by means of burning charcoal until the whole quantity was poured in. The anvil block measures 12 feet square at the base, and 12 feet 6 in. in depth. The figure is pyramidal, and it is cast base upwards. The metal contains a certain proportion of Bessemer steel. The casting was performed under the superintendence of Mr. Ireland, of Manchester. Large numbers of visitors were at the

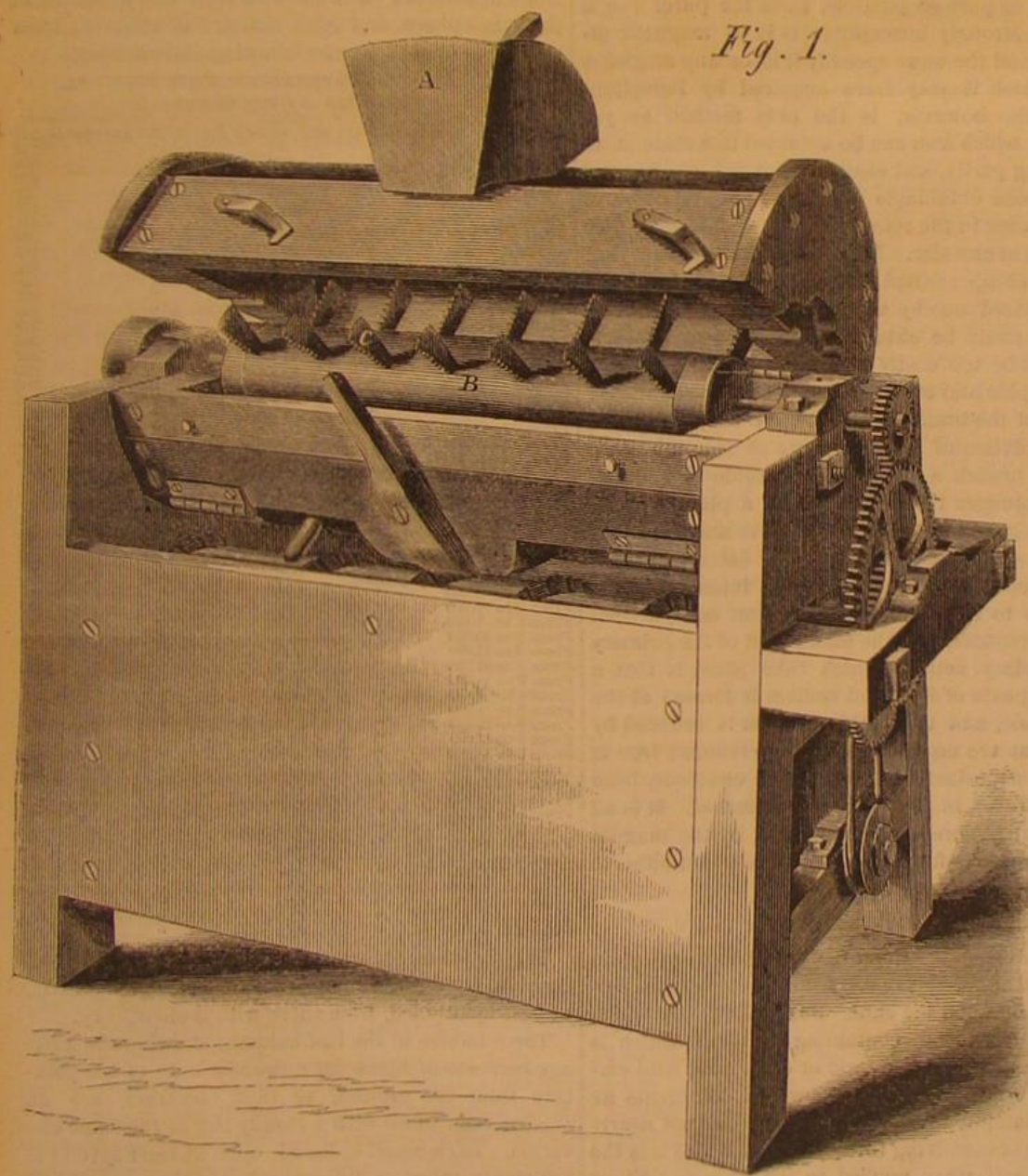


Fig. 1.

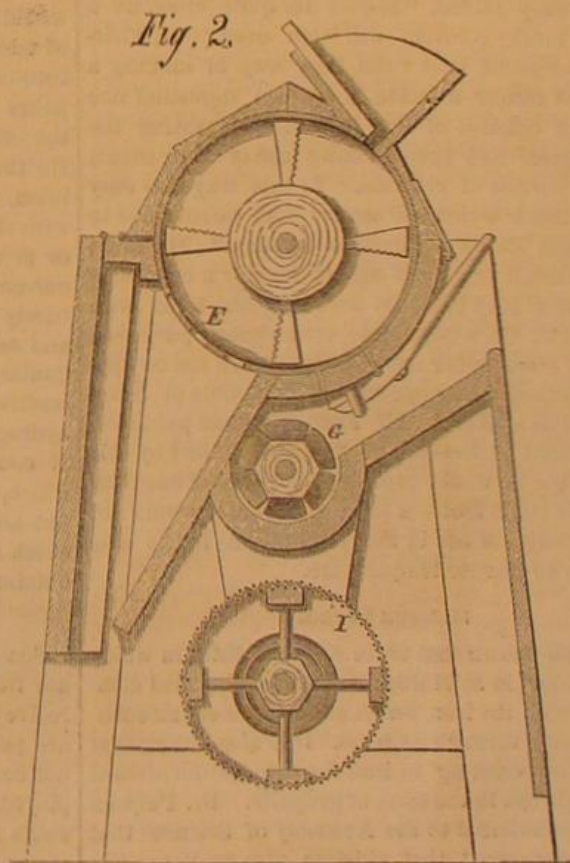


Fig. 2.

JACKSON'S HOMINY MILL.

plan, for much of the corn passes through without being broken, thus causing an amount of labor to separate it afterward, which is unnecessary.

In this mill the corn is put in in charges; that is to say, a certain amount is put in the hopper, A, and subjected to the action of the crackers or breakers, B. These crackers literally cut the corn up, for they consist of a series of steel cutters, C, arranged on a shaft in rows, and wedge-shaped or widest at the heads. The working edges of these cutters are serrated or toothed, to give them more efficiency, and they are staggered or alternated in their positions with relation to each other, so that the spaces between them are very small, the cutters in one row coming opposite, or nearly opposite, the space in the other row.

The corn admitted to these cylinders through the

These combinations give this machine many advantages, and a patent is now pending on it through the Scientific American Patent Agency by the inventor, Andrew P. Jackson, of Memphis, Tenn.; address him at that place for further information.

Another Monstrous Cast-iron Anvil.

Some months ago we chronicled the fact that an immense anvil weighing 160 tons had been cast in Sheffield, Eng. Quite recently this enormous block has been exceeded in weight by 40 tons. The Liverpool *Albion* thus speaks of a huge cast iron block weighing 200 tons:—"The engineering science in its giant progress is constantly needing increased power in its appliances; and the massive forgings now required in ship-building necessitates steam-hammers of corresponding proportions. Many huge

works during the day, and were entertained at Incehcon. The huge casting is not likely to be perfectly cold three months hence, and it will certainly not be reduced to a sufficiently low temperature to be dealt with under two months. When cool enough, it will be turned over, as already explained. The bed for the reception of the block will be enclosed in a large circular wrought iron cylinder, measuring 20 feet in depth and 18 feet diameter. This will be sunk in the ground and filled with concrete, and when finally deposited in its bed the anvil will appear about 2 feet 6 inches above the ground."

TARBOX'S SAD IRON.—The address of the patentee of this invention, illustrated on page 30, of the present volume, is New York city, not Wyoming, Pa., as given.

NOTES ON NEW DISCOVERIES AND NEW APPLICATIONS OF SCIENCE.

THE NEW METHOD OF OBTAINING OXYGEN.

We gave three weeks ago a brief account of Fleitmann's method of preparing oxygen, by gently heating a solution of chloride of lime with a small quantity of peroxide of cobalt. As cheap oxygen would be of immense value in the metallurgical and other arts, and as Fleitmann's process seems to promise to enable us to obtain that gas at a rate of cost at which it would be available for technical purposes, we now add a few further details. Chloride of lime is a compound of chlorine, calcium, and oxygen; Fleitmann's process abstracts all the oxygen, leaving behind only chloride of calcium. The peroxide of cobalt employed in the process is required only in very minute quantity,—one part of the peroxide to a thousand parts of chloride of lime will usually be found sufficient,—and as the same portion of peroxide can be used over and over again, while the reaction takes place at a temperature of between 70 and 80 deg., so that the process does not involve the consumption of much fuel, the cost of obtaining oxygen by this method should but very slightly exceed the cost of the chloride of lime, which is a tolerably cheap commodity. M. Fleitmann's theory of the process is that there are several peroxides of cobalt, containing different proportions of oxygen, and that "one of these peroxides abstracts oxygen from the chloride of lime to form a higher oxide, which is then decomposed into a lower oxide and free oxygen," this alternate composition and decomposition going on continuously. Instead of adding actual peroxide of cobalt to the chloride of lime solution, it is sufficient to add a proper quantity of solution of any cobalt salt from whose solution the hydrated peroxide is precipitable by chloride of lime. The solution of chloride of lime should be a strong one, and, as we have already stated, "should be quite clear, as a thick or murky solution will froth over." M. Fleitmann explains that "the best way of making a clear and strong solution is by first digesting one portion of chloride of lime in water, decanting the clear liquor, and then making use of it to digest another portion of chloride. In this way it is easy to get a liquor which will evolve from twenty-five to thirty times its own volume of oxygen." He adds: "On the small scale it is best to employ a capacious flask, which may be about seven-eighths filled with the solution. On a large scale, for technical purposes, a sort of steamboiler might be used, and the oxygen be so obtained under pressure, and capable of being employed as a blast." M. Fleitmann has published no statement of the cost of oxygen obtained by this method, but it would probably not exceed one half penny per cubic foot,—a price at which it would not be too costly for use in many operations in the arts requiring an intense temperature.

SILICIUM IN IRON.

It is well known that there are two states in which carbon exists in solid iron: a state of chemical combination with the iron, and a state of merely mechanical diffusion through its mass. It is also known that the carbon existing in iron in the last-mentioned state is always in the form of graphite. Dr. Phipson has just announced to the Academy of Sciences that he has discovered that silicium also may exist in cast iron either in a state of combination or in a state of diffusion merely, and that, like carbon, when merely diffused through the iron, and not in combination therewith, it is always in the graphitic form. He adds, what, if true, is of great practical importance, that upon the condition of the silicium in any given sample of cast iron depends, in a very great degree, the practicability of converting that iron into steel by the Bessemer process. He regards diffused or uncombined silicium as the least injurious, stating that while iron containing as much as three or four per cent of free silicium can be converted into excellent steel by the Bessemer method, the presence of a very much smaller quantity of combined silicium will either render the iron containing it incapable of being converted into steel by that method at all, or will cause the steel produced from such iron to be so hard and bad as to be quite incapable of being worked. He promises to publish shortly a full account of his method of determining the condition

in which silicium exists in iron, with details of his experiments upon the influence of that condition upon the results of the treatment of the iron by the process referred to.

SIMPLE METHOD OF REDUCING SOME METALS.

Glucinum and zirconium, the former being the metallic base of the emerald and the latter that of the zircon and the hyacinth, are metals of which chemists know very little. They have hitherto been obtained only from very rare and costly minerals, and by reduction from their haloid salts by means of potassium. A paper in the last number of "Cosmos" suggests, however, that these two metals, and also the still less known ones, yttrium, erbium, terbium, cerium, thorium, lanthanum, and didymium, probably exist much more abundantly than has hitherto been supposed and states that they all admit of being isolated by an exceedingly simple electrolytic method, consisting merely, in each case, in immersing in a solution of a salt of the metal which it is desired to reduce a plate of zinc and a plate of platinum, duly connected together. The metal is then gradually precipitated upon the platinum plate.

PRODUCTION OF PURE IRON FOR ELECTRO MAGNETS.

It is very important that the iron used in the construction of electro-magnets and their armatures should be as pure as possible, since the purer iron is the more strongly susceptible is it to magnetic attraction, and the more speedily it loses any magnetic power which it may have acquired by induction. Electrolysis, however, is the only method as yet known by which iron can be obtained in a state at all approaching purity, and electro-deposited iron has not hitherto been obtainable cheaply enough to admit of its being used in the construction of electro-magnetic apparatus of any size. M. Becquerel has been trying to find a cheap method of obtaining such iron, and he has devised one by which he thinks that electrolytic iron could be obtained at a price at which it would not be too costly for use in the construction of telegraphic and other electro-magnetic apparatus. Into one of the branches of a large U-shaped tube he pours a solution of proto-sulphate of iron, and into the other branch a solution of chloride of sodium. He then plunges into each branch a plate of platinum, one connected with the positive and the other with the negative pole of a constant battery of three or more cells. He so regulates the intensity of the current as to keep the disengagement of hydrogen barely perceptible, and the final result of the primary and secondary actions which take place is that a double sulphate of iron and sodium is formed at the positive pole, and that oxide of iron is reduced by hydrogen at the negative pole. The reduced iron is of course deposited on the negative electrode, from which, however, it may be readily detached. It is all but absolutely pure, and is attracted by the magnet much more powerfully than the purest iron hitherto obtainable in commerce.

ALUMINA AS AN INGREDIENT OF SOAPS.

Soaps intended for toilet use ought not to contain any free alkali, seeing that free alkali exercises a corrosive action upon the skin. Soaps, however, which are perfectly neutral, containing no alkali which is not combined with the stearic or other fatty acid employed, are not nearly such powerful detergents as soaps containing an excess of alkali,—are not nearly so capable of dissolving the substances which it is the office of soap, when applied to the body to remove from the skin. Singular to say, M. Bonnamy, a manufacturing chemist resident at Saint-Germain, has found that if that very neutral substance, pure alumina, be added to completely neutral soap, the soap becomes even more powerfully detergent than the most highly alkaline soap, while remaining entirely free from corrosive properties. The alumina may be introduced into the soap in various ways, the most advantageous perhaps being the use, in the process of manufacturing the soap, of an alkaline salt of alumina, as aluminate of potash or soda, instead of free alkali. An equally good result is however obtained by mixing free alumina, in dry powder, with melted soap which has been manufactured in the ordinary way. M. Bonnamy proposes to use alumina also in various cosmetics, and especially in cold-cream, and he moreover regards it as affording an admirable base for tooth-powders, by reason of its complete neutrality, and the ease with which it can

be tinted by means of perfectly innocent coloring matters.

ANILINE AS A TEST FOR THE ADULTERATION OF LINEN BY COTTON.

A method of using aniline as a means of ascertaining whether or not the linen in any fabric is mixed with cotton, and, if so, in what proportion, is given by Bottger in a recent number of the "Chemisches Central Blatt." At the corners of one end of a strip of the fabric to be tested he loosens the threads so as to expose both the warp and the woof. He then dips that end of the strip in an alcoholic solution of aniline red, washes it in water until the washings are colorless, and then places it in an aqueous solution of ammonia. If any cotton is present, the ammonia will discharge the color from it without touching the color of the linen portion. The linen threads will remain of a bright rose color, but the cotton threads will become quite white.

ON SCIENTIFIC EXPERIMENTS IN BALLOONS.

BY JAMES GLAISHER, ESQ., F.R.S., ETC.

The *London Artisan* publishes a long letter by Mr. Glaisher giving the results of his numerous observations in balloons on the temperature and moisture of the atmosphere, and other matters of interest; from which paper we take the following statements:—

DECREASE OF TEMPERATURE WITH ALTITUDE.

WHEN THE SKY WAS CLOUDY.			
Feet.	Feet.	Deg.	Feet.
From 0 to 1,000	the decrease was	4.5 or 1 deg. on the average of	223
From 0 to 2,000	"	8.1	247
From 0 to 3,000	"	11.8	355
From 0 to 4,000	"	15.2	263
From 0 to 5,000	"	18.5	271
From 0 to 6,000	"	21.7	277
From 0 to 7,000	"	24.4	287
From 0 to 8,000	"	26.8	299
From 0 to 9,000	"	29.0	311
From 0 to 10,000	"	31.0	321
From 0 to 11,000	"	33.0	329
From 0 to 12,000	"	35.6	337
From 0 to 13,000	"	37.8	344
From 0 to 14,000	"	40.1	349
From 0 to 15,000	"	42.1	356
From 0 to 16,000	"	44.2	362
From 0 to 17,000	"	45.4	375
From 0 to 18,000	"	46.7	386
From 0 to 19,000	"	48.1	395
From 0 to 20,000	"	49.0	409
From 0 to 21,000	"	50.1	4.9
From 0 to 22,000	"	50.9	432
From 0 to 23,000	"	51.7	445
WHEN THE SKY WAS CLEAR, OR CHIEFLY CLEAR.			
Feet.	Feet.	Deg.	Feet.
From 0 to 1,000	the decrease was	6.2 or 1 deg. on the average of	162
From 0 to 2,000	"	10.9	184
From 0 to 3,000	"	14.7	204
From 0 to 4,000	"	18.0	223
From 0 to 5,000	"	20.9	239
From 0 to 6,000	"	23.5	259
From 0 to 7,000	"	26.0	271
From 0 to 8,000	"	28.7	279
From 0 to 9,000	"	31.2	289
From 0 to 10,000	"	33.6	298
From 0 to 11,000	"	35.6	309
From 0 to 12,000	"	37.9	317
From 0 to 13,000	"	40.1	324
From 0 to 14,000	"	42.1	333
From 0 to 15,000	"	43.8	343
From 0 to 16,000	"	45.0	348
From 0 to 17,000	"	47.9	355
From 0 to 18,000	"	49.6	363
From 0 to 19,000	"	51.1	372
From 0 to 20,000	"	52.4	382
From 0 to 21,000	"	53.6	392
From 0 to 22,000	"	54.7	405
From 0 to 23,000	"	55.7	413
From 0 to 24,000	"	57.0	422
From 0 to 25,000	"	58.1	431
From 0 to 26,000	"	59.1	441
From 0 to 27,000	"	60.1	449
From 0 to 28,000	"	61.0	459
From 0 to 29,000	"	61.8	469
From 0 to 30,000	"	62.3	482

These results, showing the whole decrease of temperature from the ground to 30,000 feet, differ greatly, as just mentioned, from those with a cloudy sky.

The numbers in the last column, showing the average increase of height for a decline of 1° of temperature from the ground, to that elevation, are all smaller than those with a cloudy sky at the same elevation. Each result is based upon at least seven experiments, taken at different times of the year, and up to this high considerable confidence may be placed in the results; they show that a change takes place in the first 1,000 feet of 1° on an average in 162 feet, increasing to about 300 at 10,000 feet. In the year 1862 this space of 300 feet was at 14,000 feet high, and in 1863 at 12,000 feet. Therefore, the change of temperature has been less in 1863 than those in 1862, and less in 1864 than in 1863, but the experiments have all been taken at different times of the year.

Without exception, the fall of 1° has always taken place in the smallest space when near the earth.

MOISTURE OF THE ATMOSPHERE.

After giving long tables of his observations, Mr. Glaisher thus sums up the results:—

The law of moisture shown in a cloudy day is a slight increase from the earth to the height of 3,000 feet, and then a slight decrease to 6,000 feet, the degree of humidity being at this elevation nearly of the same value as on the ground; from 6,000 feet to 7,000

Improved Funnel and Measure Combined.

There are, unhappily, innumerable careless persons in this world who never put anything in the same place twice, and who drop whatever utensil they may have in hand just where they were using it. To such individuals the measure and funnel combined, here illustrated, will prove convenient, for it is impossible to misplace it or detach it from the vessel it is used with. This article combines the advantages of a vessel or measure with a funnel for decanting liquids, so that no waste occurs in emptying the measure into the funnel, and none from the funnel, as the fluids pass into the bottle or demijohn.

The engraving shows the several uses it may be applied to. The measures are graduated on the sides and furnished with a guard at the top from which a spout protrudes. This spout is to be inserted in the demijohn, as shown, and the measure elevated, in which position it can be left until empty; it is not necessary to hold it as the measure sustains itself. It is claimed that fluids of all kinds can be more economically measured in this vessel than in others, and that there is a saving in labor and the cost of utensils from the combining two articles, which are usually separate, in one.

This funnel was patented through the Scientific American Patent Agency on April 5, 1864, by S. R. Dummer. For further information as to sale of rights, etc., address the agent, Mr. Harry McBride, 174 Washington street, New York.

Improved Washing Machine.

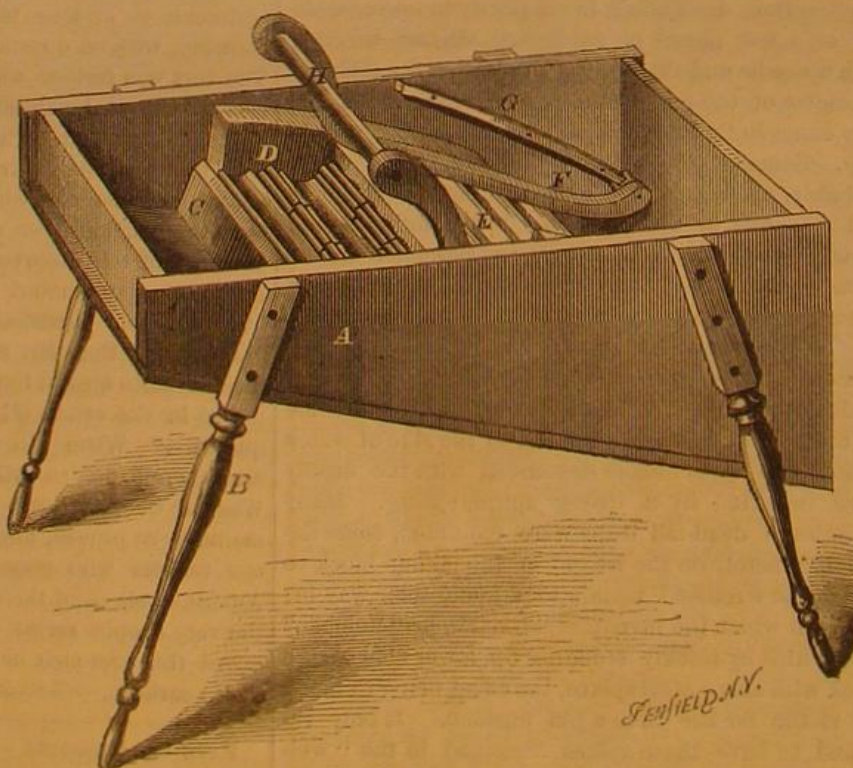
A good washing machine is one of the most desirable things in a family, for there is no more fatiguing employment in housekeeping than cleaning the linen. This machine is designed to imitate the motions and action of the hand, on the garments to be cleaned, and is so arranged that the work is spread out before the operator in full view, thus rendering it possible to direct the attention to the part which may require it the most, instead of wasting labor on the whole, miscellaneously.

The machine, in detail, consists of a water-tight case, A, having legs, B, and an inclined rubbing board, C. This board has grooves in it which carry rollers, D, also grooved. Over the top of these rollers there is another rubbing board, E, which consists of a series of slats grooved diagonally across their length; one end of the board is provided with arms, F, which slide on guides, G, so as to make it uniform in action. The top rubbing board is capable of being raised up vertically to accommodate the clothing to be washed, and at the same time it can be slid back and forth over the surface of them. Clothes to be washed are placed between the rubbing boards, and the case is partly filled with hot suds. The operator then takes hold of the handle, H, and pulls and pushes it alternately to and fro, thus subjecting the linen to a thorough cleansing process analogous to that given in washing by hand and performing the labor in a short time.

This machine was patented through the Scientific American Patent Agency on May 9, 1865, by Henry L. Buckwalter. For further information address H. L. Buckwalter & Co., at Kimberton, Pa.

**DUMMER'S FUNNEL AND MEASURE COMBINED.**

sixty acres, on the Grand Prairie, in the plowing, planting and cultivation of which no man walked a step. A rotary spader, drawn by four horses, and driven by a man upon the box, plowed the field to a uniform depth of eight inches, and gave such thorough tilth that it was not necessary to use a harrow at all. A corn-planter, drawn by two horses, and driven by a man upon the box, next planted the seed. A cultivator drawn by two mules, one walking on each side of the knee-high corn, and driven by a man upon the box, completed the culture of a row at a single operation; and in the tool-house lay another machine, also to be drawn by horses, which will cut down the corn when it is ripe and lay it in regular rows, to be finally gathered by hand. But it is expected that by next year this machine will be so im-

**BUCKWALTER'S WASHING MACHINE.**

proved as to gather up the corn also.

When it is remembered that the farmer who follows a common plow or cultivator during a long summer's day, performs a march of from ten to fourteen miles, it will be seen what a boon is the machinery which relieves him from this toil. And when we remember how scarce were men during the last four years in the West, we shall see that but for such labor-saving implements our vast crops of cereals could neither have been planted nor gathered.

The farm of which the cornfield we speak of was a part, has seven hundred acres in a single field of tim-

Agricultural Machinery.

The farmers of our Eastern States, compelled to till rocky and uneven lands, and used to small holdings, do not know, by experience, all of the changes which improved machinery has wrought in agricultural operations on the great Western prairies. There machines do the labor of men to such a degree that the farmer's heaviest toils are lightened, and one man is enabled to achieve, with ease, the work of half a dozen.

We saw, recently, a corn field of one hundred and

othy. Of what use would this be if it had to be cut by hand? But half a dozen harvesting machines sufficed to cut it all, in good time, and will do, without groaning, the work of half a regiment of men; patent horse-rakes gather it up; and two hay presses upon the place compress it into bales fit for shipping. Seventeen and a half miles of board fence inclose a little more than half of this farm, which has, as part of its furniture, comfortable sheds for ten thousand sheep, a corn crib, rat-proof, holding fifteen thousand bushels of corn, and extensive stabling for horses.

What machinery has thus done for the West it will do for the South, now that free labor is substituted for that of slaves. There is no reason why the cotton and sugar fields of a great part of the South should not be tilled by machinery. These fields are, in Louisiana, Mississippi, and indeed in almost the whole of the cotton and sugar region, level and devoid of rocks, and these are the only conditions necessary to the successful use of the most valuable farm machinery. The slaves, ignorant and careless because they had no interest in the work, used only the rudest and

clumsiest tools; but in the hands of intelligent free-men, the rotary spader, or the steam plow, or cultivator, can be used as well on the immense level bottom lands of Louisiana, where sugar is grown, as on the prairies for corn and wheat.

Yankee ingenuity, too, will presently set itself to work to devise new implements for the more economical and rapid prosecution of such labor as cotton-picking and cane-cutting. The next ten years will witness an immense revolution in the methods of cultivating the great staples of the South; and the fruits of that change will be a greatly increased production of cotton and sugar by the help of free labor, and—what the use of machinery always brings with it—such increased rewards for intelligent labor as will prove, even to the most ignorant of the Southern population, the importance of schools and the pecuniary value of education.—*New York Evening Post.*

Effects of Heat in the Preservation of Wine.

Burgundy is much improved by a voyage to and from Calcutta. This fact led the author to try the effects of warmth on wines at home, and both he and M. Pasteur have come to the conclusion that wines may be much improved by gently warming them, and that sick wines may be cured by the same means. M. Pasteur has, in fact, taken out a patent for warming wines by placing the bottles in a hot-air stove, with the corks tied down, to prevent their being forced out by the expansion. The bottles must be quite full, and have no air in them, and are heated to 64° C. for half an hour, after which the cork is untied, driven home, and sealed down. In the process just described, of course all parasitic ferments are destroyed, and the wine keeps well after it.—*M. de Vergnette-Lamotte.*

To Keep Eggs.

Eggs, says a farmer's wife, can be kept for two years by dipping them in a solution made of one pound of quick lime and one of salt to one gallon of water. Take an old pail and put in your lime and water, and then stir until it is all dissolved, then add salt as above (keep it in the cellar); when cool enough, it is ready to use. Dip in the eggs, and see that they are all covered with the solution, which must be stirred from the bottom occasionally. Pack them, small end downward, in bran or salt, or without anything. When wanted for use or market, a little warm water will wash them clean. Some dip eggs in boiling water, some grease them and pack them in bran. I packed fifteen dozen (as I could gather them) in August in salt, and kept them until spring just as good as fresh. They must all be kept in a cool cellar a little moist rather than dry.

Erosion of Lead.

The erosion of lead, and even of type metal, by certain species of insects, is not generally known, and may be extremely mischievous. Not long ago it attracted the attention of the French Academy of Sciences, and several communications respecting it have been published with their proceedings in the *Comptes Rendus*. Of these the following is a *résumé* :—

In 1858 Marshal Vaillant exhibited to the Academy leaden bullets brought back from the Crimea, in some of which the larvæ of insects had excavated circular passages three or four millimetres in diameter, and in others superficial grooves. Inquiry was made through the Russian Ambassador, M. de Kisselef, whether similar erosion had been observed in Russia. M. V. de Motschulsky replied that nothing of the kind had been detected in the cartridges of the Russian army in the Crimea, and that the insect which had caused the injury appeared to be very rare in Russia, not having been discovered by Russian entomologists in the Crimea. It is stated to be very common in England, Sweden and Germany, and to occur in the Jura in France. It attacks silver firs and pines.

The insect which damaged the French cartridges was imported from France in the wood of the cases in which they were packed. All the excavated passages were originally circular in section, and those that were semicircular in section, that is, superficially grooved, were only segments, of which the other half was in the contiguous surface of other bullets or of the wood forming the sides of the cases. The passages were always open at both ends. Excavation was effected by the mandibles of the insect, the apparatus consisting of a saw toothed, and cut like a file. The insects do not eat the lead, but simply bore it out; and it was observed that their remains, after metamorphosis, had been carried downwards by the particles of the metal, reduced to powders, and dispersed on the outside through the cracks in the bottom of the packing case. The perfect insects did not attack the lead, but died in the passages, even immediately after their complete metamorphosis, as very often occurs with insects in general.

In 1833 Audouin exhibited to the Entomological Society of Paris, sheet lead from the roof of a building deeply grooved by insects. In 1844 Desmarest mentioned erosions and perforations of sheet lead by a species of *Bostriche*, and illustrated the fact by cartridges from the arsenal at Turin. Mr. Westwood, the well-known British entomologist, has recorded observations by himself on the perforation of lead by insects. M. Bouteille, curator of the Museum of Natural History at Grenoble, sent to the French Academy of Sciences, from the collection under his charge, specimens of cartridges gnawed by insects, which were found *in situ*, and the following report upon the subject was made by Marshal Vaillant, de Quatrefages, and Milne Edwards; the insect was *Strex gigas*, a large hymenopterous species which, in the larva state, lives in the interior of old trees or pieces of wood, and which, after the completion of its metamorphosis, quits its retreat for the purpose of reproduction. As previously stated, it cuts its way by its mandibles, gnawing the woody substance or other hard bodies which it meets with in its course. Analogous perforations are made by the mandibles of the *Callidium sanguineum*. The reporters add:—"If it is probable that it is always with their mandibles that coleopterous as well as hymenopterous insects thus attack lead or other hard bodies, it is not well established that it is always the desire of liberty which prompts them so to act. Indeed, in some cases, coleopterous insects have been seen to gnaw the exterior of similar bodies."

Reference was made to a paper by Antonio Berti on the perforation of leaden pipes by an insect named *Apate humeralis*.

Scheurer-Kestner, in 1861, communicated to the French Academy a notice of the erosion by an insect of the sheet lead of a new sulphuric acid chamber. The creature was caught in the act of escaping through the lead, having been imprisoned between it and a wooden support.

Perhaps the most interesting and important case of insect erosion is that of stereotype metal, which was communicated in 1843, by M. du Boys to the Agricultural Society of Limoges. Specimens riddled

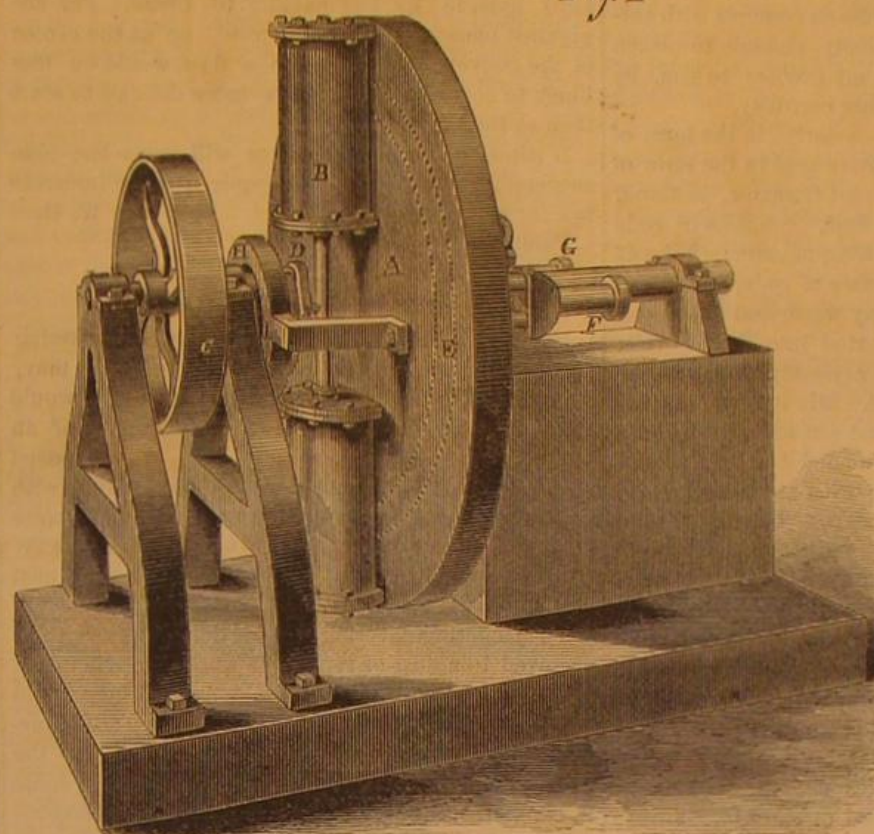
with holes were shown in illustration.—*American Annual Cyclopaedia*.

Double-cylinder Revolving Engine.

Rotary engines, in one form or another, have occupied the attention of inventors for many years, and changes in the form or details of them, with a view to render them economical and efficient, are continually being made.

The engine here illustrated is not a rotary engine, inasmuch as the pistons in such machines travel continuously in one direction, but this combines a recip-

rocating motion of the piston with a rotary one of the cylinder, and adds the weight and momentum of that detail to the force exerted by the piston. The following description will render the principle and main parts familiar to the reader:—



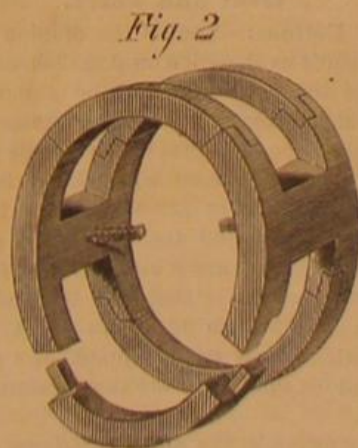
FOSTER'S DOUBLE-CYLINDER REVOLVING ENGINE.

rocating motion of the piston with a rotary one of the cylinder, and adds the weight and momentum of that detail to the force exerted by the piston.

The following description will render the principle and main parts familiar to the reader:—

The wheel, A, on which the cylinders, B, are placed, is set below the center of the shaft and pulley, C, half the length of the stroke. When, therefore, steam is admitted to the pistons, they, on being forced out, act against the crank, D, and turn the cylinders and wheel around.

The steam is let into the cylinders by the ports, E,



shown in dotted lines through the steam pipe, F, and the exhaust pipe is at G. There are two branches to both of these pipes, and when steam is let into one, by turning a valve the engine revolves in one direction, and is reversed by admitting steam to the other branch. It is intended to have two sets of cylinders, or four in all, the piston rods crossing each other at right angles, and one pair of cylinders set further from the shaft in order to allow the rods to work on different cranks on the same shaft. The yoke, H, is fitted to a bearing, I, thus distributing the labor on the main shaft. By having four cylinders there is no dead center, and the force is continuous at all times.

Fig. 2 shows the packing rings, which keep the wheel steam tight at the point where the steam is in-

Fig. 1

A patent is pending on this engine through the Scientific American Patent Agency by Joseph L. Foster, of Virginia, Nevada Territory. For further information address him as above, Box 153. [See advertisement on another page.]

Cutting Hard Steel.

The Secretary of the Franklin Institute, Henry Morton, Esq., in a recent report says:—

We give, for the benefit of those interested in the experiment, the particulars of the apparatus lately constructed for the Franklin Institute, to repeat Perkins' experiment of cutting hardened steel with a soft iron disk rotating at a high velocity. A disk of steel, such as is used for circular saws, but annealed so as to be very soft, is mounted on a steel spindle, which carries also a three-inch

cast iron pulley, and the whole is then carefully balanced until it will rest indifferently in any position, on two straight edges.

This spindle, etc., is then mounted in cast iron swiveled bearings. A belt, 2 inches wide, on the pulley is driven from a 36-inch pulley on an ordinary shaft, which carries also a 10-inch pulley, to which motion is given by a 4-inch belt from a 48-inch pulley on the engine shaft. The engine was run 120 revolutions per minute, which would give, with every allowance for "slip," between 5000 and 6000 revolutions per minute to the disk. At this velocity the hardest files were cut like soft wood, with the production of a blaze of light and showers of sparks, without the least injury to the edge of the soft disk.

The constructors of this apparatus were kindly furnished by Mr. Joseph Saxon, of Washington, with a general description of the machine originally made by him for Jacob Perkins in London, and in the above mentioned apparatus this description was followed, except where the improvements of modern machinery warranted a deviation. The most important of these deviations was in the use of cast iron swivel bearings. In these the mobility of parts necessitates an equal distribution of the pressure and friction, over the whole surface of contact, and thus renders possible the use of a material otherwise so unfit as cast iron. The friction is in fact by this means brought between the steel and oils, and in no respect between the solid surfaces, at any point.

AMERICAN ANNUAL CYCLOPEDIA.

The fourth volume of this great work, containing the register of the important events of 1864 is now before us. It gives a very full account of the operations of the army and navy, illustrated by maps and cuts, with the proceedings of Congress, public documents, obituaries of eminent persons, and other matters constituting a complete history of the year. It is a volume of 838 pages, full of reading, interesting at the present time, and of inestimable value for future reference. It is published by D. Appleton & Co., 443 and 445 Broadway, New York.



The Way to Bleach Sponges.

Messrs. Editors:—I have noticed lately in your paper articles respecting the bleaching of sponges but the method described does not agree with my experience. In one of them chlorine is used; but this substance will bleach animal matter yellow—never white, and in a free gaseous state is very apt to destroy the animal fiber. Sulphurous acid will bleach animal matters white without injuring them, but it takes a long time to bleach sponges with this gas. As I have had opportunity enough to bleach sponges, I will communicate my process to you, by which any one may do the thing correctly.

I combine the two agents—chlorine in the form of chloride of lime, and sulphurous acid in the form of sulphide of soda. Messrs. Tennant, Glasgow, Scotland, import the best chloride of lime. Sulphite of soda is easily prepared in the following manner:—Take 42 ounces of crystallized carbonate of soda, spread it on some paper in a moderately warm and dry place, where it will soon be converted into a fine white powder by losing its water of crystallization, and will then weigh only one pound. Mix it well with 10 ounces of flour of sulphur, and put this powder in a flat cast-iron vessel with a rounded bottom; put the vessel on a slow fire and stir with an iron stick; by and by the powder will commence to bake into lumps and a light blue flame will spread through the whole mass; remove from the fire and continue to stir for two or three minutes, then cover with an iron lid; after five minutes remove the cover and stir again for some time; repeat this as often as a flame again appears, and then let it cool. Dissolve the mass in two gallons of warm water and filter through paper. This solution is pure enough for bleaching.

Before bleaching the sponges must be cleaned, as they often contain a good deal of sand and always more or less small sea shells. The sand is best removed by beating the sponges with a light stick and by shaking them. The shells are dissolved in water containing the twentieth part of muriatic acid, in which the sponges are immersed for two or three hours and then washed in clean water.

Now the solution of chloride of lime has to be made. Dissolve one pound of chloride of lime in two gallons of cold water, triturating the lumps well with a wooden stick—no iron must come in contact with this solution—stir thoroughly for ten minutes, and then let the solution stand till it is clear. Decant from the sediment and pour another gallon on the same; stir and let it settle again, then add the decanted fluid to the first. The dissolving is best done in a stone vessel, and the same are best for bleaching. Besides the two vessels containing the bleaching liquids, another one of about the same capacity—say two gallons—is wanted for diluted sulphuric acid; fill this about three-fourths full of water and pour in, under constant stirring, six ounces of sulphuric acid.

To bleach the sponges, immerse them first in the acid water; squeeze them with a pair of broad wooden tongs, as the different solutions affect the skin very much, and immerse them in the solution of chloride of zinc for two minutes. Squeeze the liquid in the same vessel and put the sponges back in the sour water, squeeze out again and immerse in the solution of sulphite of soda for a short time; squeeze again, and put it in the sour water. Repeat the same operation two or three times till the color is gone and then wash well in clean water, and dry in the open air. On the place where the sponges were fastened is oftentimes a dark brown spot; it is best to cut this out, it will not bleach. GUSTAVUS A. SCHMIDT.

Swatara, Pa., June 30, 1865.

Manufacture of Mainsprings in Watches—A New Idea.

Messrs. Editors:—There is no practical watch-maker who is not familiar with the difficulty of procuring a good mainspring—one that is sufficiently strong, permanently elastic and not liable to break. I wish to make a suggestion through the medium of your paper, which, by meeting the eye of some thinking spring maker, may lead, in some measure, to the correction of this difficulty. All springs, now in use,

are made flat, like a narrow strip cut from the edge of a thin sheet of metal; and I am convinced, from careful investigation, that in more than nine cases out of ten, when a spring breaks, the fracture begins at one edge. Now it occurs to me that if the spring was made slightly convex on the outer and concave on the inner side, so that when it is coiled in the drum the convexity of one coil might fit into the concavity of the next, the object would be accomplished. This would give the spring much additional strength, so it might be made thinner, and consequently longer—all being desirable qualities. But the principal advantage which such a spring would possess over the common flat spring, would perhaps exist in its less liability to break. For the greatest tension of its metal would be at the center of the convex surface where a flaw would be less likely to occur, and a rupture more difficult to start than at the edge.

If some spring manufacturer will prove the plan successful, he will save the people from an immense tax for new springs.

J. W. H.

Paoli, Ind., June 12, 1865.

Jacketing Steam Cylinders.

Messrs. Editors:—If the advantages of jacketing the cylinder are as great as generally believed, may, we not reasonably expect increased economy would result from protecting all the steam passages of an engine. Many engines, as now built, with exposed steam chests and cylinder heads thickly covered with bolt heads and nuts, look more as though they were designed on the parlor-stove principle, to radiate the greatest quantity of heat rather than to preserve heat and convert it into motion.

The jacketing covering that portion necessary to be removed to adjust or repair the working parts might be so put on as to be readily taken off. There would be no necessity for finishing the covered parts further than to reduce the bolts heads and nuts to the proper dimensions, and true the surfaces which come in contact. The jacketing could be finished according to the taste of the manufacturer, and being attached to the engine in such a manner as to present a surface entirely free from bolt heads and like projections, there would be little difficulty in keeping it clean. Such an arrangement ought not to increase the cost of an engine; yet even if the cost should be increased a little, the investment would be a good one. We might then expect to see engines kept neater than the majority of them now are; there would be less excuse for an engineer if his machine was not clean. A saving of fuel would reduce the expenses of proprietors and lessen the labors of firemen; engine rooms would not be the ovens they now are, and promote the health and comfort of engineers.

J. H. F.

Heat and Force.

Messrs. Editors:—I am of the opinion that your correspondent's explanation on page 260, current volume, of the difference between the amount of heat and equivalent mechanical force contained in combustible substances and that which can be practically obtained does not accord with all the facts which may be adduced. After attributing the loss to imperfect combustion, and the absorption of heat by the admission of too much air into the furnace, he concludes by saying, "that the true path for improvement would seem to be to select some substance to which heat can be applied at a greater intensity, and expand it to the temperature of things around us."

Take, for example, the amount of force developed by the detonation of gunpowder. Suppose a gun is charged with one pound of powder, and a shot weighing eight pounds, all the conditions being the most favorable for enabling the powder to exert its whole expansive energy in giving motion to the ball. The two ounces of carbon contained in the powder furnishes 1,750 units of heat, equal to 1,351,000 foot pounds, or equivalent to elevating eight pounds 31 miles. Hence should the gun be discharged vertically, making no allowance for atmospheric resistance, the shot should be projected 31 miles in perpendicular height. In order to accomplish such a flight the projectile would require an initial velocity of upwards of 3,200 feet per second. That is about three times as high as that which would be practically at-

tained, and to obtain it would require the application of a force nine times as great as would be developed by the deflagration of one pound of powder. In this instance the gases generated would be heated to a temperature of 5,000 degrees, which is ten times as intense as that of steam contained in the boiler of a steam engine. The combustion is perfect, and the amount of heat absorbed by the gun insignificant. Besides the very considerable amount of heat developed by the combustion of the sulphur has not been taken into account.

While the disparity is as great here as that observable in the working of a steam engine, the theory of your correspondent would have very little application.

F. G. FOWLER.

Mechanicsburg, Ill., June 17, 1865.

An Engineer Puzzled.

Messrs. Editors:—Gentlemen, as a constant reader of your paper and having done some business in the patent line through your office, I take the liberty of writing to you in regard to an answer I found in one of your late papers. It is this:—"C. H., of Pa. If your engine yields six horse power with 100 revolutions per minute and you increase the number of revolutions maintaining the same pressure, you will increase the power in proportion. 150 revolutions will give you nine horse power." A machinist who has charge of a shop and myself have had a long argument on that question. I maintain you are right and he contends you are wrong. He says the engine does not give out any more power, not a pound more than it did before making 100 revolutions. He contends the engine consumes it in extra friction; or he puts it in this way: An engine making 50 revolutions per minute; now suppose you increase it to 100, 150 or 200—you cannot drive any more machinery with it, as the power is consumed by the additional friction. He tries to prove this by a locomotive being only able with six feet drivers to make about a mile a minute empty, that is without any train. As he is considered by some of the men here as good authority on such matters I sincerely hope that you will reply through your paper and I think it will be the means of some more of the mechanics of this place taking your paper.

JOHN BOLTON.

Greenbush, N. Y., June 22, 1865.

P. S. The person referred to does not take your paper or I think he would know better.

[If all the power of an engine is consumed in friction, it would be better to let it stand still, and save the coal.—Eds.]

A Third Kind of Clock with Invisible Works.

Messrs. Editors:—No. 22 of present volume of your valuable paper is just received. The description it contains of "a curious clock" in San Francisco reminds me of a similar one I saw in New Orleans a few months since. It had also a glass dial, with a single, light, and very nicely balanced hand, but had no box or other mechanism on the short end of the hand, and no visible connection with anything but the pivot which passed through the dial. I asked if the movement was in the base on which the supports of the dial stood. The watch-maker said yes, but would give no further information. Upon looking as closely as permitted to, I saw a very small brass pulley upon the inside end of the pivot. This led me to think that it was connected with the movement by a very fine band of some gray-colored material, which the slight color of the glass shade and dial kept from sight. Possibly it might have been operated by nicely arranged magnets in the base, which could easily be done, but it was not moved by the method you describe. I have seen many other novel and ingenious clocks in that city.

W. B. S.

Mobile, Ala., June 15, 1865.

Belts to Drive Flour Mills.

Messrs. Editors:—Since reading the communication of J. H. Cooper on "Leather Belts," in your issue of July 1st, I am induced to send you the following:—Our engine is a 16-inch cylinder, two feet stroke, running 75 revolutions per minute with 80 pounds of steam. Belt 15 inches wide, driving pulley 8 feet diameter. The distance between centers of

pulleys 24 feet; the pulleys are on horizontal shafting. The shaft carrying the driver's pulley is about 3 feet higher than the crank shaft. The driving pulley revolves towards the other bringing the "slack" part of the belt on top and between the pulleys causing it to cover more of the circumference of the pulleys than if run the reverse. We use no tightening pulley and the belt never slips. We drive with this belt a flouring mill of 3 "runs" of stone with all the necessary machinery; the engine is rated sixty horse power. Experience teaches me to use pulleys of large diameter, good lengths of belt and quick motion to transmit the greater power.

W. R. COOPER.

Sag Harbor, L. I., July 3, 1865.

The Lead Ball on a Steam Jet.

Messrs. Editors:—The explanation requested in your valuable paper, No. 2, current volume, in regard to a bullet sustained and rotated by a jet of steam or water seems to me to be of no very difficult character. It is well known that every such bullet or ball has two centers, the center of dimensions or imaginary one, and that of weight or the real one, as no ball can be manufactured so true that the weight would be equally distributed around the center of dimensions. If now the center of weight should be on the right hand side of the imaginary center, the left hand side being lighter, receives the force of the steam in a greater degree, and will, therefore, be turned from left to right, and vice versa. If a ball could be so constructed that the imaginary would be the real center, or if it could be placed over the jet in such a manner that the two centers would be in a vertical line and exactly over the center of the jet, then the ball would certainly not rotate. That part of the jet which has not actually to support the ball rises above it and surrounds it, thereby preventing it from falling off, or rather, on account of its unevenness, from being thrown aside; the water or steam around it, possessing exactly the same power as that beneath. If the diameter of the jet is smaller than that of the ball it will certainly not balance the same, but will throw it aside there being no power left to prevent it from falling.

A. V. BRIESE.

New York, July 5, 1865.

Large Pulleys vs. Small Pulleys for Belts.

Messrs. Editors:—I have been much interested in the various articles, communications, comments, etc., that have appeared in your paper on the power-transmitting capacities of belts. There is, however, one point that I think has not been touched upon, and that is the diameter of the pulleys over which the belts run. I think that a belt traveling at a certain rate per minute will give more power, without being so tight as to break out the lace holes or heat the shafting, when driven by a large pulley than by a small one; or in other words, that a belt will impart more power when drawing a four-foot pulley at fifty revolutions, than when driving a two-foot pulley at one hundred revolutions.

It appears to me that it would take double the amount of power to make the belt slip on the large pulley that it would on the small one, and that doubling the diameter of the driving and driven pulleys is equivalent to doubling the width of the belt.

J. J. W. R.

Brooklyn, July 4th.

Peculiar Action of Belts Running on Each Other.

Messrs. Editors:—As you and your correspondents are at this time interested on the subject of transmitting power through belts I would suggest an idea for your consideration which is not generally known by those who peruse your valuable paper; thus two belts, one running over the other will convey more power through them than one alone would of the same tightness. If we stitch the two belts together, however, so that they have to move as one belt they will not drive more than one half the load that they would if left to run over each other, independently.

ANDREW B. ARNOLD.

Newark, N. J., July 5, 1865.

[Mr. Arnold is a close observer of long experience in machinery and we place great reliance on his opinions. The case he mentions is an interesting one and doubtless occurs from the fact that where one

belt runs on the other, both being detached, each retains its individuality and transmits the force due to its velocity and width; where both are stitched together they become one, with only the tension and friction due to their width, length and velocity. We shall be glad to have the opinions of our readers.—Eps.

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:—

Skate—This invention provides a means for keeping the feet warm while skating; and this is effected by arranging a heating chamber under the foot-plate of the skate, into which may be readily placed any heated substance or body, such as soapstone, or any heating medium, such as a burning lamp; and in this way the foot-plate of the skate is kept warm, and, consequently, the feet from becoming numb with cold, and thus the pleasure of skating, particularly in the case of ladies, is greatly enhanced. The inventor of this improvement is O. W. Tatt, of No. 60 Pine street, New York City.

Hand-washing Device for One-armed Persons.—Our recent war has suggested many improvements for the benefit and comfort of our soldiers, and this is one worthy of especial attention. Perhaps no person, unless he has lost an arm or hand, can fully comprehend the difficulty of washing his remaining arm and hand. The patentee of this invention has been afflicted with the loss of one arm, and his device answers the purpose for which it is intended in a very satisfactory manner. It consists in the use of a sponge, or other suitable material, fixed to the upper surface of an open frame fitted to slide in a bed-plate, capable of being attached to the side of a washstand or elsewhere, its position being inclined so as to permit any water expressed from the sponge to run off from it through a channel in the bed plate. The hand or arm may be soaped and rubbed upon the sponge, and in this way a thorough washing or cleansing thereof can be easily and quickly effected. The inventor of the above is Gustave Dieterich, of 37 Park Row, New York, who may be addressed for the purchase of the patent or rights to manufacture.

Forging Machine.—This invention relates to a machine for forging various articles, such as nails, file shanks, spindles, etc. The invention consists in the employment of two pairs of hammers arranged and operated so as to approach and recede from each other, alternately, in pairs, and using in connection therewith a stop mechanism, feeding and cutting device, and certain other parts, whereby a simple and automatically working device is obtained for the purpose specified. John C. Jewell, of Boston, Mass., is the inventor.

Breeching Hook for Carriages.—The object of this hook is to facilitate the freeing or letting loose of a horse from the shafts of vehicles in case of sudden accidents, and consists in a novel construction of the breeching hooks, whereby the breeching straps disconnect therefrom, simply through the forward movement of the horse within the shafts, the traces, however, first having been unhooked or otherwise disconnected. And in addition to the above this hook also enables the breeching straps to be fastened and unfastened with more ease and rapidity by hand than with the use of the old styles of hooks, and it is in every respect greatly superior to them. Edwin Brown, formerly of Leominster, but now of Boston, Mass. (care of Messrs. Chickering & Sons), is the inventor.

Grain Separator.—This invention relates to a machine for separating impurities from grain, and also for separating one kind of grain from another, such as oats from wheat, etc., and it consists in the use of a series of screens and discharge spouts arranged relatively with each other in such a manner that the grain will be subjected to repeated screenings and thoroughly cleansed from all impurities, and one kind of grain separated from another, a blast fan being used and also a peculiar feeding spout in order to render the operation perfect or complete. Julius Tomlinson, of Newburgh, Wis., is the inventor.

Buckle for Skates and Other Purposes.—This invention consists in providing supplementary bear-

ings for the journals of the tongue of the buckle, which bearings are behind the bearings which hold the said journals when the buckle is in use, and are separated therefrom by a ridge, over which the journals pass, when the journals are to be moved from one to the other. The effect of this construction is to enable the tongue to recede from the front of the buckle where the bite is made on the strap, thereby releasing the strap without difficulty and without requiring that it be first pulled out from the loop of the buckle. B. S. Lawson, 294 East Broadway, New York, is the inventor.

Bending Metal Plates.—This invention relates to a device for bending metal plates, and is more especially designed for bending armor plates for ships and other war vessels, so that they may conform to any part of the sides of the vessel and fit snugly thereto. The invention consists in the employment of a series of adjustable bars in connection with patterns and clamps, constructed and arranged in such a manner that the bars may be very readily adjusted to form a curved or winding bed corresponding to any portion of the exterior surface of the hull of a vessel, so that each plate may, with the greatest facility be bent to conform to the portion of the vessel to which it is to be attached. John W. Easby, of Washington, D. C., is the inventor.

Head Rest for Car Seats.—This invention relates to a head rest for car seats which can be readily attached to or detached from the seat without in the least degree injuring it, and is of such a form and construction as to admit of being carried in a traveling bag or even about the person. The advantages of this are of course manifest to all, as it promotes not only the comfort and ease of the person, but also relieves a journey of the tediousness usually attending it, and supplies a want heretofore long felt. W. R. Phelps, of Elizabeth, N. J., is the inventor.

Hand Stamp.—This invention relates to certain improvements in that class of hand stamps in which a chemically prepared or inked ribbon is used to furnish the types with the requisite supply of ink or other material to produce the desired impression. The invention consists, first, in the employment of an adjustable head carrying the reels on which the ink-prepared ribbon is wound, in combination with the longitudinally sliding stem to which the handle is attached, and with the type plate in such a manner that easy access can be had to the reels and ribbon, and that the head with the type plate can be turned on the stem in either direction according to the direction in which the impression is to be taken on the paper. The reels lie in cavities in the sides of the head, the end pieces of which form the bearings for the axles of the same. The type plate is secured to the head by a nick and segmental slot in combination with a friction spring, in such a manner that the same can be readily removed and replaced or taken out to change the types, and when in position it is not liable to work loose spontaneously. The table which supports the material on which the impression is taken is made adjustable and removable so that its height can be regulated or that it can be taken off and replaced at pleasure. Horace Holt, of Brooklyn, N. Y., is the inventor, and has assigned his right to W. W. Secomb, 264 Broadway, New York.

Beater Press.—This invention relates to certain improvements in that class of presses in which the article or substance to be compressed and baled or packed is previously compacted in the press box by means of a beater which is so arranged as to serve the office of a beater and follower. The invention consists in a novel arrangement of levers and a rope in connection with a suitable windlass whereby a very compact and powerful lever arrangement for operating the follower is obtained. The invention also consists in an improved windlass so constructed and arranged that it may, by a very simple manipulation, be made to operate the beater or follower in either capacity, that is to say when worked as a beater or follower. The invention further consists in certain means for facilitating the heaping of the bale and its discharge from the press box. Loyal C. Field, Galesburg, Ill., is the inventor.

THE "American Sleeping Car Company," which proposes to "construct, run and operate," has just been incorporated by the Legislature of Connecticut.

Improved Multiplying-power Machine.

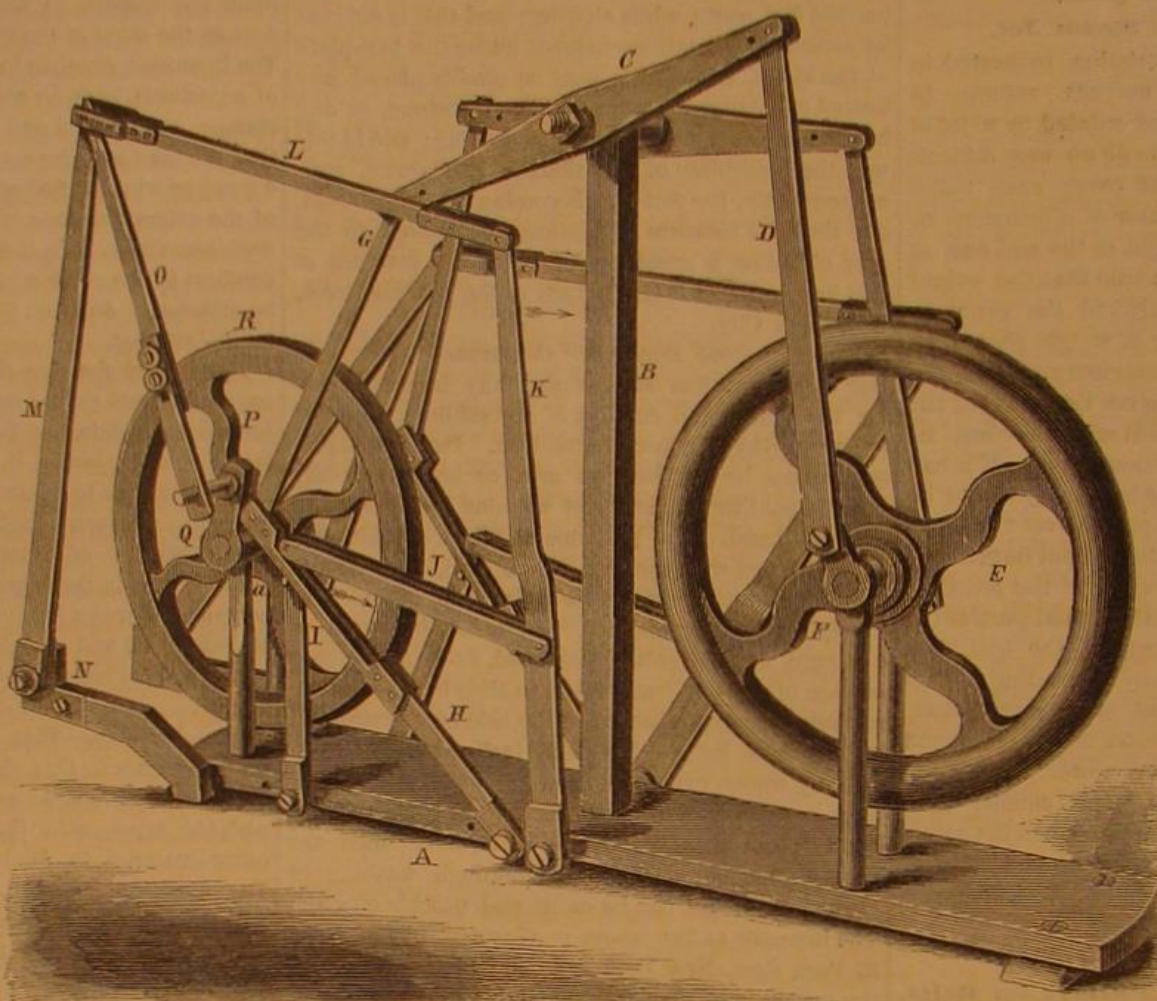
The appended article is furnished by the inventor. "This machine consists in a combination of toggle joints and levers. A represents a platform; B a standard forming the fulcrum for the working beam, C. The rod, D, connects a large heavy fly-wheel, E, mounted on a shaft, F. The other end of this working beam connects by a rod, G, with a lever, H, forming a toggle joint which rests on the supporter, I. Its lower surface forms an inclined plane, which rests on a stud, a, projecting from the sides of the supporter, I. The rod, J, forms the connection between the supporter, I, and the lever, K. This lever connects by a rod, L, with the lever, M, having its fulcrum on the end of the link, N. The rod, O, extends to the crank, P, secured to the shaft, Q, on which a second fly-wheel, R, is mounted. The rods, L and M, form a second toggle joint. This combination of the toggle joints and levers shows the remarkable property of gaining power and space at the same time, without loss of velocity, provided that all parts of the machine are in the proper proportion. Any moving force applied at the crank, P, of the second fly-wheel, R, brings the toggle joint, M L, out of its position, pushes the lever, K, forward in the direction of the arrow, sets the supporter, I, in motion, and raises the toggle joint, H G, and working beam, C, with constantly-increasing power, thus transmitting motion to the fly-wheel, E. The power gained by this machine is at the toggle joint, H G, equal to twice the force applied; at the lever, K, three times, and at the second toggle joint, L M, again twice; that is, in all, twelve times. Allowing one-third for friction, the gain in power is equal to eight times the force applied. By suspending weights from the fly-wheels on the model, it will be found that a weight of two ounces, suspended from the fly-wheel, R, is capable of balancing a weight of one pound, suspended from the fly-wheel, E, or eight times its own weight. This gain in power can be increased by the addition of toggle joints. The exact proportion of the space gained by this machine is, for all cases— $3.515 : 4.240 : 2$, or very nearly $3 : \frac{1}{2}$ —which formula cannot be explained at present for want of room. If the crank of the fly-wheel, E, has a length of 9 inches, the working beam must be raised 18 inches, but the supporter, I, has to travel only through a space of 12 inches; the lever, K, passes through 36 inches; the second toggle joint, M L, through 24 inches, and, consequently the crank of the second fly-wheel, R, must be only 12 inches long, that is, very little more than the crank of the first fly-wheel. From this it is evident that, by this machine, power and space is gained at the same time without loss of velocity, for as soon as the fly-wheel, R, is set in motion, the whole machine commences to work immediately.

"This machine can be used with advantage for increasing any motive power. For further particulars address the inventor, Henry Bickel, Elizabeth, N. J.

Cost of Stopping Railway Trains.

Much has been written about the cost of stopping a train of cars, from the great wear and straining of the machinery, rails and road-bed. A few years since the directors of a prominent railway became so impressed with the magnitude of the cost of merely stopping trains, that they discontinued several way stations where there was a very considerable traffic, withdrawing a good many trains from other stations, all to the serious inconvenience of the public and a

very considerable loss of traffic to the company. In a discussion at an annual meeting of shareholders of a company, the chief executive officer stated that in his judgment, it cost a dollar for every stoppage of a common passenger train, and for through and express trains a larger sum. A somewhat matter-of-fact shareholder entered into a computation of the number of stops made by the different trains on the road, and rather surprised the railway official by showing that the mere cost of stopping the trains of the road, according to the official estimate, was more than the entire gross receipts of the road for the year. This is what you may call running a theory into the ground with a vengeance. It is a very diffi-

**BICKEL'S POWER-MULTIPLYING MACHINE.**

cult and rather unsafe matter to estimate the cost of stopping a train of cars; but its difficulty does not seem to deter a great many persons from attempting it, and so we find different persons estimating it at from thirty cents up to two dollars per stop, all confident that they have found the exact sum. Any discussion of this matter, if it could be based upon exact facts instead of preconceived and erroneous theories might perhaps be valuable; but it seems rather difficult to get at facts, and our over careful directors and managers may take some comfort from the opinion expressed by the late Association of Railway Superintendents and Engineers of New England, who, after a long series of computations and observations, came to an almost unanimous opinion, that it would not cost, averaging all the railways and trains, more than 8 cents per stop. As the gentlemen who formed this association were careful and cautious in the statement of official opinion, and were certainly experts, in the best sense of the term, we think their evidence should hereafter prevent the propagation of the rather ludicrous estimates of men who have not made this and kindred matters a special study.—*Railway Times.*

Bandoline.

Many persons have a passion for smearing their hair with various substances so as to make it smooth and shiny. We give below a list of some compounds for this purpose which was published in the *Druggists' Circular*:—

1. Irish or Iceland moss, boiled in water, and the strained liquid perfumed.
2. Quince seed, $\frac{1}{2}$ teaspoonful; linseed, 1 tablespoonful, and a pinch of white mustard seed. Boil in a pint of soft water to half, and scent with oil of almonds.
3. Boil a table spoonful of linseed for five minutes in half a pint of water.

4. Isinglass, $1\frac{1}{2}$ oz.; water, 1 pint; proof spirit, 2 fluid ounces. Dissolve the isinglass in the water by heat, add the spirit, and scent with almond oil.

5. Tragacanth, 1 oz.; rose-water, 1 pint. Bruise the gum, digest for three days, and strain.

Any of these may be colored with cochineal if required.

Boot and Shoe Machinery.

We find the following letter in the *Shoe and Leather Reporter*:—

"I have been in the way of selling 'machine-made shoes,' both sewed and pegged, ever since they were introduced. And I have often asked myself the question:—'Will the time arrive when the sewing machine will supersede the old-fashioned mode of hand sewing in shoe-making?' and as often have I answered the question, in my own mind, at least, 'No, never,' till the inventive genius of our machine makers shall produce a more perfect machine, or the operators acquire more skill in running it, and our Eastern manufacturers more moral and business honesty than to insert for the foundation of their shoes 'shoddy leather' and 'pasteboard' for an inner sole. So far as my business experience extends, four-fifths, at least, of the 'machine-sewed shoes' I have sold, the soles have ripped off from the upper, say in three weeks to as many months; and what makes it more unfortunate for the wearer, from the insufficiency of the inner sole, the shoe cannot be repaired, thus becoming a dead loss to the owner. It is a thing of almost daily occurrence, that I have shoes of this description

brought to my repairing shop to be mended, and what makes it infinitely more annoying, too frequently have to be subjected to hearing a string of curses, both 'loud and deep,' on the makers of such shoes."

INDUSTRIAL EXHIBITION IN GERMANY.

We are informed by Mr. Marsh, the American Consul at Altona, in Germany, that an international industrial exhibition will be opened at that place in June, 1866. A new system of awarding prizes will be adopted. Every machine will be practically tested, and a certificate issued to the inventor, owner or agent of each machine entered in competition, showing the comparative merits of the whole of the machines under trial in their several classes. Medals and diplomas will also be awarded to the best articles. There is also another feature of this international exhibition which adds to its general interest and makes it exceedingly attractive to American exhibitors; it is an exhibition of industry as well as agriculture and agricultural mechanics. Every article in use in rural housekeeping will be admitted at the Altona exhibition; also agricultural, horticultural and floracultural products; garden designs and lawn-furniture farm, dairy and cellar products, and cattle. The exhibition will remain open forty days. Those desirous of learning full particulars of this exhibition may address Mr. Louis Martin, care of Messrs. Austin, Baldwin & Co., 72 Broadway, New York.

THE work on the Pacific Railroad is progressing rapidly. The road will be completed to Topeka, 25 miles west of Lawrence, by the first of November.

THE *Great Eastern* was expected to sail with the Atlantic Telegraph cable on the 8th or 10th of July.

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.

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

Contents:

(Illustrations are indicated by an asterisk.)

*Jackson's Homely Mill.....	31	A Third Clock with Invisible Works.....	36
Another Monstrous Cast-iron Anvil.....	31	Belts to Drive Flour Mills.....	36
Notes on New Discoveries and New Applications of Science On Scientific Experiments in Balloons.....	32	The Lead Ball on a Steam Jet.....	37
Interesting Details of Animal Traps.....	32	Large Pulleys vs. Small Pulleys for Belts.....	37
Benzol in Canadian Petroleum	33	Peculiar Action of Belts Running on Each Other.....	37
*Dummer's Funnel and Measure Combined.....	33	Recent American Patents.....	37
Agricultural Machinery.....	34	*Bickel's Power-multiplying Machine.....	38
On the Effects of Heat in the Preservation and Improvement of Wines.....	34	Cost of Stopping Railway Trains.....	38
To Keep Eggs.....	34	Bandoline.....	38
Erosion of Lead.....	35	Boot and Shoe Machinery.....	38
*Foster's Double-cylinder Revolving Engine.....	35	Industrial Exhibition in Germany.....	38
Cutting Hard Steel.....	35	Eight Hour System—The Way to Get It.....	39
The Way to Break Sponges.....	35	Leather Belts.....	39
Manufacture of Mainsprings in Watches—A New Idea.....	36	Keeping Cistern Water Sweet.....	39
Jacketing Steam Engines.....	36	Good Workmanship.....	39
Heat and Force.....	36	Patent Claims.....	40, 41, 42, 43
An Engineer Puzzled.....	36	Notes and Queries.....	44
		Smith's Shingle Machine.....	46
		Improved Stone-gathering Machine.....	46

VOL. XLII. NO. 3...[NEW SERIES.]...Twentieth Year.

NEW YORK, SATURDAY, JULY 15, 1865.

EIGHT HOUR SYSTEM—THE WAY TO GET IT.

At a meeting of the Polytechnic Association last winter, Professor Joy, who had just returned from Europe, described the manner in which the Italian peasants eat their hasty pudding. They gather around a flat stone, the pudding is poured out upon it, and they take up this food with their hands and eat it without either butter, molasses, or other sauce, all their meals being of the same pudding. The houses and clothing of these peasants are as cheap in proportion as their food. In Vol. I., New Series, we published a German scissors manufacturer's account of the manner in which his workmen live, and it will be remembered that these skilled mechanics are obliged to find their food, clothing, house rent and all other means of living on about 38 cents per day. The clothing of the Hindoo peasants is a strip of cotton cloth about the loins, and their food is plain boiled or parched rice. The Digger Indians of California subsist upon acorns and grasshoppers, dress with a bunch of grass about the hips, and live in caves dug in the ground.

At one time our ancestors lived as meanly as any of these. Why do they live so much better now? Simply because they have the art, the skill, the intelligence to produce the means of living in greater abundance. The German mechanic, the Italian peasant, and the Hindoo would like varied and well-cooked food, and all the conveniences of life, as well as any Englishman or American, but they do not know how to manage to get them. The Hindoo weaves his clothing by suspending his harnesses to the limb of a tree, and slowly passing his shuttle through the warp by hand; while the Englishman's clothing is woven by the power of water or steam, one girl tending four looms that run at the rate of one hundred picks per minute. Would there be any use in the Hindoo striking for a dollar a day? He can only make 2½ cents; and the reason is that this is the amount which his ill-directed labor produces.

The German scissors-maker spends half of his time in carrying iron and steel on his head over long miles of road between his village and the manufactory. On the other hand, the cutlery manufactories of England and America are arranged to economize to the utmost every step of the workman, and every stroke of his labor, and they are provided with all known engines, machines and appliances for aiding the labor and increasing the product. The consequence is that a day's labor of the English or American artisan produces twice as much cutlery as that of the German; and it will produce from 100 to 1,000 fold more value than that of the Hindoo or the Digger Indian.

In a system of hiring, wages constitute the share of the product which goes to the workman. In order that these may be large, the first step is to have the aggregate product large, in order that there may be a good deal to divide. This is effected by having the labor well organized, wisely directed, and aided to the greatest extent possible by tools, machinery and conveniences.

The next step is to secure as large a share of the product as possible for the workman. The proportion of the product which goes to the workmen depends mainly upon their economy. If a man has not money enough in his pocket to buy the next meal, he is completely subject to any man who will give him enough. One with ten dollars in his pocket is immeasurably more independent than one with only ten cents. Says Carlyle, "Any man who has sixpence is king over all other men—to the length of sixpence." If a mechanic has money enough to buy a lathe, or a set of tools, and to pay the rent of a room for a month, he may fix his own wages in his own independent way. Intelligence and the provident spirit which it engenders will not only raise the product of wealth in any community to the highest point, but it will draw the largest share of this product to the laborer.

If the eight hour system of labor is ever adopted, it will be commenced, as the ten hour system was, among the best class of mechanics. It will also be preceded by such an advance in wages that mechanics will be willing to abate one-fifth of the amount for the sake of two hours' leisure. The constant increase in labor-saving—or rather labor-doing—machinery, and the steady progress of education, with the temperance, frugality and thrift which are its accompaniments, are continually increasing the product of wealth and raising the wages of labor. We need only an uninterrupted operation of these forces to enable the workmen of this country at no distant day to command such an amount of leisure as to them shall seem good.

LEATHER BELTS.

The subject of belts and the peculiar action of them under certain circumstances and the conditions under which they work are of the greatest importance to mechanics and manufacturers. We print in this issue several communications from practical men which refer to some peculiarities not generally known or observed, and we deem it important enough to the arts to devote considerable space for a time to a full elucidation of the subject. We direct research and attention to some other features not yet remarked which may afford useful data to persons using power. We put these questions as follows:

Is a thick belt better than a thin one, or the reverse?

When belts stretch on one side, as they do from a looser texture of the leather, or from other causes, why do they run harder and run off? Why is it that some belts never will run straight on the pulley but twist like a corkscrew?

Is the hair side or the flesh side to be put next the pulley?

Is there anything better than neat foot oil for belting, to keep it in good order. Is a crowned pulley or rounded face necessary to make a belt run true? Some machines which run at high velocities have pulleys with flat faces. Why should a belt be laced straight on the inside and crossed on the outside?

KEEPING CISTERN WATER SWEET.

When water in cisterns becomes foul it is not from any alteration in the water itself, but from the decay or decomposition of organic matter held by the water in solution or suspension. These organic impurities are generally washed into the cistern from the roof. It has long seemed to us that the most simple and direct method of keeping cistern water sweet would be to allow the first portion of every rain fall to run to waste until the roof was thoroughly washed, and then to fill the cistern from a clean roof. A very simple apparatus might be arranged to effect this automatically. For instance, one plan would be to set a hogshead near the lower end of the gutter pipe, with a short, light trough hinged to the pipe and leading into the hogshead; then have a float so adjusted that when the hogshead became filled with

water, the trough would be shifted over to lead the water into the cistern. If one hogshead of water should not prove sufficient to wash the roof clean, the trough might be adjusted to conduct only half or quarter of the water passing through it into the hogshead, allowing the rest to run one side upon the ground. We do not know that this plan has ever been tried, and therefore offer it only as a suggestion.

It is common to filter cistern water, and it may thus be rendered perfectly sweet if the filtering be done through charcoal. Solon Robinson filters the water as it is pumped from his cistern by passing it through the walls of a drain pipe. The pipe is coiled around the bottom of the cistern, with one end closed and the other communicating with the pump; this is very simple and works satisfactorily.

Another plan is to make the cistern in two compartments, the water to be received in one and drawn from the other, and the dividing wall to be formed of vertical strata, alternately of sand and charcoal, through which the water passes from one compartment to the other. We should suppose that the most effectual of all plans would be to wash the roof thoroughly and fill the cistern with pure water. If any of our readers have tried this plan, or should any of them try it, we should be pleased to learn the result whether favorable or unfavorable.

GOOD WORKMANSHIP.

The character of work of any class whatsoever is made by its absolute fidelity and integrity throughout. It is not necessary to go through all trades to show that this is true, or that in general the highest priced is the best; for, all things being equal, greater pains has been taken in its construction.

A simple line or two in a late dispatch from Richmond says more in a paragraph than we could in a page; this said—"The furniture in the Spottswood House is still good after four years' hard service, although no opportunity for replenishing it from Northern workshops has occurred through the war." This furniture, it seems, was unusually elegant, but it was not the mere external finish which gave it character so much as the solid and substantial fitting of the several pieces.

If these remarks apply to furniture, how much more true are they when spoken of machinery, which does the heavy work of mankind.

A want of honesty in construction is sure to be found out and redound to the disadvantage of the maker. A half-way kind of a job, and a listless way of doing it, is sure to be detected.

Not unfrequently we see instances of haste and carelessness about steam engines which looks badly, and is an absolute loss to the manufacturer. The general excellence of American machinery is due to the care exercised in its construction. Colt's pistol factory has done more toward educating mechanics to walk the straight road, to do their work well, than any other similar factory in the world. The several sewing-machine shops—Wheeler & Wilson's in particular—and especially the Waltham Watch Company concern, are all schools for mechanics—schools where they not only learn but are "paid while learning," as specious advertisers say. Most wonderful progress in the art of working metals has been made in these shops. In the Waltham concern the nicety of the workmanship there executed is incredible, and must be seen to be believed or appreciated. Some of the screws we saw cut had 240 threads to the inch, and these were cut in an engine lathe with trains of gears as 5-8th bolts are, in a common machine shop. Other shops do larger work with equal accuracy, but none so fine as this.

We might cite innumerable instances which would go to prove the truth of the assertions here put forth, but it seems palpable that a reasonable amount of time, spent in finishing and fitting the most important parts of machines or structures of any kind, is not lost, but is absolute testimony to the fidelity of the maker.

INDESTRUCTIBLE LABELS FOR BOTTLES.—Coat the label with white of egg, and steam it until it becomes opaque; then dry it in an oven at 212°. The albumen becomes hard and transparent, and is unaffected by oils or acids.



ISSUED FROM THE UNITED STATES PATENT-OFFICE
FOR THE WEEK ENDING JULY 4, 1865.
Reported Officially for the Scientific American.

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

48,502.—Converting Rotary into Reciprocating Motion.—S. F. Ames, Stanford, Ky.:

I claim the combination and arrangement of rock shaft, A, the inclined plane wheel, B, the fly-wheel, C, shaft, D, and anti-friction rollers, a, constructed, arranged and operating as and for the purpose herein described and set forth.

48,503.—Buckle.—Truman G. Bailey, Wassala, N. Y.:

I claim the jaws, C D, with their inclined faces, C' D', and tongue or spur, G, arranged relatively to the including strap, B', and parts, B E and F, or their equivalents, substantially in the manner and for the purpose herein set forth.

48,504.—Hydrant.—William Bailey, Troy, N. Y.:

I claim the detachable valve chamber, E, with its discharge pipe, M, inlet valve-seat and screw opened inlet valve, A, in combination with the fixed supply pipe, O, united to the said valve chamber by male and female screws, N, and arranged in the hydrant box, Z, Fig. 4, substantially as herein described.

And I also claim the valves, A and B, and screw, C, all fast together, in combination with the stationary screw nut, D, valve chamber, E, inlet passage, F, discharge pipe, M, waste opening, I, and valve seats, G and J, as herein described.

48,505.—Socket for Hoe, Chisel, Etc.—Geo. Banister, Hartford, Vt.:

I claim the method of forming the shank or stem on the part to which the socket is to be attached, and of uniting it to a sheet-metal band or ferrule, so as to form an additional layer of metal to give the socket an increased thickness and strength near the bottom or smaller part thereof, substantially as herein shown and described.

48,506.—Artificial Fuel.—R. B. Bayard, Philadelphia, Pa.:

I claim the combination of petroleum or rock oil with vegetable fiber and coal dust in about the proportions herein specified.

48,507.—Egg-holder and Packer.—O. T. Bedell, New York City:

I claim an egg-holder and packer produced from a disk or plate, A, provided with or without a central hole, a, and with a series of pockets, B, each capable of holding an egg, substantially as herein set forth.

48,508.—Top for Mucilage Bottle.—John W. Boughton, Appleton, Wis.:

I claim the combination of the compressible pad around the brush handle with the pressure cap, substantially as described and for the purposes set forth.

48,509.—Lubricating Material for Wool.—Henry Botemley, Camden, N. J.:

I claim the use for lubricating wool, preparatory to carding or spinning the same, of the secretion, extracted from the wool.

48,510.—Covering for the Head.—Thomas Bracher, New York City:

I claim as a new and improved article of manufacture a covering for the head made of open weave wire cloth, combined by adhesion with the material to form the outer surface of the hat, bonnet, etc., substantially as described and for the purposes specified.

48,511.—Sewing Machine.—E. F. Bradford and L. L. Barber, Boston, Mass.:

We claim, First, The thread feed, in combination with a hook or bar needle, either with or without an awl, substantially as described.

Second, The employment of the feed finger, B, in combination with a hook needle and awl, substantially as and for the purpose described.

Third, Arranging the end of the feed finger, B, so as to slide and set upon the double thread or loop, within a slot or hole in the sewing plate, and with its upper surface either just below or flush with the surface of the plate, substantially as and for the purpose described.

Fourth, The combination and arrangement of the finger, B, with the hook needle, F, and automatically rising presser foot, D, substantially as and for the purpose described.

48,512.—Sulky Plow.—James Brewer, Albany, N. Y.:

I claim, First, Making one of the standards, E E, with the plow beam in its proper position, yielding to a certain degree, for the purpose of permitting the plow to pass obstructions which are in its line, and which are too hard to cut, substantially as and for the purpose specified.

Second, The combination with the plow beam of the rigid stand ard, F, yielding standard, E, screw bolt, o, and spring, p, substantially as and for the purposes specified.

Third, Hanging the plow beam of a sulky plow between two standards in such a manner that the operation of the plow is not affected by the passage of the supporting wheel over rough or uneven ground, as and for the purposes specified.

Fourth, In combination with the plow and its beam, G, herein described, of the laterally adjustable castor wheel, H, when fastened to the rear of the plow beam, substantially as and for the purposes specified.

Fifth, Connecting the hound in the furrow side to the pole by means of a hinge, s, for the purpose of making it and the furrow wheel adjustable, as and for the purposes specified.

Sixth, The combination with the foot lever, L, and plow beam, G, when capable of rotation within the standards, I, of the friction rolls, q, as and for the purposes specified.

Seventh, In combination with the plow beam, G, and tongue, P, the adjustable breast yoke, Q, for the purpose of cutting more or less land, as herein described.

48,513.—Breeching Hook for Vehicles.—Edwin Brown, Leominster, Mass.:

I claim, First, The construction of a breeching hook, by combining with a fixed standard a rigid hook swinging upon said standard, as described, so that the breeching strap shall be released by the displacement of the hook, substantially as herein described.

Second, In combination with a fixed standard and movable hook, I claim a spring actuating the hook, and located in relation to the hook and standard, as described.

48,514.—Dumb Bell.—D. P. Butler, Boston, Mass.:

I claim the series of movable shells held together and the spindle or handle by a halved joint on each set of shells, and a screw, g, passing through the center of each shell and into the spindle, substantially as set forth.

I also claim the sectional handle, b, made in two parts, fitting upon and detachable from a central spindle, a.

Also, The employment of the rings, k, interposed between the handle and shells, for increasing the length of the handle, substantially as set forth.

48,515.—Machine for Boring Wells, Etc.—Malcolm Campbell and Job H. Cole, Philadelphia, Pa.:

We claim corrugating or otherwise indenting the contact surfaces of the lifting cam and drill stock, so that the lifting will be positive and without liability to slip, substantially as described.

We also claim hanging the lifting-cam shafts in adjustable and self-yielding boxes or bearings, as and for the purpose described.

We also claim, in combination with the drill stock and its lifting cams, the counterpoise, P, for aiding in raising the drill, when, from its extreme length, it becomes very heavy, and to equalize the force with which it falls, substantially as described.

48,516.—Machine for Making Sheet-metal Pans.—Chas. F. Chambers, Hufonville, Ill.:

First, I claim the angling rollers, E E', or their equivalents, placed at any suitable inclination, to press the sheet-metal from the center outward, as described and set forth.

Second, The set screws, m m' and c, or their equivalents, for throwing the operating forms out of line with the remaining one, substantially as described.

Third, In this composition I claim the gage, O, when attached to the gate, D, for the purpose of regulating the depth of the pans, in the manner set forth.

48,517.—Pipe Coupling.—James Chambers, Boston, Mass.:

I claim a pipe-coupling, composed of two or more sections of a cylinder, having their contiguous edges provided with cleats or tenons, h h, and fastened by keys, F F, provided with dove-tail wedge-shaped mortises, m, or their equivalents, substantially as set forth and for the purpose described.

48,518.—Cast-iron Steam Generator.—John Chilcott, Brooklyn, N. Y. Antedated June 21, 1865:

I claim a steam generator, composed of tiers of arch-sided polygonal cast-iron water and steam tubes, arranged substantially as herein described, to form flues between the tiers.

48,519.—Machine for Stacking Straw.—D. M. Cochran and A. Gear, Richmond, Ind.:

We claim, First, The combination of a folding straw stacker, which is constructed of sections, with the hanging posts or beam, B, and rod, j, when these are used for confining and supporting the stacker in transportation or in operation, substantially as herein described.

Second, The combination of the guard or side boards, e', of the section, D, with an adjustable stacker, and the box, A, of a thrashing machine, substantially as described.

Third, A hinged or pivoted deflector, H, applied at the discharging end of the stacker, substantially as described.

Fourth, The hinged apron, H', in combination with a device or device, for protecting the straw from the wind at its point of discharge from the stacker, substantially as described.

Fifth, A folding sectional stacker, which is susceptible of being elevated or depressed without leaving wind openings at the side of the lowest section, and which is arranged and combined with the rear end of a thrashing machine in such manner that it can be folded beneath the same, substantially as described.

48,520.—Flour Sifter.—D. C. Colby, New York City:

I claim, First, The use of the shaft, B, provided with one or more rows of the strips, g g and h, in combination with the box, A, and the sieve, I, and with or without the screen, m, substantially as described and for the purposes set forth.

Second, I claim the combination and arrangement of the box, A, the standards, D D, the rod, k, and the strips, E and F, as and for the purposes set forth.

48,521.—Chuck for Lathe.—S. J. Cone, Middletown, Conn.:

I claim the use of the V-shaped split ring, D, applied in combination with the head, A, and chuck, B, in the manner and for the purpose substantially as set forth.

[This invention consists in the employment or use of a split metal ring, V-shaped on its inner edge to fit into a corresponding screw at the inner ends of the wooden chucks and provided with a screw-thread on its circumference to screw into the metal head calculated to hold the chucks in such a manner that in order to attach a chuck to a metal head nothing is required but to furnish its inner end with a screw corresponding in size and shape to the V-shaped split ring. A stud projecting from the inner circumference of one half the split ring and catching in a corresponding hole in the wood prevents the ring from slipping while the chuck is screwed on the metal head.]

48,522.—Apparatus for Boiling and Evaporating Saccharine Liquids.—D. M. Cook, Mansfield, Ohio:

I claim, First, The construction of cellular or tubular boilers, substantially in the manner and for the purposes described.

Second, The combination of one or more perforated or imperforated ledges, with cellular or tubular boilers, substantially as and for the purposes described.

Third, Constructing a tubular or cellular boiler with finishing cells or chambers, substantially as described.

Fourth, The combination of two or more cellular or tubular boilers, arranged substantially as and for the purposes described.

Fifth, The combination of a lid or cover with a cellular or tubular boiler, substantially as described.

Sixth, The construction of a cellular boiler with a bottom plate, C, or its equivalent, substantially as described.

48,523.—Baling Press.—Waldo P. Craig, Milton, Ky.:

I claim, First, The tumbling box, H, substantially as described and set forth.

Second, The arrangement of tumbling box or trunk, H, trunnions, h, slots, e, and abutment, E', substantially as set forth.

Third, The combination of the U-formed clamp irons, M M', the bars, N N', and grooved clamp boards or slabs, K K', when constructed and employed as specified.

48,524.—Well Drill.—Amos Crandall, Great Bend, Pa.:

I claim the combination and arrangement of the drill, D, rimmer, R, shaft, S, and buckets, B B B, constructed and operating substantially as and for the purpose set forth.

48,525.—Egg Beater.—Moses G. Crane, Boston, Mass.:

I claim the combination of the rotary spindles, A, the series of curved wires or arms, a a a and c, the pinions, B and B', and the central gear, C, the same being arranged so as to operate together, substantially as described.

48,526.—Smoothing Iron.—John W. Currier, Holyoke, Mass.:

I claim the combination of the block, A, with the parts, B C and G, in a flat or smoothing iron for the purpose of holding the block, A, and forming a double air space around it, substantially as described.

Second, Combined as a whole, I claim the making, forming and finishing segars, substantially as herein described.

48,528.—Corn Planter.—Frank Dean, Beloit, Wis.:

I claim the slide, A, in combination with the roller, F, cone, E, and ring, H, arranged and operating substantially as described.

48,529.—Steam Engine.—B. Demming and D. Arey Porter, Cleveland, Ohio:

We claim the valves, C D, when arranged and operating in connection with four ports, in the manner and for the purpose before described.

Second, We claim the arrangement of the cam, L, and levers, H K, in combination with the valves and valve rods, substantially as and for the purpose set forth.

48,530.—Trestle Bridge.—Andrew Derrom, Patterson, N. J.:

I claim, First, Securing the cap-piece to the legs of a trestle to be used for bridges, etc., by means of one or more wedge-shaped pieces driven into the same from the under side thereof, substantially as herein described.

Second, The adjustable feet for the trestle-legs arranged upon the same, substantially as herein described and for the purposes specified.

[For an illustration and description of this invention see page 503, Vol. XII, of the SCIENTIFIC AMERICAN.]

48,531.—Screw Bolt for Fastening Railroad Chairs.—Richard James Dewhurst, New York City:

I claim the bolt with the screw part thereof formed substantially as described, as a new article of manufacture.

48,532.—Coal Breaker.—John A. Dickson, Scranton, Pa.:

I claim the construction of rings bearing teeth separated from each other by rings without teeth as above described and for the purposes herein pointed out.

48,533.—Hand-washing Device for one-armed Persons.—Gustave Dieterich, New York City:

I claim, First, A rubbing or washing surface composed of a sponge or other suitable porous substance fixed to a frame with an open or perforated bottom, substantially as and for the purpose above described.

Second, I also claim in combination the perforated plate for holding a sponge or other flexible material with a bed plate upon which it may be fitted by sliding in grooves or otherwise, substantially as described.

48,534.—Machine for the Manufacture of Aerated Bread.—John Danglish, M. D. Reading, Eng., assignor to Steuben T. Bacon, Boston, Mass.:

I claim the process or method of fermentation, substantially as described.

48,535.—Hoop Cutting and Bending.—Jacob Dobbins, Litchfield, Mich.:

I claim the rotating knives, G K, and guides, M M', in combination with the rollers, H N, for bending the hoops as they are cut, all substantially as and for the purpose set forth.

[This invention relates to a new and improved machine for cutting hoops for barrels, casks, etc., and it consists in the employment or use of two circular knives, arranged with guides and rollers, whereby the work may be done rapidly and in a perfect manner.]

48,536.—Metallic Cartridge Case.—Wm. C. Dodge, Washington, D. C.:

I claim a cartridge case for small arms composed of ductile metal, and coated or plated, internally, or both internally and externally, with tin or other suitable metal or alloy of metals, substantially as and for the purpose herein set forth.

48,537.—Clothes Dryer.—J. P. Dorman, Galesburg, Ill.:

I claim a series of bars, a and a', arranged parallel and at right angles to one another, constituting two or more arms, B B, substantially in the manner and for the purpose herein described.

Second, Arms, B B, upright plate, D, bracelet plates, d d, and hinged plate, b, so constructed and arranged as to be readily detached from the post when desired, substantially in the manner and for the purpose described.

48,538.—Machine for Bending Metal Plates.—John W. Easby, Washington, D. C.:

I claim the combination of the patterns, E E, adjustable bars, C C C, running transversely of the said patterns, the clamps, D D, and bed plate, A, all constructed, arranged and operating in the manner and for the purposes specified.

48,539.—Self Inflator for Raising Sunken Vessels, Etc.—Temperance P. Edson, Cambridge, Ill.:

I claim the herein described inflator when constructed, applied and operating as and for the purpose set forth.

48,540.—Heat Radiator.—Alfred Edwards, Chicago, Ill.:

I claim the combination of the heating chamber, D, provided with inlet and outlet tubes, b c, with the cylinder, B, and circular plate, G, arranged and operating as and for the purposes shown and specified.

48,541.—Propelling Wheel for River and Canal Boats.—Horace Fenton, Cleveland, Ohio:

I claim the adjustable wheel, A, arms, E and slots, g, in combination with gears, C D, a-d friction rollers when arranged and operating conjointly, substantially as and for the purpose set forth.

48,542.—Corner or Joint for Soapstone Stoves.—James H. Flagg, Perkinsville, Vt.:

I claim the corner piece of stoves for holding the sides of the stove and its linings together cast in one and the same piece, substantially as herein described.

[This invention relates to the construction of corner pieces for soapstone stoves, whereby a strong and firm stove is secured, and one which can be readily put together and taken apart, when so desired.]

48,543.—Escape Valve for Pumps.—Edward A. Floyd, Macomb, Ill.:

I claim the slide, D, constructed as shown and described, operated by the stem, F, and spring, u, as and for the purpose herein set forth.

48,544.—Shoemaker's Float.—J. W. Foard, San Francisco, Cal.:

First, Constructing shoemakers' floats so that the cutters are separate from the stock and are held therein by means of a clamping screw, substantially as above described.

Second, I also claim making the cutters, C, with double faces substantially as described.

[This invention consists in a new construction of shoemakers' floats for removing pegs and nails from the inner surfaces of the soles of boots and shoes. The cutting parts are made separate from the handles. They are also made with cutting surfaces of steel on both their faces, and also so attached to their handles as to be readily turned over or changed when one of said surfaces becomes dull.]

48,545.—Clothes Wringer.—H. G. Folger, Wadsworth, Ohio:

I claim the above described arrangement of the adjustable clamps, G, levers, L, pawls, h, arm, B, end pieces, A, bearings, b, springs, I, and brace, D, for the purposes set forth.

48,546.—Saw Gummer.—A. K. Foster, Hallettsville, Texas:

I claim the grindstone, D, with the adjustable bar, F, sliding bar, H, and with the levers, J K, and clamp or jaw, L, or their equivalents all arranged in connection with the saw, M, to operate substantially in the manner as and for the purpose herein set forth.

[This invention relates to a new and improved saw gumming machine of that class in which a grindstone is employed for performing the work. The invention consists in using in connection with a grindstone an adjustable and a sliding bar and levers one of which is provided with a jaw or clamp, and all the parts so arranged as to admit of the work being performed in an expeditious and perfect manner.]

48,547.—Piston Packing.—Andrew Fulton, Pittsburgh, Pa.:

I claim the construction of the packing of a piston so as to operate as herein described, by arranging uncut hard and soft metal rings, b c b c, of the wedge form described upon a hub, A, and between heads, B D, one of which is adjustable lengthwise of the rod, C, the said soft and hard metal rings being disposed in the order substantially as described all for the purpose set forth.

48,548.—Expanding Drill.—Franklin Cleason, Philadelphia, Pa.:

I claim the plate, C, provided with the oblique grooves, d, at opposite sides fitted within the stock, A, and adjusted by means of the nut, F, on the screw of the shank, o, or an equivalent means, in connection with the cutters, D D, fitted in the cylindrical part, B, of the stock and connected to the plate, C, by pins, g, fitting in grooves, d, substantially as and for the purpose set forth.

48,549.—Steam Engine.—William Golding, New Orleans, Lou.:

I claim the radius arm, G, applied in combination with the connecting rod, b, crosshead, a, link, F, and trunk, E, substantially in the manner and for the purpose herein shown and described.

[This invention consists in the application of a radius arm in combination with the connecting rod, crosshead and link connecting said crosshead with the trunk of a trunk engine in such a manner that by the action of said radius arm the vibrations of the link in the trunk is diminished and the diameter of the said trunk can be considerably reduced and at the same time the trunk is relieved of the friction and the cutting liable from the pressure of the connecting rod.]

48,550.—Washing Machine.—Ebenzer Gordon, Cedar Rapids, Iowa:

First, I claim the combination of the supporting frame, I, the rollers R, the semicircles, F, the rubbing bars, G, provided with exterior surfaces the cross bar, P, the journals, C, C, and slots, A, A, arranged as and for the purposes specified.

Second, I claim the combination and arrangement of the box, A, B, the removable supporting frame, I, the rollers, R, corrugated blocks, D, rubber, E, G, and handle, H, operating as and for the purposes specified.

48,551.—Field Marker for Planting.—William Goltry, La Grange, Iowa:

I claim the combination of two or more runners or markers, A, A, with each other and with the connecting bars, B and C, by means of pivot pin, C, C, substantially in the manner and for the purpose herein set forth.

I also claim, in combination with the pivoted markers, A, A, and connecting levers, B, C, the lever, D, pivoted to the bar, B, and operating substantially as herein described.

48,552.—Coating for Oil Vessels.—Stuart Gwynn, New York City:

I claim the new article of manufacture constituting a tight oil seal, lined or coated internally as described.

48,553.—Railway Car.—William Smith Hall, Quincy, Mass.:

I claim the employment of the ratchet mechanism, when operated to start the car by a chain winding upon a crank shaft or pulley, substantially as set forth.

Also the method of disengaging the pawl from the ratchet, substantially as shown.

Also combining with the starting apparatus a brake mechanism operated by foot, substantially as shown and described.

48,554.—Box, Ship, or Mast Scraper.—Chas. W. Harris, Philadelphia, Pa.:

I claim constructing a box scraper of the form substantially as described.

48,555.—Door Bolt.—Wm. H. Hart, New Britain, Conn.:

I claim making the barrel of a door or shutter bolt of one piece of sheet metal, punched, formed and secured to the plate, D, substantially as described.

48,556.—Graduated Faucet Measure.—Geo. H. Henkle, Middletown, Ohio:

I claim, First, The frame, D, E, B, in combination with the measure, A, arranged and operating in the manner and for the purpose substantially as described.

Second, I also claim the faucet constructed in the manner described, in combination with the measure, A, to operate in the manner and for the purpose described.

48,557.—Combined Rake and Reel Attachment to Harvesters.—R. Hoffheins, Dover, Pa.:

I claim, First, Constructing a combined rake and reel so that the rake is independent in its revolutions of the reel upon a support which is mounted upon the hinged cutting apparatus of harvesting machines, substantially as herein described.

Second, The construction of the support, H, for the combined rake and reel, substantially as described.

Third, Securing the required motions for the rake by connecting it to a revolving ring or yoke, or coupling, and to a revolving wheel, J, which are arranged in different planes, and applied to a central shaft or axial support, substantially as described.

Fourth, The manner substantially as described of connecting the rake to its drawing wheel, J, by means of a spring bar, or its equivalent, for the purpose set forth.

Fifth, The arrangement of the four gear wheels, J, q, p, p', with the combined but independently revolving rake and reel, substantially as herein described.

Sixth, In a rake and reel combined, the rake revolving independently of the reel around the axis of the shaft which carries or drives the reel, I claim providing for stopping and starting the rake without disturbing the reel, and without stopping the machine or harvester, substantially in the manner herein described.

Seventh, The combination of the driver's seat of the harvester, independently revolving rake, independently revolving reel, and stopping and starting contrivance of the rake, substantially in the manner and for the purpose described.

Eighth, The combination of the extensible and flexible or jointed shaft, S, independent rake, and independent reel, substantially in the manner and for the purpose described.

Ninth, Connecting a rake which turns around the shaft, L, to opposite sides of a revolving device, K, which serves as a hinge, on two sides of the shaft, L, for the rake to play up and down upon, and also as a coupling which permits the rake to revolve independently of the reel, substantially as herein described.

Tenth, The combination of an independently revolving rake, an independently revolving reel, sliding clutch, wheel, q, or its equivalent, and the hinging or coupling device, K, or its equivalent, substantially as and for the purpose herein described.

Eleventh, A rake which revolves or turns independently of the reel around the shaft, L, which drives or carries the reel during its entire circuit, substantially as and for the purpose described.

Twelfth, The arrangement, with an independently revolving rake and an independently revolving reel, of a contrivance for stopping and starting the rake without stopping the reel, substantially as described.

Thirteenth, Constructing a combined rake and reel in such manner that the rake and reel have independent motions of one another, although the rake moves around the shaft which carries or drives the reel, substantially as described.

Fourteenth, An independent revolving reel mounted upon a hinged cutting apparatus of a harvester, in combination with a revolving rake, substantially as described.

Fifteenth, The arrangement in a harvester of the independent reel, independent rake, hinged cutting apparatus, and stopping and starting apparatus, substantially as described.

Sixteenth, An independent reel and an independent rake combined, both moving in a similar direction, but in different paths, about a common axis or shaft, substantially as herein described.

Seventeenth, The combination of an independent revolving rake, which is sustained at only one end, with an independent revolving reel or gatherer, which is also sustained at only one end, in such manner that the rake always maintains a position below the reel, substantially as described.

Eighteenth, The combination with a harvesting machine constructed with two driving wheels, a jointed cutting apparatus, an independently revolving rake, and an independently revolving reel—the reel and rake being mounted on the cutting apparatus—of an adjusting contrivance, which is so arranged that the driver, while riding on the machine, can adjust the cutting apparatus and the rake and reel, without stopping the machine, substantially as described.

Nineteenth, The combination of a hinged curved frame, hinged cutting apparatus, independent revolving rake and independent revolving reel, substantially as described.

Twentieth, The arrangement of the independently revolving rake and independently revolving reel upon a jointed cutting apparatus at a point forward of the axle, A, and to one side of the drive wheel, A, substantially as and for the purpose described.

Twenty-first, The arrangement in a two-wheel harvesting machine of a hinged supporting frame, C, a jointed cutting apparatus, a revolving reel or gatherer, and a rake with attachments or connections by which the attendant of the machine, while riding thereon, can control its motions, substantially as herein described.

Twenty-second, Combining a rake and reel or gatherer in such manner that the former revolves around the axis of the latter, and also independently of it, and can be stopped and started at the will of the operator while he is riding upon the machine, substantially as described.

48,558.—Padlock.—Abraham Huffer and Nathaniel Sehner, Hagerstown, Md.:

We claim, First, A padlock provided with two bolts, one being employed to hold the hasp while the other fastens the first bolt, all constructed and arranged substantially in the manner and for the purposes set forth.

Second, We claim the use of the notch, b, in combination with

the staple, S, and spring, C and D, substantially in the manner and for the purposes set forth.

Third, We also claim the use of the hasp, or its equivalent, for moving the bolt laterally into the range of the key, substantially as specified.

48,559.—Apparatus for Separating Grease from Slush.—David H. Kaufman, Kokoma, Ind.:

I claim the combined apparatus shown and described, consisting of the upper vat with its adjusting gate, the grated incline and the divided vat, I, L, with their communicating opening.

I further claim the vat, with its respective chambers, I, L, communicating at or near the bottom so as to act as a separator by allowing the lower or watery fluid to pass out of the chamber, which retains the grease.

48,560.—Forging Machine.—John C. Jewell, Boston, Mass.:

I claim, First, The stop, K, when arranged in connection with the hammers, G, to operate in the manner substantially as and for the purpose herein set forth.

Second, The knife or cutter, R, when arranged so as to be operated from the shaft, I, substantially as described.

Third, The ratchet, Y, provided with the beveled projections, n, and used in connection with the pin, o, on the hub, p, of arbor, C, in combination with the sliding bar, Y, provided with the button, u, and fork, X, the pawl, v, the bar, W, connected with shaft, T, and the cam, X, on arbor, C, all arranged substantially as shown, for the purpose specified.

Fourth, The horizontal movable or turning bed, A', with sliding trough, B', attached, operated from the rock shaft, O, through the medium of the obliquely slotted plate, I', rod, D', arranged substantially as and for the purpose set forth.

Fifth, The manner of operating the trough, B', for feeding the rod to the hammers, to wit, by means of the rack, C', attached to the slide, b', the pinion, d, gearing into rack, c', and the ratchet, e', into which a pawl, f', attached to lever, C', catches, the lever, C', being actuated from the rock shaft, O, and all arranged substantially as described.

48,561.—Laundry Water Heater.—John Keane, New York City:

I claim, First, In water-heating apparatus, connecting the branch pipes, E, F, which lead to the tub, B, with the pipes, G and L, which convey the water to the fire by means of a horizontal pipe, D, which is divided by a diaphragm, as shown, and in whose ends the pipes, G and L, are capable of turning, substantially as and for the purpose above described.

Second, I also claim the combination with boiler, H, and the circulating pipes, G and L, of a plate, K, whereby the boiler can be used with a cooking stove or range, substantially as above described.

Third, I also claim combining the water-heating apparatus above described with a tub or other vessel, B, for laundry or culinary uses, substantially as above described.

[The object of this machine is to produce a washing machine worthy of a place in the laundry, both on account of the saving of labor and of the preservation of clothes. The box to contain the suds and clothes has an abrading surface on the inside of its front, against which the clothes are brought by a frame, capable of vertical and also of horizontal motion. The inventor has given the title of "Peerless" to his washing machine.]

48,562.—Hand Corn Planter.—Clement H. Kellogg, Elyria, Ohio:

I claim the seed-distributor, A, having apertures, c, c, c, converging from opposite directions, upward and diagonally to one common point of intersection, and thence upward perpendicularly to the upper surface of the block, in combination with sliding stop, D, and seeding slide, B, the whole being arranged in the manner substantially as described, and for the purpose of inserting the seed in two or more places in the soil.

48,563.—Oscillating Engine.—Wm. H. King, Philadelphia, Pa.:

I claim, First, The arrangement of the channel, S, S', and T, through the trunnion, H, substantially in the manner described and shown.

Second, Arranging the steam chest relatively to the trunnion, H, and cylinder, A, substantially as set forth.

Third, The construction and arrangement of the valve gear hereinbefore described, in combination with the steam chest, substantially as herein set forth.

48,564.—Artificial Fuel.—Chas. Korff, New York City:

I claim the production of artificial coal out of mineral coal dust, by combining the same with animal blood and water, substantially in the manner and for the purpose above described.

48,565.—Piano-forte Action.—Frederick Koth, New York City:

I claim the arrangement of the jack, G, lever, H, spring, S, and stop, N, attached to the key, A, in combination with the adjustable stop, N, and operating on the hammer butt in the manner and for the purpose substantially as described.

48,566.—Seeding Machine.—Casper Krogh, Kroghville, Wis.:

I claim the arrangement of the adjustable corrugated apron, H, beneath the hopper of a grain drill, substantially as and for the purposes herein shown and specified.

48,567.—Medicine for the Cure of Erysipelas.—H. A. Lamb, Portland, Me.:

I claim the compound of ingredients mixed in the proportions and for the purpose described.

48,568.—Paper File.—Gustave Lautenschlager, New York City:

I claim the application of a series of folding wires, b, to a common rod, A, in combination with a suitable frame, B, constructed and operating substantially as and for the purpose set forth.

[This invention consists in the application to a central stem or axis of a series of looped wires, in combination with a folding frame, in such a manner that each wire is capable of receiving and holding its own paper, and all the wires swivel on the central stem, so that they fold one over the other, and when the frame is closed the papers are situated one above the other in a convenient position for the reader. Each paper can be conveniently removed without disturbing the others; and, furthermore, the papers are not injured or torn by passing needles through them, or by points or other devices generally employed in paper files of the ordinary construction.]

48,569.—Buckle.—B. S. Lawson, New York City:

First, In buckles for fastening skates, and for other uses, placing the journals of the tongue in openings in the frame of the buckle, of such form as that said journals can be shifted from their bearings, substantially as described.

Second, I also claim so constructing a buckle as that its tongue can be loosened from the strap by lifting the hinder end of the buckle, substantially as described.

48,570.—Fruit Dryer.—David Lippy, Mansfield, Ohio:

First, I claim a series of drawers, F, provided with slatted bottoms, C, and dampers, G, and arranged with dampers, H, at their sides, substantially as and for the purpose specified.

Second, The furnace, B, having two plates, G, D, above it, one of which, D, is provided with a register, E, all being arranged in connection with the drawers and dampers, to operate as and for the purpose set forth.

Third, The ventilators, I, applied to the building, A, and used in connection with the furnace drawers and dampers, substantially as and for the purpose set forth.

Fourth, The combination of the furnace drawers, dampers and ventilators, all arranged within a building, to operate in the manner substantially as and for the purpose described.

[This invention relates to a new and improved device for drying fruit, and it consists in a novel arrangement of a furnace, damper and drawers, whereby fruit may be dried expeditiously and with but a small expenditure of fuel.]

48,571.—Flour Sifter.—Harvey Locke, Boston, Mass.:

I claim my improved sifting apparatus, having its wings or scrapers, G, G, constructed and applied to the arms, b, b, b, and so as to operate with the sieve, in the manner as set forth.

48,572.—Flour Sifter.—S. C. Maine, Boston, Mass.:

I claim a sifter cylinder, composed of independent sections or parts, placed one within the other, and operating substantially as and for the purpose set forth.

I also claim, in combination with the above, the cover, E, operating substantially as set forth and for the purpose described.

48,573.—Grain Dryer.—Sylvester Marsh, Chicago, Ill.:

I claim the general construction and arrangement of the grain-drying apparatus, substantially as herein described; that is to say, forming the grain receivers or chambers of a cylindrical-conical form, in combination with central induct and eduction pipes, arranged circumferentially in the manner and for the purpose set forth.

Second, In combination with cylindrical-conical grain receivers or chambers, I claim forming the underside of covering plates to equally distribute the grain and insure its uniform discharge through the pipes.

Third, I claim the arrangement of the central column or radiator or smoke-stack, in combination with concentric drying chambers and inclosures, substantially in the manner and for the purpose set forth.

Fourth, I claim the combination of the discharge pipes or openings, with hinged valve traps, arranged for operation in the manner and for the purpose set forth.

Fifth, I claim the method herein described of regulating the temperature of the ascending currents by means of a blast of air down upon the furnace, substantially in the manner and for the purpose set forth.

48,574.—Endless Chain Propeller.—Angus McDonald, Mattawan, Mich.:

First, I claim an improvement in propellers the combination of the twist d wire links, D, E, buckets, F, and thimbles, G, as and for the purposes specified.

Second, The connecting of the links, D, E, of said chains together, by means of the eyes, c, protected by metal strips, d, and the metal bars, composed of the parts, f, g, as set forth.

Third, The arms, B, provided with chairs, H, at their ends, having projections, b, in connection with the thimble, G, in the links, E, of the chains, substantially as and for the purpose specified.

[This invention consists in the employment or use of endless chains of buckets, peculiarly constructed, and arranged to work over the ends of arms attached readily to rotating shafts, whereby a very durable propeller is obtained, especially for boats of light draught.]

48,575.—Cultivator.—H. S. Mead, Gloversville, N. Y.:

I claim the oblique rotating toothed shaft, F, fitted at the lower ends of pendants attached to the frame, A, of the machine, and arranged to operate in the manner substantially as and for the purpose herein set forth.

[This invention relates to a new and useful machine for cultivating and hoeing the soil, and it consists in the employment or use of two shafts placed in an oblique position relatively with each other, provided with teeth, and operated from the shaft or axle of the wheels on which the machine is mounted, whereby the earth may be cast either toward or from the plants, weeds thereby eradicated, and the soil pulverized and lightened up to promote the growth of the plants.]

48,576.—Washing Machine.—S. P. Mecay, Kilborn, Ohio:

I claim the spring, H, connected to the slides, G, in which the ends of the shaft, F, are fitted in combination with the link, E, and the arm, D, of the head, C, all being arranged substantially as shown, with a lever, J, or its equivalent, for operating the head, for the purpose set forth.

48,577.—Rotary Engine.—Truman Merrian and James Cushing, Waterloo Village, Wis.:

First, We claim the arrangement of the cylinders and pistons upon a revolving drum on a shaft, in combination with a face-plate and ports, and adapted to circular apertures in a stationary steam chest, so that a constant pressure of action steam may be alternately applied to the pistons, thereby increasing the leverage and speed, as herein set forth and described.

Second, We claim the two semicircles, in combination with friction trucks on a cross-head, by which, in connection with the movement of a common piston, rotary motion and power are obtained, as herein set forth and described.

Third, We claim the steam chest, with an oscillating joint, in such a peculiar arrangement and adaption to a face plate as will admit steam to cylinders and permit the chest to revolve one quarter, and thereby reverse the motion of the engine, as herein set forth and described.

48,578.—Apparatus for Lining Hides.—Saml. J. Miller, Albert B. Barnett and Wm. H. Study, Economy, Ind.:

First, We claim the employment of rotating hide racks in the process of lining hides, substantially as described.

Second, Applying hide racks to a shaft in such manner that they can be adjusted and set at different distances apart to adapt them to hide of varying sizes, substantially as described.

Third, The use of rotating hide racks, in conjunction with a supporting frame, which is susceptible of being elevated or depressed, substantially as described.

Fourth, A lining vat, which is constructed with a concave bottom and provided with hide racks, substantially as described.

48,579.—Hoisting Machine.—William Miller, Cincinnati, Ohio:

I claim, First, An elevator platform having a single worm wheel, F, which washes within two or more opposite worm rocks, B, B, substantially as set forth.

Second, An elevator platform supported by rollers, G, or their equivalents, on a single worm wheel, F, resting in worm rocks, B, B, substantially as set forth.

48,580.—Process for Making Sugar.—Thomas Moore, Bloomington, Ill.:

I claim the within described process of treating saccharine juices and sirups of the sorgho and lupine canes, by first treating the juice with a tannate made of white oak bark, or other equivalent while cold, and raising it to a certain point by a gradual heat, for the purpose of rendering insoluble, in order to remove certain glutinous or starchy matters contained therein, then mixing with it a weak ley for further defecation, then boiling to the point of crystallization, substantially in the manner set forth.

I also claim distinctly the use of a liquor made of oak bark, or other equivalent material, in connection with a ley of wood ashes, or other equivalent, as an effectual agent for the defecation of sorgho and lupine juices and sirups, substantially as and for the purposes specified.

[The object of this invention is to remove from the juice of sugar cane or other saccharine liquid all the acid parts which may be mixed with it, before and during the process of boiling, and also to facilitate the crystallization of the sugar after the juice has been boiled down to the requisite consistency.]

48,581.—Excavator.—Jason C. Osgood, Troy, N. Y.:

I claim the combination of the toothed chain friction wheel, C, with the friction wheel, F, the belt chain, and toothed wheel, B, and toothed shire wheel, A, for the purposes as herein set forth.

48,582.—Dust Pan and Brush.—Charles H. Parker and Grindly Burnham, Waltham, Mass.:

I claim a dust pan and brush combined, substantially in the manner herein shown and described.

[This invention consists in the combination of a dust pan and dust brush, the latter being inserted in the handle of the former, which is made hollow and sufficiently large to receive the same within it, and from which the brush can be withdrawn at any moment for use.

The advantage of having these articles combined is apparent. They are necessarily such articles as belong together, and by having them combined in this way much trouble and vexation in looking for one which has been mislaid to use with the other will be avoided.

48,583.—Paint for Ships' Bottoms.—David Parkhurst, Gloucester, Mass.:

I claim the compositions prepared substantially as hereinbefore set forth and for the purpose specified.

- 48,584.—Heating Oil Wells by Electricity.—George T. Parry and William S. Warner, Philadelphia, Pa.:
First, We claim employing the heating power of electricity for the purpose of liquefying and accelerating the flow of oil from oil wells, substantially as described.
Second, Inclosing the circuit interrupter or electrical heater within a tight chamber, substantially as herein described.
- 48,585.—Oil Can.—John M. Perkins and Mark W. House, Cleveland, Ohio:
We claim forming passages with corrugated metal plate or plates, substantially as described and for the purpose set forth.
- 48,586.—Head Rest for Railroad Car Seats.—William R. Phelps, New York City:
I claim the improved head rest herein described, to be attached to car seats, etc., the same consisting of a movable and adjustable head rest frame, in combination with a frame susceptible of being attached to or removed from the seat at pleasure, arranged and operating together, substantially as specified.
- 48,587.—Broom or Brush Head.—John Edward Phillips, Philadelphia, Pa.:
I claim the metal frame, A, as shown in Fig. 2, whether molded and cast in one piece of metal, or stamped and pressed in one piece of sheet metal, having bars, on two or more of which the loops, c, c, are formed to receive the handle, and thereby clamp the filling, as and for the purposes described.
Also the spring metal confiner, D, or its equivalent, made as described, and to be placed on the filling below the frame, as and for the purpose described.
[This invention consists in a novel construction of brooms, brushes and like articles, which are made by aggregating and confining numerous strands of fibrous or other suitable material, so as to make a mass or body whose unconfined ends make the wearing surface of the article.]
- 48,588.—Beer Faucet.—Louis Poh, Buffalo, N. Y.:
I claim the combination of the key, C, plunger, C', plunger barrel, E, and discharge nozzle, B, when arranged and operating in the manner and for the purposes described.
- 48,589.—Machine for Printing Checks.—Joseph Pollak, Chicago, Ill.:
I claim the device for printing numbers on checks, as herein described, which can be constructed so that it may be attached to scales, or otherwise, where such printing is required.
- 48,590.—Seeding Machine and Cultivator Combined.—O. M. Pond, Independence, Iowa:
I claim, First, The arrangement of described devices for jointing the tongue and reach together, and securing said joint in place as may be required in raising and lowering said tongue and reach, in combination with the cultivator apparatus, in the manner and for the purposes set forth.
Second, I claim hinging the beams of the cultivator teeth to the rod, J, as described, in combination with the bar, K, when the said bar is attached as set forth, and operating as and for the purpose herein specified.
- 48,591.—Machine for Scraping Roads and Clearing Gutters.—Nathaniel Potter, East Hamburg, N. Y.:
I claim the manner of constructing the scrapers, as described, so that they may be used either for clearing gutters at the sides of roads, or for smoothing roads and filling ruts; this I claim in combination with the cutters attached to the center piece, and other portions of the machine necessary for the purpose specified.
- 48,592.—Hood for Cook Stoves.—Fitch Raymond and August Miller, Cleveland, Ohio:
We claim, First, Hinging the sections, A and B, together in the manner described, when used in their relation to the stove, E, stove pipe, C, tubes, d, d', and valve, e, as and for the purpose set forth.
Second, We claim the adjustable cap, A, troughs, D, and rods, H, in combination with the valve, e, and opening, d, as and for the purpose set forth.
- 48,593.—Fan Blower.—Charles G. Sargent, Graniteville, Mass.:
I claim, in combination with a fan case substantially such as described, a series of fan wings or blades, inclining outward and backward, and revolving in said case, in the manner and for the purpose substantially as described.
I also claim, in combination with the inclined wings or blades of a revolving fan substantially such as herein described, the stationary inclined arms or vanes in the fan case, for the purpose substantially as described.
- 48,594.—Bolt Cutter.—Erhard Schlenker, Buffalo, N. Y.:
I claim a bolt cutter, with the die carrying disk, D, and handle, C, attached, when all are combined, arranged and operated as and for the purposes specified.
- 48,595.—Basket.—Theron Sherry, Newark, N. J.:
I claim folding baskets constructed in the manner and for the purpose herein set forth.
- 48,596.—Washing Machine.—Hamilton E. Smith, Cincinnati, Ohio:
I claim, First, The combined cover and washboard, G, constructed and applied as herein specified.
Second, The combination of the heads, B, B, slots, C, ribs, D, rods, E, and water passages, b, c, c', arranged and operating as set forth.
- 48,597.—Straw Cutter.—Basil Spencer, Lewisburg, Pa.:
I claim the arrangement and combination of the bars, F, with their pitman, K, crank shafts, I and J, as connected with the rake head, L, and feeding rollers, M and arm, V, and operating lever, W, when arranged and combined as herein described and for the purposes set forth.
- 48,598.—Sausage Filler.—O. W. Stowe, Plantsville, Conn.:
I claim the case, A, composed of a section of a hollow sphere, a, or of the suitable form and a cone, b, in connection with a slotted disk, D, placed obliquely on the shaft, B, and a piston, C, all arranged to operate in the manner substantially as and for the purpose herein set forth.
[This invention consists in the employment or use of a case constructed or cast in the form of a portion of a sphere and a cone and furnished with a rotary piston and a rotary slotted disk in or through which the piston works the disk rotating in an oblique plane in the hopper whereby a very compact and efficient implement is obtained for filling sausages, and for other purposes.]
- 48,599.—Packing for Artesian Wells.—Samuel Swartz, Buffalo, N. Y.:
First, I claim the spring packing and wedges when constructed and arranged substantially as herein set forth.
Second, I claim the wedges in combination with the spiral springs and lower ring for the purpose set forth.
Third, I claim the chain or its equivalent connected with the rod and pulley as arranged with an adjustable packing, substantially as shown and described.
- 48,600.—Horse Power.—J. B. Sweetland, Pontiac, Mich.:
I claim the arrangement of the triangular frame, A, the metallic bed plate, E and F, the master wheel, C, and the shaft, D, the several parts being constructed and used together as and for the purpose herein specified.
- 48,601.—Skates.—Owen W. Taft, New York City:
First, I claim the application to a skate of a heating attachment substantially such as herein described or any equivalent thereof for the purposes set forth.
Second, Making the foot plate detachable, substantially as and for the purpose specified.
Third, The hook catches, d, and forked stud, f, in combination with the foot plate, C, heater, E, speds, e, and spring, g, constructed and operating substantially as and for the purpose set forth.
- 48,602.—Device for Fastening Lock Key.—James R. Tempest, Philadelphia, Pa.:
I claim the disk, c, in combination with the ratchet teeth, c2, on the key, c, and the spring pawl, D, on the face of the lock case, A, B, substantially as and for the purpose described.
- 48,603.—Grain Separator.—Julius Tomlinson, Newburgh, Wis.:
First, I claim securing the pendants, C, C, and standards, D, D, of the screen frame, B, to the framing, A, by means of screws, a, passing through oblong vertical slots, b, in the pendants and standards, and into the framing to admit of the varying of the inclination of the screen frame, substantially as shown and described.
Second, The screens, E, formed with beveled lower edges provided with a flange or lip, d, and with spouts, E, and arranged or disposed within the frame, B, and with a blast spout, G, to operate in the manner substantially as and for the purpose set forth.
Third, The inclined feed spout, N, provided with a bottom, J, having perforations of different sizes, substantially as and for the purpose set forth.
Fourth, The introduction of a lever either straight or bent between the eccentric and the sieve frame, the straight lever to have a movable fulcrum and the bent lever to be operated by a movable eccentric, substantially as and for the purpose set forth.
- 48,604.—Rotary Pump.—Philip Umholtz, Tremont, Pa.:
I claim the combination of the casing, A, and its plate, B, and pin, K, with the rotary cylinder, C, vibrating valve, G, spring, L, and stopper, J, substantially as described and represented.
- 48,605.—Drilling Artesian Wells.—Salmon J. Wadsworth, Buffalo, N. Y.:
I claim the swivel, C, with its rod, c, in combination with the wheel, A, cam, B, and rope, x, in the manner and for the purpose described.
- 48,606.—Grain Rake.—Ell G. Warner, Union Township, Ohio:
I claim the construction of the rake with feet, and long teeth braced to the handle in such a manner as to form a platform on which the grain will lay, raised out of the stubble ready for the hands of the binder as above described.
- 48,607.—Thermal Motor.—George I. Washburn, Worcester, Mass.:
I claim, First, Utilizing the expansive and contractile force derived from variations of temperature in tubes or bars of metal so as to produce a regularly recurrent or continuous motion, the said force being applied through the intervention of a mainspring or resulting from the regularly recurrent artificial application of heat to said bar or tube.
Second, Utilizing the expansive force resulting from the increase of temperature of a confined body of air, to compress a spring from which a regularly recurring or continuous motion is obtained.
Third, Utilizing the expansive force resulting from the artificially produced increase of temperature of a confined body of air which is subjected to the variations of temperature without the accession of fresh air, excepting sufficient to supply the waste.
Fourth, I claim the double fork-shaped bars, M, M', or their equivalent embracing a central bar, N', of a different exhaustive power to which they are mutually attached at or near their extremities, by which the expansive power of a single rod may be almost doubled within a given length and by which according to the relative expansibility of the tongs and the embraced portion it may be made to contract or expand longitudinally by increase of temperature.
Fifth, I claim the levers, B, B', multiplying wheels or pulleys, A, A', etc., and expandible rod, D, the whole being arranged to operate in the manner and for the purpose herein set forth.
Sixth, I claim a series of multiplying levers, G, I, operating in connection with the levers, B, B, and expandible rods, E, E', in any manner substantially as described.
Seventh, I claim the connecting wires or cords, C, C, etc., H, J, formed of metal or other material and employed in combination with the multiplying wheels and levers, substantially as and for the purposes explained.
- 48,608.—Wire Straightening Machine.—George I. Washburn, Worcester, Mass.:
I claim causing the wire to rotate upon its own axis as it passes between the straightening points, in any manner, substantially as set forth.
Second, As an improvement in machines for straightening wire, I claim the combination of the reel, C, yoke, D, and wheels L, L', L2, L3, arranged and operating substantially as and for the purposes set forth.
- 48,609.—Drill.—R. G. Wells, Plummer, Pa.:
I claim forming the drill with the diagonal edge, b, and diagonally opposite straight corners, a, a, and alternate beveled corners, c, c, substantially as and for the purposes herein specified.
- 48,610.—Buckle.—Eugene White, Dixmont Center, Me.:
I claim the improved buckle consisting of the eccentric roller, C, one or more spurs, b, a frame or loop, A, and a cross bar, B, arranged and combined substantially in manner and so as to operate as specified.
- 48,611.—Slide Valve.—James A. Woodbury, Boston, Mass.:
I claim, First, Constructing the valves, D, D, independently of each other and with a space between them so that they may be free to expand or contract between the vertical parallel port walls, C, C, substantially as and for the purpose described.
Second, Connecting the valves, D, D, by means of the bar, G, or its equivalent, substantially as and for the purpose described.
- 48,612.—Self Centering Chuck or Holder.—Thomas H. Worrall, Lawrence, Mass.:
I claim the projections, d', or their equivalents extending from the ends of the jaws, c, and operating in combination with cross pieces, f, or their equivalents and with the cap, C, substantially as and for the purpose herein set forth.
Second, The adjustable tips, g, in combination with the jaws, c, cap, C, and mandrel, A, constructed and operating substantially as and for the purpose described.
Third, The differential screws, d, e, applied in combination with the thimble, D, cap, C, jaws, c, and mandrel, A, substantially as and for the purposes specified.
[In this chuck or holder the jaws are provided with projections extending through slot in the longitudinally sliding cap and provided with rigid or adjustable tips or screws in such a manner that the jaws are compelled to move in and out with the cap and a positive motion is imparted to said jaws in either direction. If adjustable tips are applied to the jaws, the chuck can be used for holding articles of a large or small diameter eccentrically or concentrically with the spindle to which the chuck or holder may be attached. The longitudinal motion of the cap may be produced by the screws of different pitch whereby the power with which the jaws are caused to gripe the articles to be held between them, can be increased to any desired extent.]
- 48,613.—Water Wheel.—Gilman F. Wright, Graniteville, Mass.:
I claim, in combination with a scroll water way, D, the ring gate or curb, C, the stationary guide, B', and the wheel, B, the whole being constructed, arranged and operated in the manner and for the purpose substantially as herein described and represented.
- 48,614.—Boot and Shoe.—F. D. Ballou, Abington, Mass., assignor to Alfred B. Ely, Boston, Mass.:
I claim the new article of manufacture, constituting a boot or shoe, substantially in the manner described.
- 48,615.—Mode of Extracting Drills from Wells.—Jacob Beyer (assignor to himself and John E. Smith), Buffalo, N. Y.:
I claim, First, Operating the gripping tongs, A, A, by the reversing or secondary levers, C, C, and rope, D, in the manner and for the purposes described.
Second, The combination of the upper ring, E, and operating cord, F, with the tapering gripping tongs, for the purposes and substantially as described.
Third, The combination of the lower ring, E', with the tapering gripping tongs and stop bar, G, operating as and for the purposes described.
- 48,616.—Cultivator and Potato-digger Combined.—Moses and John W. Chandler, East Corinth, Maine, assignor to themselves and Anthony and Wilson R. Woodard, Bangor, Maine:
First, We claim the oblique blades or cultivators, E, E, in combination with the shares, G, G, and screens, F, F, all arranged to operate substantially as and for the purposes set forth.
- Second, We also claim the shares, G, G, and screens, F, F, arranged with a space, k, between them, to admit of the passage or escape of obstructions from the shares and screens, as set forth.
- 48,617.—Car Coupling.—Wm. C. Clark, Portland, Maine, assignor to himself, W. D. Richards, Lynn, Mass., and Wm. H. Skinner, Lexington, Mass.:
I claim the combination of the arm, d, and its socket, h, with the link pin, c, and the bunter, bar, the whole being arranged and so as to operate substantially as specified.
I also claim the above-described arrangement or application of the spring latch with the socket, h; that is, so as to operate with the head of the arm, d, in manner and under circumstances substantially as specified.
- 48,618.—Horse-shoe.—George Custer (assignor to himself, Charles Toll and John Paxton), Monroe, Mich.:
I claim corrugating or otherwise roughening the countersink or crease at and around the nail hole, so that when the head of the nail is driven against them there shall be a more perfect contact of metal between them, substantially as and for the purpose described.
I also claim forming a shoulder between the inclined sides of the countersink or crease in a horse-shoe and the nail-hole, as and for the purpose substantially as described.
- 48,619.—Beater Press.—P. K. Dederick (assignor to L. and P. K. Dederick), Albany, N. Y.:
I claim, First, The employment and use in a beater press of toggle levers with the lower ends of the fulcrum levers permanently located on a plane even with or above the top of the bale, when said levers are connected by the rod, H, H, and bars, I, I, the whole being so constructed as not to interfere with the relieving of the bale endwise when pressed.
Second, The frames, O, forming a direct and substantial connection between the fulcrum bars, b', and the beater as head block, and the suspended plates, N, attached to the frame, O, in the manner and for the purpose described.
Third, The fastenings for the doors, composed of the rollers, S, connected to the frame of the press by means of links, V, and provided with the eccentrics, T, T, and handles, U, substantially as set forth.
Fourth, The relieving plates, X, X, arranged with the bars, Z, shafts, Z', having eccentrics, A', on them, and connected with the follower bars, G, to operate in the manner substantially as and for the purpose set forth.
Fifth, The follower, suspended by the bars, G, G, to the upper ends of the toggle levers, J, J, in combination with the beater, C, used as a fixed head while the bale is being pressed.
[This invention relates to a new and improved beater press, and it consists in a novel and improved construction and arrangement of the parts, whereby it is believed that the operations of beating and compressing substances for baling may be performed with greater facility than usual. It refers to a press of that class in which levers are employed for operating the follower.]
- 48,620.—Hydrometer.—William Edson (assignor to Shedd & Edson), Boston, Mass.:
I claim, First, The combination of indices in such a manner that when one is placed at the height of the mercury in a dry-bulb thermometer, and another at the height of the mercury in a wet-bulb thermometer, a third point will indicate on a scale the proportion of moisture in the atmosphere, substantially as and for the purpose set forth.
Second, A diagram of lines, so combined with a scale of figures, and so constructed or drawn as to indicate the relative humidity of the air, the dew point, and the absolute amount of moisture, either or all, when pointed out by an index whose position is regulated by adjustment to the height of the mercury in wet and dry-bulb thermometers, substantially as and for the purpose set forth.
- 48,621.—Beating Device for Baling Press.—Loyal C. Field (assignor to himself, Joseph P. Frost and W. S. Bellows), Galesburg, Ill.:
I claim closing the doors automatically just previous to the liberation and fall of the beater, and opening them after its fall by means of the horse power, by mechanism substantially as herein described and for the purposes specified.
I also claim the connecting of the doors, J, J, to pulleys, M, on a shaft, N, by means of chains, ropes or cards, L, the lever, F, connected to a pulley, O, on shaft, N, by a chain, cord or strap, Q, when said parts are used in connection with a rising and falling beater, B, and a horse power or other motor, all arranged to operate substantially as and for the purpose set forth.
- 48,622.—Magazine Fire-arm.—Joshua Gray, Medford, Mass., assignor to himself and E. H. Eldridge, Boston, Mass., W. G. Langdon, Malden, Mass., and S. S. Bucklin, Providence, R. I.:
I claim, First, So shaping the opening, L, in the magazine that it will be impossible to insert a cartridge wrong end front, substantially as described.
Second, The slot or stop, j, and a pin or stop, i, or their equivalents, to prevent the inner tube, D, from ever coming out of the magazine, C, substantially as described.
- 48,623.—Horse-shoe.—J. Wilson Hodges (assignor to himself and P. DeMurguionds), Baltimore, Md.:
I claim the attachable and removable roughing bar, C, provided with caiks, and secured in the groove of the shoe by means substantially as described.
I claim, Second, The blank bar, E, adapted to occupy the groove, B, in the absence of the roughing bar, and secured in a similar manner within the groove.
- 48,624.—Hand Stamp.—Horace Holt, Brooklyn, N. Y., assignor to Wm. W. Secombe, New York City:
I claim, First, The type-carrying head, F, constructed with cavities, d, d, for the reception of the ink ribbon, and attached to its stem, D, by a circular groove, and set screw or equivalent device, to admit of turning it on its axis, all substantially as herein shown and described, and for the purposes specified.
Second, The nick, j, segmental slot, j, and spring, k, in the type plate, G, to operate in combination with the screws or studs, i, i, in the head, F, substantially as and for the purpose set forth.
- 48,625.—Process for Lining Oil Barrels.—Charles B. Hutchinson (assignor to himself and J. H. Woodruff), Auburn, N. Y.:
I claim the within described process for applying solutions to the interior of casks, barrels, etc., to render them tight, so as to avoid the loss of their contents by leakage and evaporation, to wit, by heating and drying the interior of the cask or barrel, and opening the pores of the wood, by hot air, forced into the same through the medium of a pump, or its equivalent, and then applying the solution to the interior warm surface of the cask or barrel, and forcing it into the open pores, cracks and crevices by hot air under pressure, substantially as set forth.
- 48,626.—Curling Iron.—H. D. Jennings, Iliou, N. Y., assignor to Bernard Lavery, Waterford, N. Y.:
I claim a curling iron constructed and made in two parts, consisting of a shell and core, each having a separate handle, substantially as and for the purpose herein described.
- 48,627.—Cultivator.—John Lacey (assignor to Conrad Furst and David Bradley, Chicago, Ill.):
I claim, First, Connecting the movable parts of a mounted cultivator with the wheels and axle by the horizontal swinging bars or rods, I, substantially as shown and described.
Second, Pivoting the seat lever, K, to the axle by means of the post, M, or its equivalent, and to the movable parts of a cultivator, so as to adjust the weight of such movable parts, and cause the reaction of the force applied to move them to operate in the same direction as the direct force, all being substantially arranged and constructed as and for the purposes set forth and specified.
- 48,628.—Evaporator.—F. M. Love (assignor to himself and Samuel C. Love), Waldron, Ind.:
I claim the combination of the turnace, A, with the valves, c, c, c, c, and the graduations with plates, B, B, B, B, and f, the boxes, C, C, C, C, and D, the partitions, d, d, and doors, k, and the pipes, O, O, O, O, all or as many of each of the above mentioned boxes, plates, valves, cranks or pipes and graduations as may be desired, arranged and operating substantially as and for the purpose shown and described.
- 48,629.—Horse Rake.—Robert J. Robeson (assignor to himself and Jared W. Mills), Chicago, Ill.:
I claim, First, The employment of the hinged or adjustable fulcrum, F, provided with the slot, f, arranged and operating substantially as and for the purposes herein specified and shown.
Second, I claim the combination of the lever, E, provided with

the rod or rest, e, and the hinged arm or fulcrum, F, provided with the slot, I, as and for the purposes specified.

Third, I claim the combination of the rake, D, the levers, E, and arms, M, the lever, I, n, and hinged fulcrum, F, all arranged and operating substantially as and for the purpose specified and shown.

48,630.—Hinge.—Nathaniel Sehner (assignor to himself and Abraham Huffer), Hagerstown, Md.:
I claim fastening or locking a hinge or butt by means of a spring or springs and an eccentric, constructed and operated substantially in the manner and for the purpose set forth.

48,631.—Pantry.—Job Shattuck, Brookline, N. H., assignor to himself and John S. Proctor, Mason, N. H.:
I claim a movable pantry constructed substantially as and for the purpose above described and stated.

48,632.—Lamp Shade.—Cornelius St. John, Boston, Mass., assignor to O. M. Southwick, Woonsocket, R. I.:
I claim as my invention the combination of the pyramidal lamp shade, A, and the series of reflectors, C C and c, arranged and applied to it, substantially as and so as to operate as specified.

I also claim the pyramidal shade, as made with the heat-resisting and reflecting lining and the adjustable reflectors, arranged substantially as specified.

48,633.—Die for Making Augurs.—Edward H. Tracy (assignor to The Eagle Augur and Skate-manufacturing Company), Meriden, Conn.:
I claim the construction of the respective parts of the die which perform the operation set forth, substantially in the manner described.

48,634.—Substitute for Rosin.—Daniel T. Wilson, Harrisburg, Pa., assignor to himself and Reuben Hoffheins, Dover, Pa.:
I claim the use of coal tar, prepared substantially as described, as a substitute for rosin, for the purposes set forth.

48,635.—Lamp.—Charles Boschan, Josef Bindtner and William Caffon, Vienna, Austria:
We claim, First, Making the exterior of the lamps in sections, M M', so that they may be taken apart for the purpose of removing or replacing the oil cup or reservoir, which is separable from the said exterior of the lamp, substantially as described.

We also claim, in combination with the sectional exterior of the lamp, M M', and a removable and replaceable cup or oil reservoir, the placing of the wick tube and cap or burner on the external section, and attaching the oil cup, with the wick tube projecting therein, by a screw from the under and inner side thereof to the said outer and upper section, substantially as described.

48,636.—Preserving Wood from Decay, Etc.—Alexander Hamar, Hungary, Austria, assignor to John C. Fremont, New York City:
I claim preserving wood from decay, insects and other destructive agents by means of a solution prepared substantially as herein described, and applied in the manner herein set forth.

48,223 (dated June 13, 1865, previously omitted).—Flour Sifter.—Howard Tilden, Boston, Mass.:
I claim as my improvement in sifters for flour, sauce, etc., the rollers, or their equivalents, for mashing the lumps, in combination with the scrapers, substantially as described.

REISSUES.

2,018.—Loom.—Christopher Duckworth, Mount Carmel, Conn. Patented June 28, 1853:

First, I claim a power loom, which is provided with many-celled shuttle boxes, the movements of which are automatically controlled in such manner that the cells of the boxes can be skipped over any desired shuttle thrown from any box in the combination, according to the character or figure to be woven, substantially as described.

Second, Providing for operating many-celled shuttle boxes, so as to bring any desired shuttle into action, by means of palls, ratchets, and reversible tappets, in combination with pattern surfaces, which will control the figure to be woven, substantially as described.

Third, The use of tappets, which receive both a rotary and an oscillatory motion from a pattern or patterns, in combination with many-chambered shuttle boxes, substantially as described.

2,019.—Loom.—Christopher Duckworth, Mount Carmel, Conn. Patented June 28, 1853:

First, Giving an alternate movement to shuttle boxes in a vertical plane, by means of palls, reversible tappets, and a contrivance which will automatically control the movements of said palls, substantially as described.

Second, Giving an alternate movement to shuttle boxes in a horizontal plane, by means of palls, reversible tappets, and a contrivance which will automatically control the movements of said palls, substantially as described.

Third, Giving an alternate diagonal movement to shuttle boxes by means of palls, reversible tappets, and a contrivance which will automatically control the movements of said palls, substantially as described.

Fourth, The combination of reversible tappets, with shuttle boxes, which are so applied to the loom that they will admit of being moved either laterally, vertically or diagonally, substantially as described.

Fifth, Giving an intermittent, oscillating or rotary movement to a shuttle-box actuator, by means of palls and ratchet wheels, which are controlled by a cam surface, t, or its equivalent, substantially as described.

Sixth, The use of tappets, which receive a forward and backward movement, or a continuous rotary movement, in combination with many-chambered shuttle boxes at both ends of the lathe, which boxes are connected together by a lever, G, and operated simultaneously by means of said tappets, substantially as described.

Seventh, Giving a reciprocating movement to many-chambered shuttle boxes of looms, by means of contrivances which are controlled automatically in such manner that the boxes are moved a greater or less distance by a single vibration of the lathe, so as to throw the shuttle in regular order or to skip a shuttle, according to the figure which it is desired to weave, substantially as described.

2,020.—Self-acting Pulley Brake.—John Jochum, Brooklyn, N. Y. Patented Nov. 29, 1864:

I claim a tackle block containing one or more sheaves, and provided with one or more spherical wedges, E, and spring, F, constructed and operating substantially as and for the purposes set forth.

2,021.—Furnace for Decomposing and Desulphurizing Ores.—Robert Spencer, New York City. Patented Nov. 8, 1864:

First, I claim in a kiln or furnace for reducing quartz rock by heating and plunging the rock into a liquid bath, an arrangement by which the rock when highly heated may be precipitated at once from the furnace directly into the bath, substantially as described.

Second, In a kiln or furnace for reducing the ores of the precious metal, I claim the use of a hood and usual appurtenances for the condensation and preservation of sulphur or of the fine particles of the precious metals, substantially as hereinbefore described.

2,022.—Method of Decomposing and Desulphurizing Ores.—Robert Spencer, New York City. Patented Nov. 8, 1864:

First, The above-described process of removing sulphur from quartz rock, and rendering such rock pulverulent by long continued and high heat, and subsequent sudden precipitation into a liquid bath.

Second, I also claim reducing the ores of the precious metals when imbedded in rock, in combination with sulphur, without the necessity of previously breaking the rock into nodules by heating and quenching, substantially as above described.

Third, I also claim the electrical separation of the precious metals from quartz rock and sulphur, without the necessity of a second heating of the granulated quartz, by heating and quenching, substantially as described above.

Fourth, I also claim the use of a bath for quenching the heated rock, consisting of water impregnated with ingredients that act chemically upon the rock, for the purpose of softening it and preparing it for the action of the grinding apparatus.

2,023.—Coal Stove.—Philo P. Stewart, Troy, N. Y. Patented April 28, 1863:

First, I claim the combination of the cylinder or box, c, with the surrounding air-distributing chamber, S, and with the fire-brick, d, containing apertures, all constructed and arranged in the manner

substantially as and for the purposes herein described and set forth.

Second, I also claim the perforated plate, m, and cold air chamber, K, in combination with the said door, w, having therein the wire grate or its equivalent, and with the surrounding air-distributing chamber, S, in the manner and for the purposes herein described and set forth.

Third, I also claim the perforated plate, m, and cold air chamber, K, or its equivalent, in combination with the door, w, having therein the wire grate or its equivalent, and with the surrounding air-distributing chamber, S, constructed, arranged and combined in the manner and for the purposes substantially as herein described and set forth.

Fourth, I also claim the employment of the air distributing chamber, S, opening at its lower end into the ash drawer or chamber, g, and immediately between the fire brick or inner linings, d, of the fire chamber and the outer casing or box, c, surrounding the said air chamber, and having lugs or iron pins cast thereon, and each arranged and combined in the manner substantially as herein described and set forth.

2,024.—Machine for Incising Button Holes and Embossing and Printing Articles of Wearing Apparel.—

Samuel S. Stone, Troy, N. Y. Patented Aug. 23, 1864:

First, I claim two oblong male button-hole punches and two corresponding female punch-receiving dies, combined and arranged and made adjustable so as to punch two oblong button holes endwise, or nearly so, to each other at one operation and at various distances apart, substantially as herein set forth.

Second, I also claim two oblong male button-hole punches and two corresponding punch-receiving dies, combined and arranged and made adjustable so as to punch two oblong button holes apart from each other at one operation and in various directions, substantially as herein set forth.

Third, I also claim two oblong male button-hole punches and two corresponding punch-receiving dies, combined and made adjustable so as to punch two oblong button holes at one operation, and in various directions and at different distances apart, substantially as herein set forth.

Fourth, I also claim two oblong male button-hole punches and two corresponding receiving dies, combined and made adjustable so as to punch two oblong button holes crosswise, or nearly so, to each other, at one operation, and at various distances apart, substantially as herein set forth.

Fifth, I also claim three oblong male button-hole punches and three corresponding punch-receiving dies, combined and arranged so as to punch two oblong button holes apart from endwise, or nearly so, to each other, and another oblong button hole midway, or nearly so, between and crosswise, or nearly so, to the said end button holes, all at one operation, substantially as herein set forth.

Sixth, I also claim three oblong male button-hole punches and three corresponding punch-receiving dies, combined and arranged and made adjustable so as to punch a central and two end oblong button holes at various distances apart, substantially as herein set forth.

Seventh, I also claim three oblong male button-hole punches and three corresponding punch-receiving dies, combined and arranged and made adjustable so as to punch a central and two end oblong button holes apart from each other, at one operation, and the end button holes in various directions, substantially as herein set forth.

Eighth, I also claim three oblong button-hole punches and three corresponding punch-receiving dies, combined and arranged and made adjustable so as to punch a central and two end oblong button holes at one operation, and the end button holes in various directions and at different distances apart, substantially as herein set forth.

Ninth, I also claim three oblong male button-hole punches and three corresponding punch-receiving dies, combined and arranged and made adjustable so as to punch a central and two end oblong button holes apart from each other at one operation, and the central button hole at various distances from a line joining the two end ones, substantially as herein set forth.

Tenth, I also claim three oblong male button-hole punches and three corresponding punch-receiving dies, combined and arranged and made adjustable so as to punch a central and two end oblong button holes at one operation, and the central button hole at different distances from a line joining the two end ones, and the two end button holes at various distances apart, substantially as herein set forth.

Eleventh, I also claim three oblong male button-hole punches and three corresponding punch-receiving dies, combined and arranged and made adjustable so as to punch a central and two end oblong button holes apart from each other at one operation, and the end button holes in various directions, and the central button holes at different distances from a line joining the two end ones, substantially as herein described.

Twelfth, I also claim three oblong male button-hole punches and three corresponding punch-receiving dies, combined and arranged and made adjustable so as to punch a central and two end oblong button holes at one operation, and the end button holes in various directions and at different distances apart, and the central button hole at various distances from a line joining the two end ones, substantially as herein set forth.

Thirteenth, I also claim three oblong male button-hole punches and three corresponding punch-receiving dies, combined and arranged and made adjustable so as to punch a central and two end oblong button holes apart from each other at one operation, and the central oblong button hole in different directions, in respect to a line joining the two end button holes, substantially as herein described.

Fourteenth, I also claim three oblong male button-hole punches and three corresponding punch-receiving dies, combined and arranged and made adjustable so as to punch a central and two end oblong button holes apart from each other at one operation, and the central button hole in different directions in respect to and at various distances from a line joining the two end button holes, substantially as herein described.

Fifteenth, I also claim an imitation stitching stamp, E, with an impression bed, F, therefor, and one or more male button-hole punch or punches, with corresponding punch-receiving die or dies, all combined and arranged, substantially as herein described.

Sixteenth, I also claim a type block, E, of letters or figures, or letters and figures, with an impression bed therefor and two end or ends and central male button-hole punches adjustable to different positions, with corresponding adjustable punch-receiving dies, all combined and arranged substantially as herein described.

Seventeenth, I also claim an imitation stitching stamp, E, and a type-block, F, with impression beds therefor, and one or more button-hole punch or punches, with a corresponding punch-receiving die or dies, all combined and arranged substantially as herein described.

Eighteenth, I also claim guides or stops, G, or end and ends and central oblong male button-hole punches and corresponding female punch-receiving dies, all combined and arranged substantially as herein described.

2,025.—Apparatus for Sizing and Finishing Skirt Wire.—Ichabod Washburn and P. L. Moen, Worcester, Mass., assignees by mesne assignments of Chesney & Brown. Patented Oct. 13, 1863:

I claim, in sizing and finishing covered wire or other covered strips in a continuous operation, causing the wire to pass through a starch bath, and thence back and forth over rolls or heated cylinders, and in contact with a polisher, in the manner substantially as hereinbefore described.

DESIGNS.

2,107.—Soldiers' Memorial.—John C. Andrews, Woodstock, Me.

2,108.—Medallion of Abraham Lincoln.—Adolph Leconte, New York City.

2,109 to 2,132, inclusive.—Carpet Patterns.—Henry G. Thompson, New York City, assignor to Hartford Carpet Company, Hartford, Conn. (24 Patents.)

2,133.—Carpet Pattern.—James Hutchinson, Newark, N. J., assignor to W. and J. Sloane, New York City.

Back Numbers and Volumes of the "Scientific American."

VOLUMES IV., VII., XI. AND XII., (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., VIII., IX. and X., are out of print and cannot be supplied.



MUNN & COMPANY,

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

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

CHAS. MASON.

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

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

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

WM. D. BISHOP.

THE EXAMINATION OF INVENTIONS.

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

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

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

The Patent Laws, enacted by Congress on the 2d of March, 1861 are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

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

CAVEATS.

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

HOW TO MAKE AN APPLICATION FOR A PATENT.

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

[REJECTED APPLICATIONS.]

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

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

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

Patents are now granted for SEVENTEEN years, and the Governmen

fee required on filing an application for a patent is \$15. Other changes in the fees are also made as follows:—

On filing each caveat.....	\$10
On filing each application for a Patent, except for a design.....	\$15
On filing each original Patent.....	\$20
On appeal to Commissioner of Patents.....	\$25
On application for Re-issue.....	\$25
On application for Extension of Patent.....	\$25
On granting the Extension.....	\$25
On filing a Disclaimer.....	\$10
On filing application for Design (three and a half years).....	\$10
On filing application for Design (seven years).....	\$15
On filing application for Design (fourteen years).....	\$30

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignment of patents. Fees moderate.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

FOREIGN PATENTS.

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

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

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

INVITATION TO INVENTORS.

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

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



C. A. C., of Ind.—Doubtless by advertising in the SCIENTIFIC AMERICAN you can procure the article you desire.

J. A. H., of Me.—Turbine wheels have yielded 90 per cent of the whole power of the water; we have never known an overshot wheel to yield 75 per cent. We see no reason why a turbine set near the upper end of an air-tight tube should not be as efficient as if set at the lower end, but though this plan has been tried it has not come into general use. Where large masses of solid float upon molten metal it cannot be from the same cause as the floating of a needle upon water.

J. C. A., of Mass.—If petroleum be subjected to sufficiently high temperature it will doubtless undergo destructive distillation, and be converted, in whole or in part, into permanent gases. If the heat were great enough to convert it all into strictly permanent gases, we should suppose a large proportion would be marsh gas, and that the illuminating power of the oil would be diminished.

E. L., of N. J.—Any alcohol may be converted into vinegar by the quick process; vinegars retain the flavors of the grains or fruits from which they are made, but these flavors may be removed by filtering through charcoal. Prof. Everett, who has had a great deal of practice with the blow-pipe, says he likes the flame of a broad-wicked paraffine candle best of any; better even than that of an alcohol lamp. Magnetizing locomotive wheels has been tried on the New Jersey Central Railroad.

E. L. A., of Conn.—Probably the reason that your India-rubber would not dissolve in chloroform was that you tried vulcanized rubber.

E. G. F., of N. Y.—You can detect petroleum in springs with perfect ease and certainty by the smell.

H. C. E., of Mass.—To make 12 gallons of black ink, take 12 pounds of nutgalls, 5 pounds of green sulphate of iron, 5 pounds of gum senegal, and 12 gallons of water. Boil the nutgalls three hours, adding water for the evaporation; dissolve the gum in a little hot water and add it to the solution. See fuller directions on page 327, Vol. XI.

S. S. B., of N. Y.—You will shortly see an engraving of a steam carriage for common roads illustrated in the SCIENTIFIC AMERICAN.

A. D., of N. Y.—You will find a recipe for blue ink on page 220, last volume, SCIENTIFIC AMERICAN. We cannot publish the same thing over and over again.

J. F., of N. Y.—Address Solon Robinson, New York, for a work on farming.

A. H. Y., of Conn.—It is the common notion that the body of a drowned person may be raised to the surface by firing a cannon, but we never met with any evidence that there is any foundation for the opinion.

T. S., of Ky.—Gray hair may be dyed black by a preparation of nitrate of silver, or one of ammonia nitrate of silver. It would be better for you to buy the preparation of a druggist than to attempt to make it.

H. L. W., of Mass.—Find full directions for making transfer paper on page 341, Vol. XII., new series.

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 1833, to accompany the claim, on receipt of \$2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

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.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our receipt of their funds.

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 OF ARMY CLOTHING AND EQUIPAGE, No. 29 BROADWAY, NEW YORK, July 3, 1865.

ARMY SUPPLIES.—SEALED PROPOSALS WILL BE received at this office until 12 o'clock M., on Thursday, the 13th inst., for furnishing by contract, in such quantities, from time to time, as may be required for the use of this office and depot, until the 10th day of May, 1866, the following articles of stationery:—

Letter paper, white, ruled, first-class, 11 pounds to the ream.
Foolscap paper, white, ruled, first-class, 12 pounds to the ream.
Blotting paper, white, ruled, first-class, 100 pounds to the ream.
Folio post paper, white, ruled, first-class, 24 pounds to the ream.
Envelope paper, best quality.
Envelopes, straw color, No. 9, best quality.
Envelopes, straw color, No. 10, best quality.
Envelopes, white, No. 6.
Lead pencils, Faber's or Eagle, No. 2.
Steel pens.
Pen-holders.
Seal wafers, boxes.
Sealing wax, best English small sticks.
Black inks, quart bottles, Maynard & Noyes.
Arnold's Chemical Writing Fluid, quarts.
Black ink, quarts, copying.
Red ink, David's No. 3.
Inkstands.
Paper-folders.
Rulers.
Quills.
Office tape, best linen.
Memorandum Books.
Blank Books, cap 1/2 bound, 2, 3, 4, 5 and 6 quires.
Samples of the above articles can be seen, or further information with regard to the same can be received by application to this office. Bidders will present with their bids samples of the articles they propose to deliver.
Bonds will be required from the successful bidder for the faithful performance of the contract.
The United States reserves the right to reject any part or the whole of the bids, as may be deemed for the interest of the service.
Proposals should be indorsed, "Proposals for Furnishing Stationery," and addressed to
Col. D. H. VINTON,
Dep'ty Q. M. Genl., U. S. A.

OFFICE OF ARMY CLOTHING AND EQUIPAGE, No. 29 BROADWAY, NEW YORK, July 3, 1865.

ARMY SUPPLIES.—SEALED PROPOSALS WILL BE received at this office until 12 o'clock M., on Thursday, the 13th inst., for furnishing by contract, in such quantities, from time to time, as may be required, at and for the use of this depot, until May 1, 1866, Furnace Coal and Red Ash Coal, Egg size.

Proposals must be accompanied by a proper guaranty for the faithful performance of a contract.
The United States reserves the right to reject all bids deemed objectionable.
Proposals should be indorsed, "Proposals for Furnishing Coal," and addressed to
Col. D. H. VINTON,
D. Q. M. Genl.

OFFICE OF ARMY CLOTHING AND EQUIPAGE, No. 29 BROADWAY, NEW YORK, July 3, 1865.

ARMY SUPPLIES.—SEALED PROPOSALS WILL BE received at this office until 12 o'clock M., on Thursday, the 13th inst., for furnishing by contract, in such quantities, from time to time, as may be required, for the use of this depot until the 1st of May, 1866, the following articles:—

Nails, kegs, 100 and 120.
Lamp oil, gallon, sperm.
Box chisels.
Box scrapers.
Wooden mallets, iron bound.
Nail hammers.
Marking pots.
Marking brushes, assorted.
Trucks, Nos. 3 and 5.
Balling twine.
Brass lanterns, for oil.
Corn brooms.
Further information can be had by applying at this office.
Bonds will be required of the successful bidder for the faithful performance of a contract.
The United States reserves the right to reject any part or the whole of a bid, as may be deemed necessary for the interest of the service.
Proposals will be indorsed, "Proposals for Furnishing Hardware," and addressed to
Col. D. H. VINTON,
D. Q. M. Genl., U. S. A.

BOILER INCRUSTATIONS.

A. G. CROSS, Esq.—Dear Sir:—We have used your Anti-Incrustation Powder in our locomotives during the past year, and find it to be all that is claimed for it, both in the removal of the old incrustation, and as a complete and perfect preventive of the formation of any scale whatever, and I believe without injury to the iron. I have no hesitancy in recommending it to all who are using steam boilers, as the most perfect of all the compounds which I have yet seen for this purpose.
B. BRISCOE, M. M., D. & M. R. R.
A. G. CROSS, Detroit.
3 3y

TO CAPITALISTS AND MANUFACTURERS.—THE undersigned, after years of intense application, has perfected a number of useful inventions, including a system of locks—one of them admirably adapted for mail locks; a steam motor, especially adapted for small powers; a magazine gun, very simple and complete; the most simple and durable clock yet introduced, etc. For particulars, or a home or foreign interest on most liberal terms, address
[1*]
SPENCER HATT, Cuba, Ind.

THE EIGHTEENTH ANNUAL EXHIBITION OF THE Maryland Institute of Baltimore, for the Mechanic Arts, will commence on Monday Evening, the 2d of October, and continue to Monday Evening, the 30th of October, 1865.

The hall will be open for the reception of goods on Monday, the 25th of September.
Goods for Competition and Premium must be deposited before Thursday Night, the 25th of September.
Circulars, embracing details, may be had of the Secretary at the Institute.

Communications addressed to the undersigned, or Joseph Gibson, Secretary, will be promptly attended to. W. W. MAUGHLIN,
3 3m
Chairman Committee on Exhibition.

A GREAT CHANCE FOR PROFITABLE INVESTMENT.—The State and County Rights of Gilbert's new Patent Coal and Ash Sifter, at great bargains. The cleanest, handsomest and most convenient coal and ash sifter in use. No dust.
R. BLAKE, No. 5 Tryon Row.

THE CELEBRATED KENTUCKY CIDER MILL.—Patented Nov. 24, 1863. State, County or Shop Rights for Sale. For particulars address the patentee, THEO. SHARP, Louisville, Ky.

WANTED—A PRACTICAL MANUFACTURING ELECTRICIAN. Address E. P. FENN, No. 36 Prospect street, Cleveland, Ohio.

IMPORTANT TO ENGINEERS AND MANUFACTURERS of Engineering Requisites.—Liberal arrangements offered parties to manufacture and introduce my Combined Safety Apparatus for Boilers. Illustrated June 24. The best arrangement yet. Address immediately, P. RIORDAN, Care Munn & Co., Washington.

A RARE CHANCE.—HAVING OTHER BUSINESS to attend to, I would dispose of the entire right of my Revolving Double Cylinder Engine, illustrated on another page. This is a splendid opportunity to establish an extensive and profitable business by the manufacture and sale of these engines, or a fortune may be made in a short time by disposing of rights. Price, \$5,000. Address J. S. FOSTER, Box No. 153, Virginia, Nevada.

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

FOR BEDSTEAD AND FURNITURE MACHINERY, Friezzing, Shaping and Molding Machines, address J. A. FAY & CO., Cincinnati, Ohio.

FOR DANIELLS'S PLANING MACHINES, CAR MOR- TISING, Boring Machines, Car-Tenoning Machines, Car Planing and Beading Machines, Etc., address J. A. FAY & CO., Cincinnati, Ohio.

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

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

FOR SALE—ENGINE BOILERS, SHAFTING, HANG- ERS, Pulleys, Rubber Machinery, Belting, Bolts, and Machinery of all descriptions, and Factories bought and sold, at DAVIS'S MACHINERY YARD, No. 122 and 124 Hudson street, one block from Jersey City Ferry, foot of Courtlandt street, N. Y.

STEAM GENERATORS AND ENGINES.—THE AMER- ICAN Safety Steam Engine Company are manufacturing Brayton's Patent Steam Generators and Engines. There is a saving of 25 per cent in fuel over ordinary engines and boilers and they cost but little to keep them in repair. There is no possibility of exploding the generator. For particulars and circular address GEO. WOODMAN, Treasurer and Agent, 84 Washington st. Boston

PARTIES DESIRING TO CONTRACT FOR THE manufacture of Wood and Iron Work, Agricultural Implements, or any article of machinery, can correspond with J. T. BOSTWICK, R. R. Iron Works, Ithaca, N. Y.

PARTNER WANTED WITH \$10,000.—ANY PERSON who, for health or pleasure, desires to reside the whole or part of the year in a tropical climate will find this an opportunity such as is seldom met with. Address CUBA, SCIENTIFIC AMERICAN Office.

FOR SALE—THE PATENT RIGHT OF A DIFFER- ENTIAL Pulley Block, just issued, for raising heavy weights, whereby a great saving in time and labor is effected. Can be adapted for almost any purpose. For further particulars apply to THOMAS ALLEN, No. 192 Pearl street, or S. VAN HENCK, No. 774 Washington street, N. Y., where model of machine can be seen.

WANTED—THE ADDRESS OF THE MANUFAC- Turer of "Steel Corn Mills," in use in the Southern States. Any one having the information will confer a favor by sending it to H. F. SMITH, Box 1,469, New York.

BOILER INCRUSTATIONS EFFECTUALLY PRE- VENTED by Winans' Powder, 10 years in use. No rods in it, consequently no foaming. H. N. WINANS, No. 11 Wall st.

PATENT PORTABLE MUSKETO BAR, FOR TRAV- ELERS, Tourists, Sportsmen, Hiving Bees and Fishing. A perfect safeguard against all annoying insects. Sent free of postage by remitting \$1.25. A liberal discount made for the trade. Also State Rights for sale. Address JOHN ZENGELER, P. O. Box 2,682, Chicago, Ill.

ANDREWS' PATENT OSCILLATING ENGINES.—Double and Single Engines, from 1/2 to 125-horse power, finished at short notice. These engines leave the shop ready for use, require no special foundation, are compact, light and simple, and economical of power. For descriptive pamphlets and price list address the manufacturers, W. D. ANDREWS & BRO., No. 414 Water street, N. Y.

ANDREWS' PATENT CENTRIFUGAL PUMPS.—CA- PACITY from 90 to 40,000 gallons per minute. For draining and irrigating lands, wrecking coffer dams, condensers, cotton, wool and starch factories, paper mills, tanneries, and all places where a large and constant supply of water is required, these pumps are unequalled. They are compact, require little power, and are not liable to get out of order. For descriptive pamphlet address
2 4*
WM. D. ANDREWS & BRO., No. 414 Water street, N. Y.

PORTABLE ENGINES, SUITABLE FOR THE OIL regions, from 8 to 20-horse power, with large fire-place, independent steam feed pump, steam gage, and improved water heater. The most complete and best engines in the market. For particulars address
2 4*
WM. D. ANDREWS & BRO., No. 414 Water street, N. Y.

AGRICULTURAL AND MECHANICAL AGENCY, Havana.—EZRA K. DOD solicits consignments of and authority to contract for all articles of ready sale in the Cuban market, such as plows and other farm utensils adapted to cane culture, steam engines, boilers and mills, shovels, axes, saws, cane knives, gas fittings, brass and copper seamless pipes, cooking stoves for burning oils, etc. Patents will be secured and introduced. References, New York—Messrs. Gebhardt & Schuchardt, Moses Taylor and Thomas Downing; Philadelphia—Messrs. Merick & Sons; Baltimore—Messrs. G. DeFord & Bros.; Boston—Thos. Oxnard, Esq.

THE MOST VALUABLE MACHINE FOR BUILDERS

and Carpenters, Furniture, Carriage, Agricultural Implement, Sash and Door, Waived and Straight, Molding and Piano Manufacturers, for all kinds of irregular and straight work in wood, hard or soft, superior to all others, having the capacity of twenty good mechanics, called the Variety-Molding Machine. We own nine patents, covering the valuable inventions for machines with upright mandrels. Have them manufactured in one place only for the United States and Europe, viz.: at Pass Iron Works, No. 110 East Twenty-ninth street, New York. We hear there are parties manufacturing machines infringing on some one or more of our patents. We caution the public from purchasing such infringements. Our patents secure to us the machine with either iron or wooden table, through which are two upright mandrels, having cutters in each head held by a screw nut; also, combination collars, saving 75 per cent in cutters, feed table to plane and cut, irons outside the cutters, preventing wood from taking undue hold. Also guards acting as plane stocks, making it safe for a boy to run.

Agents solicited. Please send for circular giving full description. Information or orders for machine may be addressed COMBINATION MOLDING AND PLANING MACHINE COMPANY, New York City.

VULCAN WORKS, BALTIMORE.—THIS WELL-

known establishment is offered for sale, or would be leased for term of years, with the privilege of purchasing within a stated period. It is complete in all its departments, embracing Iron and Brass Foundries, Blacksmith, Machine, Boiler, Pattern and Carpenter Shops, Copper-smith, Etc. The tools and machinery, with power cranes and twisting apparatus, are many of them of recent construction, and all in complete order for the manufacture of Marine Engines of the heaviest class, and all other descriptions of machinery. The situation is close proximity to the water, and near the business portion of the city, is unrivaled. The reopening of trade with the South will in a short time bring a full supply of orders from that direction, and the establishment has always commanded a fair portion of Government work and of the local trade. For further particulars address

H. R. HAZLEHURST,
Vulcan Works, Baltimore.

SMALL BEAM ENGINE.—I WILL SELL A BEAUTIFUL 2-horse beam engine, suitable for a small boat or light business, for \$170 cash. Said engine is entirely new, and was made at odd times by a man "for the fun of the thing." The engine is complete, with feed pump, etc. No answers unaccompanied by stamp for return post noticed.

EGBERT P. WATSON,
Box 773, N. Y.

WORRALL'S PATENT CHUCKS FOR SCREW MACHINES and Holding Wire Drills and other articles.—The cheapest and best chuck for drills in use. 1½ inch in diameter, holding any size from ¼ up to ½ inch. Perfectly true and reliable. Address THOS. H. WORRALL, Lawrence, Mass.

INVENTORS' EMPORIUM, NO. 37 PARK ROW, N. Y.—New and useful inventions manufactured, introduced and sold on commission. Agents wanted. [241] RICE & CO.

MASON'S PATENT FRICTION CLUTCHES, FOR connecting and disconnecting shafting. Also for Starting Gears and all heavy machinery without sudden shock, are manufactured by VOLNEY W. MASON, Providence, R. I.

WATER POWER.—AT N. FALLS, N. Y., FOR 50 Mills.—Now ready for sale, a lease, at half price of Patterson Power Leases. Renewable every 20 years for ever. Apply at No. 23 Courtlandt street, New York to HORACE H. DAY.

HARTMANN & LAIST, CINCINNATI, OHIO; MANU-facturers of Glycerin Acetic Acid, Grape Sugar and Syrup.

SPOKE LATHES (BLANCHARD'S) OF AN IMPROVED Pattern, made by J. GLEASON, No. 1,030 Germantown avenue, Philadelphia, Pa.

TO MANUFACTURERS AND EXPORTERS.—ALL articles of American manufacture which are exported to foreign countries are entitled to a drawback equivalent to the amount of tax paid at the time of manufacture under the Internal Revenue Law. We offer our services to secure the refunding of this amount, and will cheerfully furnish all necessary information. MERCHANT, OAKLEY & CO., Custom-house and Internal Revenue Brokers, No. 71 Broadway, Room No. 55.

PORTABLE STEAM ENGINES.—THESE WORKS have lately increased their facilities for the manufacture of their popular engines. Prices reduced to a peace standard. Fourteen feet and more of heating surface given to the nominal horsepower. Delivery to the Oil Regions by part navigation much prompter and cheaper than from more eastern points per railroad. Send for circular before buying.

F. WM. RAEDER,
Ames Iron Works, Oswego, N. Y.

MECHANICAL DRAUGHTSMAN, FAMILIAR WITH Isometric Perspective, wanted. Address G. H. KNIGHT, Box 541, Cincinnati, Ohio.

MACHINE BELTING, ALL SIZES, ON HAND, OF superior Oak tanned Leather Belting, and for sale at reduced prices. ALBERT POTTS, cor. Third and William sts., Phila.

NEW BOILER WORKS.—LEHIGH BOILER WORKS, Allentown, Pa.—For the Manufacture of Boiler and Sheet-iron work of all descriptions, such as Locomotive, Flue, Tubular and Cylinder Boilers, Locomotive Tanks, Water Tanks, Steam and Blast Pipes, Chimneys, Etc. Also repairing of all kinds attended to with dispatch. All work done at these works is warranted to be of good material and well made. Part of the firm being Machinists, we are prepared to do out-door machine work, such as setting up engines and boilers, with steam and water pipes, and repairing generally.

NOBLE RHODA & CO.

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

MACHINISTS' TOOLS, ENGINE LATHES, HAND Lathes, Planers, Upright Drills, Etc., of best material, and superior workmanship, manufactured and for sale by WM. M. HAWES & CO., Fall River, Mass.

FOR SALE.—THE ENTIRE RIGHT OR STATE Rights of my Patent Brass Turning Cleaning Machine. It will clean from 300 to 600 pounds of dirty turnings per day. Address J. JONSON, No. 75 N. Howard street, Baltimore, Md.

A GOOD CHANCE.—GEO. BINNS, MANUFACTUR- ing Chemist, No. 7 Gold street, N. Y., will sell at half price all the New and Improved Apparatus for making Sulphate Ammonia. Also, for sale, 2,000 barrels of Ammoniated Lime, for manure, at \$1 25 per barrel.

GROVER & BAKER'S HIGHEST PREMIUM ELAS- TIC Sewing Machines, 490 Broadway, New York.

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, No. 13 East Seventh street, Cincinnati.

FOR SALE.—ONE 26-IN. FARRER PLANER AND Mather, \$6; one Double Surfer, \$4 50; one small Planer and Mather, \$4 50; one hub Mortising Machine \$1 50. Address E. C. TAINTER, Worcester, Mass.

TRUE'S POTATO PLANTER DOES THE WORK OF 12 men. Rights for sale. J. L. TRUE, Garland, Maine.

TO GAS COMPANIES.—FOR SALE AT THE ISLAND

Works of the Gas Co., Washington, D. C. 1 Retort House, roof frame of iron, 141 feet long, 53 feet wide, with the slate attached. All the Iron Work belonging to 28 benches, of 3 retorts each. 4 Washers, 18 inches diameter. 4 Purifiers of wrought iron, 5 ft. by 11 ft., with lids, etc. 28-inch Slide Valves. 15-foot Station Meter, together with sundry connections, the whole forming a complete Gas Station, in good order. For examination apply to GEO. A. McILHENNY, Engineer of Gas Works, Washington, D. C. For purchasing apply to B. H. BARTOL, Philadelphia.

TO MACHINISTS AND ENGINEERS.—FOR SALE—

Gear-calculating Rules, correctly graduated for 2,000 different gears, giving the number of cogs directly opposite their outside diameters, with allowances made for pitch lines. Warranted. Sent, with directions, \$5, or \$5 50 sent by mail, post-paid. Give plain directions, and address CHARLES D. LONG, Patentee, Worcester, Mass.

N. C. STILES'S PATENT POWER FOOT AND DROP

PRESESSES.—Dies of every description made to order. Send for a circular. N. C. STILES & CO., West Meriden, Conn.

STEAM ENGINES.—WITH LINK MOTION, VARIA-

BLE automatic cut-off, of the most approved construction; Mill Gearing, Shuffling, Hanger, Etc. Address M. & T. SAULT, New Haven, Conn.

GILBERT'S PATENT COAL AND ASH SIFTER—A

new and useful invention, of which a portion of the State Rights are for sale. Address EMERY & HUTCHINSON, Manufacturers, No. 57 Canton street, Boston, Mass.

BOLTS, NUTS, WASHERS, SET SCREWS, COACH

Screws and Machine Screws, constantly on hand for sale by LEACH BROTHERS, No. 86 Liberty street, New York.

D. LAKE'S FLY-TRAP—ILLUSTRATED IN THE

SCIENTIFIC AMERICAN of June 10, 1865. Sent by express on the receipt of \$4.¼ DAVID LAKE, Smith's Landing, N. J.

TRIP HAMMERS.

Parties using or intending to erect Trip Hammers are invited to call and examine the Hotchkiss Patent Atmospheric Hammer, made by CHARLES MERRILL & SONS, No. 356 Grand street, New York. They are run by a belt; occupy 2½ by 4 feet space; strike 200 to 400 blows per minute, according to size, and the hammer running in slides, each blow is square and in the same place. Die work can be done under them more rapidly than under a drop, and for swaging it is unequalled. They are very simple in their construction, under perfect control, and require much less power than any other hammer. Send for a circular illustrating the hammer, which gives full particulars.

THEYSON & OGG, NO. 39 GREENE STREET, N. Y.

Grand, Machinists, Brass Finishers and Model Makers, Experimental Machinery, Indicators, Registers and Steam Gages of every kind accurately and promptly made.

SCREWS.—COMSTOCK, LYON & CO., OFFICE NO.

74 Beekman street, N. Y., manufacture Turned Machine Screws (a superior article to a headed screw), of all sizes under ½ inch in diameter, 3 inches long. Also Steel, Iron and Brass Screws for Guns, Pistols, Instruments, Trusses, Artificial Limbs, Etc., of the finest quality, to order.

PATENT HORSE-POWERS—ADAPTED TO COTTON

GINs, Thrashing Machines, Farm Mills, Etc. Portable, easy-working, and proved durable by long use. For Circulars or machines address CRESSON, HUBBARD & SMITH, Philadelphia.

GRINDSTONES OF THE BEST QUALITY MANU-

factured for Mechanics, Railroad Shops, Manufacturers and the trade. Address orders to F. M. STEARNS & CO., Berea, Cuyaboga Co., Ohio.

MACHINISTS' SUPPLIES, OF ALL DESCRIPTIONS,

on hand for sale by LEACH BROS., 86 Liberty st., N. Y.

SPOKE AND HANDLE MACHINERY.—THOSE DE-

SIRING to purchase the best machine in the United States for making Spokes, Yankee Ax Handles, Plow Handles, and irregular forms generally, should send for cut and description to E. K. WISELL, Manufacturer and Patentee, at Warren, Ohio.

CLARK'S PATENT FERRULES FOR LEAKY BOILER

TUBES.—Illustrated No. 9, Vol. XII., SCIENTIFIC AMERICAN. E. CLARK, No. 321 Spring street, New York.

THE UNION MOLDING MACHINE—BEST IN USE

—For circulars address H. A. LEE, patentee, Worcester, Mass.

PATENT EXCHANGE, NO 229 BROADWAY, NEW

YORK.—Patents and manufactured articles introduced and sold on commission. THOMAS G. ORWIG & CO.

2,000 BOLTS PER DAY CAN BE MADE ON

one PATENT MACHINES. Also Rivets and Spikes of all kinds.

HARDWAY & SONS, Philadelphia, Pa.

REFERENCES:
Chouteau, Harrison & Valle, Laclede Rolling Mill.
Collins & Holliday, Broadway Foundry.
Marshall & Co., Western Foundry.
John McCarty, Bogy Nail Mill.

INGERSOLL'S IMPROVED HAY AND COTTON

PRESESSES.—We make three classes of presses.

First—HAND POWERS.
A cheap and exceedingly economical press for farm and plantation use; are very compact, easily handled, and readily put together for use, and possess superior advantages for shipping.

Second—HORSE POWERS.
These have met with much favor, and are highly commended wherever used.

Third—SCREW PRESSER.

These find large sale in foreign markets. It is a complete and superior machine for packing Cotton, Wool, Hides, Hair, Hemp, Etc. Also a very popular, light and cheap machine for Sawing Down Trees. Weight of machine less than 25 pounds, and price \$25. State Rights of this machine for sale and rich bargains offered.

Please write for catalogue and further information to INGERSOLL & DOUGHERTY, Green Point, Kings Co., N. Y.

NOTICE TO CHURCHES AND SCHOOLS—BELLS

within the reach of all. The Amalgam Bell, well known throughout the United States as "the cheapest and best." Price reduced to 20 cents per pound and warranted. Send for descriptive circular to the manufacturer.

JOHN B. ROBINSON, No. 26 Dey street, New York.

MACHINERY.—S. C. HILLS, NO. 12 PLATT STREET

New York, dealer in Steam Engines, Boilers, Planers, Lathes, Chucks, Drills, Pumps; Mortising, Tonnage and Sash Machines; Woodworth's and Daniel's Planers, Dick's Punches, Presses and shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting Oil, &c.

A MESSIEURS LES INVENTEURS.—AVIS IMPORT-

ANT Les inventeurs non familiers avec la langue Anglaise, et qui préféreraient nous communiquer leurs inventions en Français, peuvent nous adresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confiance.

MUNN & CO., Scientific American office No. 37 Park Row, New York.

THE BISHOP GUTTA-PERCHA COMPANY, EXCLU-

SIVE 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, or 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. SAM'L C. BISHOP, General Agent.

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.

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.

TWIST DRILLS—A FULL ASSORTMENT, OF ALL

Sizes, Stubbs' Wire and Machinists' Drills, on hand for sale by LEACH BROTHERS, No. 86 Liberty street, New York.

DAMPER REGULATORS—GUARANTEED TO EF-

FECT 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 diagrams or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York.

CHEAP SOAP.—SAPONIFIER OR CONCENTRATED

LYE.—The Ready Family Soap-maker. Soap for three cents per pound. See SCIENTIFIC AMERICAN March 18, 1865. Caution—Original, Genuine and Patented article is put up in one-pound iron cans, all others being counterfeit. Manufactured by PENNSYLVANIA SALT MANUFACTURING CO., Office Pitt street and Duquesne way, Pittsburgh, Pa.

\$125 A MONTH!—AGENTS WANTED EVERY-

where to introduce the improved Shaw & Clark Family Sewing Machine, the only low-price machine in the country which is licensed by Grover & Baker, Wheeler & Wilson, Howe, Singer & Co., and Bacheelder. All other machines now sold for less than forty dollars each are infringements, and the seller and user are liable to fine and imprisonment. Salary and expenses, or large commission, allowed. Illustrated circulars sent free. Address SHAW & CLARK, Biddeford, Maine.

\$70 A MONTH!—I WANT AGENTS EVERY-

where. At \$70 a Month, expenses paid, to sell Fifteen Articles the best selling ever offered. Full particulars free. Address OTIS T. GAREY, Biddeford, Maine.

ESTABLISHED 1826.—WORLD'S FAIR AND AMER-

ICAN Institute Prize Medal Turning Lathes for Foot and Steam Power, manufactured by JAMES STEWARTSON, No. 232 Canal street, New York. Amateur's Turning Lathes made to order.

W. H. VAN GIESON, SUCCESSOR TO THE WAT-

ERBURY MACHINE CO., builder of every description of Machinery and Machinists' Tools, Pin and Hook and Eye Machines, Metallic Cartridge Machinery, Double and Single-acting Power Presses, Foot Presses, Etc., of new and improved Patterns. Inventors' ideas carried out (when so requested) in the most private and confidential manner. Shop near the Depot, Waterbury, Conn. Terms Cash on delivery.

FOR WOODWORTH PATENT PLANING AND

MATCHING MACHINES, Patent Siding and Resawing Machines address J. A. FAY & CO., Cincinnati, Ohio.

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. HOAGLAND & CO., Lawrence, Mass.

NEEDLES.—SAND'S NEEDLE CO., MANUFAC-

TURERS of Machine Spring Needles. These needles are made by patented machinery, and consequently we claim a uniformity of spring which cannot be obtained in the ordinary way of making. Address, with two samples inclosed, SAND'S NEEDLE COMPANY, Laconia, N. H.

\$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.

CAN I OBTAIN A PATENT?—FOR ADVICE AND

Instructions address MUNN & CO., No. 37 Park Row, New York, for TWENTY YEARS Attorneys for American and Foreign Patents. Caveats and Patents quickly prepared. The SCIENTIFIC AMERICAN \$3 a year. 50,000 Patent Cases have been prepared by M. & Co.

REYNOLDS' TURBINE WATER WHEELS.—COM-

PATENT men are employed to measure streams, make plans, and put in flumes, wheels, and gearing. TALLCOT & UNDERHILL, No. 170 Broadway, New York.

HOLSKE & KNEELAND, MODEL MAKERS. PAT

ENT Office Models, Working Models and Experimental Machinery, made to order at 525 Water street, near Jefferson street New York. Refer to Munn & Co., SCIENTIFIC AMERICAN Office.

ENGINEERING SCHOOL, FRANKLIN, DEL. CO.,

N. Y., has full means for instruction in Mathematics, Drawing, Mechanics, Physics, Chemistry, and all applications, with full sets Eng. Instruments, Chem Apparatus, Etc. \$185 pays Board and Tuition one year. G. W. JONES, A. M., Prin. Vol. XII 16 20*

Zur Beachtung für deutsche Erfinder.

Die Unterzeichneten haben eine Anstalt, die Erfindern das Verbalten angibt, um sich ihre Patente zu sichern, herauszugeben, und verbriefen solche gratis an dieselben.

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

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

Auf der Office wird deutsch gesprochen.

Dieselbst 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 Anträge und den Patent-Gesetzen fremder Länder und darauf bezügliche Aufschlüsse; ebenfalls nützliche Winke für Erfinder und solche, welche Patente zu erwerben wollen.

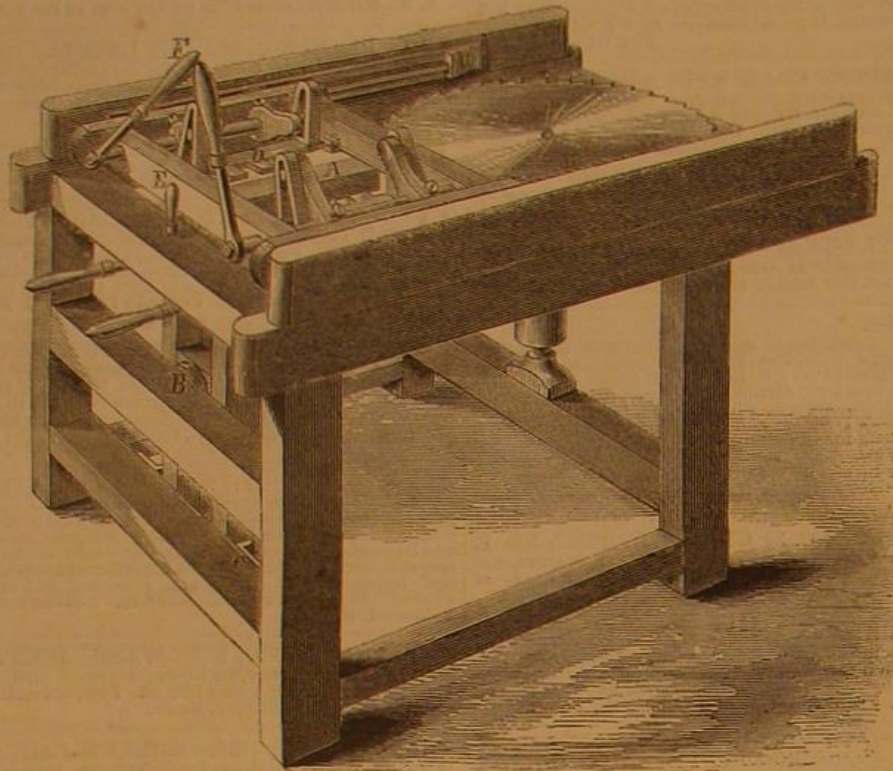
Preis 20 Cts., per Post 25 Cts.

Improved Shingle Machine.

This machine is intended to cut shingles and heading, and is highly recommended by parties who have used it. It was awarded the first premium at the New York State Fair, at Utica, in 1863, and at other places also. It is capable of cutting obliquely or otherwise, any desired thickness or length, up to 24 inches. It is safe and durable and not liable to get out of order. As shingles and heading are articles of great demand, the aim and object of the inventor has been to get up a machine that would do the work with the greatest ease, rapidity and in the most perfect manner. The saw runs horizontal, striking the bolt in the side, and cuts with the grain. The car-

riage travels only in proportion to the width of the shingle or heading, making them, when the saw is in proper order, as smooth as though shaved. It is designed to be self-acting and merely requires to be driven over the field, when the stones are all gathered up and thrown into a receiver behind from which they are afterwards discharged.

The details are as follows:—The shoe, A, of the machine is furnished with a guard, B, in front, against which the teeth, C, on the roller, D, work closely, but not in contact. As the machine advances the roller

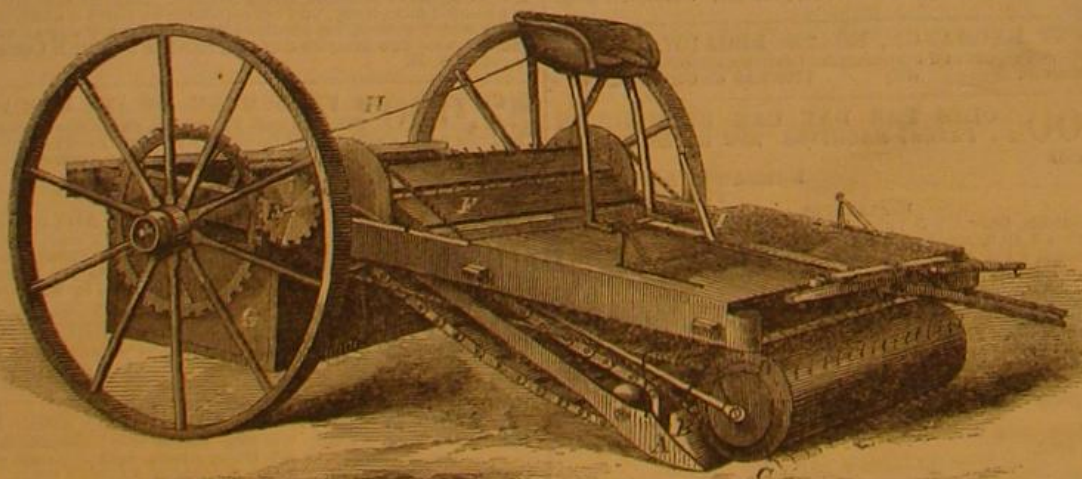
**SMITH'S SHINGLE MACHINE.**

riage travels only in proportion to the width of the shingle or heading, making them, when the saw is in proper order, as smooth as though shaved.

In operating this machine the bolt is laid on the table, A, which swings on a center, B, and is capable of being inclined at any angle. There are two gages, C, at the bottom, by which the inclination of the table is regulated. The bolt on the table is then caught and held by the dogs, D, attached to the carriage, E, and worked by the levers, F. The carriage and bolt are then moved up against the saw, which rapidly severs the shingle from it. The operation of

receives rapid rotary motion from the gears, E, affixed to the main axle. This rotation causes the hooked teeth to catch up the stones and throw them over on to an apron, F, which is furnished with slats bearing teeth similar to those on the roller. These teeth convey the stones to the hopper, G, behind, from which they are afterward dumped as required.

The cord, H, works an ingenious device in the rear for dropping the bottom of the hopper and allowing the stones to fall out, and the height of the shoe from the ground is regulated by the lever, I, so that the

**STONE-GATHERING MACHINE.**

setting and sawing is repeated continually until the bolt is used up. The alternate action of the table in moving from side to side, taking off each shingle regularly, so that all the bolt is used without loss. It is guaranteed to cut 10,000 shingles a day.

It was patented May 13, 1862, and is manufactured by Wheeler, Melick & Co., New York State Agricultural Works, Albany, N. Y. For machines, or town county or State rights, address Franklin Krum & Co., Albany, N. Y.

Improved Stone-gathering Machine.

In some parts of the country stones cover the surface of the ground so thickly that they have to be

machine works as well on rolling land as on a plain. This apparatus can be used for potatoes or other vegetables of similar nature. A great demand for machines of this kind has sprung up lately.

This invention was patented through the Scientific American Patent Agency on April 26, 1865, by J. L. Quimby, of Pleasant Grove, Pa.; for further information address him at that place.

THE BALTIMORE INDUSTRIAL EXHIBITION.—The Eighteenth Annual Exhibition of American manufactures, by the Maryland Institute, will be opened on the 2d of October next; for particulars see advertisement on another page.

TO
INVENTORS, MECHANICS, AGRICULTURALISTS,
THE ANNUAL
PROSPECTUS.

OF THE
Scientific American.

THE CHEAPEST AND BEST
MECHANICAL JOURNAL IN THE WORLD,
A NEW VOLUME OF WHICH COMMENCED
JULY 1, 1865.

This valuable journal has been published nineteen years, and during all that time it has been the firm and steady advocate of the interests of the Inventor, Mechanic, Manufacturer and Farmer and the faithful chronicler of the

PROGRESS OF ART, SCIENCE AND INDUSTRY

The **SCIENTIFIC AMERICAN** is the largest, the only reliable, and most widely-circulated journal of the kind now published in the United States. It has witnessed the beginning and growth of nearly all the great inventions and discoveries of the day, most of which have been illustrated and described in its columns. It also contains a **WEEKLY OFFICIAL LIST OF ALL THE PATENT CLAIMS**, a feature of great value to all Inventors and Patentees. In the

MECHANICAL DEPARTMENT

a full account of all improvements in machinery will be given. Also, practical articles upon the various Tools used in Workshops and Manufactories.

HOUSEHOLD AND FARM IMPLEMENTS,

this latter department being very full and of great value to Farmers and Gardeners; articles embracing every department of Popular Science, which everybody can understand.

WOOLEN, COTTON AND OTHER MANUFACTURING INTERESTS will have special attention. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Mechanics' Tools, Electric, Chemical and Mathematical Apparatus, Wool and Lumber machines, Hydraulics, Pumps, Water Wheels, etc.

STEAM AND MECHANICAL ENGINEERING

will continue to receive careful attention, and all experiments and practical results will be fully recorded.

PATENT LAW DECISIONS AND DISCUSSIONS

will, as heretofore, form a prominent feature. Owing to the very large experience of the publishers, Messrs. MUNN & Co., as **SOLICITORS OF PATENTS**, this department of the paper will possess great interest to **PATENTEES AND INVENTORS**.

The Publishers feel warranted in saying that no other journal now published contains an equal amount of useful information while it is their aim to present all subjects in the most popular and attractive manner.

The **SCIENTIFIC AMERICAN** is published once a week, in convenient form for binding, and each number contains sixteen pages of useful reading matter, illustrated with

NUMEROUS SPLENDID ENGRAVINGS

of all the latest and best inventions of the day. This feature of the journal is worthy of special notice. Every number contains from five to ten original engravings of mechanical inventions, relating to every department of the arts. These engravings are executed by artists specially employed on the paper, and are universally acknowledged to be superior to anything of the kind produced in this country.

TERMS OF SUBSCRIPTION.

Per annum.....	\$3 00
Six months.....	1 50
Four months.....	1 00

To clubs of ten or more the subscription price is \$2 50 per annum. This year's number contains several hundred superb engravings, also, reliable practical recipes, useful in every shop and household. Two volumes each year, 416 pages—total, 832 pages. **SPECIMEN COPIES SENT FREE.** Address,

MUNN & Co., Publishers,
No. 37 Park Row, New York City.

PATENT AGENCY OFFICE.

MESSRS. MUNN & CO. have been engaged in soliciting American and Foreign Patents for the past eighteen years. Inventors who wish to consult with them about the novelty of their inventions are invited to send forward a sketch and description. If they wish to put their applications into Munn & Co.'s hands for prosecution they will please observe the following rules:—

Make a substantial model, not over one foot in size. When finished, put your name upon it, then pack it carefully in a box, upon which mark our address; prepay charges, and forward it by express. Send full description of your invention, either in box with model, or by mail; and at the same time forward \$16, first patent fee and stamp taxes. As soon as practicable after the model and funds reach us we proceed to prepare the drawings, petition, oath and specification and forward the latter for signature and oath.

Read the following testimonial from the Hon. Joseph Holt, formerly Commissioner of Patents, afterwards Secretary of War, and now Judge Advocate General of the Army of the United States:—

MESSRS. MUNN & Co.—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant, **J. HOLT.**

For further particulars see advertisement inside, or send for Pamphlet of Instruction. Address **MUNN & Co.,**

No. 37 Park Row, New York City.

FROM THE STEAM PRESS OF JOHN A. GRAY & GREEN.

Scientific American.

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

Vol. XIII—No. 4.
(NEW SERIES.)

NEW YORK, JULY 22, 1865.

\$3 PER ANNUM
IN ADVANCE.

Improved Saw-mill.

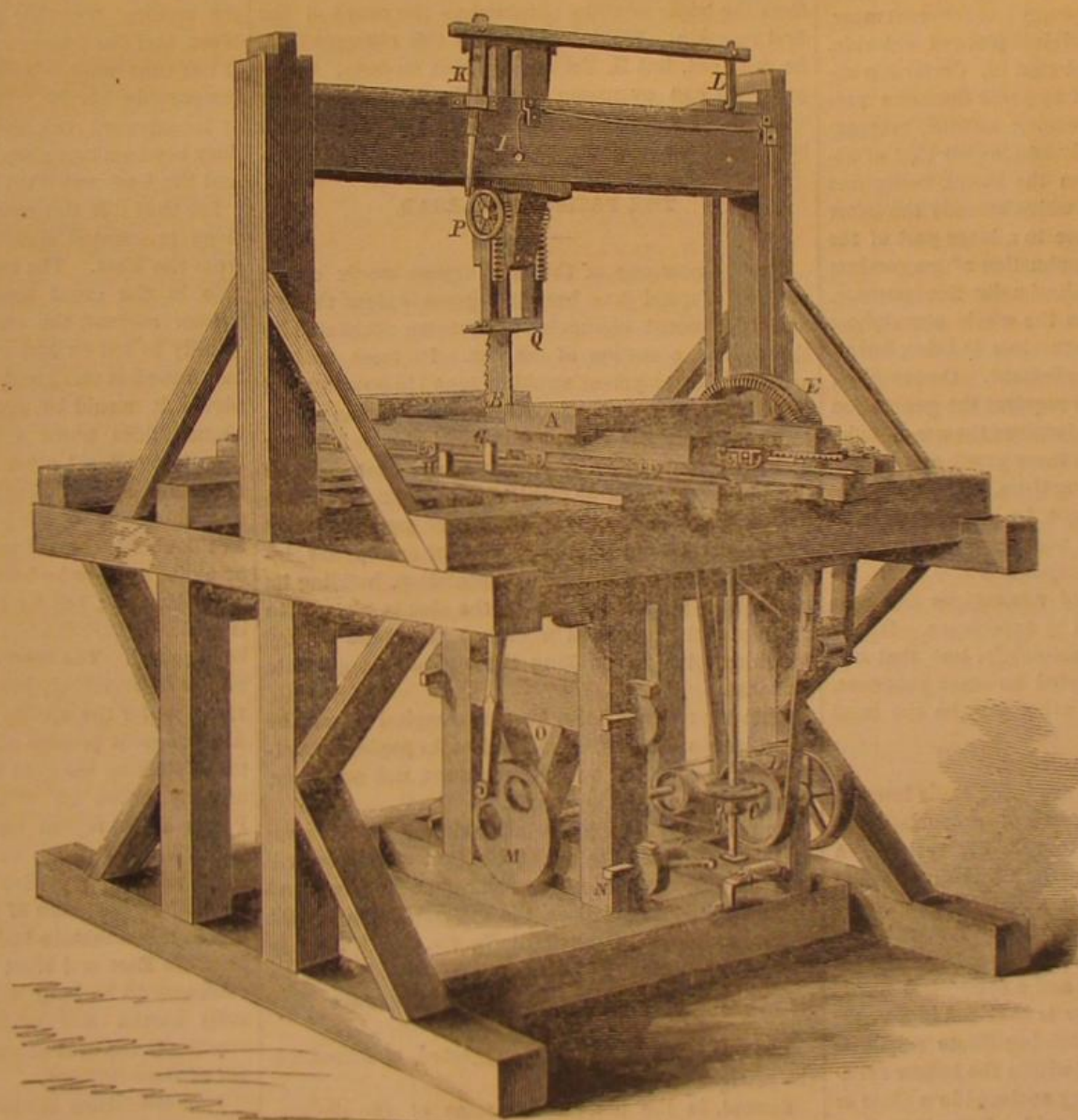
Very great advantages have ensued from dispensing with the heavy and cumbersome sash or slide formerly used in saw-mills, and substituting therefor light but rigid guides, which answer the same purpose, but do not require a tithe of the power to stop and start them from a state of rest that the sash did.

This saw-mill is exceedingly well designed in its several parts, and, at the same time, it is as simple and free from complexity in its details as such machinery can be. By examining the engraving it will be seen that it is substantial and conveniently arranged for access; every detail can be inspected or adjusted as required, with little trouble or waste of time. The details of the mill are as follows:—The timber to be cut is placed on the carriage, A, which receives a regular and gradual feed or advancing motion toward the saw, B, by means of gearing. This gearing consists of a friction wheel, C, below the frame, and the driver, D; the friction-wheel shaft has a small pinion on it, which is hidden by the frame. This pinion gears into the belt wheel, E, by the teeth on its edge, and thus (through the agency of another pinion, F,) advances the carriage in the manner previously described. After the saw has finished one cut the carriage is "gigged" back by throwing the friction wheel out of gear with its driver. This is done by moving the lever, G, which releases a catch, H, that held the pinion on the friction shaft in gear with the large wheel, and throws the pinion clear of the teeth in it. By grasping the cord, I, the idler pulley, J, is thrown into contact with the belt, forcing it to hug the wheel, E, and thus return the carriage rapidly in the contrary direction from that in which the feed gear moved it.

The amount of feed is varied by moving the friction wheel up on its shaft, so as to be nearer to, or farther from, the center of the driver. This movement is accomplished by the rods, K and L. This latter rigging is always within reach of the sawyer, and can be adjusted instantly. The black edge on the friction wheel in the engraving indicates a band of rubber, which is confined by disks of metal, thus obtaining a friction wheel which is certain to adhere under all ordinary circumstances.

The crank shaft, or wheel, M, can be adjusted laterally and vertically by keys, N, in the timbers on which the bearings are placed, and the main bearing is further strongly braced by the timber, O, above it. The crosshead is guided at the bottom by bars,

which are not shown, and at the upper end by other guides—the back of which only appear. Both of these crossheads are simply constructed to avoid excessive friction and weight on the guides under the rapid motion they are subjected to. The gearing, P, on the upper part of the frame serves to adjust the foot, Q, by which the timber is held down when being cut. These several parts thus arranged are, as we have said, well adapted for their work, and are free from the objections which attach to complex saw-mills.



GIBBS'S SAW-MILL.

The invention was patented on the 12th of May, 1863, by D. C. Gibbs, of Fleetville, Pa.; address him at that place for further information.

Laying the Atlantic Telegraph Cable.

The London Times, of June 30th, says:—"Since the *Great Eastern* has been moved from Sheerness, all the final arrangements for her great undertaking have been pushed forward to the utmost, and in the course of another few days she will be in a condition to start, though it is not probable that she will really move to sea before the 9th or 10th of July. She is now anchored in the channel, about seven miles below the Nore, swinging freely to the wind and tide, held only by a single six-ton Trotman anchor, and having a minimum depth of eight fathoms under her at low water. Since she has been moved from her old berth

in the Medway the work of coaling her to the utmost has been steadily going forward. Half of her extra supply of 1,500 tons is already aboard, and the rest will be stowed away by the end of next week. With all her weights she will then draw a little over 33½ feet, though with 24,000 tons on board.

"Mr. Glasse starts with the massive shore end for Ireland early next week. This enormous solid portion of the cable goes in a special vessel, and will be submerged from Valentia to a distance of twenty-five miles from the shore on the 10th. The end at sea

will be buoyed to await the *Great Eastern's* arrival; that on shore will be put in communication with the wires of the International and Magnetic Companies, which already give free communication to Valentia. When the *Great Eastern* arrives and the splice is completed her voyage will instantly commence; a line steamer—the *Hawk*—accompanying her for a distance of some thirty or forty miles. In this steamer will be the directors of the company and a few invited guests, but absolutely none not connected with laying the cable will be allowed on board the *Great Eastern*. Twice a day, in the morning and in the evening, signals will be sent from the ship to Valentia, stating where the vessel is, etc., and these will be regularly transmitted direct to London. Anything, therefore, occurring on board the ship will be instantly known in England, while, on the other hand, anything going wrong with the cable itself, will be as quickly ascertained—not alone from the cessation of signals, but from the tests that can be applied to the end at Valentia.

"The paying-out machine is being fixed upon

board the ship, and the leading trough has also been completed along the deck. This latter is a plain timber frame, supporting a semi-circular trough of iron, down which the cable is drawn to the paying-out machine, the friction of its passage sufficing to keep it 'taut,' and obviate all chances of 'kinks' entering the machine. All three tanks containing the cable have now been completely filled with water, and the wire, in fact, is as much submerged now as it will be at the bottom of the Atlantic—with this difference, that the pressure of the immense depths of the ocean will materially improve the condition of the cable by the compression of the gutta-percha. In these three tanks the temperature and quantity of water are kept precisely equal, and a series of electrical tests have been taken for the last three days, and will be continued for five days more, in order,

from the results of all, to obtain a standard of what the condition of the cable should be while paying out. The contents of the three tanks—that is, the entire length of 2,500 miles of cable, have now been coupled up, and signals are sent through morning and evening.

NOTES ON NEW DISCOVERIES AND NEW APPLICATIONS OF SCIENCE.

SUBSTITUTION OF MAGNESIA FOR LIME IN THE OXY-HYDROGEN FLAME.

The light emitted by the metal magnesium, in undergoing combustion, is due solely to particles of the magnesia, or oxide of magnesium, which is formed by the combination of the metal with the oxygen of the air, being raised to an exceedingly high temperature by the enormous heat developed during that combination. Pondering this fact, a French chemist, M. Carlevaris, was led to conceive the idea of obtaining the same light, so valuable for its great actinic power, by heating magnesia in the oxy-hydrogen flame, just as lime is heated in the case of the lime-light, and so without the intervention of metallic magnesium. His method is to place in the flame a piece of chloride of magnesium, fixed to a support of retort carbon. The chloride decomposes, its chlorine flying off and being replaced by oxygen; the oxide thus formed remaining as a spongy but coherent mass, of the same shape as the original piece of chloride. By this arrangement it is said that M. Carlevaris obtains a light possessing in all respects the same properties as that obtained by burning metallic magnesium. His method has one advantage over that of obtaining the light directly from the metal, being free from the only inconvenience which attends the latter method, the inconvenience due to a large part of the magnesia produced by the combustion of magnesium being thrown off as an infinitesimally fine powder, or dust, which soon pervades the whole atmosphere of the room in which the magnesium is being burnt, and renders it exceedingly unpleasant. On the other hand, M. Carlevaris's method requires the generation of oxygen and hydrogen, and involves the use of bulky reservoirs in which to contain these gases, and a complicated apparatus for applying them. The materials for the production of the light by his method cannot be carried in a waistcoat pocket, as magnesium-wire enough to burn for twenty-four hours can. To which method the balance of advantages belongs, however, can only be decided by experience. It may be that it lies with neither, absolutely, but that one method may be the best adapted for some purposes, while for other purposes the other may be the most suitable.

IMPROVED BATTERY.

The numerous efforts which are being made towards the attainment of a cheap means of procuring electricity are certainly leading to valuable results. A very promising new form of battery was described in these "Notes" only last week, and now we have to speak of still another. In an ordinary "Bunsen's battery," as the reader is aware, each couple consists of a hollow cylinder of carbon and a cylindrical bar of amalgamated zinc. The latter is enclosed in a vessel of porous earthen-ware, containing dilute sulphuric acid, and this vessel is placed within the hollow cylinder of carbon, the whole being enclosed in a glass or other vessel containing nitric acid. Some little time ago M. Duchemin discovered that the nitric acid in this battery might be replaced by a solution of perchloride of iron, and the sulphuric acid by a solution of chloride of sodium, or common salt, with great advantages as regards both cost, convenience, and constancy, and he has just announced to the Academy of Sciences that he finds that still better results are obtainable by the use of chloride of potassium instead of sodium chloride. This substitution does not appreciably increase the cost of working the battery, while it greatly increases its electro-motive force.

OXYGEN FROM AIR AND WATER.

M. Tellier, with whose ammonia engine our readers are already acquainted, is a gentleman with a genius for original conceptions lacking neither in boldness nor in ingenuity. His latest proposal is to use iron as fuel, for a purpose to which we shall refer on another occasion burning the iron in pure oxygen, obtained, by a very novel and ingenious process, from the atmosphere. If you pass a mixture of hydrochloric

acid gas and atmospheric air over pumice heated to redness, in a suitable apparatus, the hydrochloric acid will be decomposed, its hydrogen uniting with the oxygen of the air, to form water, and its chlorine being set free. There will thus issue from the apparatus, instead of the mixture of hydrochloric acid and air which entered it, a mixture of steam, chlorine, and nitrogen. On the other hand, if you pass a mixture of free chlorine and steam through a red-hot tube, the chlorine will decompose the steam, combining with its hydrogen to form hydrochloric acid, so that what will issue from the tube will be a mixture of hydrochloric acid gas and free oxygen,—the constituents of this mixture being easily separable. M. Tellier proposes to obtain oxygen by forming a circuit in which two sets of reactions should go on continually. First, hydrochloric acid should be made to decompose steam. The reaction between the chlorine and the steam would yield, as we have seen, not only free oxygen, but also hydrochloric acid, with which to repeat the process, so that the same chlorine could be used over and over again, *ad infinitum*, the only materials employed in the process fresh supplies of which would be required for each repetition of it being those two exceedingly cheap ones, air and water. The cost of oxygen obtained by this method would thus be simply that of fuel and wear and tear of apparatus, plus that of separating the nitrogen from the triple mixture obtained as the result of the first reaction. We do not see how this nitrogen is to be removed, but M. Tellier says that he does; and if he really can overcome that difficulty there can be no question but that he has solved the problem of how to obtain cheap oxygen.—*Mechanics' Magazine*.

THE PACIFIC RAILROAD.

This is now one of the most urgent needs of the nation. Capital has been to a great extent thrown out of its recent channels, and become stagnated by the sudden cessation of the war. Its most natural and useful employment would be found in opening and developing the vast mineral resources of the mountain regions of the West. But until this railroad is built, it is plain to every practical man that most of the mining schemes, so plentifully projected, are sure to be unprofitable. Expenses of transportation and subsistence eat up all the income of enterprises sincerely pursued; while empty speculation, building its silver and golden fancies in the clouds, absorbs in profitless interchange of worthless stock, the money which ought to be swelling the stream of legitimate business.

With the railroad built, however, capital would be at no loss to discover opportunities for paying investment in the actual working of mines, not on paper, but in the all-producing earth.

So much would such a result redound to the general good, that it is to be hoped that Congress will lend all possible aid to the work. One hundred and sixteen millions of dollars, the estimated cost of the central route from Council Bluffs, via. South Pass to Benicia, (a distance of 2,032 miles) would soon be repaid by the road to the nation in more ways than one.

First, in the way already suggested, of increasing the production of wealth.

Second, in the increased income of the government, derived from that increasing wealth.

Third, the decrease of government expenses for transportation of mails, troops, etc., and for subsistence of troops in remote regions.

Fourth, as a means of national defence in case of foreign war, it would pay its cost in a single year; and as a security against such a war, and as an additional bond of unity between East and West, its ounce of prevention outweighs the pound of cure.

Fifth, the rapid accumulation of specie consequent upon the completion of such a road would soon make a California of the whole nation; and even the anticipation of such a result would enable the government to resume a specie basis of finance at an earlier period, thereby saving both government and people a large percentage of present outlays.

These considerations, involving both the national defense and the general welfare, seem to make the completion of at least one through trunk line, a duty as well as a privilege of the general government. There is but little doubt that the people at large

clearly recognize the common interest in the matter, and are unanimously minded to have the Pacific Railroad built in the quickest possible way. They perceive the propriety of a common contribution of expense where the benefit is common, without quibbling about its exact distribution, which is impossible. Especially so in a work like this, so vast that private enterprise cannot grapple with it, and would accomplish it, if at all, only by piecemeal, nibbling its way along as it felt itself supported or impelled by the oncoming tide of population. It is doubtful whether indeed private enterprise would ever get through with it. The vast tracts of unarable land on these routes seem to make the work impossible except as a public one.

On this central route, above mentioned, there are estimated to be only 632 miles of arable land to 1,400 miles not capable of cultivation, about 31 per cent. On the great Northern route, from St. Paul's to Puget's Sound, the proportion is 535 miles arable out of 2,025 miles, total, about 26½ per cent. On the coast route near the 32d parallel, from Fulton to San Francisco, only 834 out of 2,034 miles are arable. This last is the largest proportion on any practicable route, being about 41½ per cent.

In this view of the subject it would seem that Providence had veined and crypted these mountain regions with the precious metals in order to insure the coming together of the people from East and West, and the consequent unity of the nation forever. It has thus made a bridge of what promised to be an inseparable barrier. And where a heaven-high wall of ice-crowned rock seemed to mark a natural boundary between two peoples, silver gates have opened and the East and West have met in chambers of gold.

For thus it is this road must be built, in two sections prosecuted simultaneously from the East and from the West. The two parts coming from either side to the great barrier ridges, will there tap the golden current, the outflow of which will give them vitality to toll on and overcome the mountains, till at last united in one great trunk line. This being completed, it would be more natural and easy to run branch lines north and south over the valley routes than to construct other trunk roads across the heavy mountain ridges. Such branch lines would quickly and efficiently develop the country, and it is therefore doubtful whether more than one trunk road can or ought soon to be built. The southern route seems quite feasible; but for this species of development it is evidently insufficient; and other routes would still be required. The central route, having medium difficulties to overcome, presents the most obvious advantages for the speedy development of the country. And its great present advantage is this one adverted to, of striking the gold and silver regions as a sort of midway house on either half of the route in the Pike's Peak region on the eastern half, and in the Sierra Nevada on the western portion. While its solitary middle way through the deserts of Utah is cheered by the oasis of Salt Lake City. Here meeting in the mountain-hedged valleys, the two currents from the East and West will spread out over regions otherwise to be long uninhabited; and that apparently barren and inaccessible region will become eventually the seat of empire, as it is the rocky summit of the continent.

Thus the future throne of America is literally one of native silver; and the golden scepter which God hath given her, she shall wield sitting above the clouds.

A New Horse Nail Machine.

We recently had the pleasure of seeing a new machine for making horse nails in successful operation at Messrs. Taylor's machine shop in this city. Little attendance is required, it being merely necessary to heat the rods in a furnace by the machine and put them in a carriage; the rods are then fed in and the nails are turned out at the bottom very rapidly. This machine makes hammered nails not rolled ones, and the quality of them appears to be excellent. See advertisement on another page—of Foreign Patents for sale.

WE are indebted to the Hon. D. P. Holloway, Commissioner of Patents, for copies of the Patent Office Report for 1862. We hope soon to receive the Report for 1863.

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:—

Lamp-wick Trimmer.—The object of this invention is to produce a simple and easily-operated instrument for trimming the wicks of kerosene and other lamps. It consists in arranging in a suitable guiding frame, a cutter or cutting blade, in such manner that it may be operated by pressing together, by the hand, the levers of the device. The cutter slides in a guide way, and is so arranged that its edge does not work against a fixed block or plate, but upon a fixed cutting blade, which greatly facilitates the cutting operation, as well as preserves the edge of the cutter for a much longer time than if it were arranged otherwise. The wick of the lamp is placed between the sliding cutter and fixed cutting blade, and the former is forced forward by the levers, when it will be found that an even cutting of the wick is produced, which causes the wick to burn with a more even flame and give a better light, than were a jagged cut made, which usually occurs when a pair of scissors are employed. This device will be found a very convenient and useful article, and the ease and accuracy with which it performs its work, recommend it to all persons using coal oil or other lamps. The inventor of the above device is Cyrus L. Topliff, of No. 37 Park Row, New York, who may be addressed for further information.

Turbine Water Wheel.—This invention relates to improvements on the Jonval turbine, in substituting the helix in place of a large iron case or wood firebag, and so constructing it as to reduce the friction of the water in passing through it to its minimum effect, the water leaving the buckets of the wheel with its full force or power. Also constructing the wheel in such a manner that the water, in passing through the buckets leaves them in its natural course and direction, giving to the wheel a strong and steady motion that is not easily affected by throwing on and off machinery, simplifying and adapting it to all mills where a first-class motion is wanted, and so arranging all its parts that there is no loss of power from continued use. The inventor of the above is J. E. Stevenson, 200 Broadway, New York. It was illustrated in No. 8, Vol. XII.

Pump for Oil and Other Wells.—This improvement in pumps is especially designed for deep wells, such as oil and other artesian wells, and it embraces several novel features, one of which is confining a piston in the cylinder of a pump by means of a detachable collar, which is fastened in place and unfastened automatically by means of the piston rod, without requiring the removal of the pump cylinder; another is inclosing the working cylinder within an annular valve chamber through which the liquid to be pumped is brought up into that part of the cylinder which is above the piston; another is a novel construction of piston, whereby its lower valve is relieved of the load of the column above it. Aaron Carver, of Little Falls, N. Y., is the inventor.

Metallic Journal and Stuffing Box.—This invention consists in a conical box with a follower in combination with a sectional or split lining and key, made tapering to correspond to the shape of the box and lining, and also adjustable by a set screw or other equivalent means, in such a manner that, by the action of the follower, the lining can be depressed and set up against the rod or shaft passing through the box, and by the key the pressure of the lining on said shaft or rod can be regulated and adjusted with the greatest ease and facility. This box is applicable to piston rods of steam engines or to rods of any other description, which have to pass air or steam tight through a stuffing box, such as valve rods, pump rods, etc. For further information as to shop, county or State rights, etc., address the inventor, H. L. Hopkins, San Francisco, Cal.

Distilling Apparatus.—This invention relates to an apparatus which is particularly intended for the manufacture of aniline, but which can be used with advantage for distilling a great many other materials or substances besides aniline. It consists in a series of hollow drums connected with each other by means of oblique pipes and secured to a shaft, one end of which is hollow and stationary, and connects with a vertical

branch pipe, in combination with or without a jacket or boiler, in such a manner that when said drums are partially filled with the liquid to be distilled, and the apparatus is rotated while being exposed to heat, the oblique pipes cause a violent agitation of the liquid to be distilled, and the distillation is materially facilitated, the gaseous products which escape from the liquid being allowed to pass off freely through the vertical branch pipe and the hollow end of the shaft. Carlos F. Frederici, 82 Wall street, is the inventor.

FARMERS' CLUB.

The Farmers' Club of the American Institute held its regular weekly meeting at its room at the Cooper Institute, on Tuesday afternoon, July 11, the President, N. C. Ely, Esq., in the chair.

THE BEST FRUIT GARDEN IN AMERICA.

Mr. Carpenter:—Mr. Chairman, I have just made a visit to the finest fruit garden in this country, if not in the world—that of Mr. Charles Downing, of Newburgh, in this State. It is of only seven acres in extent, but it contains the greatest variety of choice fruits that I know of anywhere. Mr. Downing is very moderate in his assertions, but he remarked that he has over one thousand varieties of apples and pears. He has also all the European and native varieties of raspberries; and among them all he regards Brinkell's Orange as the best. He has one variety of currant, single berries of which have measured, I am certain $2\frac{1}{2}$ inches, and I believe $2\frac{3}{4}$ inches in circumference.

Mr. Bartlett:—I would call Mr. Carpenter's attention to the fact, that this would make the berries nearly an inch—more than three-quarters of an inch—in diameter.

Mr. Carpenter:—Yes; I understand it.

THE BEST CURRANT.

Mr. Williams presented specimens of three varieties of currants—Prince Albert, Cherry and Versailles, and remarked that he brought them expressly for Mr. Robinson, to see the difference between the Cherry and the Versailles, as Mr. Robinson had remarked that he had both varieties and nobody could tell the difference between them.

Mr. Robinson, after trying the two, said that he was satisfied that both of his were one variety—the Versailles.

Mr. Carpenter, Mr. Williams, and other fruit growers, congratulated him on having the best known variety of currant; and the gentlemen present being invited to taste the three varieties, unanimously pronounced the Versailles to be the best.

THE WAY TO TRANSPLANT TREES LATE.

Mr. Carpenter gave the result of his experience in transplanting trees late in the season, and stated that that if the new wood and all the leaves are removed, trees will bear transplanting after the new wood has grown three or four inches.

OSAGE ORANGE HEDGES.

Solon Robinson read a communication from a correspondent of the Club in Missouri, saying that the osage orange, when planted for hedges, should not be cut back, but the plants should be braided together, bending them all one way the first year and the opposite the second year—thus alternating annually.

RED RASPBERRIES INDIGESTIBLE.

Mr. Bartlett:—Mr. Chairman, I should like to ask the Club if the red raspberry is generally indigestible. I find it in my own case different in this respect from all other fruit.

Solon Robinson:—It is the same in my case.

Mr. Carter:—The same with me; I cannot eat them.

Several other subjects were discussed, but the above were of the most interest.

THE Commercial and Financial Chronicle, Bankers' Gazette, Commercial Times, Railway Monitor and Insurance Journal is the heading of a new weekly paper representing the industrial and commercial interests of the United States. Each number contains thirty-two pages, modeled after the celebrated London Economist. It is a valuable journal for bankers, merchants, underwriters, stock jobbers and commercial men, and, we are pleased to see, sound in its political economy. Terms, \$10 per annum. Published by William B. Dana & Co., No. 60 William street.

DESTRUCTION OF BARNUM'S MUSEUM.

At noon on the 13th inst., that old and familiar place of amusement known as Barnum's Museum caught fire and was totally destroyed, with all its contents. The origin of the fire is not known, but it is said was first discovered about the boiler in the basement. A large number of visitors were in the building at the time but they all escaped without injury, as did also the several celebrities employed in the building. Of all the animals the learned seal and a bear alone escaped. The museum contained a great many rare minerals, coins and suits of ancient armor which were interesting to students and others; also innumerable trifles of all descriptions which can never be replaced.

Mr. Barnum lost \$300,000, and was insured for \$60,000, in several companies, and we doubt not that through his well known energy and sagacity a new Museum will arise from the ashes of the old one wherein the giants may stalk as of old and the moral drama flourish exceedingly.

Several other buildings were also consumed with the Museum and at one time the fire threatened to spread over a large area.

MISCELLANEOUS SUMMARY.

TURPENTINE.—Preparations are making, says the Wilmington (N. C.) Herald, in the different parts of the adjoining country for the manufacture of turpentine as rapidly as circumstances will admit. Numbers in the upper counties from this have been engaged for some time in rebuilding the works destroyed during the war, while many others are about commencing the work. The work will go on in good earnest when the farmers can leave their growing crops, which will be in a few weeks.

A GANG of burglars, some of them from London and others from Liverpool, have been arrested in Birmingham. They had a good stock of tools, including a newly-invented machine for destroying the locks of safes. The article is composed of several pieces of steel so securely joined, and fitted with such powerful penetrating blades of steel, that it is thought capable of gradually forcing any number of safes.

WATER-PROOF PAPER.—A fluid for rendering paper water-proof may be made by dissolving $1\frac{3}{4}$ ounces of pure tallow soap in water, then adding a solution of alum in quantity sufficient for the complete decomposition of the soap.—This fluid ought to be mixed with the paper pulp, which may be worked up in the usual manner, but needs no glueing.—*American Druggist.*

THE NATION is the title of a new weekly political and literary journal, the first number of which has made its appearance. It has a very solid appearance, and promises to take high rank with those who enjoy sound and able discussion of those great events in the political world which are now passing in review. It is published weekly by J. H. Richards, No. 130 Nassau street. Terms, \$3 per annum.

METHYLATED spirits or wood naphtha is not yet manufactured to a great extent in this country. It has most of the properties of alcohol, and for certain purposes it is a complete substitute.

COATING SHIPS' BOTTOMS.—Dr. H. De Brion, England, proposes a compound of 250 parts vulcanized India-rubber and 750 mineral pitch, to be applied hot, and like tar, for the coating of ships' bottoms.

THE Wallingford, Conn., community report the gathering this season of 850 bushels of strawberries from five acres of plants, being an average of 170 bushels per acre.

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 1833, to accompany the claim, on receipt of \$2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

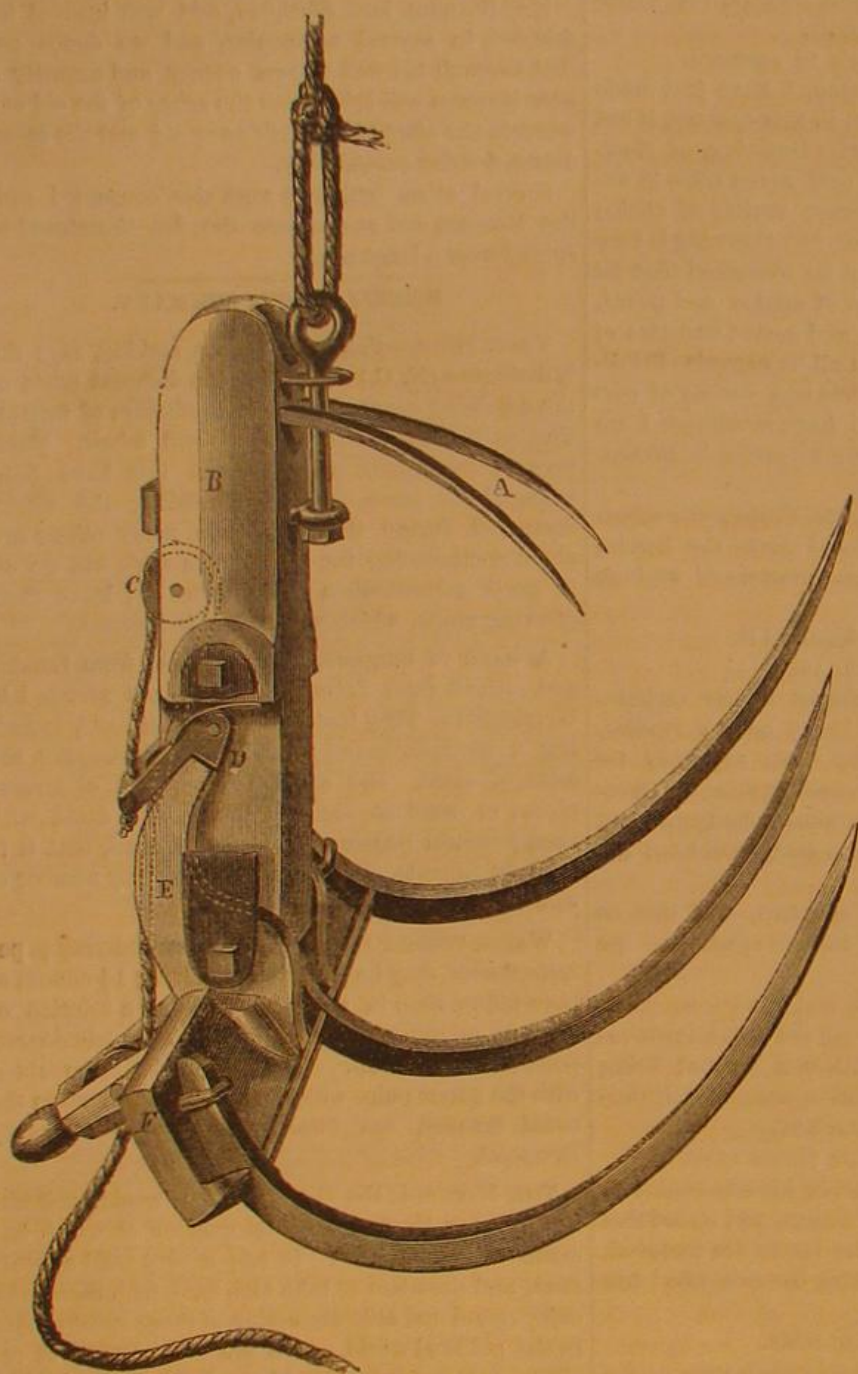
INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our receipt of their funds.

Improved Hay Fork.

Quite recently, in a trip through the country, we saw a neat farmhouse, with well-appointed buildings, sleek-looking stock, and well-kept fences, but as an offset to this picture of prosperity, there was not a sign of a machine about the premises. Thrift and economy had done by hard work what we have described, but the farmer was worn down with toil and exposure. We could not help thinking that by the aid of modern machinery he might have spared himself some labor and enjoyed his possessions all the better therefor.

It is hard work to pitch hay on to a cart, and from it to the mow, and a person engaged in this occupation does a tremendous amount of labor in a day.

**WELLS'S HAY FORK.**

Since machinery has been invented for this purpose it should be more generally used.

Horse hayforks are re-garded with great favor by enterprising farmers, and we here illustrate a new one which has lately been invented. The chief feature of this fork is the certainty with which it retains the load after it is taken on. Persons who have used these tools know that of ten times when a large quantity is taken at once, the loose portions topple off and get scattered about, making a great deal of extra labor to collect it again. With this fork no such trouble occurs, as it is provided with two projecting tines, A, on the main beam, B, which are stationary, and place the load firmly, so that there is no escape and no waste, at the same time these tines do not interfere with discharging the load. This latter duty is performed by pulling the line as usual. The rope runs over the pulley, C, as shown by the dotted lines, and the end is fastened on the latch, D; by raising this catch the arm, E, which bears against the shoulder of the catch, is displaced and the fork falls, discharging its load. The tines of the fork itself are well hung to the shank, F, being set so that they cannot spring sidewise and so that they flare at their outer ends, thus affording a good support to the load.

These are the principal features of this fork, and we regard it as a very good one of its class. It was patented through the Scientific American Patent Agency on Oct. 11, 1864, by J. L. Wells, of Ames, N. Y. Address him at that place for further information.

To Etch on Glass.

Etching with hydrofluoric acid on plate glass is practiced now to a very considerable extent, the French manufacturers especially producing splendid ornamental effects by the process. The drawings to be imitated or etched on the glass are first made on stone or plate and then printed on unsized paper with an ink consisting principally of a solution of asphaltum in oil of turpentine made with the aid of heat, to which some substance is added which shows a more or less crystalline structure on cooling, as stearic acid, spermaceti, naphthalene, paraffine. This mixture is strained and rapidly cooled with constant stirring; it is the only kind of coating which thoroughly resists the action of the corrosive acid. The printed paper is laid flat with the blank side on water, to which from 10 to 25 per cent of muriatic acid has been added, and as soon as the lines show signs of softening the negative printing is transferred to the glass by a slight pressure and when the paper is then removed the picture will adhere to the glass, and this is afterwards exposed to the fluorine vapors in leaden troughs. —*Druggists' Circular.*

[This acid is very dangerous to handle and should be used with great care. The fumes of it must not be inhaled and it makes a sore on the flesh where it touches. — Eds.]

A First-rate Paper.

With the next issue (July 1st) the New York "SCIENTIFIC AMERICAN" commences its thirteenth semi-annual volume (new series), and we avail ourselves of this opportunity of saying that if there is any mechanic, scientific man or manufacturer who is not in weekly receipt of this most excellent periodical, he does not study his own interests. It is by far the ablest of its contemporaries in its peculiar department, and deserves the widest possible circulation. Its proprietors, Munn & Co., 37 Park Row, New York city, are the sponsors of about one-third of all the patents issued in this country, and their judgment in matters of this kind adds greatly to the value of their publication. Terms \$3 per annum, in advance. — *Chicago Journal.*

"THE PIPE OF PEACE."

Sir Walter Raleigh is said to have been quietly smoking in his study long years ago, when his servant, alarmed at the spectacle, and supposing his master on fire, immediately drenched him with the contents of a jug near at hand.

This injudicious attack, like all other intemperate onslaughts on familiar habits, utterly failed of its effect, and Sir Walter continued to smoke placidly, as do all his descendants to this day.

Very great improvements have been made of late in tobacco pipes. Rosewood, laurel and brier wood

have been employed as material for the bowls and stems, in the place of fragile clay.

The pipe herewith illustrated is convenient and handsome; it has also novel features, which will, no doubt, make it popular. In detail it is constructed as follows:—

The bowl is formed with a metallic reservoir, A, at the bottom, which has a joint, B, at the side. In this joint there is an elbow, C, on which the stem is fixed. The stem itself is provided with an ingenious device, shown in the portion broken out. This consists in a scroll, D, set in the tube so that the smoke must follow the passage, E, to the top before it reaches the mouth. By that time the smoke is cooled, and deprived in a measure of the heavier portions which may have been drawn through the



tube in smoking. Besides, smoke so cooled is more agreeable to the taste than at a higher temperature. The reservoir at the bottom collects all moisture which, from obvious causes, settles in the passages, and in common pipes clogs up the bowl and stem, rendering them foul in a short time. For clearing, this pipe is especially convenient, it being only necessary to remove the scroll, E, and wash it out. The reservoir is also capable of being unscrewed from the bowl and purified. The elbow, C, enables the smoker to turn the bowl of the pipe at any angle with the stem, and thus avoid smoking in his own eyes or under the noses of other people. The elbow may be of one piece with the bowl, or separate, and of any material. The socket may be either horizontal or pointing upward.

This pipe was patented through the Scientific American Patent Agency on May 22, 1865, by F. Doellbor. For further information address him at No. 405 North Fourth street, Philadelphia.

THE department of coins and medals in the British Museum has acquired 2,567 examples during the past year. Of these 1,350 were Greek, including 5 specimens made of glass; 512 are Roman; 474 modern or mediæval; 295 of the Roman coins are Imperial, gold, valued at £3,200. The mint of the United States has presented a two-cent piece of 1864.

HOW TO SET A SLIDE VALVE.

In all the works on steam engines which have been written we do not remember to have seen any account of the manner in which a slide valve is set, and we have had frequent inquiries from young—and must we say it—old engineers, who confessed they did not know much about it. It seems strange that any person should have charge of a steam engine and be unacquainted with this simple duty, yet it is a fact indisputable. Many an hour locomotives have stood on the track helpless from the slipping of an eccentric which the driver was unable to replace, and mischievous comrades have oftentimes designedly loosened set screws, (in the early days when screws alone held the wheel in place), so as to cause confusion, and subsequent dismissal, to the incompetent driver who could not reset it.

There are indeed no lack of rules in engineering works which direct us to set the eccentric, something in this way:—

"Place the crank in the position corresponding to the end of the stroke (why not say on the center?) Draw the transverse center line answering to the center line of the crank shaft on the bed plate of the engine, or on the cylinder, if the engine be direct acting, describe a circle of the diameter of the crank pin on the large eye of the crank and mark off on either side of the transverse line a distance equal to the semidiameter of the crank pin; from the point thus found stretch a line to the edge of the circle described on the large eye of the crank and bring round till the pin touches the stretched line. When the crank is thus placed at the end of the stroke the valve must be adjusted so as to have the amount of lead or opening on the steam side which is intended to give at the beginning of the stroke and the eccentric must then be turned around upon the shaft until the notch in the eccentric rod comes opposite to the pin on the valve lever and falls into gear; mark the situation of the eccentric, and put on the catches in the usual way, etc."

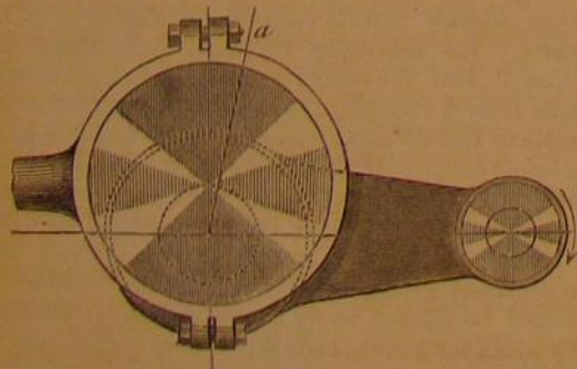
This long and incomplete instruction is from Bourne's Catechism of the Steam Engine and we are sorry to say omits one very important thing, so that it would be impossible to set a valve by this method. The omission is in getting the length of the eccentric rod at the outset. Without further criticism or discussion, we shall explain how an eccentric is set.

Presuming the proportions properly made by the draughtsman at the shop the first thing is

"TO FIND THE LENGTH OF THE ROD.

Put the straps on the eccentric and connect the valve gear as in working order. Disconnect the engine and slip the eccentric around on the shaft and observe what takes place in the steam chest. Doubtless the valve will uncover one port clear to the exhaust while the other is entirely or nearly shut. This shows the rod to be too long or too short as the case may be. If the port nearest the crank, in a horizontal engine, is wide open and the other port shut, the rod is too long and must be shortened half the difference only. We say half the difference, because it must be remembered that what is taken off one end is put on the other so that the real amount the rod is shortened will be seen in a complete revolution.

When the valve "runs square," as it is called, or opens and shuts the ports properly, set the wheel as in this diagram.



The eccentric is always in this position in every instance, whether the engine be vertical, horizontal or inclined, and the intervention of levers between it and the valve makes no difference in relation to the crank itself. The wide part of the eccentric and the crank are always at right angles to each other ex-

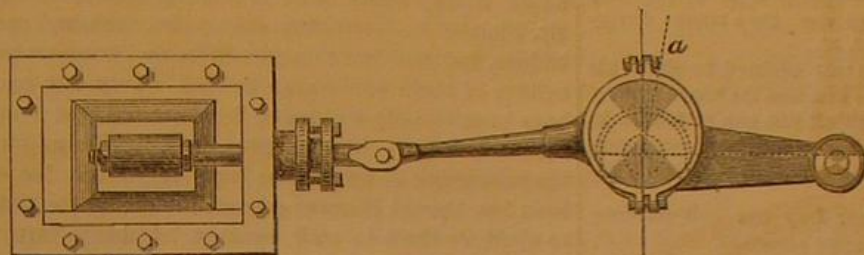
cepting such departure from a right angle as the lead and lap takes off.

The diagram represents an eccentric without lead working a valve without lap. Such a coincidence seldom obtains in practice, and the true position of the eccentric is shown by the dotted line, a; this indicates that the eccentric is turned on the shaft towards the crank thus pulling open the port behind and driving the crank in the direction of the arrows. If levers are intervened to reverse the motion of the eccentric the crank would go the other way. We are speaking of a direct connection.

It will be easily understood why the eccentric is always in this position when it is borne in mind that the eccentric must commence to open the valve a little before the crank gets to the center. In other words the eccentric must commence its stroke a little ahead of the crank.

AN IMPROPERLY SET VALVE.

Here is a drawing of an improperly set valve. It is not drawn to scale but is none the less a correct



example. It will be seen that the crank has passed the center and commenced the return stroke, but there is no lead on the steam side in front or at the port nearest to the crank, and before the crank passed the center there must have been much compression in the cylinder at the forward end of the stroke. The steam was shut up in the cylinder and its tension or elasticity greatly increased thereby. Steam like other gases follows a law discovered in some experiments by a French philosopher called Mariotte. According to this authority if steam at 60 pounds be shut up in a cylinder six inches long and the piston in said cylinder be pushed down to three inches the volume will be reduced one half and the pressure will have been raised to double or 120 pounds.

So when the exhaust closes too soon, say at six inches from the end of the stroke, when the crank is on the center the pressure will be in proportion to the amount of cushioning or compression. There are many engines working in this condition to-day; should they not be attended to?

Setting the valve with a link motion is precisely the same operation; the eccentric stands exactly as shown in the diagram. There is only this difference—the lead is somewhat disturbed by the action of the eccentric rod which is not in gear, whether it be the forward or back connection. This derangement causes some change in the lead when cutting off at low grades of expansion; and it is necessary to take this into account when setting the valves. The lead should be given properly on the point the engine is to work at, for since the lesser rates of expansion are only used on emergency it matters little whether they are correct or not.

Concluded next week.

MAGENTA AND ITS DERIVATIVE COLORS.

At the weekly meeting of the Royal Institution of Great Britain, held on Friday, May 12, 1865, a paper was read by Frederick Field, F.R.S., from which we take the following extract. After giving the chemical constitution of aniline, he says:—

From the earliest discovery of aniline it was noticed that certain oxidising agents when mixed with a solution of its salts produced a fine violet tint. Even in minute quantities, a few drops of hypochlorite of lime render it purple. There is another test for aniline, which I will show you, and which, as far as I am aware, has not been observed previously. If the red gases obtained by the decomposition of nitric acid by starch or sugar be passed into an aqueous solution of aniline, the liquid speedily assumes a yellow color, owing to the formation of a new base—azophenylamine, which is gradually precipitated as a bright yellow powder. It was not, however, until the year 1866 that aniline was applied to any great practical

purpose, although from the beauty of its compounds, and from its comparative accessibility, it had from the time of its discovery become a great favorite with chemists. Mr. Perkin was the first who produced color on an extensive scale from this base. He added a solution of bichromate of potash to a salt of aniline, and from the precipitate thereby produced he isolated a magnificent purple dye, he termed "mauve," which at once became popular, and indeed at the time almost universal. It may truly be said that this discovery has identified Mr. Perkin with the aniline colors, and that he will be always associated with one of the most striking and brilliant passages in the history of chemistry as applied to the industrial arts. It cannot be supposed that such a discovery would be allowed to rest. A mine had been opened which chemists began to explore, and in such numbers, and with such avidity and zeal, as almost to lead us to anticipate that its riches will soon be exhausted. The action of numerous bodies upon aniline and its homologues was found to be productive of

color. Nitrate of silver, nitrate of mercury, chloride of mercury, chloride of tin, arsenic acid, iodine, and many others, when heated with the base, gave a rich crimson color, in more or less abundance; and, although it would be impossible for me to enter into a disquisition on the

comparative merits of these various methods for the production of color, I trust to be able to produce magenta, although in somewhat crude form, at this lecture table, and also to dye this tassel of silk from a solution of its salt. The reagent I will employ is iodine. A few crystals of this element are placed in a tube with about twice their weight of aniline. Heat is at once evolved, and with the assistance of a higher temperature from the spirit lamp, you will observe that in a few moments intense color is developed. If a few drops are now poured into spirit, and this solution added to water, a fine rose-colored tint will appear.

It may seem strange to those who have read Dr. Hofmann's beautiful researches upon the aniline substitutive products, his chloraniline, bromaniline, iod-aniline, and a multitude of others, that he had not observed this curious reaction; and this leads me to tell you, *en passant*, for time will not allow me to dwell upon this interesting topic to night, that aniline, when perfectly pure, does not yield any amount of color with most of the reagents mentioned above—a most important fact discovered by Dr. Hofmann and Mr. Nicholson, and which has given rise to one of the most difficult questions which yet remains to be answered. I will simply say that it appears that there must be a homologue of aniline present with that base to produce the color you see before you, although that homologue, *per se*, will give no color whatever. Thus, for example, toluidine, C_7H_9N , when treated with oxydizing agents, does not produce color; let it be mixed with aniline, and the dye is immediately developed. The tintorial power of the salts of magenta is something marvellous. No dye that I have examined, whether from the animal, mineral, or vegetable world, can bear comparison for one moment with this crimson color obtained from aniline. One grain in a million times its weight of water gives a pure red, in ten millions a rose pink, in twenty millions a decided bluish, and even in fifty million, with a white screen behind the vessel in which it is dissolved, an evident glow.

Personal.

Dr. Thomas Antisell, whose card appears in our advertising columns, was for several years chief examiner of the chemical department of the Patent Office. Since the beginning of the war he has been a volunteer surgeon in the Union army, where he has rendered valuable service to our brave suffering soldiers. Dr. Antisell is the author of valuable scientific works, and is well qualified to give advice and assistance in the line of his profession. We wish him much success.

Egypt is waking up. A nobleman of Alexandria has 44 steam engines, which work 22 steam plows and cultivators on his estate.



- J. H. D., of Mass.**—According to the census returns of 1850 the property of the people of this country was worth \$16,000,000,000; the national debt, when all the bills come in, will amount to about \$3,000,000,000. Consequently, to pay off the debt everybody must contribute one-fifth part of his property; this nobody is willing to do. The debt can and will be rapidly paid, but it must be done by vigorous taxation.
- C. W. H., of Conn.**—It has been demonstrated that a balloon cannot be navigated by muscular power. The muscular force of a man could not at the utmost cause a balloon large enough to support him in the air to deviate from the direction of the wind more than four miles in an hour.
- Clarendon, of Tenn.**—We have perhaps been too accommodating in republishing articles two or three times at the request of correspondents; however, we give you again Capt. Hall's cure for drunkenness: sulphate of iron, 5 grains; magnesia, 10 grains; peppermint water, 11 drachms; spirit of nutmeg, 1 drachm—twice a day.
- E. S., of Ill.**—Iron is galvanized, as it is improperly called, by being immersed in molten zinc. For a minute description of the process see page 243, vol. XI.
- I. M., of N. Y.**—A patentee is not obliged to show his patent, but you can procure a copy of it from the Patent Office.
- J. M. C., of Fla.**—We do not think you can purchase in this market a machine capable of sawing down standing trees. Such machines have been invented but have not proved successful so far as we can learn.
- I. L. F., of R. I.**—We neither buy nor sell patents, therefore must decline to purchase your horse shoe.
- G. W., of Mich.**—You say that a certain party has obtained a patent for an invention which you and others have publicly used for upwards of ten years, and wish to know if the patentee can now stop you from continuing to use it. We answer no; the invention is public property.
- O. H. B., of Ind.**—Augers to bore hard wood are made from one to two feet in length, and can be had at most tool stores in large cities. Car-makers use them.
- C. H. B., of Mass.**—For your small boat, 18 feet long, 4½ feet beam and 12 inch draft, you can use a screw of 12 inches diameter and 20 inches pitch. You may use a larger screw by putting the shaft as low in the boat as the crank will allow, and attaching a shoe or guard to the keel behind the screw, so that its blades will not strike in shoal water, as they would if the diameter of the screw was greater than the draft. As to the form, make it a true screw; as to the blades, use three; as to the velocity, run it as fast as you can.
- P. K., of Tenn.**—We are pleased to hear from you. Iron ore is so abundant that it is of no value in the bed except in favorable positions.
- W. A. L., of Ohio.**—Giffard's injector will work with steam at a less pressure than 40 pounds.
- D. K., of N. Y.**—Gun cotton is sometimes decomposed by long exposure to air and moisture, but we never heard of its burning by spontaneous combustion.
- G. C. B., of Iowa.**—A horse-shoe magnet weighing 1 pound has been so charged as to sustain a weight of 26½ pounds. The attraction of magnetism passes freely and without diminution through all known substances.
- R. E., of Mo.**—The *London Builder* is a paper of very high character. There is no paper in this city devoted exclusively to architecture and building.
- H. H., of N. J.**—Dr. Trimble, the naturalist, of your city, will tell you how to catch humming birds.
- T. T., of D. C.**—J. W. Stevenson's turbine gave the largest yield of power at the great competitive trial at the Philadelphia Water Works. His address is No. 100 Broadway, N. Y.

SPECIAL NOTICES.

Robert Bates, of Philadelphia, Pa., has petitioned for the extension of a patent granted to him on the 30th of September, 1851, for an improvement in instruments for the cure of stammering.

Parties wishing to oppose the above extension must appear and show cause on the 11th of September next, at 12 o'clock, M., when the petition will be heard.

Stephen P. Ruggles, Boston, Mass., has petitioned for the extension of a patent granted to him on the 23d of September, 1851, for an improvement in hand stamps.

Parties wishing to oppose the above extension must appear and show cause on the 4th day of September next, at 12 o'clock, M., when the petition will be heard.

Joseph H. Moore, Chicago, Ill., and Wm. P. Parrott, Boston, Mass., have petitioned for the extension of a patent granted to them on the 2d day of December, 1851, for an improvement in steam carriages for railways.

Parties wishing to oppose the above extension must appear and show cause on the 20th day of November next, at 12 o'clock, M., when the petition will be heard.



Copper Cartridges in Cold Weather.

MESSRS. EDITORS:—My communication in regard to the effect of severe cold upon copper cartridges has naturally excited a good deal of attention, and a considerable amount of testimony, verbal and written, has reached me since its publication. I have regretted that my correspondents did not send their communications directly to you, and have waited in the hope that your columns would contain further evidence than the letters of Messrs. Plaisted and Perry, which thus far are the only published replies I have seen, and both of which are simply negative and prove nothing. Mr. Perry's testimony has rather a formidable look in consideration of the great number of cartridges he has fired, but its weight is destroyed by the fact that the ammunition was kept and fired under cover, being used in proving Spencer rifles. Mr. Plaisted has fired from one to two thousand cartridges, has had but two miss-fires, and is convinced neither of them was owing to cold. Very few men have been equally fortunate, I cannot tell how many thousands I have fired and seen fired, but I am sure the proportion of misses has been very much larger than his, though it never occurred to me at the time to attribute them to cold weather. I always turn a cartridge when it misses, and try again, sometimes with a successful result, oftener not.

By the kindness of Major Laidley, I have been furnished with a carefully-prepared report of an experiment which has been tried at the Springfield Armory, for the purpose of testing the question, and which seems clearly to prove that the cartridges are not affected by cold. A quantity of cartridges were placed in a refrigerator from which they were taken and fired at different times, none being less than an hour, and the greater portion forty-four hours in the freezer, exposed to degrees of cold varying from 30° above to 2° below zero. Five hundred and twelve cartridges were thus fired without a single miss, and Mr. Porter (the foreman by whom the report was prepared), says in conclusion, "I could see no difference between those which had been in the freezer the greatest length of time and those that had not been in at all."

This testimony would seem to be conclusive against the opinion I advanced in my former communication, which, it will be remembered, was based upon what I had learned from others. On the other hand I have the assertions of perfectly reliable men—two of whom are scientific men—as well as sportsmen, that they find these cartridges so unreliable in severe cold weather in Canada and Michigan, though taken from the same lots, which prove perfectly reliable in summer, that, as one of my correspondents says, "I have had to lay them aside as useless and should not think of taking them on any future winter expedition." He adds, moreover, "But almost invariably, on warming those which had missed, in the hand or pocket they have exploded." I have verbal and written testimony to the above effect from different sources entirely unknown to each other, and whose interests would certainly prompt them to make the best of the only ammunition they could use in the guns with which they had provided themselves. I cannot withhold my belief from their testimony, and I can only express the hope that we may have further light upon the subject which will enable us to decide a question which is certainly a very important one.

H. W. S. CLEVELAND.

Danvers, Mass., June 7, 1865.

The Perpetual-motion Clock.

MESSRS. EDITORS:—Your New Zealand and also Harrisburg, Pa., correspondents are both mistaken in assuming the so-called perpetual-motion clock described by them to be "new to all the world." My father, Col. S. Boon, of Hamilton, Madison Co., N. Y., in the year, 1842, invented and constructed a clock operating upon similar principles, viz., the expansion of fluids made upon the same principle as a thermometer. A large sphere was the receiver into which was placed a metallic cylinder; a piston was placed in the cylinder; upon the cross-head of the piston rod was attached a double rack with suitable guides to keep the piston rod straight

with the cylinder. Upon the cross-head were also placed weights of 25 lbs. each. He filled the ball or sphere with oil, which kept every thing lubricated, and obtained the power necessary to wind the clock by the contraction and expansion of the fluid. The weights carried down the piston rod and the expansion carried it up—winding the clock both by expansion and gravitation, by means of racks and ratchet wheels. The clock wound from the center of the spring, on the same principle that American watches are now made. It is unnecessary to explain further.

I would simply say that it was examined by many prominent gentlemen, and to satisfy the incredulous that it was wholly destitute of deception, we obtained certificates from Dr. Nott, Prof. Silliman, Prof. Finney and many others, who witnessed its operations and pronounced it unlimited in its power, excepting in strength of machinery, and would continue to run without aid from man as long as the material of which it was composed would last. It was on exhibition at the American Institute, in New York city, in 1843. I have many portions of it now in my possession, which I can exhibit to any inquirer.

ALONZO Z. BOON.

Galesburg, Ill., July 1, 1865.

The Government Flying Machine.

MESSRS. EDITORS:—In looking over your valuable journal I saw a statement concerning a new flying machine, in process of construction at Hoboken, to be propelled vertically and horizontally through the air by screw fans; propelled by a steam engine placed in a cigar-shaped car with one fan above and one below the car and one at each end. Now the thing looks very squally to me. How can they give a rotary motion to the lifting fan without causing the car to rotate in the opposite direction without having a fan to act against it? If the rear fan was left off, the front fan falling through the air would prevent it more or less, but not sufficiently, and the lower fan would have a tendency to equalize the thing. It looks to me as though the motion would be more like a Boomerang than anything I know of. If the propelling power was communicated from the earth, as Prof. Mitchell's experiments were, it would look more plausible; for then the engine would have a solid foundation, or a momentum given to it before it started independent of itself like the child's toy.

S. D. ENGLE.

Hazleton, July 1, 1865.

Water Wheels by Night and Day.

MESSRS. EDITORS:—In your issue of the 1st inst., I see some remarks on the mysterious effects of water on wheels, in the day time and in the night. I also see you infer from the communication from the Cumberland Valley Mills, that the mystery is only imaginary. Years ago I was placed in positions so that the fact exhibited itself to me. On investigation I found that a sluice or opening for the water to pass through in the day time would be 10 inches wide, while in the evening the opening would be 9 inches to give the same motion by the usual kind of governor and running the same machinery. On following up the investigation it was discovered that the contraction commenced, in clear weather, two or three hours before the sun set and continued until midnight, then remained until day light without change, then commenced to enlarge and continued until noon; then no change until two or three hours before sundown. In clear weather there is not so much change experienced. The philosophy my mind has settled down upon is that the sun's rays rarify the air in the day time thereby changing the center of attraction of the earth so that the same column of water would require a larger capacity to pass through while the sun is on the horizon than when not on the horizon. The results are as above related, the philosophy is my individual opinion only, as nothing has come under my observation giving me any light on the subject. I should be pleased to see an explanation of the laws by which the phenomenon is produced.

ANDREW R. ARNOLD.

Newark, N. J., July 5, 1865.

[We publish this communication out of respect for the writer, who is a remarkably skillful and successful manufacturer; but the account of the observations is not sufficiently detailed and definite to give us a particle of confidence in the conclusions. We

can see that with several kinds of wheels and gates in practical use the variations might all have resulted from changes of flow of water in the stream. Let everything be carefully weighed, measured and counted as it was by our Pepperell correspondent.—Eds.

Water Wheels and Belts.

MESSESS. EDITORS:—I see a correspondent is troubled with a mystery about water wheels going more quickly by night than by day. A wheel will go quicker by night than by day, if the night is a good deal colder than the day. The fact is that water contracts in cooling down to 39° Fah.; consequently becomes heavier, bulk for bulk; or in other words, the specific gravity is increased, the water gage and every thing else remaining the same, the wheel will go quicker with the cold water.

On the subject of belts, I think Mr. Cooper's rule—66 $\frac{2}{3}$ square feet per minute per horse power—a very good one. I lately put up one 12 inches wide, with a velocity of 800 feet per minute, to drive a pair of wheat burrs, 54 inches diameter, 140 turns per minute. I calculate the power at 12-horse. The belt works beautifully. Divide 800 by 12, and the result is 66 $\frac{2}{3}$ per horse-power. This belt had a tightener pressure, as near as I can calculate, of 400 pounds, which would be a pressure of 33 $\frac{1}{3}$ per horse-power. The belt runs horizontally. We used to put on a 10-inch belt on an 80-foot fly-wheel on engines which we sold for 12-horse power. This belt would have a velocity of 1,000 lineal feet per minute, which you see comes very near Mr. Cooper's rule—66 $\frac{2}{3}$ per horse-power. But this subject will never be definitely fixed till some one makes experiments with winding up weights, etc., for which perhaps some of your many correspondents may have time and machinery. J. W. H.

Wilmington, Del., July 5, 1865.

[The suggestion that the condensation of water by the reduction of temperature might cause a wheel to run faster in the night than in the day is perfectly sound. The effect, however, would be scarcely perceptible except by means of very delicate instruments. Large bodies of water are cooled or warmed very slowly, and the change of temperature from day to night would probably seldom be more than two or three degrees. If the change was ten degrees, 10,002 cubic feet of water at 50° would become 10,000 cubic feet at 40°, making a difference of one-fiftieth part of one per cent.—Eds.]

Further Queries About Belts.

MESSESS. EDITORS:—I notice in your columns some discussions in regard to the power of belt, rules for determining it, etc.

Now there is a question connected with belting that I would like to have solved. It is this:—Given certain sized pulleys and belt; must we double the width of those pulleys and belt at same speed, to get double the power? It seems to me in practice that a 12-inch belt, under the same circumstances will transmit more than double the power of a six-inch belt, and yet I can give no particular reason for it; perhaps some of your mechanical correspondents can give light on the subject.

Lambertville, N. J., July 1, 1865.

The Most Rational Explanation Yet of the Ball and Jet.

MESSESS. EDITORS:—In the correspondence of your last number I see a query and remarks upon the subject of a ball balanced upon a fluid jet; and it offers a striking comment on your recent remarks upon "observation," that this correspondent states an observed fact connected with the subject which at once refers it to a large list of common-place phenomena, alongside, indeed, with all that interesting class of appearances which grow from the disposition of rotating bodies to preserve the plane of their rotation. The fact once being known that the ball always exhibits a violent rotation in some plane, the retention of its position will no longer surprise those who are familiar with the feat of mountebanks in balancing large numbers of earthen plates upon the ends of sticks at such degrees of inclination that they will fall in an instant if they cease their revolutions. But the common top or tectotum and rotascope or gyroscope are still more familiar instances

of the ease of balancing a rotating body upon a point of support out of line with a perpendicular let fall from its center of gravity. The manner in which it is known a power acting upon a revolving body apparently neutralizes its own effect will show how the impinging jet would have but little power of displacement, unless it act in such a direction as to throw the ball aside without changing the plane of its rotation. Of course, I do not offer this as exhaustive, but merely as containing the germ of a probably true solution.

ISAAC E. CRAIG.

Cleveland, July 10, 1865.

Attaching Labels to Tin.

MESSESS. EDITORS:—Mr. Lefflen desires me to thank you for your perseverance in his patent case, and to assure you that in any other case he may have he shall apply to you for assistance.

While I am writing, I will you give a receipt for publication which at one time was a great want with me. It is for putting labels on tin with common paste. Whitewash of common lime will do it, and not tarnish the tin. Wash the tin, and when dry wipe it clean; the label will then stick as well as on wood. The manufacturer can wash the tin in sheets, as I did, but must be careful to put the washed side out in making up. As you publish information for the people, you can, if you wish, put this in shape. At one time I would have been willing to give \$50 for it.

GEO. T. JOHNSON.

Marshall, Henry Co., Iowa, June 26, 1865.

[It is also said that labels will adhere with common paste if the can be washed first with strong vinegar.—Eds.]

Improved Method of Setting Splinters for Diamond Drills.

MESSESS. EDITORS:—Having had occasion to use diamond drills for perforating porcelain, in experimenting toward a new method of restoring defective crowns of natural teeth, I ordered this instrument from a New York lapidary, who informed me that there was always a degree of uncertainty about the point remaining firm. I experienced this difficulty before I had drilled a single hole with a $\frac{3}{4}$ line drill. I reset this splinter in the following manner: Having prepared the pieces in the usual way, I sunk a triangular recess in the smaller piece, using for this purpose an obtuse drill and an engraver's flat burin. The usual offset was filed in the other half, but with the shoulder cut under with a three-square file, corresponding with the bevel of the splinter. The space was adjusted so that the splinter held the pieces slightly apart. The parts, with the point in place, were next attached with soft solder, and two small holes were drilled through the rod, one about a line from the splinter and the other near the end of the smaller piece. These holes being tapered with a broach, and fitted with soft steel pins, the soft solder was scraped off and the two pieces brought to a spring temper, and then riveted together.

I have used this drill considerably, and it is perfectly firm. By tempering the setting and riveting together, two important advantages are gained—hardness, with additional tenacity, and tension. These objects are defeated by using silver solder in making drills.

GAM'L JACKSON.

Winona, Minn.

Destruction of Bolting Cloths by Insects.

MESSESS. EDITORS:—Would you have the kindness to ask some inventive genius to make a machine or some contrivance to prevent the bugs from eating holes through the bolting cloth in flouring mills. The machine must be constructed so as to keep them from the inside and outside. No miller would hesitate to pay a handsome sum for an effectual preventative. As it is now, it is a great annoyance and expense; constantly repairing and patching is the order of the day through the summer season.

JOHN H. TRAIL.

Cumberland Valley Mills, June 29, 1865.

Work on the Pacific Railroad.

The *Stars and Stripes*, a paper published at Auburn, California, gives the following account of the rapid progress of the Pacific Railroad through the Sierra Nevada mountains:—

The Pacific Railroad is now being constructed through this county with a rapidity almost unparal-

leled in the history of railroad building. The hills are being cut down, valleys filled up, bridges erected, and all kinds of railroad work going on as fast as 2500 able-bodied men, with a full complement of teams can do it. It is astonishing to see how much such a force, when directed by able and skillful superintendents, and the appliances of modern engineering can accomplish. We had hardly begun to realize that the work had commenced east of Newcastle, before the steam horse was snorting on the hill tops at Clipper Gap, in the heart of the mountains, 43 miles from Sacramento and 1800 feet above the sea. Soon his shrill whistle will be heard at Illinoistown. We learn that the directors have fixed September 1st for that event, and if it can be accomplished in that time it is sure to be done. The work is heavy, but the force is strong and the zeal is irrepressible.

Our citizens now fully realize that the Pacific Railroad is becoming a fixed fact, and not many years will elapse before the completion of this gigantic work will be celebrated, and what a celebration it will be. A continuance of the energy now displayed will soon carry the road over the mountains, and then for a rapid race for Salt Lake. The heavy work on the line west of Salt Lake, is right here in Placer county, and is now being vigorously attacked by the company. We never imagined the work would be so heavy, or that it could be completed so rapidly.

One of the most interesting excursions that can be made by sight seers, is a trip on the railroad line from Clipper Gap to Illinoistown. The cuttings are all in rock of greater or less hardness, and the boom of the powder blast is continually heard—frowning embankments rise as if by magic—high trestle bridges spring up in a week. Let those who are skeptical about the construction of the work visit that portion of the road and their eyes will be opened.

Persons who have never seen the line before the work commenced, or while it is in progress, can form no correct idea of the immense amount of labor required to construct the railroad over the mountains. But the company do their work well, and when finished it will be one of the greatest feats of railroad engineering in the world. Ten, yes twenty miles of valley road can be made as easily as one of this mountain line. Everything about the road is of the most substantial character. Travelers state that it is not excelled by any railroad in the Atlantic States. For one we are proud of this movement of California enterprise.

Mode of Rendering Wood Plastic.

A new and very simple method of effecting this has been lately discovered. It consists in forcing dilute hydrochloric acid through the cells of the wood, at a pressure of about two atmospheres. This impregnation must be continued for a length of time dependent on the nature of the wood. The bark is not previously removed, and by a very simple arrangement the fluid is introduced at one end of the log and passes out at the other. If while the wood is still wet it is exposed to pressure, the cells having been first washed out with water, its volume may be reduced to a tenth of what it was originally, the fibres being brought into the closest contact without being fractured or torn; and when dry they have no tendency to separate again. If it is pressed in dies, their details are brought out with the greatest sharpness and the most perfect accuracy. Impregnation in this way can be used for a variety of purposes. After the action of the hydrochloric acid, washing out with water, and drying, the wood may be cut with remarkable facility, and it answers admirably for the purposes of the carver. The drying is effected by forcing air, at a temperature of about 100° Fahr., through the cells. The moisture is thus carried off with great rapidity; and, as the contraction is uniform through the whole mass, no cracks are produced. Dyes also may be introduced in the same manner into the entire substance of the wood, or matters calculated to preserve it from decay. Soluble glass, or recently precipitated silicic acid, renders it both very durable and thoroughly incombustible.—*Intellectual Observer*.

DYNAMOMETERS.—Parties making or selling dynamometers, or instruments to measure the force in pounds exerted by any machine or belt, will do well to advertise them, as we have had frequent inquiry for them.

Improved Eccentric.

This is a most ingenious method for reversing and cutting off steam with one eccentric. By it the steam can be cut off at any point of the stroke with a common slide valve and without altering or affecting the lead on the steam or exhaust in any way.

In detail this invention consists of two wedges, A, fitted to the shaft, B. The eccentric has a square slot in it which these wedges completely fill, and they act the same as wedges would work driven by a hand hammer, for by slacking one wedge off, and driving the other in, the throw of the eccentric is changed at will. These wedges are worked in this way by the lever, C, which is attached to the straps, D, embracing a coupling, E, formed on the end of the wedges, so that as these and the coupling revolve together the lever is enabled to shift them without being disturbed itself.

The wedges have a feather or key on the shaft which holds them from slipping. This method of operating an eccentric is applicable to all classes of engines. Any lead required can be got by setting the wheel out of the center parallel with the slot. It is a neat contrivance for the purpose.

It was patented by D. F. Walker, through the Scientific American Patent Agency on March 7, 1865. For further information address him at Clearwater, Minn.

Improved Bread Slicer.

Stimulated by inquiries for a good bread slicer, inventors have produced several varieties of them, constructed on different principles but tending to the same end—rapid and certain delivery of slices of bread smoothly cut and of equal thickness. It is obvious that a simple machine for this purpose would be very useful in restaurants, hospitals, boarding houses, etc., where large numbers of loaves are cut up in a few minutes.

The engraving published herewith exhibits a very simple device for the purpose above stated. It is nothing more than a set of knives, A, of any required number, fastened to a shaft, B, said shaft being operated by a lever, C. The shaft turns in its bearings, D, and the knives work through slots in the board; it is obvious that by giving motion to the handle the knives will pass through a loaf placed under them. The cut made is a drawing cut which tends to sever the slice smoothly and without crumbling. A patent is ordered to issue on the machine through the Scientific American Patent Agency. For further information address the inventor, S. D. Simmons, San Francisco, Cal.

International Iron-clad Show.

The iron-clads belonging to France and England are about to make an amicable tour together for the purpose of exhibiting their sailing qualities and general adaptation to the ends required of them. They are to cruise in the waters adjacent to the British Islands and to France, and will no doubt deport themselves in all ways possible—in storms and calms, in smooth seas and rough—to the end that satisfactory reports may be made to the powers that be of their performances.

To the disinterested and impartial observer on this side the ocean it would not appear that much reliable information could be obtained in this way, and that so far as judging of the offensive or defensive qualities of iron-clad ships, the cruise will be quite useless. We shall hear of extraordinary speed, no

doubt, and weatherly qualities, but what avail are these when heavy shot can be sent through one side and out at the other?

Paraffine for Waterproofing.

The materials which in modern times were first employed for water-proofing were beeswax and the various kinds of drying oil, especially linseed oil,

process which he patented nearly fifteen years ago. About three years since a patent was taken out by Dr. Stenhouse for employing paraffine as a means of rendering leather waterproof, as well as the various textile and felted fabrics; and in August last an additional patent was granted Dr. Stenhouse for an extension of and improvement on the previous one, which consisted chiefly in combining the paraffine with

various proportions of drying oil, it having been found that paraffine alone, especially when applied to fabrics, became to a considerable extent detached from the fibre of the cloth after a short time, owing to its great tendency to crystallize. The presence, however, of even a small quantity of drying oil causes the paraffine to adhere much more firmly to the texture of the cloth, from the oil gradually becoming converted into a tenacious resin by absorption of oxygen.

In the application of paraffine for waterproofing purposes, it is first melted together with the requisite quantity of drying oil and cast into blocks. This composition can then be applied to fabrics by rubbing them over with a block of it, either cold or gently warmed, or the mixture may be melted and laid on with a brush, the complete impregnation being effected by subsequently passing it between hot rollers. When this paraffine

fine mixture has been applied to cloth, such as that employed for blinds or tents, it renders it very repellent to water, although still pervious to air.

Cloth paraffined in this manner forms an excellent basis for such articles as capes, tarpaulins, etc., which require to be rendered quite impervious by subsequently coating them with drying oil, the paraffine in a great measure preventing the well known injurious influence of drying oil on the fibre of the cloth. The paraffine mixture can also be very advantageously applied to the various kinds of leather. One of the most convenient ways of effecting this is to coat the skins or manufactured articles, such as boots, shoes, pump-buckets, harness, etc., with the metal composition, and then to gently heat the articles until it is entirely absorbed. When leather is impregnated with the mixture, it is not only rendered perfectly waterproof, but also stronger and more durable. The beneficial effects of this process are peculiarly observable in the case of boots and shoes, which it renders very firm without destroying their elasticity. It therefore not only makes them exceedingly durable, but possesses an advantage over ordinary dubbing in not interfering with the polish of these articles, which, on the whole, it rather improves.

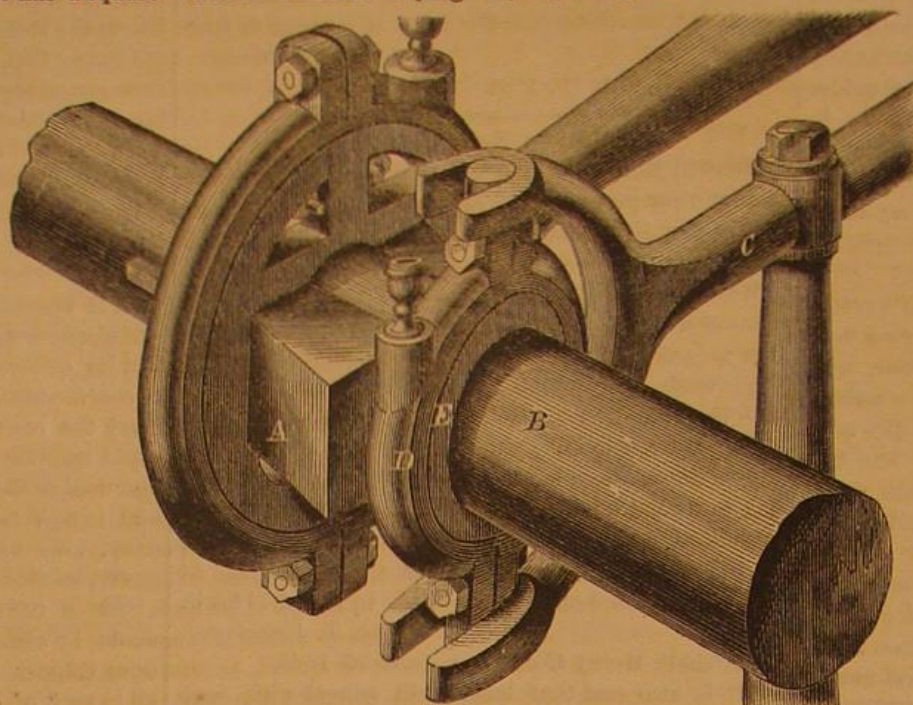
The superiority of paraffine over most other materials for some kinds of waterproofing consists in its comparative cheapness, in being easily applied, and in not materially altering the color of fabrics, which, in the case of light shades and white cloth, is of very considerable importance.

It will be evident from the statements which have just been made, that the employment of paraffine for waterproofing purposes is likely to

become very extensive.—*Practical Mechanics' Journal.*

THE Paris Society for the Encouragement of National Industry has offered a prize of \$300 for an ink which will not corrode steel pens.

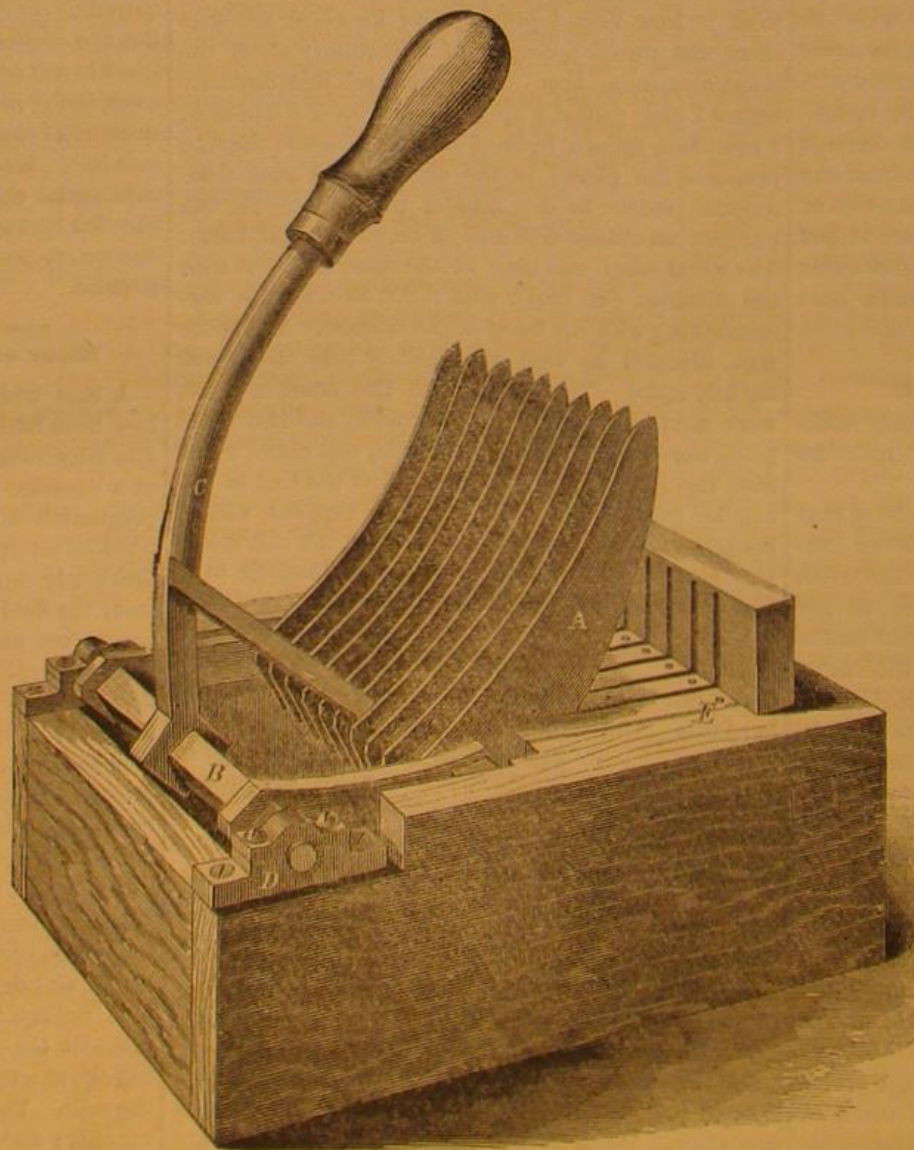
A LARGE TOTAL.—The expenditures of the Government during the past year amount to the enormous sum of \$1,200,000,000, or over \$3,500,000 per day,



WALKER'S ECCENTRIC.

which were rendered more siccative by boiling or some other of the processes usually employed for that purpose.

About forty years ago caoutchouc was first successfully used, for rendering fabrics and other materials waterproof, by the late Mr. Chas. Macintosh; and



SIMMONS'S BREAD SLICER

after an interval of about twenty years, gutta percha was first imported into this country, and immediately applied for similar purposes.

In 1832 paraffine was discovered by Reichenbach in the course of his admirable researches on wood and coal tars. He, however, only succeeded in obtaining it in very small quantity, so that for a long time it was only known as a chemical curiosity. It is to Mr. James Young that we are indebted for the production of this material on an industrial scale, by his

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.

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

Contents:

(Illustrations are indicated by an asterisk.)

*Gibbs's Saw Mill.....	47	Water Wheels by Night and Day.....	52
Laying the Atlantic Telegraph Cable.....	47	Water Wheels and Belts.....	53
Notes on New Discoveries and New Applications of Science.....	48	Further Queries About Belts.....	53
The Pacific Railroad.....	48	The Most Rational Explanation Yet of the Ball and Jet.....	53
A New Horse Nail Machine.....	48	Attaching Labels to Tin.....	53
Recent American Patents.....	49	Improved Method of Setting Splinters for Diamond Drills.....	53
Farmers' Club.....	49	Destruction of Bolting Cloth by Insects.....	53
Destruction of Barnum's Museum.....	49	Work on the Pacific Railroad.....	53
Miscellaneous Summary.....	49	Mode of Rendering Wood Plastic.....	53
*Wells's Hay Fork.....	50	*Walker's Eccentric.....	54
To Etch on Glass.....	50	*Simmons's Bread Slicer.....	54
A First-rate Paper.....	50	International Iron-clad Show.....	54
*The "Pipe of Peace".....	51	Paraffine for Waterproofing.....	54
How to Set a Slide Valve.....	51	Is a National Debt Capital?.....	55
Magenta and Its Derivative Colors.....	51	Mismanaged Concerns.....	55
Personal.....	51	New Commissioner of Patents.....	55
Notes and Queries.....	52	Resignation of the Commissioner of Patents.....	55
Special Notices.....	52	Patent Claims.....	55, 57, 58, 59
Copper Cartridges in Cold Weather.....	52	*Bradley's Indicator for Streams.....	62
The Perpetual Motion Clock.....	52	Singular Freak of a Lunatic.....	62
The Government Flying Machine.....	52		

VOL. XIII. NO. 4...[NEW SERIES.]...Twentieth Year.

NEW YORK, SATURDAY, JULY 22, 1865.

IS A NATIONAL DEBT CAPITAL.

The Government of Great Britain has a debt of about four thousand millions of dollars, which was contracted for the prosecution of war. Individuals in the nation delivered to the Government beef, wheat, iron, horses, sulphur, leather, and other articles needed in military operations, and received the Government bonds in exchange. The articles were destroyed or consumed in war; the value that was in them was annihilated. In the place of \$4,000,000,000 of property in material wealth, the capitalists of the nation found themselves in possession of Government bonds to that amount. These bonds are simply a pledge on the part of the Government to exact the interest on the amount from the nation by taxation.

Mr. Jay Cooke has recently issued a pamphlet in which he takes the ground that a national debt is an addition to the capital of the nation, and the argument is based wholly on the fact that the bonds are saleable for cash. If a nation is able to pay the interest on its bonds, and if the Government has the ability and the will to make it pay, of course its bonds, in moderate sums, will sell at some price, but their value depends on the continued ability of the nation to produce wealth. The principal difference between an individual debt and a government debt is, that one is an obligation to return property already in existence, and the other is a pledge to deliver property hereafter to be created.

When an individual contracts a debt, property, which has been accumulated by working and saving, is passed from the hands of one man to those of another, and remains in existence; the total wealth of the community is not changed. On the other hand, when a Government contracts a debt for war purposes, property which has been laboriously accumulated is passed over to the army, and consumed or destroyed; in this case the capital of the nation is diminished to the extent of the value annihilated. The idea that the capital of the nation is increased by the transaction is absurd.

We quote from Mr. Cooke's pamphlet:—

The Englishman who has £20,000 in three per cent consols at his banker's, and only ten guineas in his pocket, and who gives assent to a proposal made to him to go mine for coal on Vancouver's Island, has got £20,000 in cash to go into the operation. He knows that positively. The world knows it. British consols are cash capital. This cannot be controverted. And the \$1,000,000,000 of British debt is national cash capital to the industry and commerce of Great Britain. For half a century this seemingly and nominally huge and burdensome debt has served to vitalize the manufacturing and trading genius of the English people, and as money has enabled the British to do for that long time the marine carrying for the world, and to make for the world cloth, iron, steel, tin and hardware. This enormous mass of capital infused into the business of En-

gland at the close of her twenty-two years' war with the French Republic and Empire—almost always of par with gold—accepted as gold in all transactions—was the source of that prodigious development of mechanical industry and accumulation of wealth which so suddenly bore upward the English after the battle at Waterloo to the command of the trade and finances of the globe.

It is astonishing that a man with sufficient brains to do a large brokerage business should sign his name to such nonsense as this. England has accumulated wealth by the efforts of individuals to improve their condition. Why she has outstripped other nations in the race may be open to discussion; for our own part we suppose it to be attributable mainly to her comparatively free institutions—to the fact that her industry has been less trammelled than theirs by meddlesome legislation. However this may be, there can be no doubt that it has been done in spite of the burden of her national debt, and not in consequence of it.

It makes no material difference to the severity of this burden, whether the debt is held by native citizens or by foreigners. If a farmer who owns 40 acres of land, but has no personal property, can hire \$150 to buy a horse and plow, he can, by the use of that capital, increase several fold the amount of his crop. The man who loans the money, though he live in idleness on his interest, is no burden to the community, for the employment of his capital increases the product of the national wealth to an extent greater than the amount of his interest. But if the Government hires his capital and destroys it in war, then the support of the capitalist in idleness is a burden upon the rest of the community, and the payment of taxes for his interest diminishes to just that amount the sums which they can use for their own enjoyment.

If this war had cost the whole \$16,000,000,000 of the national wealth, it would have been a cheap price to pay for the preservation of the national integrity and our free institutions. Let the men who contributed their savings to the country in the hour of its need, be paid their interest punctually every six months, and their principal in full to the last dollar, but let us make no effort to argue ourselves into the transparent delusion, that the capital of the nation can be increased by the process of consuming or destroying it in military operations.

MISMANAGED CONCERNS.

Very many manufacturing concerns linger along without paying dividends, and finally dissolve and sell out at loss without the least idea what caused them to founder and go down. As with great ships that sink, so with great companies that fail—small leaks, insignificant in themselves, become formidable when neglected or suffered to run on in the hope that they will correct themselves.

An example of this is to be found in a recent failure, which it is not necessary to mention more pointedly. In this case the managers wisely determined to get all things in readiness before beginning, and therefore set about building their own machines, under the impression that they could do so much more economically than they could buy them. This was an error. They had no system, no fixed plan of procedure, no method, or experience in making their tools, for their line was an entirely different one, and as a consequence they went feeling their way along where it was all plain sailing to those who had been that route, or built such machines before.

On this very rock they split. The whole concern was full of separate machines, of which no one knew the cost within hundreds of dollars. The construction account, it is true, exhibited certain figures which purported to be the price of certain tools, but they were so far wrong that large sums remained unaccounted for, and no one could say where they went, and suspicion attached to one who was proved, like the Chevalier Bayard, "without fear, without reproach."

We can tell.

Suppose a man to require a drill, for instance, or a tap, or a lathe tool—for all these things are needed in making machinery of any kind—he goes to the tool maker with his order, and says "make this or that." The tool maker is already busy with other work, and the man waits until his turn comes, possibly for half an hour. It is then discovered that for this job there is no steel of the right size, so a bar is sent for; two hundred pounds, more or less, has to

be purchased to get twenty pounds from. The order goes to the dealer; the dealer sends it, not with lightning dispatch. The man wanting the tool to use is idle, the machine itself is idle, the work is delayed, and what was a simple want, by mismanagement grows into a costly matter. Doubtless the drill or the boring tool is broken after a short time, has to be renewed, and so the expense is increased. This is not a fancy sketch, but a thing that actually occurs every day in every shop in this country, where machines are used, to a greater or less extent. The remedy is simply to systematize the construction of tools, so that they may be had when wanted without waiting half a day. Three drills ready made and kept on hand do not cost so much as it would to make one drill to order at short notice; so with taps or with any tool that is commonly used. When a man breaks anything, he knows the exact cost of it, and to make a simple cutter he is not required to count the cost of running an engine or the wages of every one immediately concerned in its fabrication.

It is a good sign to see tool factories starting up in different parts of the country, for it shows that managers of machine works are alive to the importance of these small items, and that if reliable goods can be obtained they prefer to purchase tools than to make them. We have noticed in the columns of the SCIENTIFIC AMERICAN for months past various illustrations of tools of different kinds adapted to machinists' and metal workers' use, inserted by different concerns, wholly unconnected with each other, each working with plans and objects of their own. It is with a view of promoting the general welfare of all that we direct attention to them now and in future.

What has been said of tools may apply equally well in principle to other departments—to employing cheap and inefficient labor in preference to skilled, at a fair price, and to other abuses that consume the profits rapidly.

RESIGNATION OF THE COMMISSIONER OF PATENTS.

It is announced by telegram from Washington that Hon. D. P. Holloway has resigned the office of Commissioner of Patents.

Mr. Holloway has held this important position for over four years, during which time the business of the office has largely increased. Like all other Commissioners he has encountered some opposition, but we do not hesitate to say that in our judgment he has discharged his duties faithfully, and generally to the satisfaction of those who have had claims before the office.

It is very much in his favor that he has always proved the steadfast friend of the inventor. In this respect his record is one of which he may, in his retirement, remember with satisfaction.

NEW COMMISSIONER OF PATENTS.

Hon. Thomas C. Theaker is strongly recommended to succeed Mr. Holloway as Commissioner of Patents. Mr. Theaker was formerly a Member of Congress from Ohio, of which State he is a resident, and was highly esteemed as a member of that body. Upon the establishment by Congress of the office of Examiners-in-chief, constituting a Board of Appeals in the Patent Office, Mr. Theaker was appointed by President Lincoln as one of the three Examiners of that important Board, which position he has since held. During this period he has acquired an extensive knowledge of the law and practice of the Patent Office, and is especially well qualified to fill the office of the Commissioner. A better and more satisfactory appointment could not be made.

At the British Museum about 4,150 volumes are used in the reading room daily; the number of readers has been about 106,000, or 360 per diem. 38,842 volumes have been added to the library during the past year, of which 2,730 were presented, 28,426 were purchased, and 7,686 acquired by copy-right. 819 maps, charts and plans have been added, in 3,326 sheets, and 44 atlases complete. 2,378 pieces of music have been obtained. The total number of articles received by this department has been 72,214 of which 1,253 were received under the international copyright treaties. 300,000 stamps have been impressed on these articles.



ISSUED FROM THE UNITED STATES PATENT-OFFICE
FOR THE WEEK ENDING JULY 11, 1865.

Reported Officially for the Scientific American.

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

48,637.—Door Bell or Gong.—Horatio H. Abbe, Chatham, Conn.:

I claim the use of a sliding groove, or its equivalent, in combination with the clapper, B, and the spring, b, for the purposes specified.

48,638.—Foot Rest.—Charles S. Adams, Hillsdale, Mich.:

I claim, First, The combination of the section, C, and slides, a, with the spring catches, d, or their equivalents, constructed and arranged so that the section, C, or foot rest, may be raised or lowered to the desired height, substantially as herein shown and described.

Second, The combination of the section, C, spring, E, and spring catches, d, arranged and employed in the manner and for the objects herein specified.

[This invention consists in making the top of a foot-stool or ottoman in three parts or sections, the center one being so arranged that it can be raised or lowered for the purpose of providing an adjustable foot-rest. The appearance of the stool or ottoman, when the foot rest is lowered, is not in the least marred or changed by the application of the invention.]

48,639.—Hot-air Engine.—Cyrus W. Baldwin, Boston, Mass.:

First, I claim in a hot-air engine the arrangement, substantially as described, by which a single cylinder is supplied on one side only of its piston from two or more furnaces, which are separate from each other as to the means for the reception in each of fuel and air, but which discharge their gaseous products of combustion into said cylinder, as stated, through a common valve chamber.

Second, Also providing at the top of the fire box of a hot-air engine a passage around the same for conducting the gaseous products of combustion to the cylinder, so as to cut off therefrom and from the valve chamber actual flame, and cause to deposit of solid matter, substantially as specified.

Third, Also the arrangement for supplying the air for the support of combustion, and to be heated to fill the cylinder, by passing the whole of it into the fire box above the fuel, instead of passing the whole or a portion of it through the fuel, as previously practiced.

Fourth, Also increasing the valve chest, and passing the cold air from the force pump on its way to the fire box into said casing and around, and for the purpose of cooling the chest, substantially as specified.

Fifth, Also the arrangement of the lower part of the cylinder without any metallic inner boundary, and of fire brick or other suitable non-conductor, supported by a metallic casing, substantially as specified.

48,640.—Railroad Switch.—Milton Ball, Canton, Ohio:

I claim, First, So constructing a railroad switch that when the operator opens it he will be unable to leave it without closing it again, substantially as described.

Second, Surrounding a railroad switch with an inclosure having one or more entrances, which stand open while the switch is closed, but which are closed in the act of opening the switch, substantially as described.

48,641.—Sheep Rack.—Milton Barnard, Unionville, Pa.:

I claim the pyramidal partition, B, extending upward beyond and between the ends of the pivoted sides, b b, for the purpose of forming two separate hoppers and troughs, substantially as herein described.

[The object of this invention is to obtain a trough by which a number of sheep may be fed equally, that is to say, each have an equal share of the feed.]

48,642.—Compound Explosive Shell.—Henry Barton, Baltimore, Md.:

I claim the construction and arrangement of the independent chambers, J, within an external shell, A, so as to form a central chamber or magazine, K, communicating with each fuse pipe, L, as herein described and for the purposes set forth.

48,643.—Truss for Bridges.—William Batchelder, Newburyport, Mass.:

I claim as my invention the truss made substantially as described, that is to say, of the rods, a b b d d d e e e e f f f f g g h h r r t t t t, the hangers, o p p q, and the connections, A A A C C D E F F and G, arranged and applied together in manner as specified and represented.

And, in combination therewith, I claim the series of rings, c, or their equivalents, applied at the intersections or crossings of the rods.

I also claim the combination of two of the said trusses and two series of parallel rods, u, u, diagonal rods, i, k, and bent rods, l, arranged with the said trusses as specified.

48,644.—Measure for the Human Body.—George Beard, Sallineville, Ohio:

I claim an extensible measure for the human body, applied thereto and operated substantially as herein described.

48,645.—Medicated Candy.—B. H. Bener and M. H. Burgess, Erie, Pa.:

We claim a medical compound, made as herein described.

[This compound or medicated candy is intended particularly to rectify coughs, or affliction of the lungs of any description; it is also a good remedy for bronchitis, sore throat, and similar complaints.]

48,646.—Feed-regulating Mechanism for Hoppers.—John S. Bodge, Bath, N. Y.:

I claim a hopper provided with a sliding slide, b, and operating as herein shown for the purpose of being raised and lowered to regulate the feed or the discharge of the contents of the hopper from the same, as set forth.

[The object of this invention is to obtain a means whereby grain and other substances may be fed from hoppers to the machine designed for them in greater or less quantity, as may be desired, and the feed regulated from a distance, that is, from stories below that in which the hopper is placed.]

48,647.—Pump.—John Boley, Baldwinville, N. Y.:

I claim the concave extension wings, D', the flange, C', the bar, E, securing the step to the flange, the whole arranged and operating substantially as and for the purposes herein set forth.

48,648.—Damper for Violins.—Aug. F. H. Braun, San Francisco, Cal.:

I claim the combination and arrangement of the springs, D K, with

the sordine, C, as operated by the spring or lever, I, and button, E, substantially as described and for the purpose set forth.

48,649.—Straw Cutter.—Joseph Brockway, Cambria, N. Y.:

I claim the attaching the knife to the lower part of a pendulum or swinging frame, for the purpose as herein set forth.

48,650.—Shears for Cutting Paper.—Chas. Brombacher, New York City:

First, I claim the combination of a stationary shear, a moving cutter and a clamping bar, actuated by springs, to hold the material to the bed while being cut, as and for the purpose specified.

Second, I claim the combination of a stationary shear, a moving cutter, a spring clamping bar, and mechanism, substantially as specified, between the moving shear and the spring clamping bar, whereby the upward movement of the shear releases the spring clamping bar, substantially as set forth.

Third, I claim forming the clamping bar with a beveled edge next to the shears, for the purposes specified.

Fourth, I claim the sustaining slide rod, t, fitted substantially as specified, in combination with the spring clamping bar, for the purposes set forth.

Fifth, I claim the movable sustainer, v, in combination with an adjustable gage, e, for the purposes specified.

48,651.—Boot Counter Machine.—John Brooks and Charles F. Sylvester, North Bridgewater, Mass.:

We claim the combination and arrangement of the edge cutters, y y', the main cutter or knife, D, and mechanism for feeding the strip of leather to such cutters, the same being in order that such strip may not only be separated into counters, but each counter be reduced or trimmed on its opposite longer or curved edges, substantially as specified.

We also claim the combination of the rotary platform, C, and its elevating and turning mechanisms, with the stationary foot, B, the tilting knife, D, its stationary abutment, m, and movable supporter, P, the whole being arranged and the knife provided with springs, substantially as described.

48,652.—Governor Valve.—Oliver L. Brown, Manitowoc, Wis.:

I claim the combination of the projecting valve stems, d d', arms, F, screws, I I', conical valve, D, formed with trapezoidal openings, l, annular seat, H, with rectangular openings, h, steam chamber, B, inlets, a, and outlet, b, all arranged to operate as specified.

[This invention relates to a valve which is provided with a series of cavities and works in annular seat, which is surrounded by a steam chamber, and perforated with a series of apertures or slots corresponding in number and position to the cavities in the valve, in such manner that by turning the valve in its seat said cavities can be made to register partially or wholly with the apertures in the seat, and more or less steam passes through the valve.]

48,653.—Coupling for Carriages.—John Bundy, Irondequoit, N. Y.:

I claim the combination of the coupling with the reach from the rear axle by means of an arm or rod extending through the upper circular plate in such form that the plate revolves around it, substantially as above set forth.

48,654.—Corn Planter.—Robert Burns, New York City:

I claim the tubes, F, provided with vertical rods or a grating at their outer or rear sides, in connection with the adjustable seed retainers or holders, G, arranged to operate substantially as and for the purpose set forth.

I also claim the plates, I, in combination with the seed retainers or holders, G, all arranged to operate conjointly, substantially as described.

I also claim the wheel, N, provided with teeth, g h r, at one side, and arranged as shown so as to be readily thrown in and out of gear with the wheel, R, in combination with the levers, M O X, for operating the plates, I, seed retainers or holders, G, and knockers, Y Y', for the purposes set forth.

I further claim the frames, U, suspended by the pendents, m, in combination with the furrow openers, T, and adjustable covers, consisting of the flaring plates, n, and plate, o, arranged to operate in the manner and for the objects specified.

[This invention relates to a new and improved corn planter for planting corn in hills and in check rows, and it consists of a novel construction of the seed-distributing device, whereby the quantity of seed in each dropping may be varied as desired, the device prevented from choking or clogging, and the seed-distributing apparatus rendered inoperative whenever desired, as for instance in drawing the machine from place to place, turning the ends of rows, etc.]

48,655.—Seeding Machine.—Robert Burns, New York City:

I claim the perforated reciprocating slides, D, provided with pend tubes, E, and having removable plates, D, placed within them, in connection with the adjustable or pivoted tubes, F, substantially as and for the purpose herein set forth.

48,656.—Car Coupling.—Samuel S. Cheney, Hillsboro, Ohio:

I claim the method of controlling the motions of the piston in the draw head by the shoulder in the rear of the head, B, and the pin, F, which traverses the slot, G, the whole arranged substantially as described and represented.

48,657.—Cider Mill.—William and Lewis Clayton, West Philadelphia, Pa.:

First, We claim the combination of the cylinder, g, sectional pieces, f, adjustable metallic slips, h, with sharpened edges and flexible flap, d, in a cider mill, as and for the purposes herein set forth.

Second, The flexible flap, d, arranged as and for the purposes described.

[This invention relates to a peculiar arrangement of knives and scrapers for cutting the apple into thin slices or pieces, in connection with a flexible flap for cleansing the knives as they revolve, whereby the cider mill is rendered very effective and expeditious in operation.]

48,658.—Harvesting Machine.—Isaac H. Collar, Poughkeepsie, N. Y.:

I claim the application of the sleeve, D m, with the crank shaft, A, pitman, C, and sickle, B, to harvesting machines, substantially as and for the purpose herein described.

48,659.—Artificial Arm.—John Condell, Morristown, N. Y.:

First, I claim the appendage, Fig. 4, which is adapted to maintain its place by means of its auxiliary attachment, so as to afford two definite and practically rigid points, D' D'', to which the flexor and extensor straps or cords are to be attached, so as to produce those motions by the forward and backward movement of the stump.

Second, The cord, a c, or its equivalent, with or without the intervening lever, d, and attached substantially as described, by which the forward motion of the metacarpus is obtained.

Third, I claim attaching the flexor and extensor cords or straps to points on the front and rear of the shoulder joint, so as to be brought into action by the forward and rearward motions of the stump.

Fourth, I claim the combination of the flexor and extensor straps with the rocking frame, L, or its equivalent, which connects by link or otherwise with the fore-arm.

Fifth, I claim the flexor spring, L, attached to the socket and to the rocking frame, L, or its equivalent.

Sixth, I claim the combination of the spring, N, with the arm, P, on the axial bolt, and the rocking frame, L.

Seventh, I claim the spring, Z, with its tendons, Y F, or their equivalent, and extending from a point in the fore-arm to a point back of the center of vibration of the metacarpus, substantially as described.

Eighth, I claim articulating the metacarpus to the end of the fore-arm by a pivoted point or points, so as to be moved in either direction by appropriate springs or cords, which are attached to the metacarpus at points on opposite sides of the axis of vibration.

Ninth, I claim constructing the fore-arm as described, with a presentation of the hand.

Tenth, I claim operating the fingers or thumb by the motion, however induced, of the metacarpus.

Eleventh, I claim pivoting the frame piece, m, of the fingers to a point on the metacarpus, and the rods which, under the motion of the metacarpus, primarily induce the deflection of the fingers to a point on the fore-arm.

Twelfth, I claim pivoting the second joint of the frame piece, q, to a point on the frame piece, m, and the rod which gives the additional deflection due to the second joint to a point attached to or connected with the metacarpus.

Thirteenth, I claim giving the additional deflection due to the terminal section or first joint of each finger by a rod attached to it, and to a point on the frame piece, m.

Fourteenth, I claim governing the motion of the thumb by a rod attached to the end of the fore-arm, which, under the vibration of the metacarpus, influences the frame piece, x, and gives the deflection due to the second joint of the thumb.

Fifteenth, I claim giving the deflection due to the first joint of the thumb by means of the rod, y, which performs that office, as the frame piece, x, is vibrated by the rod, Z, when the metacarpus is moved.

48,660.—Artificial Leg.—John Condell, Morristown, N. Y.:

First, I claim the adjustable pad, B, or plate within the socket, for the purpose of adapting the capacity of the socket to the stump, substantially as set forth.

Second, The bridge piece, K, which is supported on the frame, G, and upon the bolt, F, and affording the superior point of attachment for the extensor spring, I P P', substantially as described.

Third, I claim the hamstrings, N N, arranged substantially as described and attached to the posterior portions of the thigh and leg, to act as checks to the forward motion of the leg, in combination with the arrangement for adjusting their tension.

Fourth, I claim the extension spring, consisting of the muscular or spring portion, L, the tendon, P, and the bifurcated tendon, P', the insertion of the upper tendon being at the bridge piece, K, which bears up the knee belt, and the lower insertion being in the toe piece, substantially as described.

Fifth, I claim the construction of the ankle joint, consisting of the socket in the foot, and the ball, P, attached by its neck, and the iron frame, Q Q', to the leg, and having a stud upon it, fitting its appropriate recess in the socket in the foot, so as to prevent vibration in a horizontal plane, while leaving the joint free for motion in vertical planes, as described.

Sixth, I claim the elastic straps, a b, proportioned as to length and strength, substantially as and for the purpose described.

Seventh, I claim the yoke, Fig. 4, which derives its rigidity and freedom from tendency to displacement from its ultimate point of auxiliary attachment, from whence the straps proceed over the shoulders, so as not alone to bring the weight upon the frame work of the body, but also to enable the shoulders, by their motion, to influence the motion of the artificial limb.

48,661.—Wood-bending Machine.—Matthew F. Connett, Evansville, Ind.:

I claim the combination of the uprights, b, carrying rollers, a, the curved formers, J, and the sliding blocks, e f, arranged and operated substantially as described, for the purpose set forth.

48,662.—Instruments for Ripping Sutures in Cloth.—F. B. Converse, New York City:

I claim the implement for ripping seams herein shown, constructed substantially as above described.

[This invention relates to a very convenient and important implement, by means of which seams of sewing in cloth or other materials can be readily and with ease ripped, with no danger of cutting the material; it is applicable both to machine and hand sewing.]

48,663.—Carpenter's Gage.—B. T. Currier, Boston, Mass.:

I claim ranging the adjustable stand, I, which carries the marking wheel, L, to traverse in the slot, G, of the gage bar, B, substantially as described.

48,664.—Photographer's Decanter.—G. W. Doty, Ravenna, Ohio, and E. A. and W. F. Stein, Portage, Ohio:

We claim the above-described decanter, when provided with the stop-cock tube and cork, substantially in the manner and for the purposes set forth.

48,665.—Hay-fork.—Charles L. Driesslein, Chicago, Ill.:

First, I claim in combination with an ordinary rigid fork and its handle, a hinged and swinging fork or shield, D, actuated by a cord or rope, substantially as and for the purpose described and represented.

I also claim weighting or overpoising the tines or arms of the swinging fork by means of the ball, E, or their equivalents, to cause it to fall with more readiness and quickness as and for the purpose described.

I also claim, in combination with the permanent and swinging forks, the arms, G, for preventing the fork from entering the material to be moved by it too far, and thus interfering with the free and unencumbered action of the swinging fork, substantially as herein described.

48,666.—Churn.—Worden Edmister and Stephen Johnson, Mount Vernon, Ohio:

We claim the dasher, C, composed of two parts, constructed as shown, connected together and applied to the shaft, D, so as to admit of being adjusted higher and lower thereon, substantially as and for the purpose specified.

[This invention relates to a new and improved dasher, and a particular means for operating the same, whereby butter may be produced from the cream in a short space of time, and with but a moderate exertion or expenditure of power on the part of the operator.]

48,667.—Coupling for Shafts of Boring Tools.—James Esler, Brooklyn, N. Y.:

I claim preventing the lower section of the boring rod, A, from turning away or being disconnected from the rod, C, by means of the sleeve, E, and the key, H, the said key passing through an aperture in said sleeve, by and past one of the squares formed, or said section, A, as and for the purpose set forth.

48,668.—Flour Sifter.—Horatio Fairbanks, Boston, Mass.:

I claim the revolving shaft, C, carrying a series of angular projections, in combination with a box or hopper, A, and sieve, B, substantially as and for the purpose set forth.

I also claim, in combination with the above, attaching a rubber strip to one or both sides of the sieve, B, substantially as and for the purpose described.

48,669.—Excavator.—H. W. Farley, Hannibal, Mo.:

First, I claim the shaft, G, with its scoops, H, in combination with the block and tackle devices for raising, substantially in the manner and for the purpose described.

Second, The partially rotating scoops, operated by a lever or levers on the shafts, to adjust their position or discharge their load.

Third, I claim the combination of the crank, W, and its connecting gearing with the rope, S, and counterbalance weight, T, for raising the shaft, G, and its scoops.

48,670.—Corn Sheller.—G. W. Fitts, South Hampton, N. H.:

I claim the arrangement of the discharging throat, G, and its back board or part, X, with the curved chute, F, and the wheel, C, to operate as specified.

48,671.—Camp Bedstead.—Christian Fostensen, Hans Iversen and Charles J. Skow, Racine, Wis.:

I claim the combination and arrangement of the sacking, a, side bars, b b, short end pieces, c and d, bars, f and g, rod, i, plates, n n, arms, p and q, plates, t t, bars, y, and legs, u u, substantially as described.

Second, attaching the two ends of the mattress or sacking used for the bedstead to and within a swinging frame of its sidebars, arranged and operating substantially in the manner and for the purposes specified.

[This invention relates to improvements in bedsteads, whereby when not in use they can be neatly folded up into a compact shape and thus be convenient for transportation or storage.]

48,672.—Apparatus for Distilling.—C. F. Frederici, New York City:

I claim a distilling apparatus, composed of a series of hollow drums, (two or more) connected by oblique pipes, and provided with gudgeons on which it revolves, substantially as and for the purpose set forth.

Also, the combination of the pipe, E, and hollow gudgeon, a', with the drums, C, with or without oblique pipes, D, constructed and operating substantially as and for the purpose described.

48,673.—Cock.—J. P. Gallagher, St. Louis, Mo.:

I claim, First, The tube, F, arranged relatively with the body, A, of the cock or faucet, and the chamber or barrel, D, and the valve, B, in connection with the tube, C, disk, G, and escape spout, H, substantially as and for the purpose specified.

Second, The groove, b, in the periphery of disk, G, when used in connection with the parts specified in the first claim for the purpose of affording an annular chamber around the disk, G, as described.

48,674.—Pipe Coupling.—Annin M. George, Nashua, N. H.:

I claim the combinations of the projections, heads or buttons, b, b', of the bolts, B B', and the inclined surfaces, k k' l' l' k' l' P, with the two parts of the coupling, substantially as and for the purpose set forth.

48,675.—Chain Holder.—Samuel Gladding, Providence, R. I.:

I claim, First, The movable fingers, d d, in combination with the catch, b, and the mortises, c c, substantially as described and for the purposes set forth.

Second, The combination of the fingers, d d, jointed at, f, mortised at, c c, with the catch, b, provided with the pins, l, in connection with the wedge, h, constructed and arranged substantially in the manner described for the purposes set forth.

48,676.—Tool for Lifting Stove Covers, Etc.—Porter J. Gladwin, Boston, Mass.:

I claim the within described tool consisting essentially of the handle, A, with its stationary jaw, B, and slot, b, in combination with the movable jaw, C, and its arm, c', the whole arranged and operating as and for the purpose set forth.

48,677.—Band for Head Dresses.—Nathaniel Grant and George Downs, Providence, R. I.:

We claim the improved band for ornamental head dresses made of the material herein described as a new article of manufacture.

48,678.—Combined Lamp and Stove.—C. B. Guy, Lybrand, Iowa:

I claim a lamp combined with a stove and register in the manner substantially as herein shown and described, so that the smoke and odor emitted from the lamp may be carried off by the stove pipe, and the rays of light admitted into the apartment or shut off from the same when desired, substantially as set forth.

[This invention consists in combining a lamp with a stove in such a manner that the smoke and offensive odor emitted from the lamp will be carried off by the tube of the stove. The invention is more especially designed for sick rooms, as the odor from lamps is not only very disagreeable but also injurious to persons in ill health.]

48,679.—Gang Plow.—A. Hammond, Jacksonville, Ill.:

I claim, First, The segment rock, L, pawl, M, and foot lever, O, all arranged and applied to the plank or timber, D, and beam, A, substantially as and for the purpose specified.

Second, The button, P, when applied to the plank or timber, D, and used in connection with the rack, L, pawl, M, and foot lever, O, for the purpose set forth.

[This invention relates to a new and improved gang or trench plow and it consists in a novel construction and arrangement of parts, whereby the plows may be readily adjusted higher or lower as may be desired, and also readily raised temporarily out of the ground when necessary, as for instance turning at the end of the furrow or field.]

48,680.—Machine for Granulating Tobacco.—J. H. Harris, Newark, N. J.:

I claim the combination in a machine for granulating tobacco of the vibrating vessel, D, having open sides, with a corrugated roller revolving therein, substantially as above described.

[This invention consists in an improved machine for granulating or dividing the leaves of tobacco into minute divisions for smoking in pipes, wherein a corrugated beater roller is made to revolve within a vibrating vessel, whose sides are composed of wire cloth on a mesh of like character, so that the tobacco is broken up and delivered in small pieces, through the meshes of the wire cloth, into a box below.]

48,681.—Cryptographic Alphabet.—K. H. Hawley, Signal Corps, Army of the Potomac:

I claim a cryptographic alphabet, arranged substantially in the manner and for the purpose specified.

48,682.—Boot Heel.—Francis D. Hayward, Malden, Mass. and Pascal Stone, Charlestown, Mass.:

We claim the improved heel or parts, A B, as made with the dovetail connection, elastic as described, or with the circular or polygonal elastic dovetail connection as explained, the whole being so that the tread part, B, may be either revolved or adjusted relatively to the part, A, substantially as and for the purpose specified.

48,683.—Washing Machine.—John Heinlein, Galena, Ill.:

I claim, First, The air chamber, E, arranged relatively with the wash board, C, to operate in connection therewith, substantially as and for the purpose specified.

Second, The combination of the swinging rollers, e, wash board, C, and air chamber, E, all arranged and combined to operate in the manner as and for the purpose set forth.

[This invention relates to a new and improved clothes-washing machine of that class in which a swinging pressure roller frame is employed in connection with an elastic wash board. The invention consists in a novel construction and arrangement of the parts above recited in connection with an air chamber whereby the clothes are acted upon in the most efficient manner both as regards the pressure and friction to which the clothes are subjected, as well as to the turning of the clothes in the suds box in order that the whole mass may be properly acted upon.]

48,684.—Flour Bolt.—Samuel Heflebower, Alexandria, Va.:

I claim making a radial prolongation, c, to the wings of the fan at the tail end of the horizontal or nearly horizontal bolt, the said radial extension of the wing or wings beyond the main portion of the fan being adapted to cause a current of air to be drawn through the bolt in the manner and for the purpose described.

Second, I claim the plate, N, fig. 3, in combination with the scooped shaped dipper.

48,685.—Disk Knives.—Anton Hehniger, New Haven, Conn.:

I claim the combination of two blades, B and C, with the spring, g, when the parts are constructed, arranged and fitted for use, substantially as herein described.

48,686.—Metallic Packing Boxes.—H. Z. Hopkins, San Francisco, Cal.:

I claim the tapering split or sectional lining, C, with expanding wedge, D, in combination with the box, A, and follower or cap, B, constructed and operating substantially as and for the purpose described.

48,687.—Machine for Making Wagon Wheels.—J. M. Howe, Portland, Oregon:

I claim the annular slide, G, with the ring, H, attached, and the latter provided with the arms, f, and the slides, g, in connection with the shafts, C C' and D, provided with cutters, G and C', all arranged substantially as and for the purpose herein set forth.

[This invention relates to a new and useful machine for manufacturing parts of wheels for vehicles, to wit, boring the felloes, sawing them to the correct level, tenoning the spokes at both ends, sawing them to the required length, and planing the felloes simultaneously, at three sides, and for planing and moulding other articles or work.]

48,688.—Carriage Top.—K. Thomas Hurlbert, Lyons, N. Y.:

I claim the combination of the pivoted socket, D, guide, a, and plate, C, so arranged as to allow the carriage top to be easily applied

or removed and to be turned half way back, substantially as described.

I also claim the construction of the top consisting of the jointed bows, E E' E'', single toggle levers, G G, and suitable covering, A, the whole so arranged as to be compactly folded up, substantially as herein set forth.

I also claim the arrangement of the pivoted socket, D, and guide, a, of the seat, and the bows, E E', toggle levers, G G, and covering, A, of the top, substantially in the manner and for the purpose herein specified.

48,689.—Process of Curing Tobacco.—W. W. Huse, Brooklyn, N. Y.:

I claim the process, substantially as herein described, of curing tobacco, which process consists in subjecting it to the action of artificial heat and steam to induce the required fermentation until nicotine is evolved, and then stopping the further progress of fermentation by opening the packages and thoroughly drying every part, substantially as described.

48,690.—Binding Attachment to Reaping Machines.—John S. Jones, Covington, Ind.:

I claim, First, The combination of the rack, a, pinion, b, wheel, C, bevel pinion, d, curved wings, G, spring, A, hand, N, fork, T, and triangle, q, for the purposes set forth.

Second, I also claim the rod, I, or its equivalent in combination with twisting devices, J and K, for the purpose described.

Third, I also claim the arrangement of the shear bed, F, and its wings, G, in combination with the elevator, X, that lifts them, the device, Y, that operates that elevator, the rods, m, that lay over the shear bed holding the straw down while the wings press it.

48,691.—Pump.—Horace M. Keith, Commerce, Mich.:

I claim the reservoir, B, the valves, m and n, the cut off, S, the swipe pole, I, and the bucket, F, and the cylinder, C, the whole constructed, arranged and operating as and for the purpose, substantially as herein set forth.

48,692.—Piston Packing.—Edwin Kendall, New Lebanon, N. Y.:

I claim a packing for pistons consisting of a coiled spring, C, secured between the heads, B B, and adapted to operate substantially as herein described.

48,693.—Construction of Glass Cases.—E. D. Kinney and Caleb Wright, Philadelphia, Pa.:

We claim the within described case composed of the plates of glass arranged in respect to each other, held by the angular slips of the frame, and supported by the bent pieces, e, all substantially as described.

48,694.—Water Wheel.—Dr. J. Kindleberger, Springfield, Ohio:

First, I claim the springs applied to the opening and closing mechanism of the gates, where a plurality of gates are used for a single wheel, so that any one of said gates in case of being prevented from closing will not prevent the closing of the others as herein set forth.

Second, The arrangement of the bent arms, C, and levers, D, with the set screws, e, springs, g, plate, E, the pendant pins, h, the segment, G, and pinion, H, for operating the gates, B, as set forth.

Third, The arrangement of the buckets, I, of serpentine form, substantially as described.

Fourth, The cap, I, through which the shaft, J, of the pinion, H, passes, and which covers and protects the parts for opening and closing the gates, as herein set forth.

48,695.—Damper.—John Knickerbocker, Hartford, Conn.:

I claim as a new improved article of manufacture, viz. The combination of the plates, b, with the damper, c, and adjusting rod, g, with their connections, substantially as and for the purpose described.

48,696.—Gang Plow.—J. H. La Boyteaux and C. A. Ashton, Jacksonville, Ill.:

I claim the adjusting of the axle, A, and consequently of the plow beams and plows, by means of the lever, J, connected with the axle through the medium of the chain, G, arranged substantially as described, for the purpose of adjusting the plows to suit the surface of the ground over which they work.

Second, The pivoted plow beams, N M, in connection with the bar, S, lever, T, and chain, X, all arranged to operate in the manner substantially as and for the purpose set forth.

[This invention consists in a new and improved means for raising the plows out of the ground when required and also for adjusting the same so that they may be made to work in a proper relative position with the ground when the latter has an inclined or uneven surface.]

48,697.—Method of Preparing Flour and Meal for Transportation.—Edwin B. Larcher, New York City. Antedated June 28, 1895:

I claim the preparation of flour or meal for its preservation, by compressing the same, as and for the purposes specified.

48,698.—Self-acting Gate.—John Lee, Massillon, Ohio:

First, I claim sliding block, E, and pivot, d, or their equivalent, constructed and operating as set forth.

Second, Hinging the weight, H, to the top of the upper rail, in the manner described, or its equivalent.

Third, Operating the latch bar, G, by means of the picket, F', and slots, Y, or their equivalent, as set forth.

Fourth, The cast-iron piece, P, or its equivalent, operating as described.

Fifth, The combination and arrangement of shafts, L and N, and lever, Q, or their equivalent, operating as described.

48,699.—Method of Forming Blank Clips for Single-trees.—Michael Loughran (assignor to himself and James R. Loughran), Pittsburgh, Pa.:

I claim a new article of manufacture, bars of iron having a raised brad running longitudinally on one or both sides, whether said brads are in the center of the bar or near one edge, and with flattened spaces on one or both sides at regular intervals along the body of the bar, made by depressing the brads in certain places, without regard to the shape of the brads, so as to form clips and clevises, in the manner herein shown.

48,700.—Vegetable Slicer.—Thomas Mason, Boston, Mass.:

I claim the combination of the series of conductors, b, with the single rotary cutter stock, d, arranged to operate together substantially as set forth.

48,701.—Portable Fence.—John M. May, Janesville, Wis., and Edwin B. Godfrey, Oshkosh, Wis. Antedated June 23, 1895:

We claim, First, Picket, C, or its equivalent, when used in constructing a fence, substantially as and for the purpose described.

Second, Braces, F F', or their equivalent, when made substantially as described, and used in combination with picket, C, or its equivalent, and base, B, substantially as and for the purposes described.

Third, A hinge or joint, when formed by means of picket, C, or its equivalent, and the perforated ends of rails, and supported by base, B, and braces, F F', substantially as and for the purpose described.

48,702.—Feather Renovator.—Wm. McArthur, Philadelphia, Pa.:

I claim, First, The casing, B, its shaft, C, and arms, h and h', in combination with the case, A, and the pipes, b c f and g, or their equivalents, the whole being arranged and operating substantially as and for the purpose described.

Second, The combination of the casing, B, chamber, d, and perforated or gauze plate, e.

Third, The frames, D and E, with their gauze or perforated plates adapted to the two halves of the casing, B, substantially as and for the purpose herein set forth.

Fourth, The long and short tapering arms, h h', arranged on the shaft, C, as set forth.

Fifth, The combination of the steam-tight box, A, and its pipes, f and b, or their equivalents, with the casing, B.

48,703.—Carpenter's Gages.—James McCrum, Locust Grove, Ohio:

I claim the employment or use of the loose head, D, and spring, E, or its equivalent, in combination with the bar, B, and adjustable heads, A, C, constructed and operating in the manner and for the purpose substantially as herein shown and described.

[This invention consists in the employment or use of a loose head and spring, or its equivalent, applied in combination with the ad-

justable head and bar of a gage, in such a manner that by the action of said spring and loose heads the cutters or marking points will be guarded when the gage is used to mark any material.]

48,704.—Device for Cutting Cornstalks on the Ground.—Thos. W. McDill, Perry, Ill.:

I claim the knives, E, attached to triangular heads, D, keyed on a shaft, C, which is placed within a suitable frame, A, and all arranged to operate in the manner substantially as and for the purpose set forth.

[This invention relates to a new and improved device for cutting down standing cornstalks in the field, and into pieces of such length that they may be plowed under the soil with an ordinary plow. It consists in the employment or use of a suitable frame, provided with a draught pole, and a shaft having tri-lateral heads upon it, to which knives are attached at the angles or corners, all being arranged in such a manner as to operate very efficiently for the purpose specified.]

48,705.—Wool Press.—T. N. Morse, Grattan, Mich.:

First, I claim a machine for binding fleeces of wool, constructed and operated as shown, having bands, C, which are attached to and detached from the windlass by means of a bar, W, and groove, Y, substantially as and for the purposes above set forth.

Second, The combination of the side leaves, a, transverse leaves, C', and grooves, d' d', all constructed, arranged and employed, substantially as and for the purposes set forth.

[The object of this invention is to put up fleeces of wool in square or nearly square forms, so as to be easily handled, and be capable of being packed for storage or transportation in less space than is now required.]

48,706.—Apparatus for Carbureting Air.—J. F. Brichard, Milwaukee, Wis.:

First, I claim the vertical tubes, b, for exposing the fluid of the hydro-carbon to the current of air, substantially as herein recited.

Second, The arrangement of the vertical metal tubes, c, or their equivalents, in relation to the tubes, b, as herein described.

48,707.—Pump.—Aron Carver, Little Falls, N. Y.:

I claim the piston, constructed substantially as described; that is to say, with a supplementary upper valve, restraining the downward pressure of the contents of the piston rod or pump tube upon the lower valve of the piston, substantially as described and represented.

Second, I also claim so fitting the piston rod of a double-acting pump to the working cylinder thereof, as that it can be detached and withdrawn thereout and replaced thereon at pleasure, automatically, by increasing the length of the stroke substantially as described.

Third, I also claim separating the cylinder of a pump from the pump tube above by a removable inner collar, within which the piston top works, and which is capable of being detached, so as to allow the piston to be withdrawn and replaced again after the piston is replaced, by means substantially as described.

Fourth, I also claim connecting the valve box, I, forming the lower part of the working cylinder to the outer cylinder, A3, by means of the screw, p, constructed and applied substantially as above described.

48,708.—Dental Hammer.—James C. Dean, Chicago, Ill.:

I claim, First, The combination of the hammer, D, with the device for holding dentists' plugging points, substantially as described.

Second, Providing for regulating the force of the blow of a hammer when the latter is applied to the holder of a plugging point, by the means substantially as described.

Third, The combination of a tool holder, c, spring hammer, D, and the device or devices for actuating said hammer, substantially as described.

48,709.—Pipe Coupling.—Chas. W. Emory, Dorchester, Mass.:

I claim the combination of the thimble, a, with the screw cap, c, constructed and operating as herein described.

48,710.—Condenser.—Addison C. Fletcher, New York City:

I claim the arrangement of the fan, G, or its equivalent, and the inlet openings, a, a', of the air box, B, substantially as herein described, in relation to the upright steam radiators, A, A', of an apparatus for condensing steam and heating air, whereby there is produced over the surfaces of the said radiators an artificial upward circulation, in which the natural upward circulation is taken advantage of, substantially as herein set forth.

48,711.—Distillation of Alcohol, Etc.—Alexander Fries, Cincinnati, Ohio:

I claim the mode substantially as set forth of distilling purified spirits direct from the mash.

48,712.—Cooking Range.—E. G. Niles, Cincinnati, Ohio:

I claim, First, The supplemental fire-grate, E, fitted in the top plate of the range directly over the fire-chamber, B, and supplemental grate, E, substantially as described.

Second, The water chamber, G, cast with the top plate, D, and placed in relation with the fire chamber, B, and supplemental grate, E, substantially as described.

Third, The arrangement of the flues, b c, provided with partitions, d, substantially as and for the purpose specified.

[This invention relates to certain improvements in cooking ranges, whereby air may be heated for warming apartments other than that in which the range is placed, and an economical water-heating attachment obtain and perfect control over the fire, so as to economize in fuel, and to heat perfectly the ovens for baking purposes.]

48,713.—Drying and Preparing Crucibles.—Geo. Nimmo, Jersey City, N. J.:

I claim, First, Drying and preparing crucibles, by gradually moving them from the cool part of a flue toward the fire, either inside or outside said flue, on a carriage, or shifted by hand.

Second, The construction of a flue, in combination with carriages, as described, and for the purpose specified.

48,714.—Manufacture of Gas.—Chas. Noble, New York City:

I claim the employment or use in the manufacture of gas of lumps produced from coal dust or waste coal, substantially in the manner and for the purpose set forth.

48,715.—Wheel for the Propulsion of Vessels in Shal Water.—Otis Olds, Aurora, N. Y.:

I claim the combination of the traction or ground wheel, H, with the compound frame, A B (including the hand wheel, I, and lifting ropes and pulleys), so that a purchase may be obtained to lift upon the bow of the boat, substantially as described.

48,716.—Stove Pipe Drum.—Joseph C. Paine, Dubuque, Iowa:

I claim the combination of cone, A2, within the drum, with the hot air chamber, B' B'', the tubes or pipes, D' D'' and E' E'', the double deflectors, G' G'', and the double damper, F1 F2, for the purpose and in the manner set forth.

48,717.—Pen Distributor.—Stephen A. Potter, Philadelphia, Pa.:

I claim the peculiar construction and combination of a case of drawers, so arranged with partitions, H H, divisions, A A, catches, C C, or their equivalents, for the purpose and in the manner substantially as shown and described.

48,718.—Washing Machine.—S. Safford Putnam, Dorchester, Mass.:

I claim a receptacle having a series of buckets so arranged and inclined upon its sides as that the series on one side shall incline upward, while the series on the opposite shall incline downward, and the series on the bottom incline from right to left, while the series on the top shall incline from left to right, so as to form buckets for dipping up and throwing the water over the clothes, as well as to turn and rub them, as herein set forth.

48,719.—Preparation of Dessicated Vegetable Extracts.—William J. Rand, Brooklyn, N. Y.:

I claim as an improvement in the process of obtaining dessicated

or highly concentrated juices or soluble extracts of animal or vegetable substances, first obtaining the juices or soluble extracts of such substances by heating or boiling them under a pressure greater than that of the atmosphere, and afterward straining and concentrating the juices or extracts so obtained by evaporation in vacuo, substantially as herein described whereby I am enabled to obtain in the concentrated or dehydrated product all the soluble or reducible matters contained in the substances.

I also claim forcing the juices, extracts or reducible substances, obtained by the direction of animal substances through strainers, by means of the pressure of steam in the digester, substantially as herein specified.

I also claim the steam pipe, H, and its cock, a, and the stop valve or cock, G, applied in relation to each other and to the digester and receiver, and in combination with the pipe, C, substantially as and for the purpose herein specified.

And I further claim the combination of the digester, A, pipe, C, one or more strainers, E, receiver, D, and vacuum pan, I, the whole arranged and operating substantially as and for the purpose herein specified.

48,720.—Pump.—Franklin Ranson, Buffalo, N. Y.:

I claim the arrangement of the inlet valves, I P, and the divided chamber, C, having two compartments of greater capacity than the displacement of the piston, in combination with each other and with the cylinder of the pump, substantially as and for the purpose herein specified.

48,721.—Cock.—Joseph Regester, Baltimore, Md.:

I claim, first, The elastic capsule as arranged with the valve stem of a stop cock, substantially as described.

Second, Seating the lower end of a valve stem loosely upon a valve, d, having its support upon a soft packing, substantially as described.

48,722.—Ventilating Apparatus.—E. Y. Robbins, Cincinnati, Ohio:

First, I claim the arrangement for warming the floor or portions of the floor by causing the hot air from the furnace to circulate through a hot air chamber, C, and return to the bottom of the furnace through the return pipe or flue, D, substantially as set forth.

Second, I claim the construction of the outer fresh air or warm air channel, x, Fig. 1, entirely separate and distinct from the inner hot air channel, y, the air in the latter, heated by contact with the hot surface of the iron, being excluded from the room, and only used for carrying heat to the hot air chamber beneath the floor or in the wall, while the air from the former, x, being warmed entirely by contact with the outer surface of the brick or earthen wall or casing, a, is conducted into the room for respiration.

48,723.—Apparatus for Curing and Drying Fish.—Benjamin Robinson, East Gloucester, Mass.:

I claim the combination with a fish flake of a screening frame, arranged to operate substantially as and for the purpose set forth.

48,724.—Water Wheel.—Timothy Rose, Cortlandville, N. Y.:

I claim the central angular floats or brackets, b b, in connection and combination with the reversed end brackets, e e, as above set forth, and working in the manner herein described.

48,725.—Winding and Setting Watches.—Henry Rothfelder, New York City:

I claim, first, The combination of the winding lever with the ratchet wheel and spring barrel, in the manner specified.

Second, I claim the shank fitted to slide in a mortise through the periphery of the case, in combination with the winding lever, spring barrel and ratchet, as set forth.

Third, I claim the arm or crank, z, affixed to the square for the minute hand, by which to set the watch, as specified.

48,726.—Chronometer Escapement.—Henry Rothfelder, New York City:

I claim the arm, J, joined to the lever, F, and provided with a spring, as set forth, in combination with the change pin, D, detent, E, and escapement, as specified.

48,727.—Pocketbook.—Louis Saarback, Philadelphia, Pa.:

I claim the elastic metal band or strip, B, combined with and arranged in respect to a pocketbook or portemonnaie, in the manner described, and having bent ends adapted to each other, as and for the purpose set forth.

48,728.—Process of Imparting Age to Wines.—John Searle, San Francisco, Cal. Antedated June 15, 1865:

I claim the introducing the heat by steam or otherwise to the wine itself by means of metallic pipes or chambers passing through the casks or vessels, substantially as set forth.

48,729.—Projectile for Rifled Fire-arms.—Christian Sharps, Philadelphia, Pa.:

I claim the within described projectiles, having a body tapering from the rear toward the front end, in combination with the wedge-shaped projections, a, the whole being constructed and adapted to the bore of the barrel and to the case, B, substantially as and for the purpose herein set forth.

48,730.—Low Water Signal.—Thomas Shaw, Philadelphia, Pa.:

I claim the described apparatus in combination with described animal or vegetable substance, when used for the purpose set forth.

48,731.—Flax-pulling Machine.—John Silvers, Lamberts-ville, N. J.:

I claim, first, The use of one or more elastic belts or bands, made of india-rubber or gutta percha, or of any of their respective elastic compounds, or of any other suitable elastic material, for the purpose specified.

Second, Coating the drum between which and the belt the plants are clamped, as described, with a sheet or surface of india-rubber or any other suitable elastic material, for the purpose specified.

Third, The use of the covered bar, X, attached to or forming a part of the platform of the machine, and arranged with regard to the drum, thereof by which the plants are pulled substantially as herein described and for the purposes specified.

Fourth, Passing the elastic belt around a pulley or pulleys, when fixed within the frame, a, and adapted to be turned by means of the shaft, b, and retained in the desired position by the ratchet wheel, c, and pawl, a, whereby the tension of the said elastic belt may be varied, as described.

[This invention relates to some important improvement in flax or hemp gathering machines whereby their effectiveness in operation is greatly increased and the flax is pulled or gathered with no injury to its fiber.]

48,732.—Petroleum Stove.—Hamilton E. Smith, Cincinnati, Ohio:

First, I claim the series of petroleum or coal oil burners, B B' B'' B''' in connection with a corresponding number of separate hot air chambers or series, G and N, having ventages for spent air at their bottom portions only, substantially as set forth.

Second, I claim in connection with two or more independent burners, B B', the oven, G, capable of vertical subdivision in the manner and for the purpose explained.

Third, In the described combination with a petroleum stove, I claim, in this connection, the tubular hot air chambered boilers, whose ventages for the spent air is at the bottom of the air chambers, as set forth.

48,733.—Fruit Dryer.—Adam Snyder, Clyde, Ohio:

I claim the employment of one or more fruit-drying sections in combination with the regulating diaphragm, substantially in the manner and for the purpose herein shown and described.

This invention relates to a novel arrangement and construction of a fruit-drying apparatus to be applied to cooking stoves, etc., whereby the currents of heated air passing through it can be regulated at pleasure, and the fruit dried with the utmost dispatch and economy.]

48,734.—Meat Chopper.—Alfred F. Spaulding, Winchendon, Mass. and Salmon M. Scott, Worcester, Mass.:

We claim as our invention in the above described meat chopping machine the combination of the four cranks, k l m p, and the connecting rod, a, or the mechanical equivalents thereof, with the remainder of the mechanism, or its equivalent, for operating the knives, the whole combination being productive of a compound motion of each knife, substantially as described.

We also claim the combination of the guard, r, with the rotary tub and one or more knives provided with mechanism for moving such knife or knives up and down in the tub.

48,735.—Horse Collar Fastener.—A. Steinbach, Evansville, Ind.:

I claim the plate, A, attached to one side or part of the upper part of the horse collar, and provided with the slot, C, having an enlarged part, and an inclined ledge, c, at each side as arranged with the plate, D, attached to the other side or part of the collar, and having a bar or arm, E, provided with a projection or lip, g, at each side of its outer part, substantially as and for the purpose set forth.

[This invention relates to a new and improved lock or fastening for connecting together the upper ends of a horse collar. The object of this invention is to obtain a lock or fastening of the kind specified which may be readily manipulated, that is to say, fastened and unfastened, and which may be constructed and applied at a trifling expense and be superior to the buckles and straps hitherto employed for such purpose.]

48,736.—Sleigh.—Isaac Stephenson, Maranet, Wis.:

First, I claim hinging the ends of the runners to each other, substantially as herein set forth and shown.

Second, The guide bars and traversing pieces constructed and operated as herein recited and shown in combination with the hinging of the runners to each other, as herein described.

48,737.—Water Wheel.—J. E. Stevenson, New York City:

I claim the curving of the lower parts of the buckets, K, of the wheel, substantially as and for the purpose herein set forth.

Second, The exposing of the lower parts of the buckets by having the rims, m m, of the wheel at their lower ends cast or formed with recesses, substantially as described to admit of a free lateral discharge of the water from the buckets.

Third, The spiral or coil shaped step, G, in connection with the tubular shaft, E, fixed spindle, A, and screw, H, with or without the bearing, J, substantially as and for the purpose specified.

Fourth, The laterally enlarged helix, B, provided with the beveled or inclined plates, l l, or their equivalents, for the purpose set forth.

Fifth, The employment or use of a screw, J, when applied to or used in connection with a wheel provided with a tubular shaft and a helix, in such a manner that the joint or space between the wheel and helix may be regulated as occasion may require.

Sixth, The combination of the wheel, d, provided with the buckets curved at their lower ends or issues and laterally exposed, the tubular shaft, E, fixed spindle, F, screw, H, and bearing, J, all arranged substantially as described.

48,738.—Coal Stoves.—Thomas L. Sturtevant, Boston, Mass.:

I claim the improved stove, as constructed not only with the radiator, B, and smoke space, D, about the same, arranged with the fire-place, T, and ash-pit, F, as specified, but as provided with a series of air-pipes, H H H, leading into the radiator and going through the fire-place, and with respect to the fire-proof lining thereof, substantially as specified.

And, in combination with the stove so made, I claim the series of lateral air-pipes, b b b, leading out of the lower part of the ventilator and opening through the sides of the case, as specified.

48,739.—Furnace for Melting Metals.—Wm. A. Sweet, Syracuse, N. Y.:

First, I claim so constructing a melting furnace that the temperature of the crucibles can be increased from a minimum to a maximum degree by transferring them from the cooler to the hotter chamber, substantially as described, and for the purposes set forth.

Second, I claim the combination and arrangement of the conical grate and feeding aperture, substantially as described, and for the purposes set forth.

48,740.—Process for Tanning.—William E. Terry, Wyoming, N. Y.:

I claim the process of tanning by means of liquors composed of the several ingredients herein named, when combined in the proportions and employed substantially in the manner herein described.

48,741.—Piano-forte Action.—Jonathan H. Tibbets, Omaha City, Nebraska Territory:

I claim the use in piano-forte actions of a rotating wheel, arranged and operating substantially as and for the purpose specified.

[This invention relates to piano-forte actions and consist of a novel arrangement of the parts composing them, whereby a much quicker, easier and better feeling action is obtained than those hitherto in use, the importance of which is obvious.]

48,742.—Hay Elevator and Stacker.—A. W. Tooker, Harvard, Ill.:

I claim, first, The combination of the crane beams, g g, with a tripod, which is supported upon a foundation frame, when said beams are supported by and applied to their frame substantially as described.

Second, The arrangement of the rope, h, upon a stacker which is constructed without a central turning post, in such manner that the movements of the horse can be made to effect the raising of the load and the turning of the crane arms, substantially as described.

Third, The use of an adjustable hitching hook, A, in combination with a crane, g g, or its equivalent, and the rigging, b, arranged to operate substantially in the manner and for the purpose described.

48,743.—Wick Trimmer.—Cyrus L. Topliff, New York City:

I claim, first, The combination of the fixed cutter, m, and movable cutter, f, arranged in parallel planes, and operating substantially in the manner and for the purposes specified.

Second, In combination with the aforesaid cutters, f and m, I further claim the handle when so pivoted as to move in a plane parallel or coincident with that of the knife, f.

48,744.—Artificial Building Block.—George E. Van Derburgh, New York City:

I claim as a new article of manufacture blocks of artificial stone, formed substantially in the manner herein set forth.

48,745.—Silicated Building Block.—George E. Van Derburgh, New York City:

I claim as a new article of manufacture a silicated building block, formed substantially in the manner herein set forth.

48,746.—Artificial Stone.—George E. Van Derburgh, New York City:

I claim my specified improvement in the production of blocks, tubes, tiles, and other articles of artificial stone, by the use of finely pulverized sand, marble, or other equivalent, analogous substance in combination with the other materials employed in the formation of such artificial stone, for the purpose of filling the interstices between the individual particles thereof, substantially as herein set forth.

48,747.—Solution for Saturating Natural and Artificial Stone.—Geo. E. Van Derburgh, New York City:

I claim the within described silicated composition for the purpose of saturating natural and artificial stones, or as an ingredient in the formation of the latter, substantially as herein set forth.

48,748.—Stump and Grub Extractor.—Izaak Van Kersen, Kalamazoo, Mich.:

I claim the combination of the grub or stump pulling lever, L, and its attachments, with the two-horse cart or dray, the whole being arranged, constructed and operated, substantially as and for the purposes herein specified.

48,749.—Windows.—Sigourney Wales, Boston, Mass.:

I claim the combination and arrangement of the bar, D, and its fastening bolts and catches, or their equivalents, with the window frame and the sash, the same being for the purpose as specified.

I also claim the combination of the flange or rib, f, with the bar, D, and the sash, applied together and to the window frame, as described.

48,750.—Corn Harvester.—Samuel Ward, Lane, Ill.:

First, I claim the bars or beaters, J J, arranged to operate in vertical planes in front of and above the sickle, D, substantially as and for the purpose specified.

Second, The arms, K K, arranged to operate in horizontal planes, and in the described relation to the sickle, D, for the purpose set forth.

Third, The bed, G*, composed of the two shafts, g g, provided with the arms, b, and arranged with cords or chains, H H, for the purpose of discharging the cut cane or corn in gravel from the machine, substantially as described.

Fourth, The arrangement of the bars or beaters, J J, arms, K K, in combination with the sickle, D, and bed, G*, with or without the guard, N, combined and arranged to operate in the manner substantially as and for the purpose set forth.

Fifth, The knife, P, arranged to operate at the rear of the bed, G*, substantially as and for the purpose specified.

48,751.—Coal Stove.—Marshall D. Wellman and James Old, Pittsburgh, Pa.:

First, I claim making the fire-pot of close stoves with its greatest diameter at the level of the fire-bed or grate, an I contracting upwards, substantially as and for the purposes hereinbefore described.

Second, The use of close stoves, in combination with a fire-pot constructed as hereinbefore described, of a double perforated grating, the lower part of which is stationary, the upper part turning thereon, for the double purpose of raking the fire and regulating the admission of air to the fire, substantially as hereinbefore set forth.

48,752.—Fire-place.—Marshall D. Wellman and James Old, Pittsburgh, Pa.:

First, I claim the use of recesses in the back and side walls of the fire-place, or in either of them, the top of which is below the level of the top of the fire-basket, in combination with flutes in the fire walls, for the purpose of preventing the packing of the fuel at the back and sides of the fire, and thus giving the air access to the back part of the fire, and allowing it to pass up the flutes so as to mingle with the unconsumed gas and smoke, substantially as described.

Second, The combination of a low grate or fire-basket, p, having slats between its bars, with the air spaces or recesses, v, in the back wall and overhanging back plate, d, for the purpose hereinbefore described.

Third, The arrangement of a hot air chamber or chambers in the back and side walls of the fire-place, and the sloping or overhanging back wall and air passages in the rear of the fire chamber, for the purpose of more readily heating the air passing through such chambers to warm the apartment, substantially as hereinbefore described.

Fourth, The use of one or more hot air chambers, constructed substantially as described, and placed in the throat of the chimney, so that the smoke and hot air passing up the chimney shall play around or upon them, and thereby heat the air passing through them, for the purpose hereinbefore set forth.

48,753.—Construction of Soap Frames.—Daniel Whitaker, Roxbury, Mass.:

I claim, as a new and improved article of manufacture, a soap frame, made of wrought iron, having its side plates corrugated, and formed in two parts or sections, substantially in the manner described and for the purpose specified.

[This invention relates to a novel manner of constructing soap frames, whereby much strength is secured, and its buckling or twisting from the weight and heat of the soap contained in it obviated; and also, it is much less in weight and more convenient to handle than the styles heretofore used.]

48,754.—Toy Gun.—Newton P. Whittelsey, West Meriden, Conn.:

I claim, first, The combination of the barrel, b, enlarged at its inner end, arranged within the stock, a, having the depression, t, with the ferrule, l, substantially as and for the purpose described.

Second, I claim as an improved article of manufacture of a toy gun, the combination of the stock, a, barrel, b, spring, c, rod and hammer, d, e, with the ferrule, l, arranged and operating substantially as described.

48,755.—Knife Polisher and Grinder.—George L. Witsil Philadelphia, Pa.:

I claim, first, The arrangement and construction of the frame, A, a, with the rubber springs, g g, discs, G G', h, and shaft, c, substantially in the manner described and represented.

Second, The arrangement of the bevel-faced grindstone, B, with the several parts named in the first claim, as herein described.

48,756.—Ruler and Paper-Cutter.—Joseph Woodward, (assignor to J. S. Uttey), New York City:

I claim the ruler and paper-cutter herein described, having a straight outer ruling edge, a, and two united straight inner cutting edges, b c, forming a continuous rectangular cutting edge.

48,757.—Manufacture of Felted Cloth.—Charles T. Young, Lawrence, Mass.:

I claim the felted cloth herein described, the same being a new article of manufacture.

48,758.—Cultivator.—L. G. Youngs, Wilmington, Ill.:

I claim the plow-bars, E E' E'', and shaft, J, provided with the loops, I I, and arms, f, f, all arranged and applied in connection with the levers, K', to operate in the manner substantially as and for the purpose set forth.

[This invention relates to a new and improved device for planting corn, and also for plowing and cultivating corn and other crops which are grown in hills or drills, and it relates to a new and improved means for adjusting the plows laterally, so that the same may be made to conform to the sinuosities of the rows of plants, when the device is used as a cultivator, and also in a novel and improved seed-dropping device when the device is used as a corn planter.]

48,759.—Revolving Mortising Tool.—William Zimmerman, Quincy, Ill.:

I claim the new article of manufacture described, to wit, a rotating mortising or slotting tool with teeth on the cutting edges, substantially as described.

48,760.—Lamp.—Joseph K. Andrews, Antrim, Ohio, assignor to himself and J. C. Tilton, Pittsburgh, Pa.:

I claim the application of the two cylinders, C D, made of perforated sheet metal, or other equivalent material, and secured one inside of the other, on a lamp-burner, A, of the ordinary construction, substantially as and for the purpose herein shown and described.

[This invention consists in the employment or use of two perforated cylinders, one inside the other, and connected together by wires extending from the inner to the outer cylinder, in combination with an ordinary kerosene lamp burner, in such a manner that by the air admitted through the perforations of the two cylinders, and by the draught occasioned by the same, the smoke and surplus carbon is consumed, and a burner is obtained which gives a brilliant and odorless light, without the use of the ordinary glass cylinders.]

48,761.—Annealing Furnace.—Edwin Bennett (assignor to himself and W. T. Gillinder), Philadelphia, Pa.:

I claim, first, Placing the furnace so as to discharge its heat at such a point between the feed and discharge ends of the leer, as that the heat shall be graduated towards both ends, for the purpose described.

Second, The use of the trays, F, for the purpose of receiving the ware and for charging and discharging the leer.

48,762.—Manufacture of Water-proof Fabrics.—Thomas Crossly, Bridgeport, Conn., assignor to The American Water-proof Cloth Company, Brooklyn, N. Y.:

I claim, first, A fabric composed of a back of linen, jute, or other material, having a coat of rubber or other gum, upon which is fastened a face of yarn, of silk, worsted, woolen, fur, or other material, the same being looped or tufted as described.

Second, A fabric made as described, and colored, dyed, or printed, or colored and dyed and printed, either before or after the face is applied, in the manner and for the purposes herein set forth, as a new article of manufacture.

48,763.—Tool Stock.—William W. Draper, (assignor to himself and Alonzo Parke.), Greenfield, Mass.:

I claim the combination of the screw-shank, constructed as specified, and conical wedge, with the inclosed nut and clamping jaws, f, the whole arranged to operate as described for the purpose set forth.

I also claim the peculiar shape of the arm-piece, B B', as shown for the purpose set forth.

48,764.—Sizing and Finishing Covered Skirt Wire.—W. E. Frost (assignor to I. Washburne and P. L. Moen), Worcester, Mass.:

I claim sizing and finishing covered wire (or covering strips of metal of considerable length) in causing it to pass continuously through a sizing mixture, and over rolls, or their equivalents, while subjected to heat, and thence on to a reel, or other receiver, substantially as described.

48,765.—Sizing and Finishing Covered Skirt Wire.—W. E. Frost (assignor to I. Washburne and P. L. Moen), Worcester, Mass.:

I claim passing the wire through the starch or size, and thence directly in contact with ironers or polishing surfaces substantially as described for the purpose set forth, whence it may be passed over rolls and heaters previous to its being reeled.

48,766.—Sizing and finishing Covered Skirt Wire.—W. E. Frost (assignor to I. Washburne and L. P. Moon), Worcester, Mass.:

I claim causing the covered wire to pass from the supply reel, through the "sizing" medium, and back and forth over drums, and thence back through the "sizing" medium again, to the second coat, and so on, any number of times desired; for the purpose of applying successive coats of "size" one over the other, in the manner substantially set forth.

48,767.—Mast Coat.—Andrew J. Gove, San Francisco, Cal., assignor to himself and William Gerard, New York City.:

I claim the metallic shield, E, and the flexible joint formed by the rings, G G', or their equivalent, attached to the shield and the deck respectively by the metallic rings, S' S'', or in any other suitable manner, substantially as described, and for the uses and purposes hereinbefore set forth.

48,768.—Beehive.—D. S. Gray (assignor to himself and M. H. Messer), Onarga, Ill.:

In combination with the inclined bottom, B, and sliding door, E, constructed and arranged as described, I claim the slides, D, for facilitating the removal of fifth, &c., from the hive, as explained.

48,769.—Machinery Clutch.—T. F. Hammer, Branford, Conn., (assignor to Gilbert J. Hine, New Haven), Conn.:

I claim, first, The combination of the clutch, E, and bar, G, when constructed and arranged with the tongue, c, or its equivalent, to operate in the manner and for the purpose specified.

Second, The combination and arrangement described of the clutch, E, inclined groove, d, and tongue, c, substantially as and for the purpose specified.

48,770.—Rotary Air Pump.—George B. Hill (assignor to Ellis S. Archer), New York City.:

I claim the combination in a rotary air or gas pump of the buckets, M, curved as described, so as to gather in the air or gas, with the space or chamber, O, substantially as described and to the effect set forth.

48,771.—Paddle Wheel.—G. Martin, (assignor to himself, and Watson Sanford, Thomas M. Davis, L. H. Walton), Philadelphia, Pa.:

I claim the smooth-faced friction slide or roller, d', on each of the floats or paddles, D D', and the smooth-faced, irregularly curved bearing E, on the vessel; the said parts being constructed and arranged to operate together substantially as and for the purpose described.

48,772.—Apparatus for Carburetting Air.—Patrick Mihan (assignor to Oliver P. Drake), Boston, Mass.:

I claim as my invention or improvements in the above described air-forcing apparatus the construction of each bucket educt with the pointed triangle or tapering form substantially as and so as to operate as described.

I also claim the arrangement of the back of each bucket, relatively to the shell of the drum and the educt of the said bucket, the said back in such case springing from the base of the educt and being arranged at an acute angle, or substantially so, with such educt, the whole being as and for the purpose specified.

I also claim the arrangement of the several bucket educts, viz., so that one may lap or extend by that or those next contiguous to it, substantially as and for the production of results as specified.

48,773.—Grates for Cooking Stove.—James B. Clarke (assignor to S. H. Burton & Co.), Cincinnati, Ohio.:

I claim, first, In the described combination, the stationary grated bottom, A B C D', and the folding grate, E D D', or their equivalents, for a convertible wood and coal fire-place, as set forth.

Second, The stationary grates, B and F, and the hinged and folding grate, E, combined and operating as set forth.

Third, The parts A B C D', D D', E F and G, or their equivalents, arranged and combined to form a convertible wood and coal fire-place, as herein described.

48,774.—Fence.—David L. Pettegrew, (assignor to Sylvester Davis and Jacob Smith), Claremont, N. H.:

I claim the double posts, B, with the key, D, and the adjustable brace, C, combined and arranged substantially as and for the purposes specified.

48,775.—Revolving Fire-arm.—Louis C. Rodier, (assignor to Samuel Norris), Springfield, Mass.:

I claim, first, The arrangement of a repeating fire-arm, having a many-chambered cylinder hung upon a central axis, in such manner that the said cylinder shall revolve or oscillate between two given points, i. e., between the first and last chamber, substantially as set forth.

Second, Combining with an open frame, provided with a projecting stud, a cylinder movable upon its axis and grooved between two points of its circumference, so as to allow of its revolution or oscillation, as herein set forth.

Third, Providing the skeleton frame plate or retractor on the end of the sliding pin, when located in the rear of the cylinder, with ratchet teeth, in combination with a pawl actuated by the lock to operate the sliding pin together with the cylinder, as herein described.

Fourth, Holding the cylinder and sliding pin within the open frame of the arm by means of a hollow axle upon one end of the cylinder, in combination with a central socket at the other end thereof, and wrought into the skeleton frame of the sliding pin, together with a short movable pin fitting into the said socket, substantially as herein set forth.

Fifth, The combination with a cylinder held in the frame, as set forth, of a spring lever bearing the movable cylinder holding pin, under such an arrangement that the same may be operated from without, for the purpose of releasing the cylinder and enabling it to be disconnected from the hit or stock of the arm.

Sixth, Combining with a cylinder held in its frame, as hereinbefore described, the method of mounting the frame, carrying the barrel and cylinder upon an axle, so as to allow of the disconnecting of the cylinder and barrel from the lock and stock by shifting the same sideways, as herein described.

48,776.—Lubricating Cups.—James Sangster, (assignor to Harvey Ball and Wm. H. Bonnell), Buffalo, N. Y.:

I claim the brace, B, when constructed to operate as herein substantially set forth and described.

48,777.—Steam Engines.—Wm. Mont. Storm, (assignor to himself and R. Charlton Mitchell), New York City.:

First, I claim an engine constructed as follows, to wit: Of a cylinder containing two single acting pistons, rigidly connected by open "cross-heads," substantially as described, to the crank, both the latter (crank and cross-head) being located within the body of such cylinder and between its pistons, the whole being proportioned and arranged to this end, as set forth.

Second, I claim, in combination with the above, the superposed cylinder or engine, B, to act upon a crank parallel to the first and on the same shaft, also, through the mediation of a "cross-head," located in the same chamber, between the pistons of the horizontal cylinder, substantially in the manner and for the purposes described.

Third, I claim the arrangement whereby the stroke of the piston of such superposed engine is made considerably less than those of the horizontal one, so that the length of its "cross-head," as will be understood, may not render necessary an undue separation of the horizontal pistons, thus occupying unnecessary space, while the combined action of the whole device obviates a dead point, etc.

Fourth, I claim making the pistons of the horizontal cylinder with an overhang, for the purpose described.

Fifth, I claim the pin, d, projecting longitudinally with, but eccentric to the shaft, and rotating with it, to operate the valve by fitting slots, X X', in their tails, at right angles to the lines of their motion, all as explained.

Sixth, I claim the combination of the parts, e, f, h, i, j, l, constituting the reversing gear, as described.

48,778.—Measuring Faucet.—Shepherd H. Wheeler, (assignor to Richard Hedden, James T. Stillwell, C. T. Lee, Thomas J. Martin, A. G. Townsend, James Sullivan, Daniel Henderson and S. H. Wheeler), Dowagiac, Mich.:

I claim, first, The adjustable cap, g, and thimble, f, in combination with the valve, d, for tightly closing the discharge orifice, a, of the faucet tube, substantially as described.

Second, The valve chamber, b, provided with a valve, d, which is actuated by a spring, e, in combination with a reciprocating valve piston, D, and the tube, A, substantially as described.

Third, The combination of tube, A, piston, D, valve chamber, b, and nozzle, C, constructed and operating substantially as described.

48,779.—Machine for Skinning Vegetables.—Oscar Hase, Mecklenburg Schwerin, Germany.:

I claim the combination in a vegetable or fruit skinner of a stationary

cylinder, having an internal roughened surface, with a rotating roughened disk, to impart centrifugal motion to the commodities to be skinned, substantially in the manner described.

48,780.—Transmitting Motion.—Edward Wadhams, (assignor to Edward Robert Kent), Hamilton, Canada West.:

I claim the double segmental rack, A, on the rock shaft, C, in combination with pinions, b b', ratchet wheels, d d', and pawls, e e', said ratchet wheels being keyed to the shaft, D, substantially as and for the purpose set forth.

(The object of this invention is to transmit motion from an oscillating or rock shaft to another revolving shaft, or, in other words, to convert the oscillating motion of one shaft in a continuous revolving motion of another shaft.)

REISSUES.

2,026.—Curtain Fixture.—Edward T. Briggs, Boston, Mass. Patented May 19, 1863.:

I claim the combination composed of the tubular curtain roller, A', its stationary shaft, a, and helical spring, c, as set forth, and a friction apparatus (substantially as described), or its equivalent, for the purpose or to operate as set forth, the whole being for application to a shade and a weighted tassel, and co-operative, as explained.

I also claim the combination of the nut, E, and the screw, c, with the shaft, A, the roller, A', and its spring, e, they being arranged and applied as described, and the purpose of such screw and nut, irrespective of their use with the remainder of the friction apparatus, being to prevent the spring from unwinding further than is necessary to cause the roller to wind up the shade.

I also claim the friction apparatus constructed or composed of the screw, c, the disk, F, the nut, E, the spring, I, and the nut, H, and arranged with the roller, A', and its shaft, a, so as to operate therewith substantially as set forth.

2,027.—Truck for Street Railways.—Robert H. Lecky, Allegheny, Pa. Patented April 5, 1864.:

First, I claim arranging the axles with relation to the wheels so that the inner end of the axles of the wheels which travel on the short or inner curve of the track will, in turning curves, move more than the inner end of the axles of the wheels which travel on the long or outer curve of the track, said axles and wheels being operated substantially in the manner and by the means herein described and for the purpose set forth.

Second, The combination of the swivel bearings, 6 and 20, with the disks, m (or their equivalents—levers), axles, l, wheels, i, and connecting rod, 10, operated by the means and in the manner substantially as described, for the purpose set forth.

Third, Securing the tongue, a', to the bottom, b, by means of the flanged tube, x', and support, x, as herein described and for the purpose set forth.

Fourth, The use of the catch, 17, and guide, q, when used in combination with the tongue, a', flanged tube, x', bottom, b, and lever, b', arranged and operating substantially as herein described and for the purpose set forth.

Fifth, The arrangement of the brakes, z, cups, w, plungers, v, and levers, 9 8 18 and 12, arranged and operating substantially as herein described for the purpose set forth.

EXTENSIONS.

Lanterns.—Hugh and James Sangster, Buffalo, N. Y. Patented June 10, 1861. Reissued Aug. 21, 1865. Extended June 8, 1865.:

We claim constructing and arranging the spring catches, I, in the manner described or its equivalent, to cause the attachment of the lamp to the lantern by the operation of pressing the lantern down upon the spring catches.

Also arranging the thumb pieces, L, within the flange, G, at the base of the lamp by extending the springs, I, towards each other horizontally as described, and thus forming the elbow catch to rest against the shoulder of the flange, E, of the lantern in the manner and for the purposes specified.

Regulators for the Pen Beam in Ruling Machines.—W. O. Hickok, Harrisburg, Pa. Patented June 17, 1861. Extended June 14, 1865.:

First, I claim the pieces, G H A B, in combination with the hinge-joints, 1 2 3, arranged and combined substantially and for the purpose as herein described.

Second, I claim the sliding piece, B, the bearings, C C C', and the finger wheel, F, in combination with the pieces, G H A, uniting by hinge joints, or in any other manner, substantially the same; using in the construction of the whole machine any material adapted to the purpose of forming, as herein described, a pen beam regulator, for ruling machines.

Printing names of Subscribers upon Newspapers, Etc.—Henry Moeser, Pittsburgh, Pa. Patented June 24, 1861. Extended June 14, 1865.:

I claim the arrangement and construction of a machine for printing names of persons or places on newspapers and other papers after the manner substantially as described, viz. of a form containing the column of names to be printed, set up in types, and being brought under the action of a stamp by means of a slide, moving by degrees; together with the application of a slitted plate, allowing the paper to be printed to be pressed down on the line, right beneath the slit of the plate, and shielding the paper from the lines, adjoining that under action of the stamp, as herein before described.

Railroad Car.—Lawrence Myers, Philadelphia, Pa. Patented June 24, 1861. Reissued March 21, 1865. Extended June 16, 1865.:

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.

Machinery for Cutting Files.—John Crum, Ramapo, N. Y. Patented July 1, 1861. Extended June 24, 1865.:

I claim connecting the file blank to be cut with a bed, which has a positive feed motion, substantially as described, in combination with an incidental rolling motion depending upon the shape of the blank and the angle which the cutter forms therewith, substantially as described.

I also claim connecting the chisel with its stock by a joint, as described, in combination with a rolling bed, as described, by which they are rendered self-adapting, as described.

I also claim holding the file down on to the bed during the operation of cutting, by means of a roller, or its equivalent, combined with the rolling bed, substantially as herein described, but this I only claim when the end of the file is so connected with its bed that it shall be free to move up and down that the pressure of the roller may keep that part of the file that is being cut firmly down on to the bed, as herein specified.

Portable Hydraulic Press.—Richard Dudgeon, New York City. Patented July 8, 1861. Extended June 23, 1865.:

I claim a hydraulic press, quite portable, in which the ram is hollow, and serves as the reservoir to supply the cylinder with water or other liquid, while the force pump and its appendages are contained within the ram, so that by working this force pump the ram is forced up until the liquid in such ram is exhausted, and by moving the handle of the pump down it will come in contact with a rod attached to a valve in the pump piston, and the latter comes in contact with a valve in the end of the ram, opening them both, and allowing the water to return into the ram again through passages.

Harvester.—(A.)—Aaron Palmer, Brockport, N. Y., and Stephen G. Williams, Janesville, Wis. Patented July 1, 1861. Reissued April 10, 1865. Again reissued Jan. 1, 1861. Extended June 29, 1865.:

We claim discharging the cut grain from a quadrant-shaped platform, on which it falls as it is cut, by means of an automatic sweep rake, sweeping over the same, substantially as described.

Harvester.—(B.)—Aaron Palmer, Brockport, N. Y., and Stephen G. Williams, Janesville, Wis. Patented July 1, 1861. Reissued April 10, 1865. Reissued Jan. 1, 1861. Again reissued May 31, 1864. Extended June 29, 1865.:

We claim the combination of the cutting apparatus of a harvest-

thereof, and a sweep rake operated by mechanism, in such manner that its teeth are caused to sweep over the platform in curves when acting on the grain, these parts being and operating substantially as hereinbefore set forth.

We also claim the combination of a quadrant-shaped platform, a sweep rake operated by mechanism, which causes the rake to move in alternately opposite directions, an inclined rail to raise the rake, and a switch, these parts being and operating substantially as hereinbefore set forth.



MUNN & COMPANY,

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

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

CHAS. MASON.

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

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

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

THE EXAMINATION OF INVENTIONS.

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

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

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

The Patent Laws, enacted by Congress on the 2d of March, 1831 are now in full force and prove to be of great benefit to all parties who are concerned in new inventions.

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

CAVEATS.

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

HOW TO MAKE AN APPLICATION FOR A PATENT.

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

REJECTED APPLICATIONS.

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

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

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

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

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

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignment of patents. Fees moderate.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 57 Park Row, New York.

FOREIGN PATENTS.

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

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

Pamphlets of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO.'s Agency, the requirements of different Government Patent Offices, &c., may be had, gratis, upon application at the principal office, No. 57 Park Row, New York, or any of the branch offices.

INVITATION TO INVENTORS.

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

EXTENSION OF PATENTS.

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

Patents may be extended and preliminary advice obtained, by consulting, or writing to, MUNN & CO., No. 57 Park Row, New York.

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.

SCHOOL OF MINES, COLUMBIA COLLEGE, EAST FORTY-NINTH STREET, NEW YORK.

FACULTY.
F. A. P. BARNARD, S. T. D., LL.D., President.
T. EGGLESTON, JR., E. M., Mineralogy and Metallurgy.
FRANCIS L. VINTON, E. M., Mining Engineering.
C. F. CHANDLER, Ph. D., Analytical and Applied Chemistry.
JOHN TORRY, M. D., LL.D., Botany.
CHARLES A. JOY, Ph. D., General Chemistry.
WILLIAM G. PECK, LL. D., Mining Surveying.
JOHN H. VAN AMRINGE, A. M., Mathematics.
OGDEN N. GOOD, A. M., Mathematics and Physics.

The plan of this School embraces a three years' course for the degree of Engineer of Mines of Bachelor of Philosophy. Instruction is given in Higher Mathematics, Mechanics, Physics, General and Analytical Chemistry, Assaying, Mineralogy, Botany, Geology, Metallurgy, Technology, Mining, Machines, Machine and Map Drawing, Mining Surveying, &c.

For admission, candidates for a degree must pass an examination in Arithmetic, Algebra, Geometry and Plain Trigonometry. Persons not candidates for degrees are admitted without examination, and may pursue any or all of the subjects taught. The School is well provided with analytical and assay laboratories, drawing-room, mineralogical and geological collections, apparatus, instruments, models, library, &c. The next session begins November 15, 1863. The examination for admission will be held on November 13th and 14th. For further information and catalogues apply to
4 2

DR. C. F. CHANDLER, Dean of the Faculty.

THOMAS ANTISELL, M. D., ANALYTICAL AND CONSULTING CHEMIST (Late Chemical Examiner in U. S. Patent Office, Washington, D. C.) Chemical investigations made and advice given on unperfected inventions. Analysis made; Ores and Mineral Lands Examined. Address Georgetown, D. C. 4 12

ROSS'S NEW PATENT OIL CUP, FOR LUBRICATING the Cylinders of Steam Engines. This is acknowledged by all who have used it to be the most durable and cheapest oil cup ever made, as it dispenses entirely with the three cocks on the old-fashioned oil globes, having two valves which are operated by one lever handle.

Engine Builders will find it to their advantage to use these cups, as they are both cheap and durable. Send for descriptive circular and price list.

Orders addressed to the undersigned will receive prompt attention.
B. E. LEHMAN,
Manufacturer of Steam Cocks, Globe Valves, Gage Cocks, &c., Lehigh Valley Brass Works, Bethlehem, Pa.
Recommended by Hubbard & Whittaker, Surden Engine Works, Brooklyn. 4 1

THIRTY THOUSAND DOLLARS WANTED.—A MASTER Mechanic wishes to find one or two men with this amount to invest in the manufacture of heavy machinery. Address I. R. A., No. 192 Friendship street, Providence, R. I.

WOOD-WORKING MACHINERY.—THE SUBSCRIBER is Agent in New York for J. A. Fay & Co., C. B. Rogers & Co., Ball & Williams, Richardson, Meriam & Co., H. B. Smith, Gray & Woods, Lane & Bodley, D. Doncaster, and all other manufacturers of Wood-working Machines. E. C. HILL, No. 12 Platt st. d

VALUABLE BOOKS FOR PRACTICAL MEN.

American Cotton Spinner, and Manager's and Carder's Guide. By R. H. Baird, 12mo., cloth.....	\$1 25
American Miller and Millwright's Assistant. By William Carter Hughes. A revised and very much enlarged edition, illustrated by engravings of the most approved machinery. 12mo., cloth.....	1 25
Assayer's Guide; or Practical Directions to Assayers, Miners and Smelters. By Oscar M. Lieber, 12mo., cloth.....	1 25
Brewer (The Complete Practical). By M. L. Byrn, M. D. 12mo., illustrated, cloth.....	1 25
Builder's Companion; containing the Elements of Building, Surveying and Architecture, with Practical Rules and Instructions connected with the subject. By A. C. Smeaton. Illustrated by 70 cuts. 12mo., cloth.....	1 25
Cabinet-maker's and Upholsterer's Companion. By J. Stokes. With illustrations. 12mo., cloth.....	1 25
Colburn—The Locomotive Engine; including a Description of its Structure, &c. By Zerah Colburn. Illustrated. 12mo., cloth.....	1 25
Daguerreotype and Photographer's Companion. 12mo., cloth. Illustrated. The Complete Practical. By M. L. Byrn, M. D. Illustrated. 12mo., cloth.....	1 25
Dyer and Color-maker's Companion. 12mo., cloth.....	1 25
Gas and Ventilation. A Practical Treatise on Gas and Ventilation. By E. E. Perkins. 12mo., cloth.....	1 00
Inventor's Guide—Patent Office and Patent Laws; or, a Guide to Inventors, and a Book of Reference for Judges, Lawyers, Magistrates and others. By J. G. Moore. 12mo., cloth.....	1 25
Larkin—The Practical Brass and Iron-founder's Guide: A Concise Treatise on the Art of Brass Founding, Molding, Etc. By James Larkin. 12mo., cloth.....	1 25
Marble-worker's Manual; containing Practical Information respecting Marbles in general, their Cutting, Working and Polishing, Veneering, &c. 12mo., cloth.....	1 50
Mortimer—The Pyrotechnist's Companion. By G. W. Mortimer. Illustrated. 12mo., cloth.....	1 25
Painter, Glider and Varnisher's Companion; Containing Rules and Regulations in everything relating to the Arts of Painting, Gilding, Varnishing and Glass-staining; with numerous useful and valuable Recipes; Tests for the detection of Adulterations in Oils and Colors, and a statement of the Diseases and Accidents to which Painters, Gliders and Varnishers are particularly liable, with the simplest methods of Prevention and Remedy. Eighth edition. To which are added Complete Instructions in Graining, Marbling, Sign Writing, and Gilding on Glass. 12mo., cloth.....	1 25
Paper-hanger's Companion. By James Arrowsmith. 12mo., cloth.....	1 25
Practical Surveyor's Guide. By Andrew Duncan. Illustrated. 12mo., cloth.....	1 25
Railroad Engineer's Pocket Companion for the Field. By W. Griswold. 12mo., tucks.....	1 25
Templeton—Practical Examiner on Steam and the Steam Engine. By Wm. Templeton. 12mo.....	1 25
Treatise on a Box of Instruments and the Slide Rule; being a Guide to the Gauger, Engineer, Seaman and Student. By Thomas Kenfish. Illustrated by numerous engravings. 12mo., cloth.....	1 25
Turner's (The) Companion; containing Instructions in Concentric, Elliptic and Eccentric Turning. Illustrated by steel plates, of various chucks, tools, instruments and patterns. 12mo., cloth.....	1 25

The above or any other of my publications sent by mail free of postage.

Baird's New Catalogue of Practical and Scientific Books sent free of postage to any one who will favor me with his address.

HENRY CAREY BAIRD,
Industrial Publisher.

4 2 No. 406 Walnut street, Philadelphia.

BOOKS ON DYEING, SCOURING, CALICO PRINTING, Colors, Cotton Spinning and Weaving.

Baird—The American Cotton Spinner and Manager's and Carder's Guide: A Practical Treatise on Cotton Spinning; giving the Dimensions and Speed of Machinery, Draught and Twist Calculations, Etc., with Notices of recent improvements; together with Rules and Examples for making changes in the size and numbers of Roving and Yarn. Compiled from the papers of the late Robert H. Baird. 12mo., \$1 25	
Capron De Dole—Dussauce—Blues and Carmines of Indigo. A Practical Treatise on the Fabrication of every Commercial Product derived from Indigo. By Felicien Capron de Dole. Translated with important additions, by Professor H. Dussauce. 12mo.....	2 50
Chemistry Applied to Dyeing. By James Napier. Illustrated. 12mo., cloth.....	2 50
Dussauce—Treatise on the Coloring Matters Derived from Coal Tar; their Practical Application in Dyeing Cotton, Wool and Silk; the Principles of the Art of Dyeing and of the Distillation of Coal Tar, with a Description of the most important New Dyes now in use. By Professor H. Dussauce, Chemist. 12mo.....	2 50
Dyer and Color-maker's Companion. 12mo.....	1 25
Love—The Art of Dyeing, Cleaning, Scouring and Finishing, on the most approved English and French methods; being Practical Instructions in Dyeing Silks, Woolens and Cottons, Feathers, Clippings, Straw, Etc.; Scouring and Cleaning Bed and Window Curtains, Carpets, Rugs, Etc.; French and English Cleaning, any Color of Fabric of Silk, Satin or Damask. By Thomas Love, a Working Dyer and Scourer. 1 vol., 12mo.....	3 00
Scott and Byrne—The Practical Cotton Spinner and Manufacturer. By W. Scott. Adapted to American Machinery. Practice and Usages, by Oliver Byrne. With large Working Drawings of American Cotton Machines. 8vo., sheep.....	5 00
Sellers—The Color-mixer. By John Sellers, an experienced practical workman. In 1 vol., 12 mo. (Nearly ready).....	2 50
Smith—The Dyer's Instructor; comprising Practical Instructions in the Art of Dyeing Silk, Cotton, Wool and Worsted, and Woolen Goods, containing nearly 800 Recipes. To which is added a Treatise on the Art of Paddling; and the Printing of Silk Warps, Skeins and Hankerehels, and the various Mordants and Colors for the different styles of such work. By David Smith, Pattern Dyer. 12mo., cloth.....	3 00
Ulrich—Dussauce—A Complete Treatise on the Art of Dyeing Cotton and Wool as Practised in Paris, Rouen, Mulhausen and Germany. From the French of M. Louis Ulrich, a Practical Dyer in the principal Manufactories of Paris, Rouen, Mulhausen, Etc., to which are added the most important Recipes for dyeing Wool as practised in the Manufacture Imperiale des Gobellins, Paris. By Professor H. Dussauce. 12mo.....	3 00
Watson—The Theory and Practice of the Art of Weaving by Hand Power, with Calculations and Tables for the use of those connected with the Trade. By John Watson, Manufacturer and Practical Machine-maker. Illustrated by large drawings of the best Power Looms.....	5 00

The above or any other of my publications sent by mail free of postage at publication prices.

My new Catalogue of Practical and Scientific Books sent by mail free of postage to any one who will favor me with his address.

HENRY CAREY BAIRD,
Industrial Publisher.

4 2 No. 406 Walnut street, Philadelphia.

BOILER INCrustATIONS.

VULCAN IRON WORKS, CHICAGO, Feb. 9, 1865.
During the past two months we have been using the Anti-Incrustation Mixture prepared by Mr. A. G. Cross. From our experience we are satisfied of the great utility of the preservation to overcome the universal evil of incrustation of Steam Boilers, stopping of leakages, and proving a general protection to the iron of the boiler. We find it a useful article, and most cheerfully recommend its use.

This preparation is in use in one hundred different establishments in Chicago. P. W. GATES, Pres., Eagle Works Manufacturing Co., and GEO. DUNBAR & CO., Nos. 19 and 21 Dearborn street, Chicago, Agents. 4 3

THE AMERICAN INSTITUTE HAVING ENGAGED

The spacious Armory on Fourteenth street, in the City of New York, will hold their 36th Annual Fair from the 12th day of September to the 19th of October next. Articles for Exhibition will be received from the 6th to the 12th of September. The exhibition will consist solely of American Inventions, Machinery and Manufactures and Agricultural and Horticultural Productions. The time for a reunion of American Inventors, Manufacturers and Agriculturists was never more appropriate than the present. The American People, after vindicating their nationality and demonstrating the importance and magnitude of their Mechanical and Agricultural Resources, enter now upon a new career, when it becomes alike the duty and interest of every citizen to promote the reward of American Ingenuity and the encouragement of American Manufactures and Productions. Individuals and Companies engaged in these industries are invited to co-operate by contributing for exhibition the product of their skill and industry, thereby promoting and advancing the material prosperity of the country. Every indication promises to make this exhibition one of the grandest and most varied ever held in this country, while the managers are determined to use every effort toward the accomplishment of such a result. Machinery in motion will constitute the great feature of the Fair, and steam power will be provided. Premiums of Gold, Silver and Bronze Medals and Diplomas will, by competent and impartial judges, be awarded to those exhibitors whose articles shall be adjudged most meritorious. Special Premiums of Gold and Silver Medals, and Silver Cups and Plates will be awarded on such articles as are set forth in the circulars issued by the Board of Managers. All correspondence must be directed to Prof. S. D. TILLMAN, Sec. American Institute, New York City, and articles for exhibition to JOHN W. CHAMBERS, Clerk of American Institute, Armory 14th street, New York City, freight prepaid. 4 3 & 200w

FOR SALE.—THE 3-STORY FRONT AND 4-STORY

Back Buildings, with 12 horse Steam Engine Boller, Shafting, Pulleys and Belting in good order. Also one Weymouth's Variety Wood-turning Lathe, one Centering Machine, one Machine for Making Blind Rollers, one Polishing Drum, one Molding Machine, one 12-foot Wood-turning Lathe, and one large Lot for seasoning lumber by steam. There is a well in the cellar that supplies the boiler with water; \$100 per month steam power is rented to good tenants, and there are five rooms unoccupied, two of which are 16 by 45 feet. It is located in the center of the city. Ground rent \$57 a year. The whole will be sold for \$6,000; \$3,000 can remain on mortgage if necessary. Apply to
GEO. PEARSON,
No. 46 Hollis street, Baltimore, Md.

HANCOCK'S PATENT STEAM BLOWER.—THIS

instrument, after two years' use, has proved a perfect success. It is the cheapest appliance for increasing the steaming capacity of boilers where there is a defective draft, or where cheap fuel is required to be used, like the screenings of anthracite or bituminous coals, screenings from coke, tanner's spent bark sawdust, tanner's chips, shavings, etc. It requires no attachment to any other motor than the boiler; is noiseless, and requires no room available for other purposes. Send for a circular. F. W. BACON & CO.,
4 12 Agents, No. 84 John street, New York.

FOR SALE.—A SCREW-CUTTING LATHE; WILL

cut every variety of thread used on steam, gas, water pipe and fittings; both right and left hand. BULLARD & PARSONS,
4 2 Hartford, Conn.

BOILER INCrustATIONS.

Detroit, Jan. 24, 1865.
A. G. CROSS, Esq.—Dear Sir:—We have used your Anti-Incrustation Powder in our locomotives during the past year, and find it to be all that is claimed for it, both in the removal of the old incrustation, and as a complete and perfect preventive of the formation of any scale whatever, and I believe without injury to the iron. I have no hesitancy in recommending it to all who are using steam boilers, as the most perfect of all the compounds which I have yet seen for this purpose.
B. BRISCOE, M. M., D. & M. R. R.
3 35* A. G. CROSS, Detroit.

THE EIGHTEENTH ANNUAL EXHIBITION OF THE

Maryland Institute of Baltimore, for the Mechanic Arts, will commence on Monday Evening, the 24th of October, and continue to Monday Evening, the 30th of October, 1865.

The hall will be open for the reception of goods on Monday, the 25th of September.

Goods for Competition and Premium must be deposited before Thursday Night, the 25th of September.

Circulars, embracing details, may be had of the Actuary at the Institute.

Communications addressed to the undersigned, or Joseph Gibson, Actuary, will be promptly attended to. W. W. MAUGHLIN,
3 3m Chairman Committee on Exhibition.

A GREAT CHANCE FOR PROFITABLE INVESTMENT.—THE STATE AND COUNTY RIGHTS OF GILBERT'S NEW PATENT

Coal and Ash Sifter, at great bargains. The cleanest, handsomest and most convenient coal and ash sifter in use. No dust.
3 5* R. BLAKE, No. 3 Tryon Row.

THE CELEBRATED KENTUCKY CIDER MILL.—

Patented Nov. 24, 1863. State, County or Shop Rights for Sale. For particulars address the patentee, THEO. SHARP,
3 5* Louisville, Ky.

PLATINA—WHOLESALE AND RETAIL—FOR ALL

purposes. H. M. RAYNOR, Importer, No. 748 Broadway, New York. Platinum Scrap of any sort purchased. 3 4*

FOR DANIELLS'S PLANING MACHINES, CAR MOR-

TISING, Boring Machines, Car-Tenoning Machines, Car Planing and Beading Machines, Etc., address J. A. FAY & CO., Cincinnati, Ohio. 3 1y

FOR WOODWORTH PATENT PLANING AND

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

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, Etc.

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

FOR SALE.—ENGINE BOILERS, SHAFTING, HANG-

ERS, Pulleys, Rubber Machinery, Belting, Bolts, and Machinery of all descriptions, and Factories bought and sold, at DAVIS'S MACHINERY YARD, No. 122 and 124 Hudson street, one block from Jersey City Ferry, foot of Courtlandt street, N. Y. 3 4*

STEAM GENERATORS AND ENGINES.—THE AMER-

ICAN Safety Steam Engine Company are manufacturing Braxton's Patent Steam Generators and Engines. There is a saving of 25 per cent in fuel over ordinary engines and boilers and they cost but little to keep them in repair. There is no possibility of exploding the generator. For particulars and circular address GEO. WOODMAN, Treasurer and Agent, 84 Washington st. Boston 2 12 1/2

PARTIES DESIRING TO CONTRACT FOR THE

manufacture of Wood and Iron Work, Agricultural Implements, or any article of machinery, can correspond with TITUS & BOSTWICK, R. R. Iron Works, Ithaca, N. Y. 3 4*

FOR SALE.—ONE 26-IN. FARRER PLANER AND

Matcher, \$400; one Double Surfacers, \$450; one small Planer and Matcher, \$450; one hub Mortising Machine \$250. Address
4 2 E. C. TANTER, Worcester, Mass.

PARTNER WANTED WITH \$10,000.—ANY PERSON who, for health or pleasure, desires to reside the whole or part of the year in a tropical climate will find this an opportunity such as is seldom met with. Address CUBA, SCIENTIFIC AMERICAN Office. 2 4*

BOILER INCURSTATIONS EFFECTUALLY PREVENTED by Winans' Powder, 10 years in use. No rods in it, consequently no foaming. H. N. WINANS, No. 11 Wall st. 2 4*

PATENT PORTABLE MUSKETO BAR, FOR TRAVELERS, Tourists, Sportsmen, Hiving Bees and Fishing. A perfect safeguard against all annoying insects. Sent free of postage by remitting \$1.25. A liberal discount made for the trade. Also State Rights for sale. Address JOHN ZENGLER, P. O. Box 2,682, Chicago, Ill. 1 4*

ANDREWS' PATENT OSCILLATING ENGINES.—Double and Single Engines, from 1/2 to 125-horse power, finished at short notice. These engines leave the shop ready for use, require no special foundation, are compact, light and simple, and economical of power. For descriptive pamphlets and price list address the manufacturers, W. D. ANDREWS & BRO., No. 414 Water street, N. Y. 2 4*

ANDREWS' PATENT CENTRIFUGAL PUMPS.—CAPACITY from 90 to 40,000 gallons per minute. For draining and irrigating lands, wrecking, coffer dams, condensers, cotton, wool and starch factories, paper mills, tanneries, and all places where a large and constant supply of water is required, these pumps are unequalled. They are compact, require little power, and are not liable to get out of order. For descriptive pamphlet address W. D. ANDREWS & BRO., No. 414 Water street, N. Y. 2 4*

PORTABLE ENGINES, SUITABLE FOR THE OIL regions, from 8 to 20-horse power, with large fire-place, independent steam feed pump, steam gage, and improved water heater. The most complete and best engines in the market. For particulars address W. D. ANDREWS & BRO., No. 414 Water street, N. Y. 2 4*

AGRICULTURAL AND MECHANICAL AGENCY, Havana.—EZRA K. DOD solicits consignments of and authority to contract for all articles of ready sale in the Cuban market, such as plows and other farm utensils adapted to cane culture, steam engines, boilers and mills, shovels, axes, saws, cane knives, gas fittings, brass and copper seamless pipes, cooking stoves for burning coke, animal coal for refining sugar, illuminating and lubricating oils, etc. Patents will be secured and introduced. References, New York—Messrs. Gebhard & Schuchardt, Moses Tay or Thomas Downing; Philadelphia—Messrs. Merick & Sons; Baltimore—Messrs. G. DeFord & Bros.; Boston—Thos. Oxnard, Esq. 2 4

VULCAN WORKS, BALTIMORE.—THIS WELL-known establishment is offered for sale, or would be leased for term of years, with the privilege of purchasing within a stated period. It is complete in all its departments, embracing iron and brass foundries, blacksmiths, machine, boiler, pattern and carpenter shops, coppermiths, etc. The tools and machinery, with powerful cranes and twisting apparatus, are many of them of recent construction, and all in complete order for the manufacture of Marine Engines of the heaviest class, and all other descriptions of machinery. The situation, in close proximity to the water, and near the business portion of the city, is unrivalled. The reopening of trade with the South will in a short time bring a full supply of orders from that direction, and the establishment has always commanded a fair portion of Government work and of the local trade. For further particulars address H. B. HAZLEHURST, Vulcan Works, Baltimore. 1 6*

SMALL BEAM ENGINE.—I WILL SELL A BEAU-TIFUL 2-horse beam engine, suitable for a small boat or light business, for \$170 cash. Said engine is entirely new, and was made at odd times by a man "for the fun of the thing." The engine is complete, with feed pump, etc. No answers unaccompanied by stamp for return post noticed. EGBERT P. WATSON, Box 773, N. Y. 25

WORRALL'S PATENT CHUCKS FOR SCREW MA-CHINE and Holding Wire Drills and other articles.—The cheapest and best chuck for drills in use. 1 1/2 inch in diameter, holding any size from 1/4 up to 1/2 inch. Perfectly true and reliable. Address THOS. H. WORRALL, Lawrence, Mass. 25 8*

INVENTORS' EMPORIUM, NO. 37 PARK ROW, N. Y.—New and useful inventions manufactured, introduced and sold on commission. Agents wanted. [24H] RICE & CO. 25 5*

MASON'S PATENT FRICTION CLUTCHES, FOR connecting and disconnecting shafting. Also for starting gears and all heavy machinery without sudden shock, are manufactured by VOLNEY W. MASON, Providence, R. I. 25 5*

WATER POWER.—AT N. FALLS, N. Y., FOR 50 Mills.—Now ready, for sale, a lease, at half price of Patterson Power Leases. Renewable every 20 years for ever. Apply at No. 23 Courtlandt street, New York to HORACE H. DAY. 1 8*

HARTMANN & LAIST, CINCINNATI, OHIO; MANU-facturers of Glycerin Acetic Acid, Grape Sugar and Sirup. 1 26*

SPOKE LATHES (BLANCHARD'S) OF AN IMPROVED Pattern, made by J. GLEASON, No. 1,050 Germantown avenue, Philadelphia, Pa. 1 4*

PORTABLE STEAM ENGINES.—THESE WORKS have lately increased their facilities for the manufacture of their so popular engines. Prices reduced to a peace standard. Fourteen feet and more of heating surface given to the nominal horsepower. Delivery to the Oil Regions by part navigation much prompter and cheaper than from more eastern points per railroad. Send for circular before buying. F. WM. RAEDER, Ames Iron Works, Oswego, N. Y. 1 12*

MECHANICAL DRAUGHTSMAN, FAMILIAR WITH Isometric Perspective, wanted. Address G. H. KNIGHT, Box 541, Cincinnati, Ohio. 1 4*

NEW BOILER WORKS.—LEHIGH BOILER WORKS, Allentown, Pa.—For the Manufacture of Boiler and Sheet-iron work of all descriptions, such as Locomotive, Flue, Tubular and Cylindrical Boilers, Locomotive Tanks, Water Tanks, Steam and Blast Pipes, Chimneys, Etc. Also repairing of all kinds attended to with dispatch. All work done at these works is warranted to be of good material and well made. Part of the firm being Machinists, we are prepared to do out-door machine work, such as setting up engines and boilers, with steam and water pipes, and repairing generally. 1 8*

MILL STONE DRESSING DIAMONDS SET IN Patent Protector and Guide.—Sold 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. 24 12*

MACHINISTS' TOOLS, ENGINE LATHES, HAND Lathes, Planers, Upright Drills, Etc., of best material, and superior workmanship, manufactured and for sale by WM. M. HAWES & CO., Fall River, Mass. 24 9*

GROVER & BAKER'S HIGHEST PREMIUM ELAS-TIC Stitch Sewing Machines, 426 Broadway, New York. 1 11*

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, No. 13 East Seventh street, Cincinnati. 11 XII 26*

TRUE'S POTATO PLANTER DOES THE WORK OF 12 men. Rights for sale. J. L. TRUE, Garland, Maine. 25 10*

THE MOST VALUABLE MACHINE FOR BUILDERS and Carpenters, Furniture, Carriage, Agricultural Implement Sash and Door, Waived and Straight, Molding and Plane Manufacturers, complete for all kinds of irregular and straight work in wood, hard or soft, superior to all others, having the capacity of twenty good mechanics, called the Variety Molding Machine. We own nine patents, covering the valuable inventions for machines with upright mandrels. Have them manufactured in one place only for the United States and Europe, viz.: at Place Iron Works, No. 110 East Twenty-ninth street, New York. We hear there are parties manufacturing machines infringing on some one or more of our patents. We caution the public from purchasing such infringements. Our patents secure to us the machine with either iron or wooden table, through which are two upright mandrels, having cutters in each head held by a screw nut; also, combination collars, saving 75 per cent in cutters, feed table to plane and cut, irons outside the cutters, preventing wood from taking undue hold. Also guards acting as plane stocks, making it safe for a boy to run. Agents solicited. Please send for circular giving full description. Information or orders for machine may be addressed COMBINATION MOLDING AND PLANING MACHINE COMPANY, New York City. 25 4*

TO MANUFACTURERS AND EXPORTERS.—ALL articles of American manufacture which are exported to foreign countries are entitled to a drawback equivalent to the amount of tax paid at the time of manufacture under the Internal Revenue Law. We offer our services to secure the refunding of this amount, and will cheerfully furnish all necessary information. MERCHANT, OAKLEY & CO., Custom-house and Internal Revenue Brokers, No. 71 Broadway, Room No. 55. 1 8*

TO GAS COMPANIES.—FOR SALE AT THE ISLAND Works of the Gas Co., Washington, D. C. 1 Retort House, roof frame of iron, 141 feet long, 51 feet wide, with the slate attached. All the Iron Work belonging to 28 benches, of 3 retorts each. 4 Washers, 18 inches diameter. 4 Purifiers of wrought iron, 5 ft. by 11 ft., with lids, etc. 2 8-inch Slide Valves. 1 15-foot Station Meter, together with sundry connections, the whole forming a complete Gas Station, in good order. For examination apply to GEO. A. McILHENNY, Engineer of Gas Works, Washington, D. C. For purchasing apply to B. H. BARTOL, Philadelphia. 23 XII H

MACHINISTS' TOOLS. Engine Lathes, Hand Lathes, Vertical Drills, Horizontal Drills, Boring and Reaming Lathes, Slide Rests, Chucks, Planers, Shaping Machines, Compound Planers, Bolt Cutters, Slotters, Gear-cutting Engines, Portable Engines, Ac., etc. Of various sizes and numbers, manufactured by the LOWELL MACHINE SHOP, from new and improved patterns. For sale by STEVENSON & PEIRSON, 206 Milmaso* No. 48 Kilby street, corner Liberty square, Boston. 1 12*

N. C. STILES' PATENT POWER FOOT AND PROP PRESSES.—Dies of every description made to order. Send for a circular. N. C. STILES & CO., West Meriden, Conn. 15 2*

STEAM ENGINES.—WITH LINK MOTION, VARIA-BLE automatic cut-off, of the most approved construction; Mill Gearing, Shafting, Hanger, Etc. Address M. T. SAULT, New Haven, Conn. 1 26*

BOLTS, NUTS, WASHERS, SET SCREWS, COACH Screws and Machine Screws, constantly on hand for sale by LEACH BROTHERS, No. 56 Liberty street, New York. 21 12*

D. LAKE'S FLY-TRAP.—ILLUSTRATED IN THE SCIENTIFIC AMERICAN of June 10, 1865. Sent by express on receipt of \$4.1/2 DAVID LAKE, Smith's Landing, N. J. 24 10*

TRIP HAMMERS. Parties using or intending to erect Trip Hammers are invited to call and examine the Hotchkiss Patent Atmospheric Hammer, made by CHARLES MERRILL & SONS, No. 556 Grand street, New York. They are run by a belt; occupy 2 1/2 by 4 feet space; strike 200 to 400 blows per minute, according to size, and the hammer running in slides, each blow is square and in the same place. Die work can be done under them more rapidly than under a drop, and for swinging it is unequalled. They are very simple in their construction, under perfect control, and require much less power than any other hammer. Send for a circular illustrating the hammer, which gives full particulars. 1 11*

THEYSON & OGG, NO. 39 GREENE STREET, NEAR Grand, Machinists, Brass Finishers and Model Makers, Experimental Machinery, Indicators, Registers and Steam Gages of every kind accurately and promptly made. 1 8*

PATENT HORSE-POWERS.—ADAPTED TO COTTON GINS, Thrashing Machines, Farm Mills, Etc. Portable, easy-working, and proved durable by long use. For Circulars or machines address CRESSON, HUBBARD & SMITH, Philadelphia. 24 6*

GRINDSTONES OF THE BEST QUALITY MANU-factured for Mechanics, Railroad Shops, Manufacturers and the trade. Address orders to F. M. STEARNS & CO., Berea, Cuyahoga Co., Ohio. 1 7*

MACHINISTS' SUPPLIES, OF ALL DESCRIPTIONS, on hand for sale by LEACH BROS., 56 Liberty st., N. Y. 21 12*

CLARK'S PATENT FERRULES FOR LEAKY BOILER TUBES.—Illustrated No. 9, Vol. XII, SCIENTIFIC AMERICAN. E. CLARK, No. 321 Spring street, New York. 23 5*

THE UNION MOLDING MACHINE.—BEST IN USE—For circulars address H. A. LEE, patentee, Worcester, Mass. 20 10*

2,000 BOLTS PER DAY CAN BE MADE ON PATENT MACHINES. Also Rivets and Spikes of all kinds. HARDWAY & SONS, Philadelphia, Pa. REFERENCES: Jas. Rawland & Co., Kensington Iron Works, Phila. Thiers & Bradshaw, Mount Pleasant Foundry, 361 Beach st., Phila. Jas. W. Landell & Co., 396, 58, 62 Beach st., Phila. Chouteau, Harrison & Valle, Leclerc Rolling Mill, St. Louis. 1 11*

FOR PATENT STAVE AND BARREL MACHINERY Shingle Machines, Etc., address J. A. FAY & CO., Cincinnati, Ohio. 46 H

WOODWORTH PLANERS.—IRON FRAMES TO Plane 18 to 24 inches wide, at \$120 to \$150. For sale by S. C. HILL, No. 12 Platt street, New York. a

FOR SALE.—ONE SINGLE AND ONE DOUBLE Circular Saw-mill (in the West). One new 40 H. P. Steam Engine, in New York State. One large and several small Engine Lathes. Address E. C. TAINTER, Worcester, Mass. 1360w

GALVANIZED IRON.—GALVANIZING DONE WITH despatch and castings furnished if desired, either Malleable or Gray Iron. Address WILCOX & HALL, Middletown, Conn. Vol. XI. 23 26 cow*

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

THE BISHOP GUTTA-PERCHA COMPANY, EXCLU-SIVE 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 5 feet, of superior quality, or batteries, 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. SAM'L C. BISHOP, General Agent. 20 12*

OIL! OIL! OIL! For Railroads, Steamers, and for machinery and Burning PEASE'S Improved Engine Oil, and Car Oil, 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, pronounced 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. 111

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. 111

TWIST DRILLS.—A FULL ASSORTMENT, OF ALL Sizes, Stubbs' Wire and Machinists' Drills, on hand for sale by LEACH BROTHERS, No. 56 Liberty street, New York. 29 12*

DAMPER REGULATORS.—GUARANTEED TO EF-FECT 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 diagrams or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York. 23 XII 26*

CHEAP SOAP.—SAPONIFIER OR CONCENTRATED LYE.—The Ready Family Soap-maker. Soap for three cents per pound. See SCIENTIFIC AMERICAN March 18, 1865. Caution—Original, Genuine and Patented article is put up in one-pound iron cans, all others being counterfeit. Manufactured by PENNSYLVANIA SALT MANUFACTURING CO., Office Pitt street and Duquesne way, Pittsburgh, Pa. 1 8*

\$125 A MONTH!—AGENTS WANTED EVERY-where to introduce the improved Shaw & Clark Family Sewing Machine, the only low-price machine in the country which is licensed by Grover & Baker, Wheeler & Wilson, Howe, Singer & Co., and Bachelder. All other machines now sold for less than forty dollars each are infringements, and the seller and user are liable to fine and imprisonment. Salary and expenses, or large commission, allowed. Illustrated circulars sent free. Address SHAW & CLARK, Biddeford, Maine. 29 13*

\$70 A MONTH!—I WANT AGENTS EVERY-where. At \$70 a Month, expenses paid, to sell Fifteen Articles the best selling ever offered. Full particulars free. Address OTIS T. GAREY, Biddeford, Maine. 29 13*

ESTABLISHED 1826.—WORLD'S FAIR AND AMER-ICAN Institute Prize Medal Turning Lathes for Foot and Steady Power, manufactured by JAMES STEWARTSON, No. 253 Canal street, New York. Amateur's Turning Lathes made to order. 23 10*

FOR WOODWORTH PATENT PLANING AND MATCHING MACHINES, Patent Siding and Resawing Machines address J. A. FAY & CO., Cincinnati, Ohio. 3 11

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. HOOPER & CO., Lawrence, Mass. 1 11*

NEEDLES.—SAND'S NEEDLE CO., MANUFAC-TURERS of Machine Spring Needles. These needles are made by patented machinery, and consequently we claim a uniformity of spring which cannot be obtained in the ordinary way of making. Address, with two samples inclosed, SAND'S NEEDLE COMPANY, Laconia, N. H. 1 11*

\$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. 1 11*

CAN I OBTAIN A PATENT?—FOR ADVICE AND instructions address MUNN & CO., No. 37 Park Row, New York, for TWENTY YEARS Attorneys for American and Foreign Patents. Caveats and Patents quickly prepared. The SCIENTIFIC AMERICAN \$3 a year. 30,000 Patent Cases have been prepared by M. & Co.

REYNOLDS' TURBINE WATER WHEELS.—COM-PETENT men are employed to measure streams, make plans and put in flumes, wheels, and gearing. TALLCOT & UNDERHILL, No. 170 Broadway, New York. 1 XII 13*

HOLSKE & KNEELAND, MODEL MAKERS. PAT-ENT Office Models, Working Models and Experimental Machinery, made to order at 525 Water street, near Jefferson street New York. Refer to Munn & Co., SCIENTIFIC AMERICAN Office. 111

ENGINEERING SCHOOL, FRANKLIN, DEL. CO., N. Y., has full means for instruction in Mathematics, Drawing, Mechanics, Physics, Chemistry, and all applications, with full sets Eng. Instruments, Chem. Apparatus, Etc. \$150 pays Board and Tuition one year. G. W. JONES, A. M., Prin. 1 10*

SCREWS.—COMSTOCK, LYON & CO., OFFICE NO. 74 Beekman street, N. Y., manufacture Turned Machine Screws (a superior article to a headed screw), of all sizes under 1/2 inch in diameter, 3 inches long. Also Steel, Iron and Brass Screws for Guns, Pistols, Instruments, Trusses, Artificial Limbs, Etc., of the finest quality, to order. 1 11*

Zur Beachtung für deutsche Erfinder. Die Untergelichteten haben eine Anweisung, die Erfindern das Ver-bolien angibt, um sich ihre Patente zu sichern, voranzugeben, und verabschieden solche gratis an die Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Stützen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen welche man zu adressiren an Munn & Co., 37 Park Row, New-York.

Auf der Office wird deutsch gesprochen. Dasselbe ist zu haben: Die Patent-Beise der Vereinigten Staaten, nach den Regeln und der Geschäftsverbarung der Patent-Office und Anweisungen für den Erfinder, um sich Patente zu sichern, in den Ver-einigten Staaten sowohl als in Europa. Dieser Ausgabe sind den Patent-Staaten fremder Länder und darauf bezügliche Nachrichten; ebenfalls nützliche Winke für Erfinder und solche, welche patentiren wollen. Preis 20 Cts., per Post 25 Cts.

Improved Indicator for Streams.

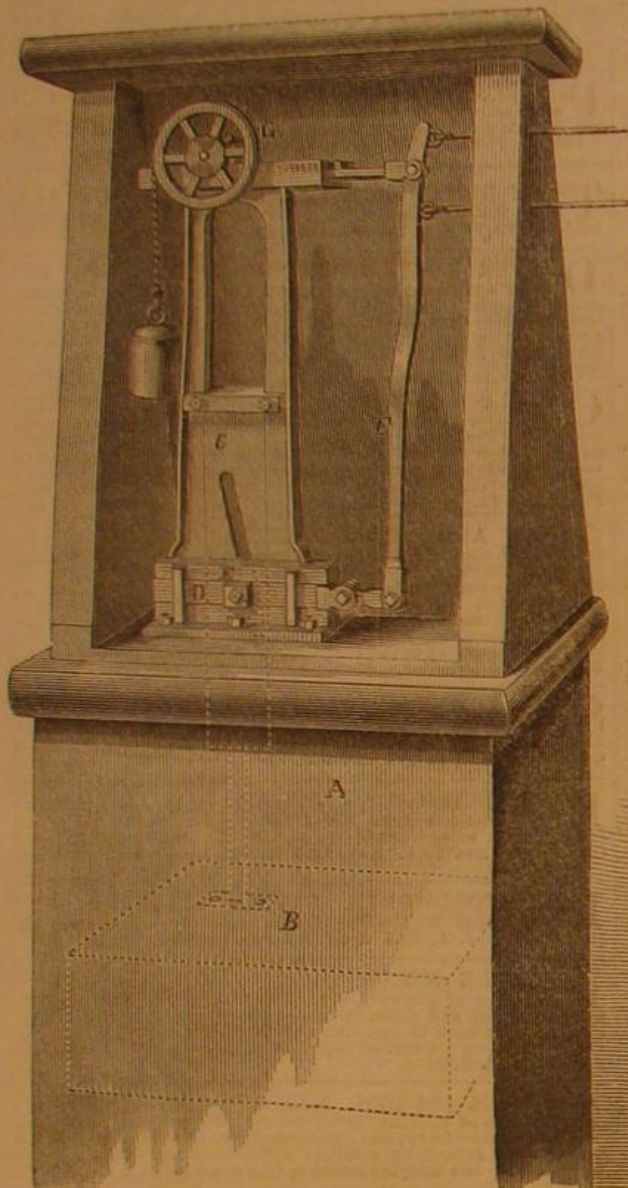
This invention is designed to indicate the height of water in streams or flumes, and give notice immediately of any dangerous increase, so that injury to dams can be foreseen and prevented. It also indicates loss of water from any cause, and strikes an alarm bell to call attention to the derangement, whatever it may be. The apparatus may be placed in the house or the mill; in the first instance the necessity for going out doors is obviated. The details are as follows:—

The case, A, contains a float, B, which has a cross-head, C. This cross-head works between guides and has a slot in it which moves a bar, D, by a pin, E,

with sluices and gates, and mounting heavy ordnance.

There never was a more patient worker for humanity or patriotism than this poor addled head. Nobody else being insane upon the same point he could get no assistance. All the other monomaniacs had oil on the brain, or poetry, or capital punishment, or negro suffrage, and were quite as devoted and zealous as he upon their several claims.

So the old soldier, with a long sigh and a brave heart, took up his single shovel and commenced to build the whole fort by himself. He wheeled barrow after barrow of earth into the sea, tugging from morning till night, until at last he raised a narrow



BRADLEY'S INDICATOR FOR STREAMS.

placed therein. The bar is connected to a long lever, F, which, in common with a sliding rack and weighted wheel, G, causes the index hand on the dial, H, to move around, through the action of the levers aforesaid, and at the same time liberate an alarm bell to inform persons in the vicinity that a change is taking place.

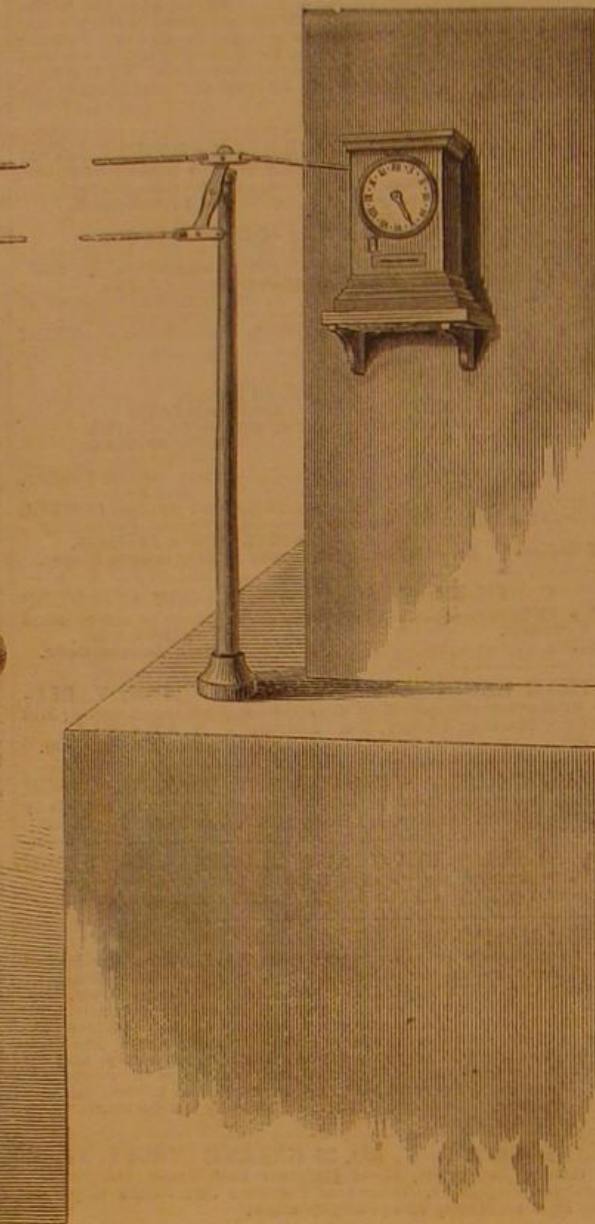
This instrument can be used, we are informed, in shoal or deep water, and is valuable to pilots, millers and all other parties interested in the matters it professes to control.

It was patented through the Scientific American Patent Agency, Nov. 8, 1864, by R. D. Bradley, of Preston, Md.; address him as above for further information.

Singular Freak of a Lunatic.

Has any one noticed the miniature fort at the top of Blackwell's Island to the north of the Lunatic Asylum? It is the work of an insane man, who has spent half his life upon it. He lost his mind in Mexico, or somewhere else where high privates were in demand, and just escaped being Mr. Armstrong, or Mr. Parrot, or Mr. Whitworth, by going crazy.

Gunnery was what ailed him—and fortification. As he was found to be quite hopeless, and obedient to his monomania, they gave him intrenching tools and told him to fortify the island. He took the geographical and geological bearings with the accuracy of a West Pointer, and concluded that any attack upon it would come from the Sound. So he devised a sea-coast battery with bomb proof, approached by a dike



causeway from the main land to a rock at the end of a long sand bar. With pebbles and shells and stones from the river, he walled this causeway until it became permanent. All this was not a month's or a year's work; year after year passed over his gray hairs, but he kept on wheeling, wheeling. The great city, on the greater island required protection, and he was making its agis. So he went on like the men who threw up the Charleston redoubts, and for fear that he might be late to his task he left his bed in the asylum altogether and built himself a hut close to his place of labor. Here he slept and dwelt, in the company only of his assuring conscience; and when at last his path was done, he set to work at his fort.

The result of all these years is before us. His battery is sodded green, with parapet, berm, ditch, magazine, revetments, abattis, and it mounts mock or Quaker guns, upon carriages of capital construction, looking up from the sound towards Hell Gate, like real arbiters of dominion.

The old lunatic is worn and failing, but he is not satisfied. His fort is done, but not his whole duty. So he has projected a water battery and sea-wall around the entire island, and means to bring to bear upon it all the knowledge of Vauban and Todleben. When the Island is impregnable he will wrap his mantle about him and die at his battery.

For the truth of all this story let anybody passing up the East river look upon the island tip, and see an old man ditching and building, and the little fort close by him bristling with pop-guns.

TO
INVENTORS, MECHANICS, AGRICULTURALISTS,
THE ANNUAL
PROSPECTUS.
OF THE
Scientific American.

THE CHEAPEST AND BEST
MECHANICAL JOURNAL IN THE WORLD,
A NEW VOLUME OF WHICH COMMENCED
JULY 1, 1865.

This valuable journal has been published nineteen years, and during all that time it has been the firm and steady advocate of the interests of the Inventor, Mechanic, Manufacturer and Farmer and the faithful chronicler of the

PROGRESS OF ART, SCIENCE AND INDUSTRY

The **SCIENTIFIC AMERICAN** is the largest, the only reliable, and most widely-circulated journal of the kind now published in the United States. It has witnessed the beginning and growth of nearly all the great inventions and discoveries of the day, most of which have been illustrated and described in its columns. It also contains a **WEEKLY OFFICIAL LIST OF ALL THE PATENT CLAIMS**, a feature of great value to all Inventors and Patentees. In the

MECHANICAL DEPARTMENT

a full account of all improvements in machinery will be given. Also, practical articles upon the various Tools used in Workshops and Manufactories.

HOUSEHOLD AND FARM IMPLEMENTS;

this latter department being very full and of great value to Farmers and Gardeners; articles embracing every department of Popular Science, which everybody can understand.

WOOLEN, COTTON AND OTHER MANUFACTURING INTERESTS will have special attention. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Mechanics' Tools, Electric, Chemical and Mathematical Apparatus, Wood and Lumber machines, Hydraulics, Pumps, Water Wheels, etc.

STEAM AND MECHANICAL ENGINEERING

will continue to receive careful attention, and all experiments and practical results will be fully recorded.

PATENT LAW DECISIONS AND DISCUSSIONS

will, as heretofore, form a prominent feature. Owing to the very large experience of the publishers, Messrs. MUNN & Co., as SOLICITORS OF PATENTS, this department of the paper will possess great interest to **PATENTEES AND INVENTORS.**

The Publishers feel warranted in saying that no other journal now published contains an equal amount of useful information while it is their aim to present all subjects in the most popular and attractive manner.

The **SCIENTIFIC AMERICAN** is published once a week, in convenient form for binding, and each number contains sixteen pages of useful reading matter, illustrated with

NUMEROUS SPLENDID ENGRAVINGS

of all the latest and best inventions of the day. This feature of the journal is worthy of special notice. Every number contains from five to ten original engravings of mechanical inventions, relating to every department of the arts. These engravings are executed by artists specially employed on the paper, and are universally acknowledged to be superior to anything of the kind produced in this country.

TERMS OF SUBSCRIPTION.

Per annum.....	\$3 00
Six months.....	1 50
Four months.....	1 00

To clubs of ten or more the subscription price is \$2 50 per annum. This year's number contains several hundred superb engravings, also, reliable practical recipes, useful in every shop and household. Two volumes each year, 415 pages—total, 832 pages. SPECIMEN COPIES SENT FREE. Address,

MUNN & Co., Publishers,

No. 37 Park Row, New York City

PATENT AGENCY OFFICE.

MESSRS. MUNN & CO. have been engaged in soliciting American and Foreign Patents for the past eighteen years. Inventors who wish to consult with them about the novelty of their inventions are invited to send forward a sketch and description. If they wish to put their applications into Munn & Co.'s hands for prosecution they will please observe the following rules:—

Make a substantial model, not over one foot in size. When finished, put your name upon it, then pack it carefully in a box, upon which mark our address; prepay charges, and forward it by express. Send full description of your invention, either in box with model, or by mail; and at the same time forward \$16, first patent fee and stamp taxes. As soon as practicable after the model and funds reach us we proceed to prepare the drawings, petition, oath and specification and forward the latter for signature and oath.

Read the following testimonial from the Hon. Joseph Holt, formerly Commissioner of Patents, afterwards Secretary of War, and now Judge Advocate General of the Army of the United States:—

MESSRS. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

For further particulars see advertisement inside, or send for Pamphlet of Instruction. Address

MUNN & CO.,

No. 37 Park Row, New York City.

FROM THE STEAM PRESS OF JOHN A. GRAY & GREENY.