Scientific American.

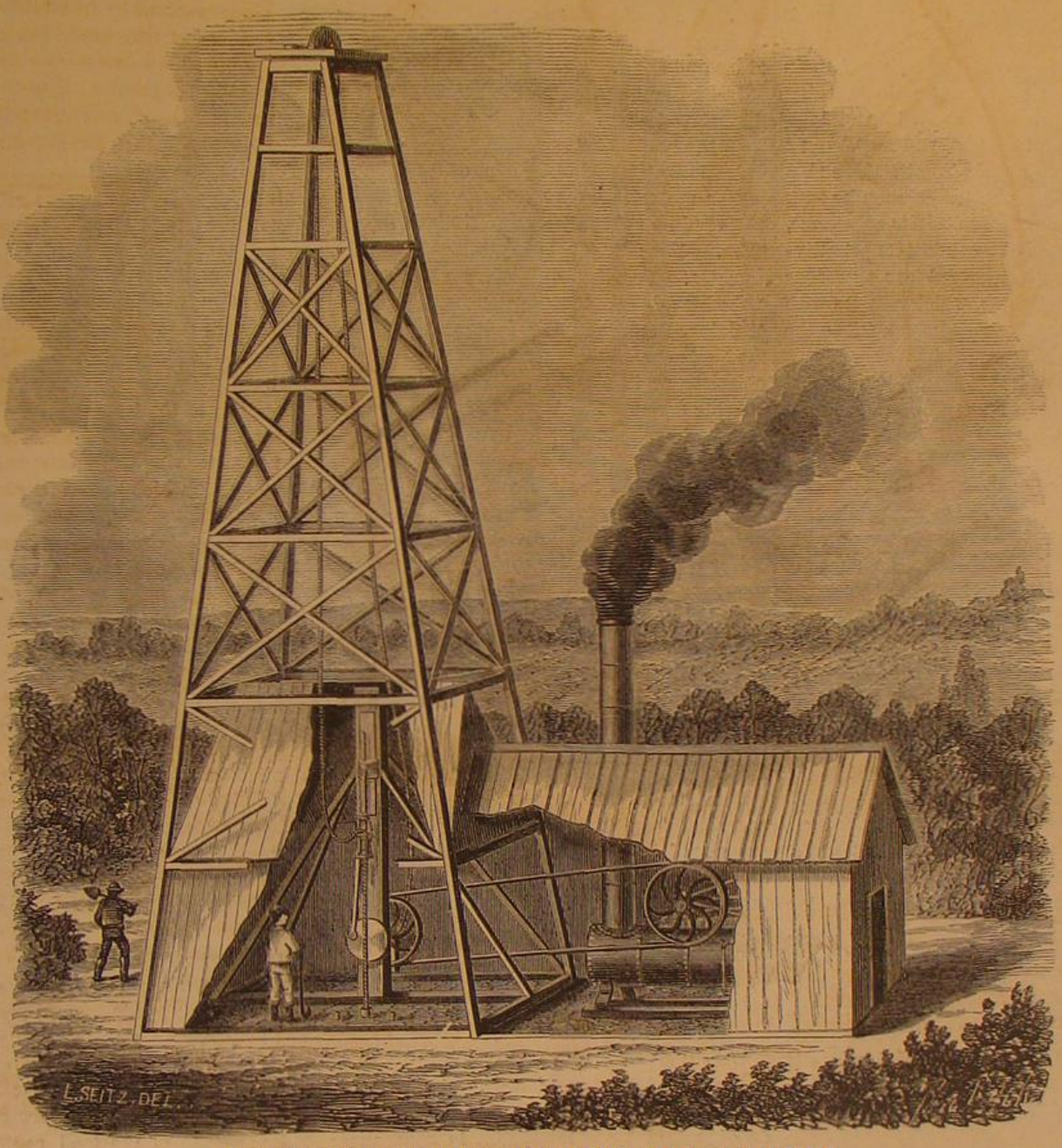
A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XIV.—No. 23. (NEW SERIES.)

NEW YORK, JUNE 2, 1866.

$3 PER ANNUM IN ADVANCE.

Drilling and Pumping.



CLAPHAM'S DRILLING AND PUMPING MACHINE.

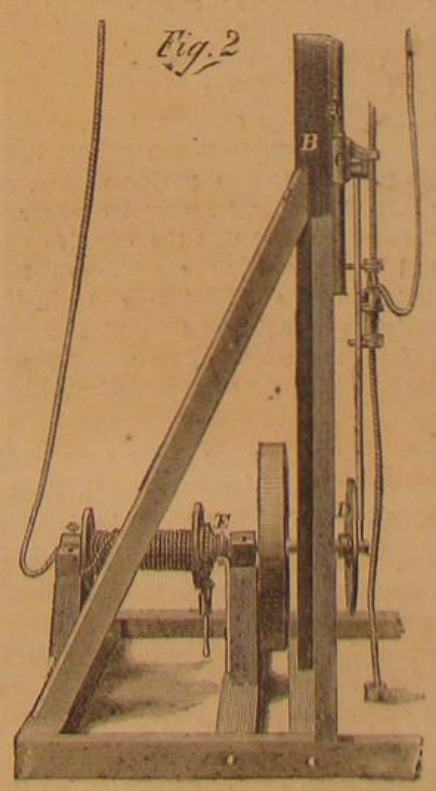
The framework of this machine consists of six lower sills—four forming the square, upon which the derrick is placed, and two cross pieces, one to bear the center post and the other a short post, as a center bearing for the shaft.

A slide, A, is fixed on the upper part of the center post, B, and upon it a crosshead, C, works, which is connected with the crank wheel, D. Attached to the crosshead are the temper screw and swivel rope clamps, which are so fitted that they can be worked by the action of the pitman. Between the center post and the inner short post is the band wheel, F, which is driven by belting from the engine. Upon the shaft outside of the inner short post is a cone coupling that can be worked so as to graduate the speed in hoisting or lowering the tools. The windlass is fitted with a pawl and ratchet which can be used when any work is to be done without the aid of the engine. The outside journal of the windlass is made to receive the bight of the rope, for the purpose of taking out the twist during the operation of drilling. This gives it a continuous rotation and enables the tools to be worked with much more mechanical precision, thereby insuring a round hole. The sand pump is attached very easily.

This machine simplifies the operation of drilling, rendering altogether unnecessary the use of the samson post, walking beam, bull wheel, bull-wheel rope, and several large sills. The advantage of dispensing with the use of these large timbers will be readily seen, for in many districts wood is so scarce that the delay in procuring them often causes a great deal of inconvenience and expense. It is equally well adapted for the use of wire rope, hemp cable, or pole tools. It admits of the rope being continually turned in the same direction, the rotary motion being accomplished by the action of the machine.

In the old system of drilling, the rope being turned at intervals, in opposite directions, it is impossible, especially when working at great depths, to be certain whether the tools have turned at all. Thus it often happens, from the tools merely working vertically, that "flat holes" so frequently occur.

The direct attachment to the windlass affords the drillers much greater facility for taking a strain on the rope or hoisting tools. With the old bull wheel, there is often much delay in adjusting the rope, and this frequently occurs when the power is most needed. The direct connection overcomes this trouble and inconvenience. The cone coupling enables the power



to be graduated in hoisting and lowering the tools. The band wheel being in the lower part of the derrick, dispenses with much strain and vibration. The whole machinery is more compact, and can be perfectly inclosed, and made as comfortable as any workshop.

The negligence of allowing property in the shape of producing wells to be uninclosed, and so exposed by day and night to the danger of fire and other accidents, is too apparent to need any comment. Hitherto the works have required so much space that it would have been difficult to inclose them, but by adopting the new method, everything becomes more compact, and can be more easily brought under cover. In cold weather the derrick room can be heated by small pipes from the boiler, without any risk from fire. The importance of this fact cannot be too highly appreciated, as hundreds of wells are every winter stopped from working by the frost. The derrick room can also be lighted from the engine room, by a glass window being placed in the partition, which brings everything under view at a glance. In pumping, the work can be done with much less power than by the old method, a six-horse engine being able to do as much work as a nine-horse by the old system.

It is often found that wells require to be worked energetically and with a rapid motion; but as a rule this cannot be done with a walking-beam, for when any speed is required, there is such an expenditure of power, and so much vibration and risk of a breakdown, that a slow motion is generally preferred.

One of these machines has been at work at the "Manor Wells," Story Farm, and one at the "Stirling Well," Tarr Farm, Oil Creek, Pa., since September last, and they are spoken of as having given the highest satisfaction.

Patented May 8th, 1866, by J. H. Clapham, whom address, at Messrs. Beebe, Son & Co.'s, 184 Fulton street, New York.

Nitro-Glycerin.

The April number of *The London Quarterly Journal of Science* copies from a German paper an extract in relation to the properties of this new chemical compound. Anything which tends to throw light upon this subject is of interest:—"Nitro-glycerin has been much lauded as an explosive agent for mining purposes. It is now stated that it freezes at a temperature of about 42° Fah., when mere friction will occasion it to explode. In one of the Silesian mines, an overseer was attempting to break a frozen mass, weighing about eight pounds, when it exploded, and the poor man was blown high into the air, and, of course, killed."

MIGHT AND MAGNITUDE.

Little by little the belief is gaining ground that fat is not force, nor size strength, nor plethora power. If we are to trust the most modern deductions of science, Goliath ought to have been a monster of weakness, while Samson, whose feats proclaim his prowess, can hardly have reached the middle hight. Hercules, too, must have been quite a small man. "Long and lazy, little and loud," are proverbial expressions physically accounted for. The Pygmæi of Thrace, who went to war with the cranes, were indeed a valiant race, if only three inches high.

The bodily frame of any animal is as much a machine as a steam engine is a machine. Now the more carbon a machine consumes, the more force it is capable of producing.

We must be careful to avoid forgetting that, in strict fact, at the present epoch, not a single thing in nature is either created or annihilated. It is transformed, and that is all. Thus, you may *burn* a piece of paper; but you do not *destroy* it. You simply make it suffer a metamorphosis. If such be your desire you can find it again, and collect its substance, weight for weight. Instead of retaining its primitive shape, the greater portion has passed into a gaseous state. It has become partly gas, which mingles with the atmosphere, and partly ashes, which fall to the ground.

Force undergoes similar transformations. *We* do not generate our own strength, as we are apt, in our pride, to fancy we do. We receive it ready generated, and then we transform it or displace it. Charcoal, for instance, in obedience to our will, supplies us with heat, that is, with force. Do you think that it really creates that force? Indeed it does not. It derives it from the sun. And when, in the depth of winter, a bright sea-coal fire is blazing in the grate, all the light and heat it gives are bestowed at the expense of the solar heat.

In truth, every vegetable substance has been actually built up, bit by bit, organ by organ, by rays of light and heat from the sun. The materials so grouped remain together; but only on one condition, namely, that the solar force, which originally assembled them, shall not quit them.

Coal is a mass of vegetable matter, which has been buried in the earth for a considerable lapse of time. It is solar light and heat put into a savings bank ages upon ages ago. It is power and action from the sun, imprisoned in the bowels of the earth. To us nineteenth centurians falls the lucky task of making it our slave, by setting it at liberty from its primeval trammels. Throw a piece of coal or wood into the fire; it is absolutely as if you took a small quantity of sun heat in your hand, to manipulate it according to your requirements. And this is not a mere form of speech; it is a correct expression of the real fact.

When an animal exerts his strength, do you also believe that *he* creates that strength? Not more than the coal creates the steam engine's strength. Here again it is entirely derived from the sun. The animal eats. *What* does he consume to keep himself alive? Alimentary substances, composed, in few words, of carbon, oxygen, azote, and hydrogen.

In an animal organism, those elements undergo a veritable transformation. Outside the animal, before they were eaten, they were combined, aggregated, united together, and in that state constituted food. Inside the animal, they are disunited, decomposed; the force which held them together quits them, allows them to separate, and so is free to do other work. It causes the creature's body to grow; endows it with vital and muscular force; and, in short, produces all the phenomena of life.

Who created the aliment? The Sun—himself created by the Great Maker of all things. Here again, therefore, the life and strength possessed by an animal are actually engendered by the sun.

Throughout your whole existence you will find, by following up the same reasoning, that your most trifling act, your most thoughtless movement, has derived its origin from the sun. A blow with the fist, a breath, a sigh, can be exactly estimated in rays of sunshine. Whether you trifle or whether you work, to make such an effort you have been obliged to expend so much strength; and that strength had already been stored in you by the sun, through the agency of a series of transformations. Your clothing is all borrowed from the sun. It is he who has spun every thread of your linen, and fed every fiber of your cloth and flannel. He either bleaches it snowy white, or dyes it purple and scarlet with indigo and madder. He furnishes leather for useful service, and furs and feathers for finery and parade. He gives you your bedding; whether you repose luxuriously between eider down and wool, or stretch your weary limbs on straw, chaff, Indian corn husks, seaweed, or even on a naked plank, as is the lot of not a few, it is the sun who gives both the one and the other. And what do we receive from regions where the sun, as it were, is not—from the immediate neighborhood of either pole? We receive just nothing. We cannot even get to them. The absence of the sun bars our progress with an impenetrable zone of ice and snow.

In like manner, your fine cellars of hock, burgundy, and claret are nothing but bottled sunshine from the banks of the Rhine, the slopes of the Cote d'Or, and the pebbly plain of the Medoc. Your butter and cheese are merely solid forms of sunshine absorbed by the pastures of Holland or Cambridgeshire. Your sugar is crystallized sunshine from Jamaica. Your tea, quinine, coffee, and spice are embodiments of solar influences shed on the surfaces of China, Peru, and the Indian Archipelago. It is the sun's action which sends you to sleep in opium, poisons you in strychnine, and cures in decoctions of tonic herbs. You taste the sun in your sauces, eat him in your meats, and drink him even in your simplest beverage—water. Without the sun, no blood could flow in your veins; your whole corporeal vitality, your very bodily life, is the result of the overflowings of his bounty.

Nor is this all we owe to our great central luminary. The physical forces with which we are acquainted—heat, light, electricity, magnetism, chemical affinity, and motion—dancing their magic round, and alternately assuming each other's form and action, and now believed in all probability to be one in their common birth and origin—are direct emanations from the sun.

But how grand and beautiful is the theory that *all* material blessings here below come to us entirely and alone from the sun! Its simplicity and unity are completely consistent with the attributes of the Maker. Given motion, and given matter, all the rest follows as an inevitable consequence. All nature, from the simplest fact to the most complex phenomenon, is nothing but a work of destruction or reconstruction, a displacement of force from one point to another, according to laws which are absolutely general.

With this much said about might, let us now look at the question of magnitude. From the foregoing statements, it may easily be conceived that the more an organized being is capable, in consequence of its physiological structure, of assimilating a given amount of aliment, the more effective force it will set at liberty, or, in other words, the more strength it will have at its own disposal.

Now, the solar forces, thus rendered active within the frame of a living creature, have, by determining its growth, to construct the animal itself. They have to generate its own proper vitality, as well as the result of vitality, its muscular power. It may therefore be asserted that the effective force at the disposal of every living creature will increase in proportion to its alimentation, and will diminish in proportion to its weight. Otherwise expressing the same idea: The more food an animal consumes and the less it weighs, the more muscular strength it will possess.

These deductions have lately been confirmed by curious experiments instituted by M. Felix Plateau, who has determined the value of the relative muscular power of insects—power of pushing, power of drawing, and the weight which the creature is able to fly away with.

It had already been remarked that animals of small stature are by no means proportionally the weakest. Pliny, in his "Natural History," asserts that, in strength, the ant is superior to all other creatures. The length and hight of the flea's leap also appear quite out of proportion to its weight. No very definite conclusion, however, had hitherto been arrived at. M. Plateau has settled the question by employing exact science as the test. Insects belonging to different species, placed on a plane surface, have been made to draw gradually increasing weights.

A man of thirty, weighing on an average a hundred and thirty pounds, can drag, according to Regnier, only a hundred and twenty pounds. The proportion of the weight drawn to the weight of his body is no more than as twelve to thirteen. A draught horse can exert, only for a few instants, an effort equal to about two-thirds of his own proper weight. The man, therefore, is stronger than the horse.

But, according to M. Plateau, the smallest insect drags without difficulty five, six, ten, twenty times its own weight, and more. The cockchafer draws fourteen times its own weight. Other coleoptera are able to put themselves into equilibrium with a force of traction reaching as high as forty-two times their own weight. Insects, therefore, when compared with the vertebrata which we employ as beasts of draught, have enormous muscular power. If a horse had the same relative strength as a donacia, the traction it could exercise would be equivalent to some sixty thousand pounds.

M. Plateau has also adduced evidence of the fact that, in the same group of insects, if you compare two insects, notably differing in weight, the smaller and lighter will manifest the greater strength.

To ascertain its pushing power, M. Plateau introduced the insect into a card-paper tube whose inner surface had been slightly roughened. The creature, perceiving the light at the end through a transparent plate which barred its passage, advanced by pushing the latter forward with all its might and main, especially if excited a little. The plate, pushed forward, acted on a lever connected with an apparatus for measuring the effort made. In this case also it turned out that the comparative power of pushing, like that of traction, is greater in proportion as the size and weight of the insect are small. Experiments to determine the weight which a flying insect can carry were performed by means of a thread with a ball of putty at the end, whose mass could be augmented or reduced at will. The result is that, during flight, an insect cannot carry a weight sensibly greater than that of its own body.

Consequently, man, less heavy than the horse, has a greater relative muscular power. The dog, less heavy than man, drags a comparatively heavier burden. Insects, as their weight grows less and less, are able to drag more and more. It would appear, therefore, that the muscular force of living creatures is in inverse proportion to their mass.

But we must not forget that it ought to be in direct proportion to the quantity of carbon burnt in their system. To put the law completely out of doubt, it would be necessary to determine the exact weight of the food consumed, and the quantity of carbonic acid disengaged in the act of breathing. Some chemist will settle it for us, one of these days.—*All the Year Round.*

NOTES ON NEW DISCOVERIES AND NEW APPLICATIONS OF SCIENCE.

SILK FROM FISHES.

The epidemic which has of late years wrought such ravage among the silkworms has led to a vast amount of searching for substitutes for silk, and M. Joly, a well-known chemist of La Rochelle, conceives that he has at length found one likely to become of practical importance. He has found it, singularly enough, in the sea—that is to say, within the bodies of certain marine fishes. The exterior envelope, he tells us, of the eggs of the fishes in question consists of a very fine tissue composed of an immense number of exceedingly delicate filaments, which admit of being readily separated, and then exactly resemble those of ordinary silk. The eggs are twenty-five centimeters in diameter one way by thirteen the other, and weigh 240 grammes each, and in their interior is a white albuminous matter, which M. Joly believes can be utilized in calico printing, and a yellow coloring matter, which he imagines may prove valuable as a dye. The obtainment from the envelopes of the eggs of a material for textile fabrics, closely resembling ordinary silk, he declares to be economically practicable on any scale.

PHOTOGRAPHIC ENGRAVING.

[illegible]dvantage of the process for obtaining [illegible]on copper plates, which we described

The great [illegible]sists in the circumstance that photo-photographs [illegible]ained may be readily "bitten in," so as last week obt[illegible] plate to be printed from just as though gr[illegible] to enable the [illegible]dinary engraved plates—the result, how-they were of [illegible] being a far more perfect reproduction of the original photographic picture than could be obtained by the most skillful mechanical engraving. When it is desired to etch a photographic picture obtained on a coppar plate by this process, the plate, after having been dried must be varnished on the back and sides, but not on the face, must have all the black dust composing the shadows of the picture carefully removed, must next be well washed under a strong jet of water, and must then, without first drying, be plunged into the liquid to be employed as a mordant. A suitable mordant is one consisting of one part of nitric acid, two parts of a saturated solution of bichromate of potash, and five parts of water. Where more convenient, the nitric acid may be replaced by sulphuric acid. The quantity of this mordant used in the first instance should be simply enough to completely cover the plate, but from time to time, as the liquid turns blue, more should be added, the action of the mordant being continued for a whole day, or for even longer, according to the temperature. The mordant acts only on the bare copper, and does not affect those parts of the plate which are covered by silver, so that the result is an incised engraving, fit for printing from. If, instead of treating the plate as thus described, the black dust composing the dark parts of the original picture be not rubbed off, and the mordant used consist of iodine associated with either bichromate of potash or nitric acid, an engraving in relief will be obtained, the iodine acting only on the parts of the plate on which there is a deposit of silver, and from this engraving in relief a reversed proof, suitable for printing from, may be procured by the galvano-plastic process.

PEROXIDE OF HYDROGEN.

Professor Schonbein has discovered a new and very ready method of procuring the peroxide of hydrogen. It consists simply in agitating, in a large flask, to which air has access, amalgamated zinc, in powder, with distilled water. Oxygen is then absorbed by both the zinc and the water, with formation of oxide of zinc and peroxide of hydrogen. The peroxide of hydrogen obtained by this method, unlike that obtained by the ordinary process, is quite free from acid, and so may be kept for a long time without decomposition. It does not contain, moreover, a trace of either zinc or mercury, but is absolutely pure. This new process has therefore great advantages over the old process of preparing peroxide of hydrogen, both as being far simpler and more expeditious, and as yielding a much purer product; but it is almost as far as the old process from yielding peroxide of hydrogen cheaply enough for use in the arts.—*Mechanics' Magazine.*

GLEANINGS FROM THE POLYTECHNIC DISCUSSIONS.

THE GALVANOMETER—MEASURING MAGNETIC CURRENTS—TELEGRAPH INSULATORS—DEEP GULLIES.

Prof. Tillman:—There is a great want for means of measuring the stength of magnetic currents. Every current will deflect a magnetic needle which it passes near, and the stronger current will deflect the needle more; but a current twice as strong will not deflect a needle twice as much. Now what is the law? There is room for invention here. The various European savans have attacked the problem, but as yet the world is without a galvanometer which will give mathematically the proper relations. Gen. Lefferts and Mr. Farmer, of Boston, have succeeded in manufacturing coils of small wire which will give uniform amounts of resistance to currents passing through. Dr. Bradley, of Jersey City, has recently combined a very compact and effective instrument, using a quantity of these coils or spools of wire.

Dr. Bradley:—Weak currents, which deflect the needle a little, produce deflections which are proportional to their force; a current twice as strong, producing twice the deflection. This law holds good only for small angles of deflection. As the angles increase, it requires a greater addition to the current to add an equal amount to the deflection. A magnetic needle points to what we call the magnetic pole, near the north pole of the earth. The artificial current to be measured is carried under such needle in the direction parallel to it. The tendency of all currents is to induce the needle to stand at right angles thereto. A weak current will produce a deflection—it will pull the needle to one side but no current can be made so strong as to pull it quite around at right angles to the magnetic meridian. De La Rive conjectured that the tangent of the angle of deflection of the needle was an approximate measure of the force of the currents. There are strong reasons for believing that the tangent of the angle is an exact measure of the force of the currents. But the speaker had based his instrument on no such supposition. It was well determined that an equal force would produce an equal deflection. The Bradley instrument is constructed on that principle alone.

The series of Leffert's and Farmer's resistance spools were arranged like a grocer's weights so as to give any resistance desired. The unit of resistance was that due to the traversing of a mile of number eight galvanized-iron wire, well insulated. By switching a number of these spools together he could make a resistance of six hundred miles, or could subdivide it down to hundredths of a mile.

The chief practical importance in the present state of the arts of an exact measure of resistance is to select and adjust telegraph instruments. Send the current through one, and measure the deflection of the needle produced by the current which passes that resistance. Then send the current through the resistance measure, and switch on or take off the resistance spools until the needle is deflected the same. Then read the result on the switch levers, as accurately as you weigh a lot of hay on the best Fairbank's platform scales.

Actual telegraph lines always impose more resistance and loss than the theoretical standard miles; but are rarely if ever so bad as to offer double the standard resistance.

Mr. Stetson:—Bad insulation in wet weather is another great difficulty to be met by inventors in telegraphy. The webs of insects extending across, become so good conductors when wetted by storms as to seriously impair insulation. This is the main cause which prevents the success of otherwise excellent inventions, for insulators. Who can overcome the mighty obstacle imposed by a spider's web to the progress of invention in this line?

Dr. Stevens:—The wearing or gullying away of the earth by the action of streams is familiar to all; but the immensity of this influence in modifying the surface of our globe is rarely appreciated except by the professed geologist. The Niagara has excavated a valley or narrow ditch with perpendicular sides, so deep that the surface of the water for about twelve miles below the falls is some three hundred and fifty feet below the adjacent country. The Ohio river between Pittsburgh and Cincinnati, runs some seven hundred feet below the natural level. It has excavated a valley to that depth. But such instances of the sinking of streams much below the general level of the country through which they pass, though comparatively rare east of the Mississippi, are very common in the great territories of the West; there they are the rule. Canons of immense depth seem to be the natural accompaniements of the water courses. The most remarkable instance in the world is the Black Canon, where the Colorado river flows through the Black Mountain region. The land lies in elevated plateaus. For a little distance the general level of the land immediately adjacent is six thousand feet above the surface of the river. At one point there is a perpendicular precipice forming one bank of the river which is one mile high as measured and verified with ordinary care by repeated observations by the anaeroid barometer.

Lacquers.

Lacquers are used upon polished metals and wood, to impart the appearance of gold. As they are wanted of different depths and shades of colors, it is best to keep a concentrated solution of each coloring ingredient ready, so that it may at any time be added to produce any desired tint.

1. *Deep Golden-colored Lacquer.*—Seed lac, three ounces; turmeric, one ounce; dragon's blood, a quarter of an ounce; alcohol, one pint. Digest for a week, frequently shaking. Decant and filter.

2. *Gold-colored Lacquer.*—Ground turmeric, one pound; gamboge, an ounce and a half; gum-sandarach, three pounds and a half; shell lac, three-quarters of a pound (all in powder); rectified spirits of wine, two gallons. Dissolve, strain, and add one pint of turpentine varnish.

3. *Red-colored Lacquer.*—Spanish anatto, three pounds; dragon's blood, one pound; gum-sandarach, three pounds and a quarter; rectified spirits, two gallons; turpentine varnish, one quart. Dissolve and mix as the last.

4. *Pale Brass-colored Lacquer.*—Gamboge, cut small, one ounce; cape aloes, ditto, three ounces; pale shell lac, one pound; rectified spirits, two gallons. Dissolve and mix as No. 2.

5. Seed lac, dragon's blood, anatto, and gamboge, of each a quarter of a pound; saffron, one ounce; rectified spirits of wine, ten pints. Dissolve and mix as No. 2.

The following recipes make most excellent lacquers:—

1. *Gold Lacquer.*—Put into a clean four-gallon tin 1 pound ground turmeric, 1½ ounces of powdered gamboge, 3½ ounces of powdered gum-sandarach, ¾ of a pound of shell lac, and 2 gallons of spirits of wine. After being agitated, dissolved, and strained, add one pint of turpentine varnish, well mixed.

2. *Red Lacquer.*—2 gallons of spirits of wine, 1 pound of dragon's blood, 3 pounds of Spanish anatto, 4½ pounds of gum-sandarach, 2 pints of turpentine. Made as No. 1 lacquer.

3. *Pale Brass Lacquer.*—2 gallons of spirits of wine, 3 ounces of cape aloes, cut small, 1 pound of fine pale shell lac, 1 ounce of gamboge, cut small, no turpentine varnish. Made exactly as before.

But observe that those who make lacquers frequently want some paler, and some darker, and sometimes inclining more to the particular tint of certain of the component ingredients. Therefore, if a four-ounce vial of a strong solution of each ingredient be prepared, a lacquer of any tint can be procured at any time.

4. *Pale Tin Lacquer.*—Strongest alcohol, 4 ounces; powdered turmeric, 2 drachms; hay saffron, 1 scruple; dragon's blood in powder, 2 scruples; red saunders, ½ scruple. Infuse this mixture in the cold for 48 hours, pour off the clear, and strain the rest; then add powdered shell lac, ½ ounce; sandarach, 1 drachm; mastic, 1 drachm; Canada balsam, 1 drachm. Dissolve this in the cold by frequent agitation, laying the bottle on its side, to present a greater surface to the alcohol. When dissolved, add 40 drops of spirits of turpentine.

5. *Another Deep Gold Lacquer.*—Strongest alcohol, 4 ounces; Spanish anatto, 8 grains; powdered turmeric, 2 drachms; red saunders, 12 grains. Infuse and add shell lac, etc., as to the pale tin lacquer; and when dissolved add 30 drops of spirits of turpentine.

Lacquer should always stand till it is quite fine, before it is used.—*Larkin's "Brass and Iron Founder."*

ENGLISH engineers have found out that one of our monitors, the *Monadnock*, made an excellent voyage to Valpariso, that she encountered the ordinary gales and behaved as well as any ship in the squadron. The monitor carried two 15-inch guns in each turret and her sides are but 15 inches out of water. It appears that the new English turret vessel *Monarch* has sides 14 or 15 feet high, which makes some grumbling among engineers; they do not seem to like such exalted structures.

THE following opinion of Mr. Solly was sent to Rome by telegram, by one of the late Mr. Gibson's friends. It is a curious sign of the times in two ways: first, in the mere fact of such a means of transmission of medical advice; and, secondly, in the extraordinary dread of bleeding a patient which exists out of, as well as in, the profession, at this present time. The message was: "Mr. Solly thinks no blood-letting is required, unless the head be hot and painful. Quiet and nourishment are indicated."

WE understand that Capt. John Ericsson is to be paid $13,030 as his reward in full for planning the United States war steamer *Princeton*, and superintending the construction of machinery of the vessel. Mr. Ericsson has realized a large fortune by his improvements and inventions during the war, which we rejoice to hear, as his services and skill have been exceedingly valuable to the Government.

A NEWSPAPER in California says they are so much annoyed out there with mosquitoes and bed bugs, that a physician advises, first a bath in a solution of soft soap and molasses, then a sprinkle of saw dust on the head, after which the patient should take to his bed and maintain perfect repose.

SODIUM DANGEROUS—THE SEA SET ON FIRE.

The Boston *Commercial*, of May 19th, has this story:—

"We understand that the ship *S. T. Joseph*, recently arrived here from Liverpool, had a narrow escape on the passage. It seems, as the matter is reported to us, that among the cargo was a box marked sodium, which was placed on deck, with instructions to the effect that if there was any trouble with it from getting wet or otherwise, to throw it overboard. Soon after getting to sea the captain took a dislike to this box, supposing it might be something of the nature of lime, and possibly might set the ship on fire. So he ordered a couple of old salts to pick it up carefully, and throw it over the stern. Instantly on its striking the water a terrific explosion occurred, and an immense column of water was thrown up, filling all hands who witnessed it with consternation and amazement. Captain Alexander is entitled to much praise for acting thus promptly with the terrible stuff (probably nitro-glycerin), for had a stray block from aloft or a heavy sea struck the box as it lay on deck, the ship might never afterward have been heard from."

The box no doubt contained sodium. It is the nature of sodium to be very violent when thrown into water. We have heard of several similar accidents. Some of the importers of sodium have had a pretty costly experience of its dangerous properties. Shippers who are aware of the risks will have nothing to do with it. One reason of the high price of sodium in this country is an extra charge to cover losses by shipment. We understand that the Wurtz Amalgamation Co. are about to commence the manufacture of sodium on a large scale, and that on account of the danger of transporting it they will offer it for sale only when combined with mercury.

The danger from sodium comes from its extraordinary affinity for oxygen; it (Na) will take that element (O) away from almost any other. When brought in contact with water (HO) it seizes the oxygen, forming caustic soda (NaO) while the hydrogen escapes. But these chemical changes are brought about with violence and if the quantity of material be great, as in Captain Alexander's case, the effects are fearful. Generally, also, there is something besides noise. The sodium and hydrogen are both combustible in the ordinary sense of the word, and when these burn together the fire is not to be put out with water.

Potassium (K), the base of potash (KO), is very like sodium. Its dangerous properties are much more decided. Whenever it touches water it bursts into flame; it even burns fiercely when placed upon a piece of ice.

Sodium and nitro-glycerin are new applicants for employment in the arts, and as is fitting for our position, we have given them a hospitable welcome. They are well commended to us and we have asked for them a trial. They havetheir faults, it is true, and who has not? But when we understand them, we have only ourselves to blame if we suffer instead of profit by their employment.

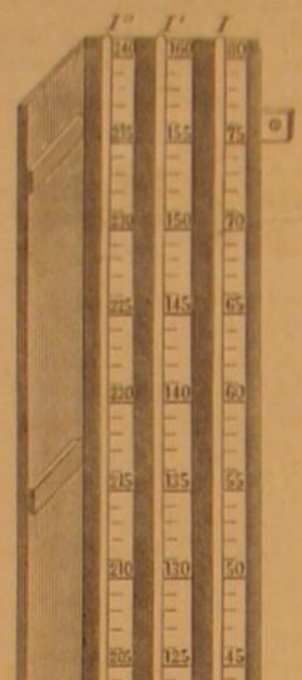
PERMANENT INK FOR WRITING IN RELIEF ON ZINC.—Bichloride of platinum, dry, one part; gum arabic, one part; distilled water, ten parts. The letters traced upon zinc with this solution turn black immediately. The black characters resist the action of weak acids, of rain, or of the elements in general, and the liquid is thus adapted for marking signs, labels, or tags which are liable to exposure. To bring out the letters in relief, immerse the zinc tag in a weak acid for a few moments. The writing is not attacked, while the metal is dissolved away.

A SUBMARINE VARNISH.—Rosin, two parts; galipot, two parts; essence of turpentine, forty parts. Melt the above and add, in the form of very fine powder and well mixed, sulphide of copper, eighteen parts; regulus of antimony, two parts. This varnish is said to protect wood from worms and to prevent the adherence of barnacles and parasites to the bottom of ships. It also preserves iron from oxydation. The author of this does not say whether the sulphate of copper (blue vitriol) will answer the same purpose. In all probability it would serve quite as well as the sulphide.

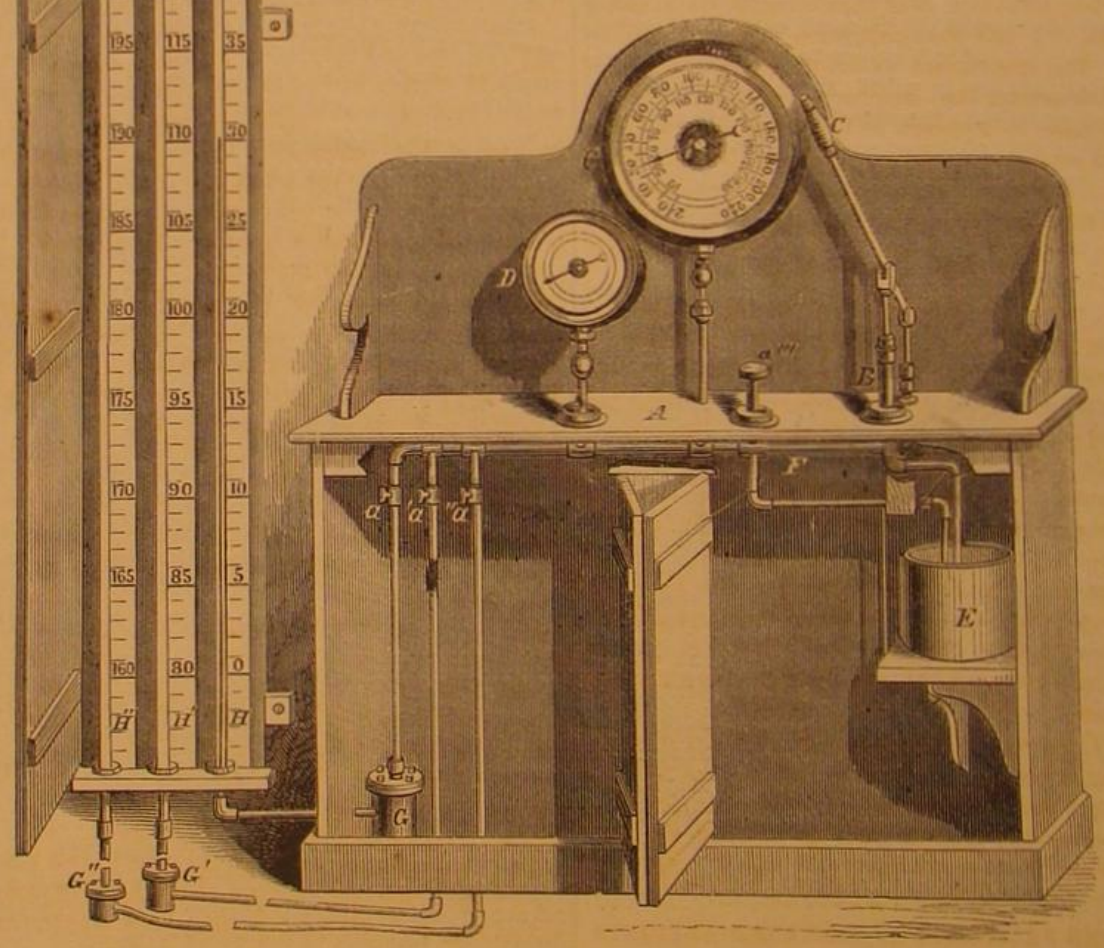
[Communicated.]

Improved Steam Gage.

The most accurate and convincing means of testing gages is a column of mercury; but to test a gage up to 240 lbs. requires a column about 40 feet high, which is inconvenient to the observer. In the arrangement illustrated by the accompanying engraving the inconvenience of a glass tube of great hight is avoided by using three tubes of mercury, whose upper ends are on the same level, so that they may be observed without ascending steps. The lower parts of two of the columns descend into rooms or cellars below; and columns of water transmit the pressure down to the cisterns of mercury at their feet.



In the engraving, A is the table on which the gages to be tested and the hand pump to produce the pressure are fixed. B is the pump; C is the test gage, and D the gage to be tested; E is a cistern from which the pump draws water; F is a pipe into which it pumps the water. From this pipe there are branches leading to cisterns, G, G', G'', which contain mercury enough to fill the respective graduated glass tubes, I, I', I'', connected with them.



KEEN BROTHERS' STANDARD STEAM GAGE.

The operation of testing is as follows:—1st. The gage is screwed on to the nipple; and the pump is worked until the mercury rises in the tube, I, to the hight marked 80 on the scale, H. This shows 80 lbs. per square inch pressure. The stop cock, *a*, in the pipe leading to the cistern, G, is then shut to prevent more water from entering that cistern and forcing the mercury out of the open top of the tube. 2d. While the mercury was rising to 80 in the glass tube, I, it rose in the iron tube from the cistern, G', up to the glass tube, I', to the level marked 80 on the middle scale. The pumping is then continued until the mercury rises to 160 lbs. on the middle scale. 3d. The stop-cock, *a'*, is then shut, to prevent more water from going into cistern, G', and pressing the mercury further up in tube, I', and the pumping is resumed, forcing water into the cistern, G'', until the mercury rises to 240 lbs. In the same way other tubes and scale[illegible] if it be required to test gages to [illegible] in the tube, I''. [illegible]s may be added, pressures. The steam gages manufa[illegible] indicate higher Brothers are all tested by this mercu[illegible]tured by Keen

This gage is used at the headquar[illegible]ers upo[illegible] tropolitan Police in New York for test[illegible]ing the steam gages of boilers officially inspected by [illegible] acting under the Police Commissioners, and by Messrs. Hopper & Douglas, U. S. Local Inspectors for this district, who have them for test gages; and they are recommended by the superintendents of many steamboat and railway companies.

Manufactured by Keen Brothers, 218 Fulton street, New York.

OUR SPECIAL CORRESPONDENCE.

First Impressions of Washington—Some facts in Ethnology—The way debates are conducted in Congress—Able administration of the Patent Office.

WASHINGTON, May 21, 1866.

As seen from the upper windows of the Capitol, Washington seems to be a flat city of brick houses, with green rows of tree tops rising from among the red walls; on traveling over it, however, it is found to be an excellent site for a town—sufficiently rolling for drainage, but not too hilly for the easy transportation of merchandise. Like most American cities, it is traversed in all directions by street cars; the fare is six cents—the same as in New York, and one cent less than in Philadelphia. The place has an unfinished air, but in a few years, with its wide streets and large trees, it will be one of the most beautiful of all our cities. The great public buildings, of white marble and pure Grecian architecture, are magnificent, but in their location the grave fault has been committed which has been remarked generally of American public buildings—that of placing them directly upon the street instead of locating them in the midst of ornamented grounds. The Capitol and the White House are exceptions; but even the grounds of the Capitol, though beautiful exceedingly, are far too contracted for the size of the edifice. What a pity that the Capitol, with its superb dome, could not have been placed on the highest ground in the city—say where the City Hall now stands.

As the SCIENTIFIC AMERICAN embraces within its province the whole circle of sciences, I keep my eyes open for any facts, in any department of these, which may prove of interest to its readers. There is one department of ethnology which has attracted my attention for several years, and which seems to me of peculiar interest to the American people—that is,

the rapid fading out of the negro race. Among all the colored people that I have observed in this city and on my way here, I have not seen a single full-blooded negro. I observed this same shading away of the black race many years ago in St. Louis, I noticed it in a trip through the Southern States to Texas just before the war, and I have remarked it very particularly in Boston, Providence, New York, and other Northern cities. It is manifestly rapidly increasing; the children everywhere are lighter colored than their parents. Henry Clay estimated that this process would extinguish all traces of the negro race in this country in the course of two hundred years.

Saturday afternoon I went into the hall of the House of Representatives—a rectangular, frescoed room, with a beautiful white marble pulpit for the speaker's desk, and the seats of the members—looking with their tables like large and handsome school desks—arranged in segments of circles around it. The House was in session, though nearly all the seats were vacant—some twenty members being in their places. One member was standing up reading a speech, and one other member—apparently a personal friend—with his right leg hanging over the arm of his seat, was listening to it. No one else in the room was paying any attention to the speech; the speaker was reading a newspaper, and the several members were either reading, writing, or talking. The conversation of one group was more audible than the reading of the member who was addressing the House, and as I was looking about the room, I was startled by a loud blow at the speaker's desk, which sounded like striking a mallet upon a book; when attention was thus secured, the speaker remarked, "I call the gentlemen upon my left to order." The speech had evidently been written for circulation among the member's constituents, but in order to make it a speech in Congress, it was necessary to read it, whether any person listened to it or not. I would suggest to your ingenious subscribers to devise some plan by which this ridiculous humbug, with its consequent waste of the costly time of Congress, might be overcome.

I have, of course, visited the Patent Office, and have only to remark that from Mr. Theaker, the Commissioner, down, I was very favorably impressed with the *personnel* of the establishment. Among the Examiners, I saw Governor Farwell, of Wisconsin, manifestly a man whose ability and weight of character should place him in a higher position; and the same remark might be made of others of the officers. I suppose the Patent Office has always been managed with more honesty and efficiency, and with less complaint from the people, than any other department of our Government. It has certainly done more than any other to increase the production of wealth and to advance the prosperity of the country.

When I started for Washington I had in view the obtaining of certain interesting information for your columns; I shall make an effort toget this to-day, and, it successful, will forward it in time for your next issue. G. B.

IMPROVED FACILITIES IN RAILROAD FREIGHTS

A novel project has recently been presented through the papers of New York and Brooklyn, designed to increase the freight capacity of railroads. It is as follows:—A double-track railroad, to be owned by a joint stock company, but to be open to free competition in transportation—any one being allowed to put trains on the road and to run them, paying tolls to the company for the privilege of transporting over the road. Also, the adoption of a uniform speed, such as will give the road its greatest freight capacity.

The *Tribune*, in allusion to the plan, says:—

"It is estimated that a road of this character would be equivalent in tunnage capacity to twenty single-track, or ten double-track roads with unequal rates of speed, while nine-tenths of the difficulties of management and liability to accidents would be taken away. The suggestions, to us, appear to be nearly, if not quite, self-evident propositions. They are analogous in principle to the operation of a grain elevator, and we do not see why the principle cannot as well be applied to a railroad as to any other piece of machinery. It is difficult to estimate the tunnage capacity of a road capable of being filled with carts its whole length, moving at a uniform rate of speed, and pouring a stream of commerce that would rival the capacity of all our canals and railroads of the State combined. We do not doubt that a road of this description could be so constructed and operated as to cheapen transportation one-half, and benefit the public in the same ratio. Our railway system, like many other things, is in its infancy, and if we mistake not, public necessity will soon bring it into a state of increased efficiency far beyond the present."

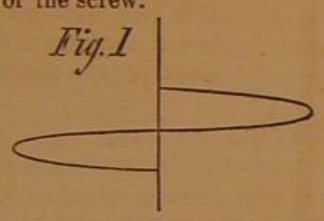
CORRESPONDENCE

Mechanical Drawing.

MESSRS. EDITORS:—There are many young persons devoting themselves to the study of mechanical drawing who find their skill and patience sorely taxed to execute a neat drawing of a screw, by any rules that are known to the draughtsman. Having overcome the difficulty in my own experience by a simple and, I think, geometrically accurate method, I propose to describe it for the benefit or gratification of your patrons who find pleasure in such things.

The perspective of any screw may be drawn by the use of a parabola whose base is equal to half the pitch, and whose hight is equal to half the diameter of the screw.

Fig. 1



The annexed double parabola (Fig. 1) describes the outline of a two-inch screw with a half-inch pitch. Cut this parabola accurately from a card, and set its base at the center of a two-inch screw with a half-inch pitch, one leg of it at the top of one thread, and the other at the under side of the next thread, and you will see that it exactly coincides with the perspective outline of the screw.

The parabola desired may be cut singly from a common business card, and used to draw the right side of the screw first, and then reversed to draw the left. But I prefer the mode of preparing a card with a double parabola as illustrated in Fig. 2.

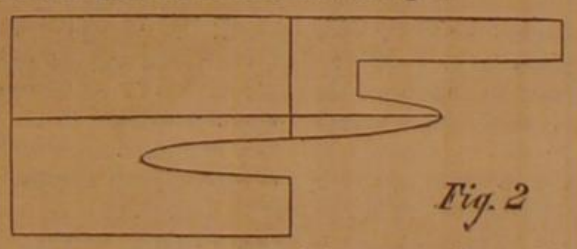


Fig. 2

After drawing these parabolas on cards or thin pieces of wood, from triangles whose hight is just the diameter of the screw, and the breadth of whose base is half the pitch required, carefully cut away, as in Fig. 2, and your card is ready for use.

The practical application of the rule, by this simple instrument, may be described thus: After drawing a center line and two light parallel lines for the diameter and length of the screw, and two others for the depth of the thread, with dividers, space off the outer lines, or only the center, into divisions equal to half the pitch, and draw light lines across the screw at right angles to the center. With a proper drawing board the dividers are not needed.

Fig. 3

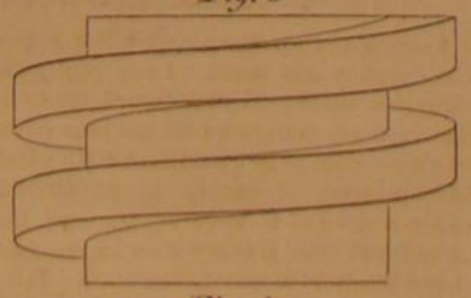
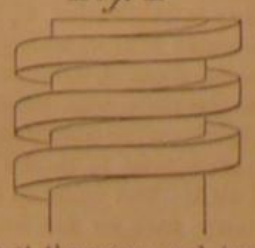


Fig. 4



Let the base line of the parabola coincide with the center line of the screw to be drawn, and the center line of the parabola coincide with any one of the half pitch lines, and then draw the under side of the thread first and then the upper, as in Figs. 3 and 4.

These examples are sufficient to illustrate the principle and convince the critic of its correctness. All bodies thrown into the air, out of a line perpendicular to the earth's surface, describe parabolas. In cutting a screw, the force moving the tool corresponds to gravity; that of the screw, to projectile force. The resultant of these two forces, when seen in a line perpendicular to the center of motion, is a parabola.

The perspective line, showing the bottom of the thread in the example, is drawn by another parabola whose hight is less than the first by the depth of the thread.

JOHN B. KELLOGG.

Birmingham, Conn., April 6, 1866.

FINANCIAL BREAK-DOWN IN ENGLAND.

Recent news from Europe represents affairs as generally very serious. Austria is arming, Prussia is arming, and Italy is arming, and Napoleon has, in a recent speech, uttered a significant word which has added fuel to the flames. It appears as though Austria was about to be ground between the upper and nether millstones. The effect of all this has been to create a wide spread distrust in financial and business circles. In England it amounted to a very critical panic among the bankers, which resulted in the suspension of several large firms. The old banking house of Overend, Gurney & Co. suspended with liabilities amounting to $50,000,000, of which sum $30,000,000 were due to depositors. This firm was doing this immense business on a paid-up capital of only $7,500,000. We do not wonder that the concern went *over-end* or overboard. We are thankful to believe that, with all our varied faults, our bankers do not transact business in this loose manner.

We regret that the firm of Peto & Betts, of which Sir Morton Peto is the senior member, and who cut such a figure in this country, was also compelled to succumb. Their liabilities are some $15,000,000, which is considered secure.

The effect of the news in Wall street stimulated the shipment of gold, and the consequent advance of 10 per cent in its price. Over $10,000,000 in gold have been shipped from New York within the past two weeks. The effect of such a large and sudden drain of the precious metal cannot be otherwise than injurious, though we do not anticipate any serious financial trouble in this country as likely to result therefrom.

Napoleon's little speech of a few words, in which he declared that he despised the Treaty of 1815, produced all this sad result. This is the whole of it in a sentence.

FOOD AND ITS ADULTERATIONS.

High prices for food lead to the introduction of injurious substitutes and adulteration. At the present time an unusual number of articles of food in daily use are badly adulterated. Common scandal for years has assigned to the milk vended from the wagons a reputation by no means creditable to the salesmen. Whiting, flour, water and many other things have been found to constitute the ingredients of the produce which confiding persons have supposed to be elaborated by the mammary glands of the cow. Cream is a mythical affair altogether.

Butter has also been found to be extensively adulterated in England. About fifteen years ago the owners of the London *Lancet* employed Arthur Hill, Hassel, and others, to investigate the matter of the adulteration of food, and published the results of their experiments in a series of papers. The scales and test tubes were employed in the endeavors to determine the quality and ingredients of the various staple articles employed in diet by the inhabitants of the British metropolis. Dr. Hassel afterward embodied the results of his labors in a volume, which is declared to be a very cyclopedia of dishonesty. No less than forty-eight samples of butter were examined by these investigators, and their discoveries were recorded at full length. They ascertained that about one-fifth of the whole weight consisted of salt

and water, the water having been stirred up with the butter rendered half fluid by heating. Potato flour was also detected.

The adulteration of coffee is more notorious. Chicory and dandelion are commonly mingled with it; and, indeed, peas, barley, sweet corn, wheat, are substituted in its place. Even the chicory itself is too valuable to escape analogous treatment. Doctor Hassel and his associates examined thirty-four samples of the prepared sort, and found carrot, parsnip, beet, beans, acorns, roasted corn, biscuit powder, and burnt sugar.

These gentlemen examined forty-two specimens of coffee, finding thirty-one to be adulterated purely with chicory; twelve chicory and roasted corn; one with beans, and one with potato flour. A packet of "Jamaica coffee" was found to be composed almost entirely of chicory; the "finest Java coffee" consisted of half coffee, much roasted corn, and a little chicory; "superb coffee" was principally chicory and roasted corn; "fine Plantation Ceylon" was almost entirely chicory; "fine Java" was heavily charged with chicory and potato; "delicious drinking coffee" was chicory and roasted corn. The more imposing the name, the grosser the counterfeit appears to have been. We remember some months since to have been presented with a sample of made coffee, the flavor of which greatly resembled that of charred wool, and its effect upon the stomach was anything but agreeable. Indeed, in this country, as well as elsewhere, there are but two certain plans to follow to obtain real coffee: to witness the grinding of it or to purchase it whole and grind it at home. Nevertheless, there are honest coffee merchants occasionally.

The same remark applies with equal justice to the trickery played upon tea. The Chinese adulterate it themselves before selling it to the "outside barbarians" by mixing it with ash or palm leaves. The English are large in the practice of gathering the "grounds" or exhausted leaves, mixing them with a solution of gum and drying them; after which by adding rose-pink and black lead to "face" them, they are made into black tea, and by using copperas they have green tea. The leaves of the beech, elm, chestnut, plane, oak, willow, poplar, hawthorn, sumach, holly, sloe, are used more or less in the work of adulteration. Black tea, however, does not appear to suffer much in reputation in this manner; but of green teas this cannot be said. Of course, it is not necessary to remark that the difference between genuine green and black teas consists in the peculiar manipulation given them by the Chinese.

Chocolate has also become notorious by reason of its adulterations. Flour appears to be the principal ingredient employed for this purpose; starch, sugar, cocoa-nut oil, lard, tallow, sweet ocher, and chalk, have also been used. The very mode of preparing it affords facilities which the dishonest could not leave alone. The proclivity is unfortunate, for the beverage is cheaper and more wholesome than its rivals.

The corruptions of sugar are less numerous, and are confined principally to confectionery. Gamboge, starch, flour, pipeclay, plaster of Paris, chalk, and even copper, lead, and mercury, are used in the preparation of cheap candies.

Wheat flour is generally sold in this country in a pure condition, owing to its cheapness. But in England, it has been found upon analysis to yield such queer constituents as white corn meal, potato flour, plaster of Paris, ground bones, chalk, rye, bean, pea, and rice flour. Bread, however, is badly adulterated. There is some reason for our people to adopt the suggestion of the French tiger Marat, and hang up the bakers at their own doors. The bread which they serve becomes thoroughly unpalatable when but a few hours old, owing to the improper ingredients employed in its preparation. Alum, either pure or mixed with salt, is a familiar article in the manufacture, making inferior flour white, and enabling it to absorb a larger quantity of water.

The remedy for these evils is an important topic for consideration. Legislation has often been proposed, but we cannot quite agree with those who regard it as the panacea of human ills. Indeed, it is hardly possible to establish in any large community, like Boston, New York, or Philadelphia, a system by which unwholesome or adulterated articles would be excluded from the market. Beside, we are a people jealous of much governing. We prefer to be cheated in the weight or quality of our bread, the quantity of our berries, the constituents of our milk, or even the ingredients which constitute our coffee or wine, to the alternative of an espionage into our habits and employment. The surveillance which in many European countries exposes every man's most trivial acts to the cognizance of government, would be resented by us as an unpardonable outrage on personal rights. We prefer to take our chances with the petty knaveries of our neighbors, to hourly contact with the informer, the policeman, or the magistrate. —*Merchants' Magazine.*

Magic Photography.

Two sheets of paper are supplied to the purchaser, together with instructions. One of these sheets is albumenized, the other is a sheet of blotting paper. There is no picture visible on the albumenized paper; but when, in accordance with the instructions given, the sheet of blotting paper is moistened by means of a few drops of water and pressed in contact with the face of the albumenized paper, a picture immediately springs into existence. The question now arises, How is this accomplished? Light has evidently nothing to do with it, seeing that the same phenomenon occurs both in sunshine and in comparative darkness.

The following is the method by which these "magic photographs" are produced:—Print a picture on albumenized paper in the usual way, taking care not to print so deeply as ordinarily. Fix the print (without toning) in plain hyposulphite of soda, wash thoroughly, and then immerse it in a saturated solution of bichloride of mercury till the image disappears. Again wash thoroughly and dry. The paper now appears like a piece of plain albumenized paper, without any appearance of a picture on it, and in this condition it may be kept for an indefinite time.

To cause the image to appear instantaneously and in more than its pristine vigor, dip the paper in a weak solution of hyposulphite of soda; or, preferably, dip a piece of white blotting paper in a solution of hyposulphite of soda and dry it. This prepared paper may be kept in contact with the latent picture so long as moisture is excluded. When it is required to develope the image, moisten the blotting paper with common water and press it against the albumenized surface of the print, when, presto! the "magic photograph" is produced, and is, when well washed, as permanent as many of the photographs of the present day. The image, by being again immersed in the bichloride of mercury solution, may be once more rendered invisible, and by the hyposulphite solution again restored as often as may be desired.

The amusement that can thus be introduced into the social circle by the "magic photographs" may be easily conceived.—*British Journal of Photography.*

"Magic Photographs."

The familiar experiments of the laboratory have in the present day a great tendency to become the magic of the drawing room. Magic photographs are among the most recent of the scientific toys which take the public attention. These are of various kinds. The first and most common mode of producing them consists in placing an apparently common piece of blotting paper upon an apparently plain piece of white albumenized paper, moistening the two and producing at once a photographic picture. The explanation of this is simple, and is doubtless familiar to old photographic experimentalists; we practiced the same feat a dozen years ago. It consists in bleaching, until it is white and invisible, by means of bichloride of mercury, a silver print; then taking a piece of blotting paper which has been previously immersed in a solution of hyposulphite of soda, and placing it in contact with the immersed print; this, when moistened, at once darkens the bleached image, and a picture, consisting chiefly of sulphide of mercury, is produced. We have received some examples from Mr. Swan, and details will be found in Dr. Vogel's German letter in this number. We have just received from Mr. Hughes's establishment a still prettier application of parlor magic, in which, by placing an apparently blank piece of paper into a solution—the material for which is inclosed in the packet—a beautiful blue print is produced. This is doubtless the result of one of the applications of the Cyanotype process of Sir J. Herschell, which may be made to produce many beautiful transformations. —*Photographic News.*

The Sterhydraulic Press.

The above is the name given to the new hydraulic press, invented by MM. Desgoffe and Olivier, civil engineers, which has excited considerable attention, owing to the satisfactory results obtained after a long practical trial. The principle on which it acts is so simple that we wonder it was not thought of long ago. There is no forcing or injecting pump, and instead of a liquid being introduced into the press, already filled, a rope is made to enter, and as it enters, it gradually displaces the liquid, causing the plunger to rise. As the substance introduced into the apparatus is solid, the inventors have given it the appropriate name of sterhydraulic press (stereos). According to the description given in the *Mining Journal* there appear to be two pulleys or drums, one inside the press and the other outside; on the outside pulley is coiled a rope, which passes through a stuffing box into the interior, when it is wound round the other pulley. The recipient being full of liquid, the inner pulley being set in motion, it is plain that the rope as it coils will occupy the place of the piston and cause it to rise. When the reverse motion is required the outer drum is set in motion, and the cord is wound out of the press, the piston descending accordingly. Oil is the liquid with which the chamber is filled, and the rope is made of gut. The joints of the piston and of the axes of the internal pulley are made stanch with leather collars; that of the rope is simply tow. There is no leakage where the rope enters, as when the press is at work any tendency of the liquid to escape is met by the velocity of the rope as it enters in a direction opposed to the effect of the liquid to escape. As these presses are, for the present, only to replace vineyard and oil presses of the olden times, they have as yet only been made up to a force of fifty tuns.—*Mechanics' Magazine.*

PATENT-OFFICE DECISIONS.

BEFORE THE EXAMINERS IN CHIEF, ON APPEAL.

Application of Thomas W. Roys and G. A. Lilliendah for a patent for Improvement in Harpoon Guns

E. Foote, S. H. Hodges, and S. C. Fessenden, for the Board.—The Harpoon in this device is propelled by a rocket shot from a case to direct it in the usual manner. The instrument as formerly constructed and patented by one of the applicants had, at the end of the tail or shank, a hook that, on its passage out from the case, caught and carried with it the rope that connects it with the boat, and a groove was provided in the case for the hook to slide in and to insure its catching the rope.

In the improved instrument the tail consists of a long loop to which the rope is attached by a ring that can slide from the front to the rear end. A slot in the case for the ring to slide in extending from the front a short distance, only, back, completes the arrangement.

A patent has already been issued for all the novelties in the instrument. A separate patent is now asked for, for the slot in the case.

In Whitely's application we had occasion to examine the subject of severel patents for one invention, and came to the conclusion that when two or more distinct inventions related to the same subject matter, there might be one patent for all, or separate patents for each, as the applicant desired, but that for a single invention there could be but one patent.

This case comes within the same principle. The slot is a part of the invention that attaches the rope to the harpoon; without it the instrument would be useless, the invention imperfected, and no patent should have been granted for it. The slot of itself, separately considered from the harpoon, has no novelty, utility, or invention. It is found in many tubes for different purposes, as well as in the gun to which the Examiner referred. Should two patents be granted, neither of them without the other would give any right to use the invention, or convey anything of the least value. A practice of issuing such patents might lead to frauds upon the community, and great injury to the character and value of patented property.

Had the features for which a patent is now asked been claimed in the former patent, they might perhaps have been allowed as parts of the same invention, but they are not the proper subjects of a separate patent.

The decision of the Examiner is affirmed.

Effect of Sinking Artesian Wells.—The San Jose (California) *Mercury* reports that a great number of flowing artesian wells in and about San Jose have completely dried, rendering worthless hundreds of acres of lagune in the southern part of the country.

Tall Rye.—A California paper says rye stalks seven feet high and yet growing, are to be seeen on Sutton's ranch, Nevada county.

Re-touching Negatives.

BY J. GRASSHOFF.

By the above it is to be understood only a touching up and improving of the plates, which is especially of advantage in the portrait department, especially if it aid in the removal of freckles and other yellow and brown spots which show themselves in the complexion, as disturbing and too dark. Following the instructions in a communication of Herr Hummel, photographer, I employed for this purpose the common soft lead pencil, and that in simple application to the varnished plate.

For parts to be very strongly re-touched (*e. g.*, in the case of enlarged copies of pictures, where the fiber or texture of the paper proves a disturbing cause) it is preferable to use a black "oil chalk" (*creta polycolor*). With this it is more easily drawn, especially in the dark parts under the eyes, etc., which are often taken too dark. In order to have a clearer and better view or insight into the work itself, it is best to work at a lamp which has an opal glass shade. A round piece of pasteboard, bent so as to suit, and in which a hole is cut of 1½ to 2 inches, is put over this as a dark shade. The plate is so directed that the light is always chiefly thrown upon the head, or the part to be wrought upon. If one works by day, however, lay the plate on a fine thin-cut pane of glass; cover the varnished side with a piece of pasteboard, which has a sufficiently large piece cut out, hold the whole toward the window, and get the light cast only on the parts to be worked on. By this arrangement the eye is kept from overexertion, and protected from the dazzling light; and the attention is concentrated on those places which are just to be worked upon. One perceives then the defects to be covered more easily and quickly.

The lead pencil or the "oil chalk" adhere both fast enough to the layer of varnish. There is no danger at all of the one or the other coming off on the paper in the copying.

Spots and pin-holes are best closed with India ink.

A certain skillfullness, however, is always necessary for this easy method, especially in the fixing of the lights; but one can very soon and very easily make himself thoroughly acquainted with the work, since it is always easier to work with pencils than with brush and colors. It should be noticed that in places where there is penciling, the oil chalk no longer adheres. In such places, therefore, where lead pencil has not sufficiently covered, India ink must be used to intensity.—*Photographische Mittheilungen.*

Ascent and Return of the Aereon.

In our last number we alluded to the Aereon, then constructing by Dr. Andrews. On Saturday, the 26th, the aerial ship was launched for a trial trip, ascending to a considerable elevation, apparently for a time under the perfect control of the aeronaut, rising but slowly, and going rapidly forward at an angle of less than forty-five degrees in the direction of Westchester county. Having reached somewhere about Harlem, the Aereon seemed to be less under control than before, being drifted forward in the direction in which the wind was blowing, following in that course till she was lost sight of.

The Aereon crossed the East River with a southwest wind, passing over a portion of Blackwell's Island, and on getting over Hunter's Point she was turned head to wind. In this position she lay perfectly still for nearly five minutes, the breeze passing by and being distinctly felt, by the occupants of the car, blowing in their faces. The ship was then put about and slowly sailed away toward Ravenswood. Owing to the fact that rather too much gas had been let out, the car touched the tops of the trees and was dragged along in this manner for some distance. On gaining an open space the Aereon was allowed to descend, and the party finally alighted in a field near Astoria, where every assistance was rendered them. The gas was then permitted to escape, and the apparatus was brought back to the city.

It appears that it had been the intention of Dr. Andrews to sail against the wind, but this was found to be impracticable from the fact of the rudder not being sufficiently large and strong. The ship was three times turned head to wind, but she could not be held in that position. Another difficulty arose from the car not being long enough, and consequently not permitting the forward end of the ship to be sufficiently elevated. The greatest altitude reached is supposed to have been about 2,000 feet.

The inventor and his friends express themselves well satisfied with the results of the trip, and feel assured that when a few more improvements have been perfected they will be enabled to navigate the air with as much certainty and more safety than we now navigate the waters.

NEW INVENTIONS.

Among the large number of patents issued on the 22d inst., we note some of the most prominent, with the names of the patentees :—

BURGLAR-PROOF DOOR AND WINDOW BOLT.—H WOODMAN, Dubuque, Iowa. Date of issue, May 1, 1866.—This is a mortise bolt fastening, and appears externally, when adjusted, for use simply as a small ornamental knob, being wholly concealed from view and consequently inaccessible to a burglar. In fact the knob is the key which, after the door or window is fastened, may be removed and applied at pleasure. The advantages of this bolt are its great simplicity, neatness, durability, strength, and cheapness, together with its burglar-proof quality, and ease with which it may be inserted, making it a very desirable door and window fastener. The manner of moving the bolt is novel, not liable to get out of order, and is so arranged, that any number of bolts can be operated by the same knob at the same time, and cannot be moved by the application of force at any other place than the point reached by the adjustable knob applied within the house. Manufacturers and others wishing to learn further particulars, can do so by addressing the inventor as above, who, we learn, has already had several applications for manufacturing rights.

WATER WHEEL.—JOHN C. MILLER, Amsterdam, N. Y.—The design of this invention is to give increased power to water wheels receiving water at the center, and discharging it at the perphery, by giving the water a spiral direction before it is received in the wheel.

CHURN DASHER.—DAVID A. MAURICE, Springfield, Ohio, — This dasher consists of two circular disks attached to a revolving shaft, connected together by a number of slats arranged so as to introduce the needed amount of air to the cream. This is done by each alternate slat causing a vacuum at its rear, thus breaking the current formed by the preceding one.

HARVESTER RAKE.—CHARLES F. DAVIS, Auburn, N. Y —This harvester has its several parts so arranged as to bring it under the control of the driver to so revolve the rake teeth that they will pass over the platform without coming in contact with any grain thereon and also regulate the size of the gavels in cutting uneven grain.

TRAP.—A. A. FRADENBURG, Dutch Flat, Cal.—The object here is to provide a self-setting trap for vermin, which has provision also for forwarding the animals entrapped through an inner apartment into a common receptacle in the rear, whence they may be removed through a door.

ANCHOR.—C. F. BROWN, Warren, R. I.—This invention consists in making anchors, wherein the main part is cylindrical in form, the flukes being connected therewith by being bolted transversely on the inside of the lower part of the cylinurical body.

STOVE FOR RAILROAD CARS.—H. G. DAYTON, Maysville, Ky.—This stove is intended particularly for railroad cars, but it can also be used for steamboats or in buildings. It is composed of an inner fuel and combustion chamber, which is surrounded by an air jacket, to which the cold external air is admitted through a suitable pipe near its base.

NAIL MACHINE.—RIVERA WARD, Alder Creek, N. Y.—This machine is intended particularly for the manufacture of horse-shoe nails. The rods from which the nails are to be forged, are passed, two at a time, through a furnace, the fire box of which is furnished with an adjustable bottom, so that the fuel can be gradually fed up from below, and an even heat can be maintained. When fresh fuel is to be introduced, a piece of sheet metal is inserted between the bottom of the furnace and the top of the fire box, and the incadescent fuel already in the furnace is sustained until the bottom of the fire box has been lowered and the box is filled with fuel. The rods after being heated in the furnace are exposed to the action of two hammers which operate at right angles to each other, and the faces of which are made in the form of two steps, and which operate in combination with an M-shaped anvil in such a manner that each hammer operates simultaneously on two rods, one to produce the flat side and the other the edge of the nails to be made.

HAT TIP GAGE.—H E. BODWELL, JR., Paterson, N. J.—The object of this invention is to facilitate the work of making the tips and side linings. It consists in a device by means of which the embroidering and the attaching of the lining to the tip are accomplished by the same act of stitching.

COTTON-SEED PLANTER.—ALBANY PACKHAM, Prestonville, N. Y.—A conical hopper is here provided with a rotating spiral tooth and distributer on a mounted frame, having a furrow opener, covering shores, and roller.

STOVE PIPE HEATER AND DAMPER.—FRANK B. HUNT, Medina, N. Y.—This device is to regulate the draft of a stove so as to save the heat; this is done by two interior perforated flanged cylinders combined together and with the exterior cylinder.

DEVICE FOR SHELLING PEAS AND BEANS.—W. K. LEWIS, Boston, Mass.—The improvement in this device is in operating the endless feed apron, which may be tightened as deemed necessary without affecting the driving mechanism. By an auxiliary attachment the proper feeding of the peas or beans to the rollers is effected, and the splitting of the pods insured.

RIVETING MACHINE.—JOHN ADT, Wolcottsville, Conn.—A reciprocating tube is employed in this machine, having a hammer, rod, and spring, operated by a crank and pitman. The tube having a pulley on it is rotated by a belt from the driving shaft; and the pulley and tube are connected by means of a feather and groove. The parts are so arranged as to give a rapid reciprocating motion to the drift rod, and also a moderate rotating one, and thus the riveting is rapidly accomplished.

LOCOMOTIVE HEAD LIGHTS.—PETER BUDENBACH, New York City.—This device consists in a combination of plates standing out and covering holes in the sides of the base of locomotive head light lamps, so as to admit air obliquely, with a circle of radiating oblique plates at the bottom, for the same purpose.

ROCK-DRILLING MACHINE.—WALTER HYDE, New York City.—This machine is intended for horizontal, vertical, and oblique rock-drilling, for tunneling and mining purposes.

SWITCH STAND.—CHARLES E. BYERS, Mahanoy Plain, Pa.—This device consists in the construction and arrangement of the suitable stand and lever that shifts the rails. If a rail is broken, it can be removed and replaced without removing the stand; the bolt is also so constructed that the bolt which holds the lever in position, can be unlocked and withdrawn by one turn of the key, and at the same time well secured from reach, and from being operated without the key.

APPARATUS FOR PRESERVING DEAD BODIES.—JACOB KUNSMAN SEN., Reading, Pa.—The object of this invention is to preserve dead bodies in any climate, till ready for interment. A box with perforated supports fitting different parts of the body is provided, by which they are kept cool. Pipes and stop-cocks are also employed to draw the water from the boxes when required.

READING DESK.—ERNST KAST, Waterbury, Conn.—This desk has a shank fitting into a tubular arm adjustable in a vertical direction on the supporting column of a table. The shank has also set screws to adjust it on the column and desk to suit the convenience of the user, while a light can be used on the table when necessary.

PILE FABRICS.—JAMES W. CROSSLEY, Bridgeport, Conn.—This invention retains in the loops of pile fabrics, the wires used in weaving the loops until the fabric has been cemented to the back. These wires thus take the place of the weft, and when the back has been cemented to the fabric they are withdrawn.

HAND PROTECTOR FOR FLAT IRONS.—J. R. BATEY, New York City.—The object in this device is accomplished by means of a wrapper of leather or other material placed on the iron to guard the hand from the heated handle and other parts.

HOOP SKIRT—CAESAR NEUMANN, New York City.—The inventor arranges the pockets or shirrs which support the hoop in sections of two or more shirrs thus bringing two or more wires close together; he also arranges single or double wires in sections of two or more to give the skirt strength and lightness.

MEDICAL COMPOUND.—E. G. PERRY, Boonville, Ill.—This is a compound for the prevention and cure of hog cholera.

SHADE HOOK.—SAMUEL WHITE, Philadelphia, Pa.—The object of this device is to hold and keep taut the cord used in drawing up window shades. A screw socket with screw for securing it to the window frame, is employed and a screw rod passes through this locket having a hook on one end and a nut on the other; by the latter the rod can be thrown up or drawn down at will.

CALK FOR HORSESHOES.—FREDERICK JUDSON, Jersey City, N. J.—A shoe plate is here provided with sockets at the toes and heels passing through it which taper gradually upward; calks with tapering heads are provided to correspond to the sockets, which become wedged therein and securely fastened to the shoe plate. By cutting slight notches in the edge of the hoof the upper ends of the socket are reached to remove the calks at any time without removing the shoe.

ATTACHMENT TO GAS FIXTURES.—BERNARD JACOB, New York City.—In this invention a spring valve is employed inside the gas pipe where it joins a chandelier or at any convenient point between the upper pipe and burner, which will shut off the gas automatically when the pipe is detached.

Notes and Queries

R. H., of N. Y.—An experiment tried by a French philosopher demonstrated that rotary pumps, of approved construction, did more work with less power than reciprocating pumps. The wings or vanes of centrifugal pumps are made taper so as to equalize the pressure or strain upon the surface, being of less area at the ends where the greatest strain would be if they were parallelograms.

W. L., of Ill.—We do not believe that an ox weighs more, all things being equal, when hot than when cold.

S. P., of Mass.—You can obtain a nautical almanac of G. W. Blunt, New York.

J. S., of N. Y.—A shaft 2 inches diameter is amply strong enough for a flutter wheel 28 inches diameter; 3½ inches is out of all reason. A balance weight would be an advantage.

A. B.—of——.We should esteem an article of moderate length, on making steel direct from malleable iron in a refining furnace, very much; particularly from the inventor of malleable iron.

E. S., of Mass.—If you had trouble with the solution of shellac in alkalies, others have not. We have seen very clear and perfect solution made in this way.

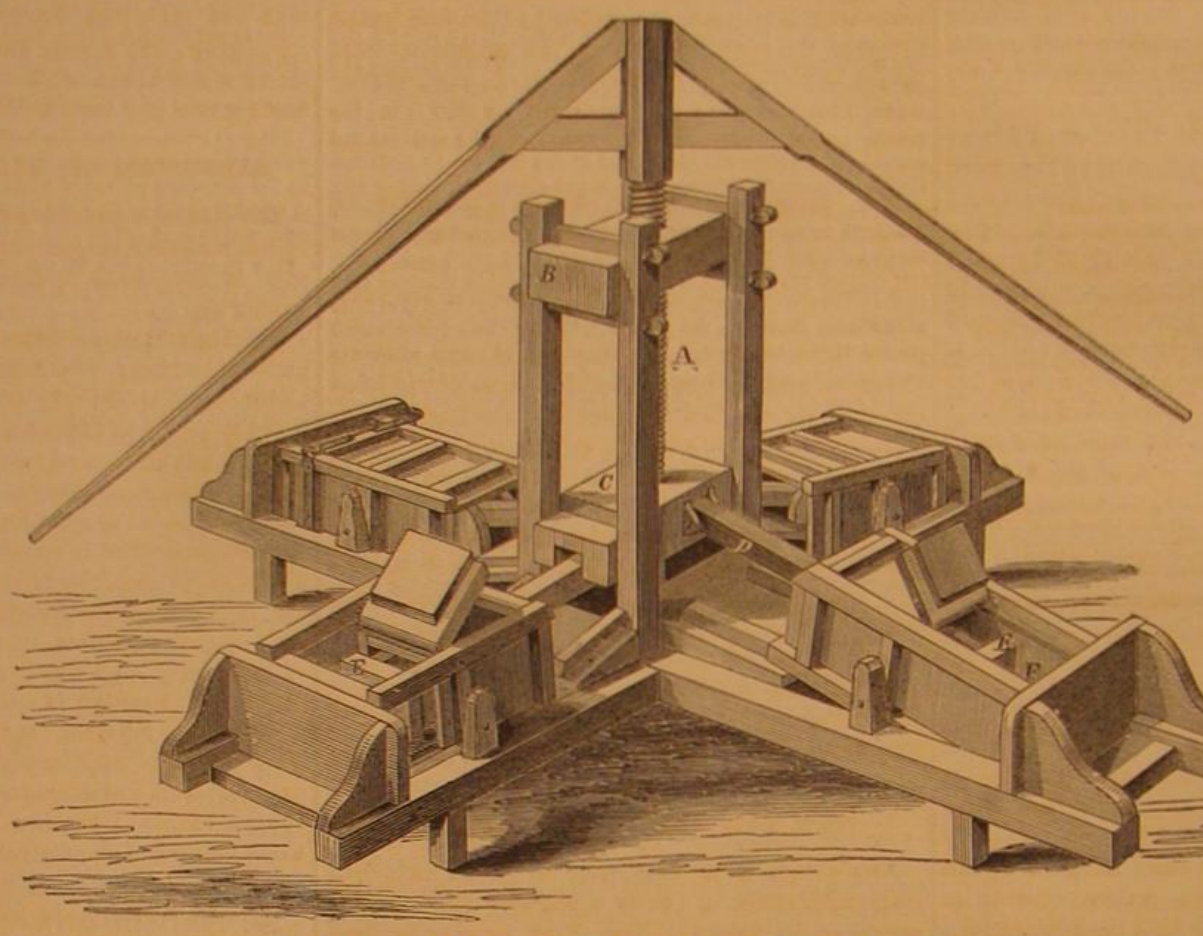
J. C. F., of O.—"Is there any mordant that will set a yellow ink made of chromate of potash? I have tried a number but all failed to prevent the corroding by exposure of light." We are very anxious to answer the queries of correspondents satisfactorily to them and to the public. But unless a question is clearly put, and the drift of it is apparent, we cannot give a straight-forward answer. Perhaps we do not understand J. C. F. and therefore may tell him something very wide of what he needs. If writing be made with chromate of potash, and after it is dry be washed with a solution of almost any metallic salt, the writing will become fixed and changed in color, the colors produced are yellow and red, and are not materially affected by light provided that the excess of soluble salts be removed by washing the paper in water.

Improved Toggle Joint and Screw Press.

The transportation of such a bulky flocculent material as cotton would be practically impossible but for the existence of presses which enable the producer to pack it in a small compass, so that hundreds of pounds can be stowed away in a comparatively small bale.

It is obvious that for plantation use, where unskilled labor is employed—that of negroes—anything like cumbrous machines, delicate adjustment, or mechanical accuracy, is entirely useless. Force is the one thing needful, and to get this other considerations must be laid aside.

In this engraving we have shown a cotton press which is well designed for its purpose, being strongly built and put together, and without any details that cannot be put in place as readily as an ox can be yoked.



GRIFFIN'S TOGGLE JOINT AND SCREW PRESS.

It consists of a strong screw, A, working in a nut, B, through which it is driven by horses or mules attached to the sweeps. The end of the screw is connected to a bed piece, C, in which four toggle arms, D, are jointed, the other end of said arms being fastened to a sliding head, E, working in the box.

It is not necessary to multiply phrases to show that, as the screw is forced down through the nut the bed piece is carried before it, which extends the arms and the sliding head with terrific force, determined by the pitch of the screw, its velocity, and the approach of the arms to a straight line. As the cotton is placed in the compartment, F, it meets the full pressure of the ram or sliding head, E, which speedily reduces it in bulk. Any substance of a similar nature can be compressed, such as hay or straw.

Patented Jan. 8, 1861, through the Scientific American Patent Agency, by Isaac B. Griffin, Milford, Ga.; address him for further information.

One of the Lost Arts Found.

Fifty years ago the hand-loom was a household institution. Linen, flannel, carpets, and other domestic goods were wrought in a majority of families. In process of time the hand-loom was neglected, and finally became an obsolete affair. The power-loom at the factory and excessive importations seemed to remove the necessity for hand-wrought fabrics. Here and there one held fast to the old custom, and covered the bed with snowy linen and the floors with honest, home-wrought carpets. But these were so rare as to become rather objects of curiosity than the fruits of ordinary industry.

The first revolution and the war of 1812, quickened the energies and inventive talent of the people for all sorts of home productions. It is interesting to note that the late rebellion has not been void of the same salutary influence. All textile fabrics commanded excessive prices during the war, and productive industry hardly kept pace with consumption, while so much of the industrial energy of the nation was swallowed up in that great contest. Necessity brought out the old hand-loom, stored away in forgotten garrets. But as the world had been progressing for fifty years, it was hardly up to modern ideas of handcraft. It has been reconstructed with many modern improvements, so that the new loom is a light, comely and ingenious piece of mechanism, fit to adorn any household. It is now manufactured with various improvements under different names, by two or more of the leading iron workers of Cincinnati, and we presume is produced in some of the other large cities of the Eastern States. Whether it will have such universal introduction into families as the the old loom obtained, may be an open question. But we should suppose, that in the present time of high prices, a hand-loom which a child can operate, capable of turning out from fifteen to thirty yards of linen or woolen goods per day, readily adapted to all sorts of light and heavy fabrics, and afforded at moderate cost, would still be a most desirable thing. In new countries, remote from market, where there is an abundance of cheap raw material, it would add greatly to the comfort and independence of the household. The people of the Pacific slope are quick to find out and utilize any new invention, and are fertile in all inventive expedients. We lack machinery to supply home necessities. The factories now in existence here supply but a tithe of the fabrics needed. Our raw material is sent out of the country and we buy it back again in manufactured goods] at an advance of 300 or 400 per cent. and often with no little discouragement of home industry. The hand-loom may be set up with little capital, and if it should become popular, one of the nearly lost arts would be restored. A little skill and patience in this development of our resources would add greatly to the wealth of the State.—*San Francisco Bulletin.*

DEMBOIS'S CULINARY VESSEL.

The wise saw says, "a watched pot never boils," but the modern instance shows that it does—it boils over.



When milk that is scalded on the fire suddenly rises up and foams over on to the stove, a stench is created that is exceedingly unpleasant. So with other culinary processes, as when sirups are boiled.

The engraving annexed represents a cooking utensil so made, as to its cover, that it cannot boil over. The vessel may be of any shape, having a flaring rim, A, and a cover, B, fitting tightly as usual. The cover has a central tube, C, which communicates with the interior, and also holes, D, all round the outer edge. The inventor says that when the fluid gets so hot as to boil over, it rises up through the central tube and falls over on the cover, which lowers the temperature so much that the ebullition on top ceases, and the fluid subsides, which is the end he desires. This, it is claimed, will save much time and material.

It was patented through the Scientific American Patent Agency on March 27, 1866, by F. W. Dembois, of East Saginaw, Mich.; for further information address him at that place.

A STUBBORN ENGINEERING JOB.

To make use of a trite figure of speech, it would appear, from recent reports, that the ancient Commonwealth of Massachusetts had bargained for, and made a considerable advance on account of, a very large elephant, known as "the great bore," or Hoosac Tunnel. It appears that the whole cost of the road and tunnel, when completed, was estimated at a trifle over five million dollars, but owing to high prices and other unforeseen difficulties, it is likely to reach nearly, if not quite, twelve millions.

The total length of the proposed tunnel is $4\frac{66}{100}$ miles, or 24,586 feet. The total length of the bore or excavations in the main tunnel, to Nov. 1, 1865, was 3,598 feet, leaving nearly four miles unfinished. The size of tunnel proposed by the Commissioners requires an excavation of 433 cub. feet to a lineal foot. For the entire tunnel the excavation required would be 10,645,738 cubic feet. But there had been excavated, before the work was assumed by the State, 565,848 cubic feet, leaving over ten millions of cubic feet to be excavated when the Commissioners commenced. Of this amount the Commissioners have excavated 108,000 cubic feet, or a fraction more than the one-hundredth part of the whole, and yet they have expended about $1,500,000 in two years of actual work.

When we consider that this is the total progress made in the tunnel, which was to have been completed in anticipation, from time to time, in from three and one-half to five and one-half years; and when we consider that the State has had undisputed control, with unlimited means at her command, for a time, that should complete it some time during the coming year, we are satisfied that the plan of constructing a road over the mountain is entitled to favorable consideration.

We have not had much experience in tunneling mountains for railroad purposes, and it is not strange that miscalculations should be made in such gigantic enterprises. There is a great deal of pluck in Massachusetts, and the work must be very formidable to deter its final accomplishment.

Our Boston friends, it appears, have been imposed upon by the ice companies, and they threaten a terrible vengeance. They propose to go out to sea, hook into a few icebergs, and then tow them into the city. Mountains of ice cream, and seas of root beer and lemonade, and a good hitch on the ice companies, are in prospect. On the other hand the ice companies, of course, warm up in the discussion of the subject, and denounce the scheme as a cool swindle.

M. Torreggiani recently informed the Academy of Sciences that after repeated experiments he had proved that a pile, in which the positive pole was represented by metallic lead, and the negative by carbon, and which contained a saline solution (an alkaline acetate), gave a large quantity of pure carbonate of lead besides electricity, which might be profitably employed. M. Torreggiani considers that is an easy and innoxious way of making white lead.

THE

Scientific American.

MUNN & COMPANY, Editors & Proprietors.

PUBLISHED WEEKLY AT

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

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

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

☞ American and Mexican News Company, Mexico, are Agents for the SCIENTIFIC AMERICAN.

☞ Messrs. Trubner & Co., 60 Paternoster Row, London, are also Agents for the SCIENTIFIC AMERICAN.

VOL. XIV., No. 23..[NEW SERIES.]. *Twenty-first Year.*

NEW YORK, SATURDAY, JUNE 2, 1866.

Contents:

(Illustrations are indicated by an asterisk.

*Clapham's Drilling and Pumping Machine	375	Patent Office Decisions	380
Nitro-Glycerin	375	Re-touching Negatives	381
Might and Magnitude	376	Ascent and Return of the Aereon	381
Notes on New Discoveries and New Applications of Science	376	New Inventions	381
Gleanings from the Polytechnic Discussions	377	Notes and Queries	381
Lacquers	377	*Griffin's Toggle Joint and Screw Press	382
Sodium Dangerous	378	One of the Lost Arts Found	382
*Keen Brothers' Steam Gage	378	*Dembois's Culinary Vessel	382
Our Special Correspondence	378	A Stubborn Engineering Job	382
Improved Facilities in Railroad Freights	379	The Limited Nature of Patents	383
*Mechanical Drawing	379	How Fast Does the World Move?	383
Financial Breakdown in England	379	Exhaustion of British Coal Fields	383
Food and its Adulterations	379	Patent Claims, 384, 385, 386, 387, 388	
Magic Photography	380	Thomas & Seaman's Bolt Cutter	390
"Magic Photographs"	380	Gibson's Anchor Tripper	390
The Sterhydraulic Press	380	Another New Developer	390

No SUPPLEMENT is issued with the present number.

THE LIMITED NATURE OF PATENTS.

We think, beyond doubt, that the practice of making grants for the sole use of inventions originated in England, and that this English system of rewarding inventors has since been adopted by all civilized nations. Among the earliest grants of which we have any record, was that of Edward III., of England, who was persuaded by two friars and two aldermen, that a philosopher's stone might be made; the king, therefore, granted a patent privilege, that they and their assigns should have the sole making of the philosopher's stone. It was early contended that inventors were not entitled, as of *right*, to Letters Patent, but as a matter of *grace* and of favor. If an inventor was entitled to the exclusive use of his discovery as a right, merely, there could be no good argument against the enjoyment of this right in perpetuity, the same as other species of enduring property.

The idea of a limited right was early adjudged to be based upon sound philosophy, and, as a matter of public expediency, a term of fourteen years was fixed as the proper duration of exclusive privilege. Our statute was based upon this limitation to which was also added the right of extension for an additional seven years in case it could be made to appear that, without fault of his own, the patentee had failed to receive a sufficient reward for his discovery during the first term of the patent.

It was the intention of our patent law, that the real inventor of any valuable improvement should be liberally rewarded for his time and ingenuity, under the expectation that it would stimulate an eager search after improvements in the useful arts.

If an inventor could maintain his right to a patent in perpetuity, or if the grant of a patent conferred exclusive privilege for a half-century or more, it is very evident that such grants would operate as a bar to all improvements in the same branch of invention, as they would compel every subsequent patentee to pay tribute to the original inventor and patentee. The justice and expediency of limited patents will therefore be apparent to all reflecting minds. The public welfare requires such limit, and the practice of extending patents under our liberal system had been so frequently perverted that Congress enacted a law limiting the grant of Letters Patent to a period of seventeen years, without the privilege of an extension. We do not doubt that, under this very liberal term of protection, some cases of extreme hardship—very exceptional in their character—will arise, which would justify an extension, but the law abridging the right of extension was deliberately enacted by Congress, and was intended to subserve the general good, and not to meet merely such exceptions as might happen to exist.

The recent action of the House of Representatives, in regard to the extension of patents, points to the theory that Congress will not directly extend patents. The SCIENTIFIC AMERICAN has uniformly opposed such special legislation. We have regarded it, in a general sense, as unwise and unjust, and especially when it was attempted to revive *expired* patents.

We have always held to the reasonable doctrine that, after a patented invention had become public property, the right of all to use the invention, without let or hindrance, was fully assured; and, furthermore, that Congress had no right to deny to the whole public, thereafter, the free use of such invention.

The proposition of the House Committee on Patents is to authorize the Commissioner of Patents to hear and decide upon testimony, such cases as do not come within the intent of the general law, and, therefore, beyond his legal jurisdiction. We much prefer this course to a special act of extension by Congress, and are free to say that some of the cases reported in our last number are meritorious and worthy of the attention bestowed upon them, but we still most seriously question the propriety of allowing the Commissioner to extend expired patents.

If this system is to obtain, Congress will have plenty of such cases, and the Commissioner of Patents will have his whole time taken up in considering them. We suggest, therefore, before this proposition is carried into effect, that Congress establish a new office entitled the "Bureau for the Resurrection of Dead Patents," with a dead house or "Morgue" attached, where parties interested could view the subjects to be operated upon.

HOW FAST DOES THE WORLD MOVE.

Now-a-days it is very easy to go a great way without knowing it. It is a common thing, for example, to be asleep in New York or near by, and wake up in Boston, Albany, or Washington. Those who go to sea in ships have a custom of now and then making an observation and a reckoning in order to determine how far they have sailed and where they are. Those who sail with the current or drift with the tide, unless they watch the landmarks or make some mathematical calculation, may not be aware of the motion, it is so gentle. How few people think or even know that they are whirling about the axis of the earth at the rate of a thousand miles an hour, and around the sun at the rate of a million miles a day. If people would only think, there might be less complaint of slowness and dullness.

Some people find that we get on very slow in the arts and sciences, and there is nothing new under the sun, that all the inventions are trivial or worthless. Such sailors have lost their reckoning and do not look out for the landmarks.

The fact is that every civilized man carries about with him some evidence of recent progress in the arts. He does it unconsciously perhaps, for improvements may come on by such small degrees that it is not easy to fully appreciate their amount or their value. We would suggest, as a profitable exercise to the reader, to enumerate and fix the value to himself and to the world of the novelties he uses. This exercise will show him perhaps that there is not an article of clothing or of household use, or of use in his avocation, which is not in some respects better than what his grandfather possessed, and that the latest perfections of all these things have been recorded at the Patent Office within his life time.

A useful art may be compared to a tree which, from a small beginning, becomes by degrees a stately form. An art always originates from some isolated fact, which at first may seem insignificant; the finding of such a fact is what we call a scientific discovery. The discovery may be announced in the societies or the newspapers in a few uninteresting words, and it soon becomes forgotten by the world. But the inventor gives nourishment to the germ and out of it grows the useful art. When the art has reached to large proportions, those who do not observe carefully, do not take notice that new buds and new twigs are being constantly added. What a bright vision it would have been to the discoverers of the expansive force of steam, or of new substances like phosphorus, chlorine, iodine or chloroform, if they had but the slightest glimpse of what has grown from their discoveries in the nineteenth century!

We are often told by those who cynically criticise new inventions that in, a machine, for example, it is only that another screw is put in, or that a part is made straight which before was crooked. The test of an invention is the improvement; if the addition of a single screw makes the machine better, let us have it, and let us thank the inventor. Some wise man has said, that he who makes two blades of grass grow, where was only one before, is a benefactor of mankind; might not the wise man with as much grace pay such a compliment to the inventor?

EXHAUSTION OF BRITISH COAL FIELDS.

The idea of a possible exhaustion of the coal fields of England is a subject that now excites apprehension in the minds of English statesmen and manufacturers.

The Right Hon. J. Stuart Mill, the able writer upon political economy, in a recent speech in the House of Commons, the delivery of which occasioned great interest, spoke as follows upon this subject:—

"The termination of our coal supplies, though always certain, has always, until lately, appeared so distant, that it appeared quite unnecessary for the present generation to occupy itself with the question. The cause of that was that we had calculated upon the then rate of consumption; but the fact now is that our consumption of coal increases with such extraordinary rapidity from year to year that the probable exhaustion of our supplies is no longer a question of centuries, but of generations. I hope there are many members in this House who are acquainted with a small volume written by Mr. Stanley Jevons, entitled 'The Coal Question'; and it appears to me that Mr. Jevons's treatment of the subject is almost exhaustive, for he seems to have anticipated everything which it is possible to be said against the conclusion at which he has arrived, and to have answered it; and that conclusion is, that if the present rate of consumption of coal continues, three generations at the most, or very possibly a much shorter period, will leave no workable coal nearer to the surface than 4,000 feet in depth; and that depth will entirely put it out of the power of the country to compete in manufactures with the richer coal fields of other countries. I think, then, if there be any one in this house or out of it, who knows anything that will invalidate these conclusions of Mr. Jevons, it will be right of him to come forward and make it known. I have myself read several attempts to answer Mr. Jevons, but I may say that every one, admitting the truth of everything said, has only made out that our supplies will continue a few years longer than Mr. Jevons has assigned."

Mr. Gladstone, Chancellor of the Exchequer, in a recent speech of wonderful power, perhaps never before excelled in the British Parliament, fixes the time when this anticipated calamity will be nearly reached, and bases thereon an argument that it is the duty of the government, as representing an industrious and honest people, to provide now for the gradual extinguishment of the national debt. He argues that whenever the period is reached that the coal fields can no longer be worked profitably, the country will not be able to bear the taxation necessary to support so large a public debt. It is quite certain that whenever Great Britain reaches the point of dependence upon other nations for her supply of coal, that moment will witness the rapid decline of her industrial resources and political power. The ratio of annual consumption of coal must continue to be very great.

PROF. CHARLES A. SEELY, the distinguished practical chemist, has removed his laboratory from Canal street to No. 26 Pine street, New York. We would recommend any of our readers who may desire to obtain analyses of any substance, to communicate with Prof. Seely. We have known him for many years, and can bear testimony to his extensive knowledge of the chemical arts.

Patent Claims

ISSUED FROM THE U. S. PATENT OFFICE
FOR THE WEEK ENDING MAY 22, 1866.
Reported Officially for the Scientific American

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

54,836.—Drilling Machine for Wells.—M. E. Abbott, Summit Hill, Pa.:

First, I claim the arrangement of devices herein described for imparting to the drill rod a movement in a vertical plane, the same consisting in securing it within the frame or cross bar, o, moving on suitable vertical guide rods or bars, p p, and connected with the engine beam, g, in proper manner, substantially as set forth.

Second, Revolving the drill through the vertical movement of the same, by means of the sliding plate, x, moving in and between parallel inclined guides, b' b', and provided with a spring pawl, a', engaging substantially in the manner described.

Third, The combination of the jaws, q' q', and bent arms, s' s', arranged and operating with the rod, v, in the manner and for the purpose herein specified.

Fourth, The combination of the jaws, t' t', and lever frame, v', arranged and operating with the rod, v, in the manner and for the purpose herein specified.

Fifth, In the described combination with the drill rod, v, and the beam, g, for operating the same, I further claim the crank arms, d' h' m', rods, f n', and adjustable tappets, g' g', arranged and employed, substantially as set forth, to regulate the stroke of the drill.

54,837.—Riveting Machine.—John Adt, Wolcottville, Conn.:

I claim the reciprocating and rotating tube, I, operated substantially as shown, in combination with the internal hammer rod, O, arranged with the springs, P Q, and the nut, R, or its equivalent, substantially as and for the purpose set forth.

I further claim the adjustable or rising and falling disk or bed, T, in combination with the reciprocating tube, I, and the hammer rod, O, and spring, P, all constructed and arranged substantially as and for the purpose specified.

54,838.—Method of Combining Wrought Iron with Cast Iron.—W. M. Arnold, New York City. Antedated May 18, 1866:

First, I claim the mode, hereinbefore described, for combining and uniting wrought with cast iron, that is to say, forming a skeleton of wire, which has been coated or tinned, and so arranged and placed at such intervals, that the melted metal can penetrate all portions of such skeleton, and then filling those interstices with cast metal, substantially in the manner and for the purpose above set forth.

Second, I also claim, in this connection, the tinning or coating of iron wire in such a way as to prevent the molten metal, which shall afterwards be combined with it, from producing any injury to such wire, substantially as above set forth.

Third, I also claim forming a skeleton of metallic wire, and then filling up the interstices with molten metal, for the purpose and substantially in the manner above set forth.

54,839.—Apparatus for Preparing Peat.—Edward H. Ashcroft, Lynn, Mass.:

First, I claim the hollow perforated shaft, B, and the screw, C, or their equivalents, in combination with the cylinder, A, the whole being constructed and made to operate together, substantially as described, and for the purpose set forth.

Second, The combination of the steam jacket or cylinder, F, with the inner or forming cylinder, E, constructed and operating substantially as described, and for the purpose set forth.

54,840.—Coupling for Carriage Thills.—C. H. Bassett, Derby, Conn.:

I claim the employment of centers, or taper bearings, in combination with the tongue piece and clip, and a suitable means of holding the parts in adjustment, substantially as set forth.

54,841.—Hand Protector for Sad Irons.—J. R. Batey, New York City:

I claim a hand protector for flatirons composed of a wrapper, A, and guard, B, substantially as described, as a new article of manufacture.

54,842.—Furrowing Machine.—Francis M. Birdsall, Martinsville, Ohio. Antedated May 16, 1866:

I claim the plow frames, e, longitudinal strips, e', and levers, d, in combination with plows, g, frame, A, and sliding strips, h, constructed as above described, and for the purposes set forth.

54,843.—Sash Fastening.—Eli S. Bitner, Lockhaven, Pa.:

I claim the lever, D, with flange, C, and knob, E, constructed and connected with plate, B, as shown in combination with the spring, C, having the spur, A, at its end, all arranged and operating as herein shown and described.

54,844.—Sewing Machine Guide for Stitching Hat Tips to the Side Linings.—H. E. Bodwell, Jr., Paterson, N. J.:

I claim the combination of the hemmer, C, and gage plate and guide, D F, constructed and arranged substantially as above set forth, for the purpose of stitching, and also of connecting a side lining to a hat tip, at the same operation.

54,845.—Hydrant.—B. P. Bower, Cleveland, Ohio:

First, I claim the adjustable toothed plate, B, the corresponding depression in the plate, B', and the pipes, C' and D, arranged in the manner, and for the purpose set forth.

Second, I claim the adjustable tooth plate, B, with the corresponding depressions in the plate, B', arranged in relation to the screw stem, h, and cap F', the washers, m, valve, L, packing, q, and groove, e, in the manner and for the purpose set forth.

Third, The cylinder, F, with flaring end, G, pipes, E, and pipes, D, in combination with packing, t, and induction pipe, H, arranged as and for the purpose set forth.

54,846.—Churn.—J. C. Bridgman, London, Ohio:

I claim the combination of the cover, B, and pin, H, with the handle, D, having spiral thread, D', the loose collar, E, and dasher, C, the parts being severally constructed and arranged for use substantially in the manner and for the purpose set forth.

54,847.—Anchor.—E. F. Brown, Warren, R. I.:

First, I claim forming the sides of anchors of continuous bands, with the flukes arranged across the inner sides thereof, substantially as described.

Second, I also claim strengthening the body of an anchor whose sides are made continuous, by means of an inner rib or membrane, E, and by a stay rod, C, one or both, substantially as described.

Third, I also claim cutting away the upper parts of the body of an anchor, whose sides are continuous, as at D D, and forming points, F F, at one side of the center of gravity, so that the anchor will right itself, substantially as described.

54,848.—Croquetrie.—Lewis Bradley and Milton Bradley, Springfield, Mass. Antedated April 17, 1866.

First, We claim the combination of arch, a, and sockets, b c, to form a croquet bridge or arch, substantially in the manner and for the purpose herein set forth.

Second, An iron croquet bridge or arch coated with zinc, tin or other similar metal, substantially in the manner and for the purposes herein fully set forth.

Third, The method herein fully described of painting croquet balls in which the light balls are designated by black or dark stripes and the dark balls by white or light stripes.

54,849.—Trunk Lock.—T. Stewart Brown, Philadelphia, Pa.:

I claim the combination of the two bolts, b and b', arranged in respect to the case, a, and operating substantially as and for the purpose herein set forth.

54,850.—Head Light for Engines.—Peter Budenbach, New York City:

I claim the combination of the plates, B, covering and extending beyond the margin of the aperture, C, with the radial and oblique director plates in the lower opening of the tube of A, the combined devices operating to deflect the entering currents of air to prevent the direct infringement of the air upon the flame and the consequent disturbance thereof.

[This improvement consists in a combination of plates standing out and covering holes in the sides of the base of locomotive head light lamps, so as to admit air obliquely with a circle of radiating oblique plates at the bottom for the same purpose.]

54,851.—Steam Valve.—M. Burnett and H. Comstock, Boston, Mass.:

We claim as an improvement in stop valves, the arrangement of the seat, a, and valve, b, when constructed substantially as described.

54,852.—Ice Pick.—E. G. Burnham, Bridgeport, Conn.:

I claim the pick iron or steel point formed on the tube which is held in the hand in combination with the solid metal rod fitted within the tube, so as to work up and down therein, and act as a hammer upon the pick, all substantially in the manner and for the purpose described.

54,853.—Rail for Railroads.—Jesse S. Butterfield and M. S. Green, Philadelphia, Pa.:

We claim the rail, composed of the upper portion, A, with its longitudinal groove, and pins, S, and lower portion, B, with its longitudinal rib, b, adapted to the said groove, and its openings, e, substantially as set forth.

54,854.—Cultivator.—H. F. Byerly, Clinton, Ill.:

First, I claim the sliding bolts, K K, slots, I I, and pendants, b b, combined and operated, substantially as and for the purpose specified.

Second, The rolls, L, lever, f, and chain, M and h, combined and operated substantially as and for the purpose set forth.

54,855.—Switch Stand for Railroads.—Charles E. Byers, Mahanoy Plain, Pa.:

I claim the combination of the bolt, G, lever, K, piece, I, and spring, J L, applied to lever, D, arranged relatively to each other and with the top, F, of the switch in the manner and for the purpose herein specified.

54,856.—Needle Wrapper.—William Byfield, New York City:

I claim the combination of a wrapper having two flaps with a holder, substantially as described, so that the opening of two flaps will permit the points and eyes of the needles to be seen while they are held securely to be removed one at a time.

54,857.—Flour Dipper, Measure, and Sifter.—George G. Carver, Roxbury, Mass.:

I claim the combination of the dipper with ridges or lines indicating quarts and pints, the horizontal beater with radial flexible rubbers and concave seive, all as specified.

54,858.—Paper Neck Tie.—Elisha Childs, Jr., Springfield, Mass.:

I claim the ornamental neck tie composed of a paper scarf, stock, and band, and the metallic clasp carrying an elastic loop, combined and arranged substantially in the manner and for the purpose set forth.

54,859.—Apparatus for Inducing the Flow of Oils from Wells.—John B. Christian, Mount Carroll, Ill.:

I claim the combination of the flanged pipe, A, with the slotted, double hollow cylinder, B, and the hollow cylinder, Y, as arranged in relation to each other, substantially as and for the purpose specified.

I claim lowering the pipe, A, or its equivalent, and securing it firmly to its place in the well, by means of the tube, D, with its circular base, E, in combination with the rod, H, substantially as set forth.

54,860.—Mop Head.—Charles B. Clark and O. S. Garretson, N. Y.:

We claim the nut, K, with the collar which carries the movable jaw, E E, by means of the lugs, g g, or their equivalent, in combination with the threaded shank of the jaw, C, arranged and operating substantially as set forth.

We also claim connecting the movable jaw, E E, with the collar, D, by means of the bows, I, I, constructed and operating substantially in the manner and for the purpose specified.

54,861.—Churn.—Amos Clift, Jr., Mystic River, Conn.:

First, I claim the combination of the hollow journals or axles constructed with flaring enlargements on their inner ends, with the revolving churn box, substantially in the manner and for the purpose described.

Second, Making the inner funnels removable, substantially as and for the purpose described.

54,862.—Horse Rake.—Lyman Clinton and Ezra S. Munson, North Haven, Conn.:

First, I claim combination of the slide, c, the rod, h a, and axle, A, with the double acting lever, I, substantially as and for the purpose specified.

Second, The combination of the lever, L, with the axle, A, when arranged upon a movable fulcrum and constructed so as to operate substantially as and for the purpose specified.

54,863.—Chair, Sofa and Car Seat.—G. W. Cochran, New York City:

I claim the employing the perforated or whole sheets of hardened or enameled india-rubber or gutta-purcha for chair, sofa, car and carriage seats, substantially as above described and set forth.

54,864.—Apparatus for Preparing Hay for Market.—Samuel Colahan, Cleveland, Ohio:

First, I claim the arrangement of the follower, a, and sheaves with their respective ropes or chains in combination with the side doors, L M, trap door, R, loops, V, and clamps, P, substantially as and for the purpose set forth.

Second, The followers, m, bolts, L, and ratchets, p, in combination with the follower, constructed and arranged in the manner and for the purpose substantially as set forth.

Third, The adjustable ends, e, connected with the frame, as specified, in combination with the followers, a m, and side doors arranged as and for the purpose substantially as set forth.

54,865.—Cow Milker.—L. O. Colvin, New York City:

First, I claim the construction of a cow milker in such manner that it may be operated by water or other fluid acting upon its flexible diaphragms, substantially as herein specified.

Second So constructing the water spaces on the backs of the several flexible diaphragms of a cow milker that all are in free communication and made to communicate with a single pipe, substantially as herein specified.

Third, The combination of two or more cow milkers with a pump, L, or its equivalent by means of a pipe or pipes filled with water or other fluid, substantially as set forth, for the purpose specified

54,866.—Detecting Check Boxes.—John P. Conkling, Batchellerville, N. Y.:

First, I claim the combination of ratchets and pawl, c d, and gravitating follower, G, substantially as and for the purposes described.

Second, The open-bottom ticket boxes, in combination with the follower, G, or its equivalent, substantially as described.

Third, The stops, g g, substantially as and for the purposes described

Fourth, The use of locking bars, a' or J, applied substantially as described.

Fifth, The removable transparent graduating face plate, E, I combination with ticket holder, substantially as described.

54,867.—Sand Pump.—Robert Cornelius, Philadelphia, Pa.:

First, I claim the employment of wire gauze or perforated metal in the sand pump, in the manner and for the purpose substantially as described.

Second, The employment of the turning plate, D E F, in the interior of the sand pump.

Third, The combination of the sand pump, having an interior turning plate, with the drill

54,868.—Railway Chair.—D. W. Crocker, Deposit, N. Y.:

First, I claim dividing the chair into two similar parts or sections in the direction of its length, in combination with the wedge-shaped plate or regulator, G, having the general form and construction herein above described, which plate is driven in and between the bases of the said chair, suitably constructed or formed thereior, and the rail, extending across from one section to the other and operating upon the same, substantially in the manner and for the purpose specified.

Second, The combination with the two-part chair, a and its regulator, G, of the spring catch, i, interlocking with suitable notches made in the base of the chair, and arranged substantially as and for the purpose specified.

54,869.—Chair.—M. E. Cronk, Auburn, N. Y.:

First, The combination of the rod, s, and plate, n, constructed and operating as and for the purpose herein described.

Second, The combination of the rod, s, the plates, n, the hinges, h, and rubber springs, the whole constructed and operating in the manner herein set forth.

54,870.—Pile Fabric.—James W. Crossley, Bridgeport, Conn.:

I claim the process herein described of producing the pile fabric by the aid of wires which are withdrawn after cementing the warp upon the backing.

54,871.—Harvester Rake.—Charles F. Davis, Auburn, N. Y.:

I claim the combination in a harvester rake of the lever, L, springs, M, or equivalent latches, I, and catches, J K, with each other and with the rake heads, F, arms, D E, and frame or guide, B, substantially as described and for the purpose set forth.

54,872.—Stove for Railroad Cars.—H. G. Dayton, Maysville, Ky.:

I claim the arrangement of the flanges, F, the combination chamber, B, air jacket, E, and pipe, G, substantially as and for the purpose described.

54,873.—Machine for Turning and Jointing Screw Blanks.—Jonathan Dennis, Jr., Washington, D. C.:

I claim pointing screw blanks, rivets, and other articles at the same time their heads are turned or shaved, by the devices shown and described or their equivalents.

I claim arranging the pointing tool behind the griping jaws for turning the heads of screw blanks, rivets, and other articles, so as to point them the same time their heads are turned or shaved.

I claim the rod, H, made hollow or otherwise, and arranged in the arbor to hold the pointing tool, substantially as described, in combination with a pointing apparatus.

I claim arranging the shanks of the griping jaws, the levers, and other devices in the arbors of screw machines, in such a way and manner as to allow the rod which holds the pointing tool to traverse in the arbor between them, substantially as described.

In combination with a pointing tool arranged behind the griping jaws, I claim the cross, L, pins, L', lever, N1, springs, N3, and cam, S2, or such other equivalent mechanism as will hold and traverse the pointing tool to do its work, substantially as described.

In combination with the pointing tool I claim the mechanism described, or its equivalent, for pushing the blanks out of the griping jaws after they are pointed.

I claim making the cutting edges of tools for turning the scored, picked, or grooved heads of screws, screw blanks, or other articles, curved, or rounded, as shown and described.

54,874.—Hatchway Door.—Marshall S. Driggs, Brooklyn, N. Y.:

I claim constructing a hatch, E, with trucks, D, running upon horizontal ways, B, suspended beneath the floor so that the hatchway may be opened and closed from below, substantially in the manner set forth.

54,875.—Reaping and Mowing Machine.—M. Easterbrock, Geneva, N. Y.:

First, I claim the sliding gears, B and C, connected together by the feathered sleeve, S, and arranged to slide upon the shaft, D, without moving the latter longitudinally, as and for the purposes set forth.

Second, The arrangement of the hand lever, E, ratcheted arch, H, and yoke, y, in combination with the feathered connecting sleeve, S, and gears, B and C, as shown and described, and for the purposes specified.

54,876.—Harvester.—M. Easterbrook, Jr., Geneva, N. Y.:

First, I claim the combination of the hand lever and two loose pinions, p and p', with the double pinion b, and the spur wheel, B, arranged and operating, substantially as and for the purposes set forth.

Second, The two loose pinions, p and p', (whether they are adjusted with a hand lever or other suitable device), in combination with the double pinion, b, and the spur wheel, substantially in the manner, and for the purposes shown and described.

54,877.—Bed Bottom.—Thomas Falloon, Lyons, N. Y.:

I claim the combination of the elastic slats, B B, and the expanding frame, A, as a whole, substantially as and for the purpose herein set forth

I also claim the combination of the caps, f f, covering the ends of the slats, the links, g g, pins, h h, friction rollers, i i, and elastic loops, m m, operating substantially as herein set forth.

I also claim the cross strap or straps, D, provided with the loops, q, or equivalent, and connected with the elastic loops, s, when used in combination with the slats, B B, substantially as described.

54,878.—Churn.—Benjamin S. Fletcher, Cornish, N. H.:

I claim the form and arrangement of the dashers, F F, and the breakers, G G.

54,879.—Bed Bottom.—James H. Fletcher, Lowell, Mass:

I claim the said improved bed foundation or combination and arrangement of the frame, A, with its mortices, a a a a, and india-rubber springs, c c c c, the cross bars, B B, with their series of notches, d d d, and the series of slats, C C C, with their supporting springs, e e e, or the same and the holding bands, D D, the whole being substantially in the manner and for the purpose specified.

54,880.—Machine for Stripping Cane.—Delos C. Flint, Bushnell, Ill.:

First, In combination with the strippers, E' H, I claim the auxiliary hinged or jointed strippers, F F, attached to the movable stripper, E', and operated by the action of the upwardly divergent grooves, h h, in the fixed stripper, H, on the ribs or points, f f, all arranged and constructed substantially as shown to operate as set forth.

Second, The combination of strippers, E, vertically slotted, parallel guides, B B, spring, D, and screw, C, all arranged and operating in the manner herein described.

Third, The slotted vertically adjustable angular plate, G, when used for the purpose herein described.

54,881.—Pump.—Nelson T. Fogg, Lewiston, Me.:

I claim the described arrangement and combination of the rod, y, the bail, A, the screw, B, the cross-bar, C, valve, d, screw, k, and fastening rods, M M', as and for the several purposes herein set forth.

54,882.—Tool Holder for Dentists.—George F. Foote, New York City:

I claim the combination of the slot, P, in the tool rack, with the flattened surface, N, of the tool, and its upper point, C, fitting a corresponding socket of a tool holder, for the purpose herein set forth.

54,883.—Manufacture of India-Rubber Shoes.—Geo. H Fowler, New Haven, Conn.:

I claim the napped woolenet (or its equivalent), in combination with the cottonet (or its equivalent) and the India rubber, for making an elastic ventilating shoe, when they are prepared, fitted together and finished, substantially as herein described.

54,884.—Ore Crusher.—Joseph Fowler, Rahway, N. J.:

First, I claim the crank shaft, e, and connecting rods, h h and l, in combination with the jaws, g and k, when the parts are arranged and operating as and for the purposes specified.

Second, In combination with the jaws, g and k, I claim the adjustable side pieces, n n, and screws, o o, for the purposes and as set forth.

54,885.—Animal Trap.—A. A. Fradenburg, Nevada City, Cal.:

I claim, in traps for vermin, the combination of the grating, D, on the platform, P, with the revolving door, E, the stops, N and F, substantially as shown.

54,886.—Clothes Dryer.—William Gallaway, Sheboygan Falls, Wis.:

I claim the annular channel, c, around the point or shank of the staff so that when the arms, D I, are wholly or partially distended the head cannot be lifted from the staff, substantially as set forth.

The revolving head, F, resting upon the projecting metallic shoulder, E, in combination with said shoulder and the notched braces, D, for the purposes specified.

The collar, G, attached to the heads, for the purpose of preventing the same from being split, substantially as described.

54,887.—Apparatus to Prevent Horses from Kicking.—Elijah H. Gammon, Batavia, Ill.:

I claim the device to prevent horses from kicking, etc., constructed substantially as herein described, as a new article of manufacture.

54,888.—Wrench.—George P. Ganster, New York City:

I claim a wrench constructed of the hollow frame or bundle, A, the moveable rack or hammer bar, B, and the volute toothed wheel, c, these several parts being combined and arranged in the manner substantially as set forth, and operating as described.

54,889.—Shackle for Prisoners.—John C. Gardner, Portland, Oregon:

I claim the invention of an improved shackle and the supporter, and the mode of fastening them upon the ankle, as hereinbefore described.

54,890.—Machine for Jointing Oval Frames.—David Garrison, Philadelphia, Pa.:

I claim the combination of two saws, the cutting planes of which are at an angle to each other, a table having a movement parallel with the cutting planes of the two saws, and a set of adjustable stops or guides arranged upon the said table, in relation to each other and to the saws, substantially as and for the purpose herein specified.

54,891.—Churn Dasher.—John Gelston, Cincinnati, Ohio:

First, I claim the provision in the tubular handle of a churn dasher, of the apertures F, for passing compressed air through the body of the cream, at right angles to said tubular handle, substantially as described, and for the purpose set forth.

Second, The arms, E, when provided with deflecting faces, e, in combination with the perforated dash, D, all arranged to operate substantially as and for the purpose herein described.

54,892.—Washing Machine.—Franklin A. Gleason, Brooklyn, N. Y.:

I claim constructing the tub and cone of corrugated sheet metal, in combination with the balance wheel, gear wheel, and pinion, substantially as herein described, and for the purpose specified.

54,893.—Machine for Making Auger Bits.—W. W. Grier and R. H. Boyd, Hulton, Pa.:

First, We claim a machine for twisting auger bits, drills, and similar articles, and consisting essentially of the shaft, B, and a series of dies, arranged to operate substantially as and for the purpose set forth.

Second, The rotating and longitudinally moving shaft, B, having a hole made longitudinally therein, of proper size and form to receive the blank and hold it while being twisted and drawn out, as shown and described.

Third, In combination with said shaft, B, we claim the tongs, L, having their jaws constructed as shown and described.

Fourth, In combination with the shaft, B, we claim the screw, C, with its thread, constructed as described, for the purpose of imparting to the shaft an intermittent longitudinal movement, while it has a continuous rotary movement during the operation of twisting the blank for the purpose of both twisting the blank and setting the lips at one operation.

54,894.—Filter.—Frank P. Griffitts, Philadelphia, Pa.:

I claim the frame or stand clamped between the permanent flange, d, and the movable flanged ring, F, for the purpose of firmly clamping the felt diaphragm to its seat, and allowing it to be readily removed, cleansed and replaced, substantially as described and represented.

54,895.—Grain Separator.—P. Griswold, Hudson, Mich.:

First, I claim the arrangement of the frame, L, with its vibrating bottom and trough, N, attached with the screw, I, substantially as and for the purpose herein specified.

Second, The arrangement of the shaft, H, rod, P, and curved plate, b, with the frame, L, for the purpose of giving the bottom of said frame and the screw, I, a vibratory as well as a vertical motion, as and for the purpose specified.

Third, The adjustable cleat, O, as constructed when arranged with the screen, J, as and for the purpose specified.

Fourth, the arrangement of the bar, R, button, S, and screw, C, the same being constructed and used as and for the purpose herein set forth.

54,896.—Machine for Cutting Corks.—George Hammer, Philadelphia, Pa.:

I claim the use of pressure pad, E, when arranged and operating in combination with a cutter and cutting block, substantially in the manner and for the purpose set forth.

54,897.—Broom Clamp.—Asaph S. Harwood, Malone, N. Y.:

I claim the mode of strengthening and supporting corn brooms by means of the ring above described, attached to springs made of wire and arranged as above specified.

54,898.—Die for Swaging Hands for Watches.—George Hastings, Waltham, Mass.:

I claim the combination and arrangement of the tube projection forming chamber, f, with the finger and ring forming parts, a b d, made as described.

I also claim the combination and arrangement of the eye former, c, or c c', the tube projection forming chamber, f, ring former, d, and the finger dies, a b, the whole being substantially as and for the purpose specified.

54,899.—Fodder Cutter.—Thomas Hazard, Wilmington, Ohio:

I claim, First, the provision of the guard or mouthpiece, H, having the slotted arm, I i, and screw bolt, N, and being formed and adapted to operate in connection with the throat, G, and knife, K, in the manner explained.

Second, The arrangement of obliquely moving knife, K, pressure board, 12 arm, 13, and roller, 14, for the purpose described.

54,900.—Machine for Making Cigars.—Isaachar A. Heald, Carlisle, Mass.:

First, I claim mounting the roller, D, in such a manner that it can be moved in the arc of a circle, without throwing it out of gear, substantially as and for the purpose set forth.

Second, I claim forming a filler or body of a cigar by rolling it between two disks more or less inclined, substantially as shown and described.

Third, I claim smoothing and cutting the wrappers for cigars, substantially as herein shown and described.

Fourth, I claim cutting the end of the cigar off, by moving it past a knife fixed in position, substantially as shown in fig. 1, and herein described.

Fifth, I claim the socket or cup, t, arranged to operate substantially as described, to hold and form the end of a cigar ready to receive the wrapper.

Sixth, I claim providing the surface of the rollers with a series of cavities increasing in size and depth toward the center and decreasing toward the end of the rolls, as shown and described.

Seventh, I claim the revolving and sliding fingers, e', for seizing and holding the wrapper, substantially as set forth.

Eighth, I claim holding the end of the wrapper upon the cup, t, or other device more unyielding than the cigar itself, said device being arranged opposite to the end of the cigar and caused to revolve with it, for the purpose of drawing the wrapper sufficiently tight.

54,901.—Corn and Seed Planter.—John L. Heisey, Elizabethtown, Pa.:

First, I claim the radiating rods, M, with their markers, N, across the periphery of the wheels, supported by and made adjustable by the loose cog wheels, G' G2, in combination with the gear, I, shifting and turning levers, E, and slide toothed pulley, D, all on the seeding or roller shaft, B, arranged and operating substantially in the manner and for the purpose specified.

Second, I claim the combination of the seed valves, when placed in the bottom of the spouts, P, and operated in unison with the markers, N, simultaneously actuated by the seeding or roller shaft, B, with its gearing, I, and depressing loops, F, arranged substantially in the manner and for the purpose set forth.

Third, I also claim the adjustable mold board-like side plate, x, adjustable on the supporting bars, T, of the shovels, R, constructed and operated in the manner specified.

54,902.—Bed Bottom.—A. R. Henderson and James Ford, Andover, N. Y.:

We claim the combination of the side rails, C D, hanging webbing, G, double slats, E F, arranged in the manner and for the purpose herein specified.

54,903.—Window Sash Spring.—Foster Henshaw, Washington, D. C.:

I claim the construction of the steel wire spring with its incline slot at top, in which the grooved axle of the roller operates and is combined as herein described and for the purposes set forth.

54,904.—Bung for Beer Casks.—Michael Hey, Philadelphia, Pa.:

I claim the sharp edged disk flure, 3, when applied to operate upon a flat seat in a ventilating beer bung, as and for the purpose described.

54,905.—Air Compressing Pump.—Birdsill, Holly, Lockport, N. Y.:

First, I claim the combination and arrangement of the air and water reservoir, L, with the water extension, B', of the pumping cylinder, B, operating substantially as described.

Second, I also claim the cylinder, B, constructed substantially as described in combination with the reservoir, L, and water extension, B'.

54,906.—Steam Engine.—William Cleveland Hicks, New York City:

I claim the arrangement of the cylinder, valvular pistons, and steam admission and exhaust passages, substantially as herein described, to operate in the manner and for the purpose set forth.

54,907.—Disinfecting Composition.—Fred. Hoffman and Robert Wendler, Brooklyn, N. Y.:

We claim a disinfecting compound made of charcoal and hydrated oxide of phenyl, substantially as described.

A disinfected compound of charcoal hydrated oxide of phenyl and burned lime, as described.

A disinfecting compound made of charcoal, hydrated oxide of phenyl, burned lime, and hypochloric acid, and with or without the addition of an indifferent vegetable cellulose, as specified.

54,908.—Window Shade Fixture.—Joseph Horner and Silas Van Doren, New Brunswick, N. J.:

We claim the brackets, B B, for supporting a roller, D, constructed with flanges which are applicable to the top of the frame, substantially as shown and described.

Second, Attaching the roller to its journals, by forming in its ends a T-shaped groove into which is inserted an I-shaped arm or plate extending from each journal, substantially as shown and described.

54,909.—Manufacturing Flexible Tubing.—David K. Hoxsie and Thomas L. Reed, Providence, R. I.:

I claim in combination with flexible gas tubing, as a finish for the same, a covering of webbing or braid of many single strands, plaited in minute stitch-like wales, substantially as described for the purpose specified.

54,910.—Process of Building Concrete and Mortar Walls for Buildings.—Ebenezer Hunt, Danversport, Mass.:

First, I claim the construction of concrete or mortar walls for dwelling and other houses by the use of cores made of sand, loam, or some other cheap material, so arranged within the molds which form the walls as to leave a space for the concrete or mortar forming the exterior surface of the wall, and from this outer face of the wall projections of the same material extending perpendicularly from top to bottom and inwardly as far as the contemplated thickness of the wall, strengthened, if required, by horizontal projections of the same material at proper distance, substantially in the manner and for the purposes set forth.

Second, I claim the building of posts, fences, roofs, floors, flagstones and other like structures of concrete or mortar, or their equivalents, by the use of cores, substantially in the manner and for the purpose set forth.

54,911.—Stove Pipe Drum.—Frank P. Hunt, Medina, N. Y.:

First, I claim the interior perforated cylinders, I and K, and the perforated disks, J and L, constructed and arranged substantially as described in combination with each other and with the exterior cylinder, A, substantially as and for the purpose set forth.

Second, The combination of the damper, O, with the interior cylinder, I, and the exterior cylinder, A, substantially as described and for the purpose set forth.

54,912.—Heat Radiator.—Jacob B. Hyzer, Janesville, Wis.:

I claim the combination and arrangement of the flues, F, and hot air chamber, T, (when constructed with the partition, U, and damper, s), with the flues, C, hot air chamber, I, and return flues, H, substantially as and for the purpose set forth

54,913.—Car Coupling.—Marshall Ingersoll, Grafton, Ohio:

I claim the arrangement of the coupling hooks, C, connected to the springs, g and a, in combination with the lifting hook, J lever, m, pawl, E and bumpers, operating in the manner and for the purpose set forth.

54,914.—Hay Rack for Wagons.—Albert Jackson, Clifton Springs, N. Y.:

First, I claim in connection with the frame, A, the detachable bars, B, constructed of two parts, a a, and fitted to the frame in the manner substantially as shown and described.

Second, The removable wheel fenders, G, attached to the cleats, E E', H, on the bars, B B B I, substantially as and for the purpose set forth.

Third, The removable boards, F F, placed between the cleats, E E, substantially as described.

Fourth, The combination of the frame, A, bars, B, fenders, G, and ladder or guard, L, all arranged substantially as and for the purpose specified.

54,915.—Attachment to Gas Fixtures.—Bernard Jacobs, New York City:

I claim the spring valve, b, or its equivalent, in combination with the pipes, A and B, or in the joints between two pipes bearing a similar relation to each other as said pipes, substantially as and for the purpose set forth.

54,916.—Shuffle Hoe.—J. D. Jenkins, Jackson, Ill.:

First, I claim the combination of a rake and a hoe blade, A, when arranged to operate substantially as described.

Second, Making the blade, A, with a concave bottom surface and connecting this blade to the forked head at a point which is beneath the rake teeth, substantially as described.

54,917.—Collecting the Light Oils from Oil Wells.—John Johnson, Saco, Me. Antedated May 10, 1866:

I claim the separating and gathering at the wells, a new article of commerce, viz: the light condensable vapors which rise with petroleum and which may be pumped off, under any suitable seal and condensed, substantially as herein set forth.

I also claim volatilizing and condensing the condensable products from petroleum at the wells, by forcing air or gases through petroleum as carriers of the light products, for the purpose herein described.

54,918.—Calks for Horse Shoes.—Frederick Judson, Jersey City, N. J.:

I claim the tapering calks, C C', constructed as described in combination with the projections, B B and tapering sockets, A A, of the shoe, A, arranged and operating in the manner and for the purpose herein described.

54,919.—Reading Desk.—Ernst Kast, Waterbury, Conn.:

I claim the reading desk, A, provided with an adjusting shank, B, in combination with the tubular arm, C, which is adjustable on the vertical column, D, and with the table, E, constructed and operating substantially as and for the purpose described.

54,920.—Machinery for Forming Flanges upon Boiler Heads.—Joel F. Keeler, Pittsburgh, Pa.:

I claim the rotary tables, b d and e e, in combination with the cone, g, or their equivalents, for the purpose set forth.

54,921.—Broom Head.—John Kiefer, Hamilton, Ohio:

I claim the two series of leaves, a a a, and a' a' a', in combination with the central continuous leaf, b, each of which is provided with teeth by punching the sheet metal, as described, and so arranged as to be capable of self-adjustment upon the stalks of broom corn constituting the wisps, when compressed thereon, in the manner and for the purpose herein set forth.

54,922.—Alarm Whistle.—Patrick Killin, Mount Healthy, Ohio:

I claim the bellows, B, in the cylindrical chamber, A, the spring, C, rod, D, and whistle or horn, G, constructed and operated as above described and for the purpose set forth.

54,923.—Machine for Making Tin Fruit Cans.—August Kollenberg, Owensboro', Ky.:

I claim the combination with the adjustable cylinder, A, of the retaining lever, C, arranged to operate substantially as described.

54,924.—Heating Stove.—Leonard Lakin and Norman Hall, Brodhead, Wis.:

We claim the construction of a stove with its fire chamber surrounded by a smoke chamber and an open space between said fire and smoke chambers, and the conveyance of heat and smoke from the one chamber to the other, by means of the flues, in such manner as to secure three heating or radiating surfaces and a draft of air between said fire and smoke chambers, substantially as herein set forth.

54,925.—Car Wheel for Lubricating Purposes.—John W. Latcher, Albany, N. Y. Antedated, May 7, 1866:

First, I claim forming an oil reservoir, B, in the body of independent revolving car wheels and the oil retained therein for gradual use, by means of plugs, d, in combination with stationary journals, C, substantially as described.

Second, Forming an oil reservoir in such a manner as shall compromise unequal shrinkage, as shown and described.

54,926.—Sewing Machine.—William M. Leavens, Philadelphia, Pa.:

First, I claim preventing the operation of the thread carrier, F, by throwing it back and securing and retaining it in that position, so that the stitch may be changed without further modification or substitution of the parts, substantially as described.

Second, I claim securing and retaining the thread carrier, F, in a position to prevent it from operating by means of lever, P, pin, n, arm, m, or their equivalents, substantially as described.

54,927.—Pea and Bean Sheller.—W. K. Lewis, Boston, Mass.:

I claim the serrated wheels, I, placed on a shaft, D, over the front part of the apron, C, when used in combination with the endless apron and rollers, B B, and as an auxiliary feed for said rollers, for the purpose specified.

54,928.—Buckle.—Henry Loewenberg, New York City:

I claim a buckle having sectional cross bars with points turned toward each other, and that will hold and be adjustable on both straps without being permanently attached to either, and constructed substantially as herein described and represented.

54,929.—Device for Opening Fruit Cans.—William W. Lyman, West Meriden, Conn.:

I claim the fulcrum bridge or yoke, d, and lifting lever, e, substantially as and for the purpose as described.

54,930.—Churn Dasher.—David W. Maurice, Springfield, Ohio:

I claim an improved churn dasher, constructed and arranged substantially as herein described for the purpose set forth.

54,931.—Refrigerator.—James McKelvey, Ogdensburg, N. Y.:

I claim the filter, J, in combination with the ice chest, I, and refrigerating chamber, H, arranged substantially in the manner and for the purpose set forth.

54,932.—Manufacture of Paper Pulp.—Harrison B. Meech, Fort Edward, N. Y.:

First, I claim the method of treating hay, hemp, flax, and other grasses for the manufacture of paper, substantially as described.

Second, Using liquors in a rotary boiler prepared in the manner and for the purpose herein set forth.

54,933.—Making Coffee.—Josiah V. Meigs, Washington, D. C.:

First, I claim making coffee by inclosing the ground coffee in an immersed chamber through which hot water is forced, substantially in the manner herein described.

Second, The combination of the kettle or boiler with the coffee-chamber, when arranged and operating substantially in the manner and for the purpose set forth.

Third, The combination of the coffee tube with a check, substantially as and for the purpose described.

Fourth, Cleansing the coffee tube by condensing the steam in it, as described.

Fifth, The combination of the coffee pot and inclined planes, I J, substantially as and for the purpose described.

54,934.—Breech-loading Fire-arm.—J. V. Meigs, Washington, D. C.:

First, I claim reciprocating the breech block vertically by reciprocating the guard, or its equivalent, horizontally.

Second, The combination of the trigger with the dog and sliding guard, to fire the gun, and lock, or release the breech block, substantially in the manner described.

Third, The combination of the reciprocating guard and vertically sliding breech block with the bar carrying a rebate to correspond with the recess of the barrel for the purpose of removing the cartridge case, substantially as described.

54,935.—Lamp.—Rufus S. Merrill, Boston, Mass.:

First, I claim the method herein described of insulating the wick tube from the can of the vessel by the interposition of a non-conductor of heat, in the manner and for the purpose set forth.

Second, I claim the combination with a cap provided with a socket to contain the insulating cementing substance of the wick tube provided with an annular plate, to prevent its being moved within the cementing matter.

Third, As an attachment to and in combination with the wick tube, I claim the chambers or reservoir arranged in the manner and for operation as described.

54,936.—Loading Attachment to Hay Wagons.—James Madison Miller, Greenwood Township, Pa.:

I claim the wheel, m m, attached to the wagon wheel in combination with the wheel, N, lever, D, bar, E E, and the crane, P O O, when the same are constructed in the aforesaid combination, for the purpose set forth in the manner described.

54,937.—Water Wheel.—John C. Miller, Amsterdam, N. Y.:

I claim as an improvement in water wheels, the arrangement of the spiral or helical scroll, F, and curved buckets, C, of the wheels, D, when constructed and operating in the manner and for the purpose herein specified.

I further claim the combination of the helical or spiral scroll circular bottom plate and curved buckets, when applied in connection with a water wheel which receives the water at its center and discharges it from its periphery, in the manner substantially as herein described.

54,938.—Heating Stove.—Geo. Rodney Moore, Lyons, Iowa:

First, I claim the construction of a fire chamber with a part, H, shelving inwardly and terminating at any desired distance above the grate, I, for the purpose and in the manner herein set forth.

Second, I claim the recess or chamber between the fire, J, the plate, H, and door, D, as and for the purposes described.

54,939.—Machine for Attaching Clasps to Skirt Hoops.—C. Newmann, New York City:

I claim the cup-shaped receptacle with flanged edges to its conducting chute, constructed, arranged and operating substantially as described and represented.

54,940.—Feed Water Heater.—John Nicholson, Allegheny City, Pa.:

I claim the steam chamber, A, furnished with an inlet, B, and outlets, C c, for steam, and placed within a water chamber, D, which is connected to the steam boiler by pipe, x', and to the supply of water by pipe, O, the whole being constructed, arranged and operating substantially as herein described, and for the purpose set forth.

54,941.—Spring Balance.—John K. O'Neil, Kingston, N. Y.:

I claim the arrangement of any desired number of springs, so that by detaching or attaching they may be used either separately or conjointly for a weighing instrument, substantially in the manner herein described, for the purposes set forth.

54,942.—Cotton Seed Planter.—Albany Packham, Prestonville, Ky.:

I claim the inverted conical hopper, F, in combination with the rotary spiral toothed strip or seed distributor, G², with bar, H, attached, all arranged on a mounted frame to operate in the manner substantially as, and for the purpose herein set forth.

54,943.—Lime Kiln.—Halsey Pelton, Erie, Penn.:

I claim making the furnaces of lime kilns, with upper openings or doors for admitting coal in combination with horizontal doors or openings for admitting wood, so that either kind of fuel can be used, substantially as described.

Second, I also claim the blocks, G, made substantially as described for filling the front part of a furnace when coal is to be used as fuel, and for conducting the coal to the grate, as above shown.

Third, I also claim making the body of a lime kiln substantially as above described, that is to say, with a metallic outer cylinder, a fire brick or equivalent lining, and a non-conducting material between the two, with a projecting base for the arrangement of flues.

Fourth, I also claim making a horizontal flange on the inside of the metallic cylinder, I, for the purpose of separating the upper part of the inner lining from the lower part, substantially as above described.

Fifth, I claim the arrangement of the grate H, and base of the kiln, in the manner and for the purpose herein specified.

54,944.—Medical Compound.—E. B. Perry, Knoxville, Ill.:

I claim the within described compound made of the ingredients set forth, and mixed together, substantially in the manner specified

54,945.—Apparatus for Making Extracts from Bark, Etc.—Francis W. Perry and John H. Pierce, Woburn, Mass.:

First, We claim a revolving and self-emptying leach for extracting or displacing tannic acid from bark, substantially as herein described.

Second, We claim the combined arrangement, substantially as herein described, for revolving the leach and introducing steam thereto, or any analogous device to produce the same results, when used for extracting tannic acid from bark for tanners use.

54,946.—Harvester.—John G. Perry, South Kingston, R. I.:

First, I claim the centrally open rim or axle, z, or its equivalent of the main wheel, C, in combination with the frame, B, constructed substantially as herein described and for the purpose set forth.

Second, I claim the brace rod, J, passing through the open wheel, C, or axle, z, in combination with the drag bar or shoe, V, connected to the frame, B, substantially as described and for the purpose set forth.

Third, I claim the combined hand and foot lever, s a, arranged for raising either or both ends of the cutting apparatus, substantially as described and for the purpose set forth.

Fourth, I claim the arrangement of the bevel gears, a m, crank, b, or its equivalent and pitman, S, in combination with the open wheel, C, or axle, Z, and main frame, B, substantially as herein described and for the purpose set forth.

54,947.—Horse Rake.—William M. Platt, West Liberty, Ohio:

I claim the arrangement of engaging and releasing mechanism, J K L M N P, all constructed and operating as and for the purpose specified.

54,948.—Boot Jack.—Asahel Pierpont, New Haven, Conn.:

I claim the combination of the two parts, A and D, for a folding boot jack, when hinged laterally and constructed, arranged, and fitted for use, substantially as herein described and set forth.

54,949.—Vegetable Slicer.—J. C. Plumer, Boston, Mass.:

I claim the disk, P, with the raised cutting edges, E E', as described, in connection with the support, S, and receptacle, R, all substantially as and for the purpose specified.

54,950.—Method of Preparing Vacuum Vessels for Condensing Milk, Etc.—Julius R. Pond, New Hartford, Conn.:

I claim treating metal with an oily or greasy substance, substantially such as set forth, or its equivalent, in the manner and for the purpose substantially as described.

54,951.—Corn Harvester.—William E. Prall, Knoxville, Tenn.:

I claim the combination of the cutter provided with the ratchet edged upon its under side, cutter bar, R, provided with a lip, S, and friction wheel, P, when arranged and operated substantially as and for the purpose set forth.

54,952.—Lock.—D. A. Pratt, New York City:

First, I claim the employment or use of the movable lip, c, on the key, C, in connection with a notch in the stationary plate, B, attached to the lock, or to the escutcheon on the door, arranged in such a manner that the one will, as the key is turned in order to lock the door, engage automatically with the other, substantially as set forth.

Second, The tumbler, E, arranged within the plate, B, so as to be operated by the turning of the key in the manner shown, or in any equivalent way, so as to serve as a guard to the key hole to prevent the passing of a rod or instrument through the key hole to act upon the lip, c, and thus admit of the key being turned from the outer side of the door.

Third, The combination of the lip, c, upon lever, d, applied to the key, C, the arm, k, the notch, b, in the plate, B and the rotary tumbler, E, all arranged and applied to operate in the manner substantially as and for the purpose set forth.

54,953.—Sash Fastening.—D. A. Pratt, New York City:

I claim the sash fastening in a sash frame with its catches, d, placed on separate rods, d d', arranged and constructed as described, so that the point of contact with the stile, B, of the window, is at the center of frame of the fastener, b.

I further claim the combination of the catches, secured laterally to the levers c c', end springs, e, applied to the frame, A, arranged to operate with the notches on the stile, B, of the sash, in the manner and for the purpose herein specified.

54,954.—Shoe Jack.—Levi H. Proctor, East Sangers, Mass.:

I claim the combination and arrangement of the arms, d c, the spring, o, the grooves, i l, the racks, k m, and the sets of teeth f g, with the heel and toe rests, F G the plate, C, and its plates, E E, the whole being substantially as and to operate as described.

I also claim the arrangement and application of the pin, p, the bolts, r, and spring, s, and nut, t, with the heel rests, F.

I also claim the application of the curved bar, H, to the plate, B, by means of the socketed projection, w, the hole, b', and the ears, y y, arranged as described, whereby the two may be connected or disconnected as circumstances may require.

54,955.—Car Coupling.—George Quick and John N. Wallis, Fleming, N. Y.:

First, I claim the swinging bolt, F, when combined with the link, A, slotted piece, K, and shaft, G, in the manner and for the purpose described.

Second, The arrangement, as described, of shaft, G, with its arms, J and I, and slotted piece, K, to release the coupling of the cars without passing between them, in the manner and for the purpose described.

Third, The combination of the hook, N, upon the link, A, with the lug, M, or shaft, G, so that the withdrawal of the link the coupling will be restored to its nominal position as herein described.

54,956.—Hay and Cotton Press.—Thomas D. Read, F. R. Read, and Cyrus Dorrel, Rising Sun, Ind. Antedated May 3, 1866.:

I claim the combination of the levers, d e and i, rollers, f and h, inclined plate, g, and notch, j, in the guide of the beater, constructed as above described and for the purpose set forth.

54,957.—Manufacture of Dyes and Colors.—George H. Reed, Boston Mass.:

I claim, First, As a new manufacture or composition of matter, and as a new article of commerce, liquid dyes produced from vegetable or mineral coloring matters, so mixed and prepared with the proper proportion, or quantity, or mordants, and glycerin, alcohol, pyroxylic spirit, or naphtha, or either of them, that the same will endure both heat and cold, and may be kept for any period without undergoing change, and will produce a complete and effectual dye upon either silk, or woolen cloth, or fabric, at one application.

Second, I claim the process of making liquid dyes in all colors by the mixture and preparation of coloring matters, and mordants, either of vegetable or mineral origin, or both, with the addition of glycerin, alcohol, pyroxylic spirit, or wood naphtha, or either of them, in such manner that the dyes will endure both heat and cold, and may be kept for any length of period without undergoing changes, and will produce a complete and effectual dye upon either silk, or woolen cloth, or fabric, at one application, in the manner substantially as above set forth.

54,958.—Fifth Wheel for Vehicles.—Uel Reynolds, New York City:

I claim a stop guard for preventing the wheels coming in contact with the body, formed by projections or stops upon the fifth wheel, substantially as set forth.

I also claim the anti-friction rollers, and jaws in combination with the fifth wheel circle or arcs, as set forth.

54,959.—Balance Valve for Steam Engine.—Thomas Richards, Lansingburgh, N. Y. Antedated May 7, 1866:

I claim the within described arrangement of the ports in valve seat and valve, so as to make the steam and exhaust ports balanced, under any pressure of steam, substantially as set forth.

54,960.—Cane Mill.—John W. Richardson, Daniel L. Davis, and Wm. C. Howell, Sligo, Ohio:

We claim, First, The provision, in a cane mill, of the series of feeding chopping, crushing, and expressing apparatus, arranged and co-operating as set forth.

Second, The combination of the revolving sickle-formed knives, E, throat piece, F, and intermittent feed mechanism, G g g' H I J K, substantially as set forth.

Third, In a cane mill, arranged and operating substantially as described, we claim the nozzle, z', when used for injecting steam upon the cane while in the operation of being crushed, for the purpose set forth.

54,961.—Sash Fastener.—W. J. Ross, Worcester, Mass.:

First, I claim the combination with the case, A, of the lift piece, C, lever, D, with its locking projection, J, and springs, f, substantially as set forth.

Second, Making or coring out the case, A, as seen at h, in combination with the use of spring, f, as and for the purpose stated.

Third, The combination with the projections, d and e, on the end, F, of lever, D, of the edge, g, as and for the purpose stated.

54,962.—Tool for Removing Scale in Boiler Tubes.—Philip C. Rowe, Boston, Mass.:

I claim, in combination with a cutter head, the tubular screw, d, and its internal screw, i, arranged to operate substantially as described.

Also, in combination with the piece, c, supporting the nut for the screw, d, the turn-buckle clamping device, substantially as set forth, and the construction and arrangement of the parts described, by which the cutters of the head are adjusted, substantially as specified.

54,963.—Gang Plow.—Jacob L. Runk, James H. Brown, and Elias M. Morgan, Nashville, Ill.:

First, I claim the plow beam, attached to a bolster, the latter being hinged or pivoted to the axle or carriage, substantially as and for the purpose described.

Second, Attaching the draft-rod to the beam in such a manner as to utilize the draft of the team in raising the plows from the ground, when the forward support of the beam is removed.

Third, the combination of the beam, A, and tongue, G, or its equivalent, affixed to the carriage, with the toggle, V U, the latter forming a brace, when straight, and a means, by deflection, of depressing the fore end of the beam.

Fourth, the combination of the beam, A, tongue, G, or its equivalent, and the notched stay hook, X.

Fifth, The arrangement of the hand lever, S, connecting rod, T, beam, A, and carriage or tongue, operating as described.

Sixth, The arrangement of the hand lever, S, connecting rod, T, toggle, U V, beam, A, and tongue or equivalent, substantially as described and represented.

Seventh, Attaching the draft rod to a point so far removed from the fore end of the beam, and above and near the axis of vibration of the latter, as to maintain the draft point, when the plows are out of the ground, at or about the same hight as when in working position.

Eighth, The combination of the beam, hinged to the bolster of the foot board and pivoted hand lever, as described and represented.

Ninth, The seat post, pivoted to the carriage and beam, substantially as and for the purpose described.

Tenth, The arrangement for the lateral adjustment of the tongue, for the purpose described, consisting in the pivoting of the tongue on a vertical bolt in the axle, and the side braces adjustable as to length, as described and represented.

54,964.—Boiler for Culinary Purposes.—Sarah E. Saul, New York City:

I claim the combination of the hinged cover, b, and tube, C, arranged relatively with the boiler, A, and escape pipe, a a d', constructed and operating in the manner and for the purpose herein specified.

54,965.—Washing Machine.—Emery Sawyer, Millbridge, Maine:

I claim the hinged cover, with its washing ribs, C, when operated by the cam wheel, G, as and for the purpose described.

Also the wringing box, working between the arms, f, and furnished with the rubber bottom and screw pressure, as and for the purpose described.

54,966.—Instrument for Cutting Finger Nails.—Charles C. E. Schwartz, Philadelphia, Pa.:

First, I claim the plate, A, the circular shaped opening, a, and the straight opening or guide, b, substantially as specified and set forth.

Second, The combination of the plate, A, the circular opening, a, the straight opening, b, the sliding knife, B, and set screw, d, and the serrated edges or files, e, as specified and described.

54,967.—Brick Press.—David W. Seeley, Albany, N. Y.:

First I claim a brick press which is so constructed that the brick will be supported on two opposite sides during the act of releasing the other sides of the brick, substantially as described.

Second, The combination of a reciprocating mold box, D, a reciprocating piston, E, and a platen, G, the piston and platen having each an irregular motion, and all operating so as to press and release bricks, substantially as described.

Third, Discharging the bricks from the pressing devices, substantially as described.

Fourth, Constructing the ends of the rectilinear moving piston and platen, substantially as described.

54,968.—Slide Valve for Steam Engines.—John F. Shearman, Brooklyn, N. Y.:

First, I claim the cover, g, forming a termination to the exhaust pipe, h, within the steam chest, in combination with the exhaust port, 3, passing through the slide valve, substantially as and for the purpose specified.

Second, I claim the arrangement of the exhaust pipe, h, and cover, g, to the exhaust port of the valve, and the expansion joint or stuffing box on the valve chest, around the exhaust pipe, as and for the purposes specified.

54,969.—Mode of Ventilating Grain.—John Shone, Blackwoodstown, N. J.:

First, I claim combining with the main tubes, C C, the auxiliary vertical tubes, G, and horizontal tubes, H constructed, arranged, and operating substantially in the manner and for the purpose hereinbefore described.

Second, The combination of the cap pieces, C', with the main tubes, C, substantially in the manner and for the purpose specified.

Third, Combining the perforated tubes, I, with the sides of the bin, substantially as and for the purpose set forth.

54,970.—Artificial Leg.—S. P. Sleppy, Wilkesbarre, Pa.:

First, I claim the combination of the lever, a, connecting rods, d and f, thigh, c, leg, e, and foot, g, in the manner and for the purpose described.

Second, The combination of the straps, j j j and i, with the lever, a, thigh, c, leg, e, foot, g, connecting rods, d and f, all arranged and operating substantially as described.

Third, The combination of lever, a, straps, i, and connecting rod, d, substantially as described.

54,971.—Gas Burner.—J. Lawrence Smith, Louisville, Ky.:

I claim a gas burner, constructed as herein described, with an aluminium tip, to adapt it to resist corrosion, and to be readily and safely cleansed.

54,972.—Mechanical Movement.—Peter J. Smith, Philadelphia, Pa.:

I claim the combination of the two shafts, A and A', arms, D and D', rods, E and E', and the radius rod, F, the whole being arranged and operating substantially as and for the purpose herein set forth.

54,973.—Tumbler Washer and Cooler.—D. M. Somers, Washington, D. C.:

I claim the combination of the tumbler rest, D, the spring, K, and valve, J, when constructed and operated, substantially as herein described, and for the purposes set forth.

54,974.—Hen's Nest.—Hiram Stevens, New Haven, Conn.:

I claim the construction and arrangement of the box, C, within a case, A, so as to operate substantially in the manner specified.

54,975.—Railway Truck.—Hiram Strait, Cincinnati, Ohio:

I claim, First, The arrangement or combination of car wheels, brackets, springs, and cross and longitudinal ties, either with or without the rubbers, substantially as herein specified.

Second, The grooved or flanged rubbers, (either adjustable or fixed) attached to either the ends of the brackets or to brakes, to remove all obstacles from before the car wheels, substantially as herein specified.

54,976.—Stovepipe Damper.—Daniel Sweeney and Stephen Sweeney, Constableville, N. Y.:

I claim, First, The damper composed of the annular concave disk, a, and cap, c, in combination with the cross bar, E, constructed and operating substantially as and for the purpose described.

Second, Also the perforated diaphragm, D, in combination with the damper, C, and cross bar, E, constructed and operating substantially as and for the purpose set forth.

54,977.—Horse Rake.—Benjamin C. Taylor, Dayton, Ohio:

I claim, First, The supporting pieces, p and q, constructed and arranged substantially as described, and for the purpose specified.

Second, The adjustable spring bar, b, when arranged with reference to the springs, s s, and the rods, o o, substantially as and for the purpose specified.

54,978.—Treating Oil.—H. C. Taylor and D. M. Graham, Cleveland, Ohio:

First, We claim the treatment of petroleum and other similar hydrocarbons by means of nascent hydrochloric acids, chlorine, flourine, or other equivalent chemical reagents, so as to change the constitution of the oil, and purify it, substantially as herein described.

Second, We also claim the use of sulphuric acid, nitric acid, or salts containing these, or either of them, when used in combination with other materials, such as herein described, or their equivalents, for the purpose of treating petroleum or other hydrocarbons, as described.

54,979.—Composing Stick.—William T. Tillinghast, Dayton, Ohio. Antedated May 7, 1866:

I claim the gaging slide, B, screw shaft, g, and clamping nut, h, in combination with check blocks, c c c, and the checking bar, b, constructed and operating as above shown, and for the purpose set forth.

54,980.—Refrigerator.—Peter A. Vogt, Buffalo, N. Y.:

I claim the arrangement of the induction air passage through the drip pipe l, and extension pipe, m, in combination with the trap, k, or its equivalent, whereby the air entering is carried to the top of the ice chamber and cooled in its passage, substantially as set forth.

54,981.—Nail Machine.—Rivera Ward, Alder Creek, N. Y.:

First, I claim the arrangement of a movable fuel box, C, with adjustable bottom e, in combination with the furnace, A, feed rollers, n o, hammers, H H*, and shears, M M*, substantially as and for the purpose set forth.

Second, Imparting to the nail rods a retrorgade motion before cutting, and a forward motion after cutting, by means substantially such as herein described, or any other equivalent means, for the purposes specified.

Third, The oscillating guide, G, in combination with the M-shaped anvil, I, constructed and operating substantially as and for the purpose set forth.

Fourth, The hammers, H H*, in combination with M shaped anvil, I, constructed and operating substantially as and for the purpose described.

Fifth, The oscillating jaw, M*, in combination with the feed lever, F, clamps, S and t, disk, E, and feed rollers, n o, constructed and operating substantially as and for the purpose described.

Sixth, The dog, h, and pin, i, in combination with the arms, j' l', rod, m', lever, n', bolt, q', and jaws, M M*, constructed and operating substantially as and for the purpose set forth.

Seventh, The rock shaft, y', and tappet, t', in combination with the jaws, M M*, and cam, K, constructed and operated substantially as and for the purpose described.

Eighth, The tappet, b2, in combination with the studs, a2, on the cam, K, and with the arms, j' b', jaws, M M*, and rock shaft, g', substantially as and for the purpose set forth.

Ninth, The ratchet wheel, c2, and stud, g2, in combination with the catch, h', spring, u', arm, j', and with the rods connecting said arms with the jaws, M M*, substantially as and for the purpose set forth.

Tenth, The disk, k', with its cavity, l'', in combination with the dog, i2, catch, b', and hammer, H, substantially as and for the purpose described.

Eleventh, The hand lever, N, with springs, o2, in combination with the catch, S2, and hammer, H*, constructed and operating substantially as and for the purpose described.

Twelfth, The combanation of the catch, S2, dog, j2, disk, k2, and catch, b2, with the hammers, H H*, substantially as and for the purpose described.

Thirteenth, The spring catch, b2, in combination with the annular grooves, w2 w2*, in the cam, K, and with the hand lever, N, constructed and operating substantially as and for the purpose set forth.

54,982.—Rock Drill.—Owen G. Warren, New York City:

I claim loading the shaft with the collar weight, to render unnecessary a high lift for rapid boring.

54,983.—Steam Engine.—George J. Washburn, Worcester, Mass.:

I claim the arrangement of the piston, B B', and valves, D D', the latter being respectively actuated by one piston and the means of actuating the other piston, substantially as described.

54,984.—Process of Refining Hydrocarbon Oil.—Phillipp Weisenberger, Pittsburgh, Pa.:

I claim the above described process of purifying distilled petroleum or other liquid hydrocarbons, without the aid of any alkalies, by means and with the use of water at 212 degrees Fah. or approximate degrees of temperature, in the manner specified.

54,985.—Shade Hook.—Samuel White, Philadelphia, Pa.:

I claim the combination of the socket, A, screw rod, B, and nut, d, the same constituting an improved device for holding and regulating the tension of the cords used for raising window shades.

54,986.—Hat and Cap.—William H. White, West River, Md.:

First, I claim making metallic or hard rubber sweat bands, with flanges, as and for the purposes set forth.

Second, The combination of a sweat band, with a hat rim or cap visor, when made in one piece.

Third, The combination of a metallic or hard rubber sweat band with a wrapper provided with draw cases and draw springs, substantially as herein set forth.

54,987.—Potato Masher.—A. L. Whitney, Brooklyn, N. Y.:

I claim an implement consisting of a suitable handle and provided with a series of arms, D, constructed, arranged and operating substantially in the manner described, and for the purpose specified.

54,988.—Tweer.—Levi Wilkinson, New Haven, Conn.:

I claim a cast-iron tweer, when constructed, shaped (both inside and

outside), and fitted for use, substantially as herein described and set forth.

54,989.—Fence.—Samuel B. Williams, Sheridan, N. Y.:
In combination with the iron stapled-shaped posts, [illegible] iron rod or and scored rails, arranged substantially as described.
And in combination with the rails.—William Wimmer, Elizawires extended between [illegible]
—and the combination of the entire socket, A, the sliding ring, C', and the catches, B B, each of said catches being formed with a flange, a, and a nose, b, to dispense with the customary pivot pins, and all arranged as herein described, so that the torsional strain shall be sustained by solid socket, and the bit firmly secured within said socket, by the noses, b b, engaging beneath its head.

54,991.—Means for Holding Glass Bottles.—John Wood, Brooklyn, N. Y.:
I claim the adjustable holder for receiving and retaining articles of glass while being heated and formed, substantially as specified.

54,992.—Flying Machine.—John Wootton, Boonton, N. J.:
First, I claim in combination with a parachute, A, constructed substantially as described, the arrangement of one or more screw propeller, placed underneath said parachute and operated by a suitable engine, and arranged on a movable frame, N, operated in the manner and for the purpose substantially as described and set forth.
Second, I claim the parachute, A, composed of a large ring or hoop, B, with numerous rods or braces, G G, running from the central frame to the ring, thereby making it into a continuous arch, or rigid circle, said circle to be covered with oil cloth or its equivalent on the underside of the rods or braces, and to be held in its proper or rigid position, at right angles with the frame of the machine by rods or braces, C and C', fastened to the ring, B, and to the top, D, and lower part, D', of the frame of the machine, substantially as described and set forth.
Third, I claim in combination with the parachute, A, and the propeller wheels, M M, arranged as described, the coil of their copper pipes, P, when arranged in the manner and for the purpose as specified.
Fourth, I claim in combination with a flying machine, constructed as described, the arrangement for hoisting up and lowering the car from the machine, substantially in the manner and for the purpose set forth.
Fifth, I claim in combination with the car of a flying machine arranged and constructed as set forth, the wheels, f, rollers, R, and springs, Q, when arranged in the manner and for the purpose substantially as described and specified.

54,993.—Apparatus for Washing Paper Pulp.—Larnard M. Wright, Fort Edward, N. Y.:
I claim the adjustable arms, S, in combination with a shaft, A A, cog wheels, B and C D F K L and M, with their shafts and the clutches, H and H', and the pulleys, 1 2 3 4 and 5, and the rack, R, R, and the guide, x x x x, substantially as and for the purposes described.
Second, I claim broadly the application of an adjustable revolving beater or washer to a tub or vat containing stocks to be beaten or washed in the manner and for the purposes above described.
Third, I claim broadly the reciprocating, or back and forward or right and left motion which may be given to the revolving arms, s, by which they rotate both ways.

54,994.—Flour Sieve.—Charles E. Yager, Hudson, N. Y.:
I claim the attachment consisting of the removable radial frame, C', with the clamp and set screw, a b c, carrying the rotary scrapers, D, shaft, e, and crank, f, arranged and operating with reference to each other, when applied to a circular flour seive, substantially as herein set forth, for the purpose specified.

54,995.—Seed Drill.—Elijah Young, Fayetteville, Mo.:
First, I claim extending the mold boards of the plows, D, out behind the other parts of the plows as and for the purpose set forth.
Second, I claim the rock shaft, H, the lever, H, and links, g g, or their equivalents, in combination with the beam, E', and tubes, C', when employed for the purposes herein set forth.

54,996.—Blind Fastener and Operator.—James Aborn (assignee to Henry H. Gibbs) Providence, R. I.:
I claim the hinge provided with the arm, e, in combination with the connecting bar, S, and the sliding bolt, G, the whole being constructed and operating substantially as described and for the purpose specified.
I do claim the combination of the apparatus employed as described for swinging the blind with a series of notches in the sliding bolt, G, and a button or key, d, substantially as described.

54,997.—Punching Machine.—George A. Alger (assignee to himself and Waldo Whitney) Manchester, N. H.:
I claim the use of two revolving cams and collars or double cam on the punch bar, one cam to set the punch to the thickness of the metal plate or other material, and the other cam to force the punch through the metal plate or other material to be punched.

54,998.—Hoop Skirt.—Anna M. Bardwell (assignor to C. D. Clapp and H. C. Bardwell) Amherst, Mass.:
I claim, First, The combination of the hoops, C, and tapes, B, B', the ends of the hoops being arranged as described in the manner and for the purpose herein specified.
Second, I also claim in combination therewith the tubular fastening, D, with a loop at one end, made substantially as shown.

54,999.—Hand Corn Planter.—Orson Billings, Lagrange, Ohio, assignor to himself and Russell H. Penfield and Homer Penfield, Elyria, Ohio:
I claim, First, The angularly shaped rubber spring having the two upper surfaces plain and the lower surface convex, and having the inner end cut at right angles to its axis, and the outer end cut at such an angle, that when adjusted, and the handle of the machine is extended that it just corresponds to said angle, thus obtaining an equal pressure on all parts as described and set forth.
Second, I claim spring, D, inclined apron, E, and seeding slide, F, in combination with the inserters for the purpose of delivering said seed to said inserters in a uniformly divided state, in the manner described and set forth.

55,000.—Device for Attaching Handles to Hoes, Rakes, Etc.—Alexander Boydon (assignor to Alfred Fales and Erastus P. Carpenter), Foxboro, Mass.:
I claim the stationary jaw, B, in combination with a movable jaw, F, operated by a screw nut, C, or equivalent device, for receiving and holding the implement, substantially as described.
I also claim in combination with the above, a blade or other implement provided with a lip, projection or recess, substantially as and for the purposes set forth.

55,001.—Guide for Boom Jaws.—Mellen Bray, Newton, Mass, assignor to himself and William Woodbury, Chelsea, Mass.:
I claim the guide piece, d, in combination with the boom, C, and saddle, D, substantially as and for the purpose set forth.

55,002.—Welt Trimmer.—John Brooks (assignor to himself and Joseph Brooks), North Bridgewater, Mass.:
I claim as my invention, the improved welt trimmer as made not only of the guard, C', and grooved handle or stock, A, but with the long knife, B, to fit into the groove of the stock, and be confined by means, substantially as described.
I also claim the arrangement of the lip, f, with the guard, C', and the knife, B, when arranged with, and applied to the stock, substantially as described.
I also claim the combination and arrangement of the adjusting screw, g, with the knife stock and guard arranged and applied together, substantially as specified.

55,003.—Sash Supporter.—Charles E. Condon, (assignor to himself and G. B. Hammer), Harrisburgh, Pa.:
I claim the bar, a, with the reversed notches, arranged to operate in connection with the hook, e, substantially as shown and described.

55,004.—Apparatus for Tempering Steel.—C. B. Cottrell (assignor to himself and Nathan Babcock), Westerly, R. I.:
claim in the draw tempering of steel the employment of a vessel constructed substantially as described so as to admit of the temper [illegible] the ignition of the tallow, oil, or other oleaging medium, as herein set forth.
ing process the employment of an independent perforated basket surrounding the steel, in combination with oil vessel, constructed substantially as herein described.

55,005.—Machine for Folding Paper Collars.—John J. Currier (assignor to himself and James H. Plaisted), Boston, Mass.:
First, I claim a machine consisting of plates, C and D, a roller, G a beam, F, and guide, I I, constructed and operating substantially as described and for the purpose specified.
Second, I also claim the two plates, C and D, in combination with the roller, G.
Third, I also claim the plate, C, in combination with the roller, G, substantially as and for the purpose specified.
Fourth, I also claim the mode of perfecting the fold by guiding the roller, G, under the plate, C.

55,006.—Machine for Shaping Wood.—John Dane, Jr., Newark, N. J., assignor to W. J. Dudley and W. U. Dudley, New York City:
I claim, First, The vise or clamp, I, arranged to rotate upon a pivot, K, which attaches it to the table, H, substantially as and for the purpose herein specified.
Second, The vertically movable frame, G, carrying the revolving cutter, spindle, and tracer, and the horizontally-sliding cross head, F, carrying the said frame, arranged in relation to the universally-movable table, H, upon which the work is placed, substantially as herein described to operate as set forth.

55,007.—Fly Trap.—James Emery and Joseph E. Gott (assignors to James Emery), Bucksport, Me.:
We claim the said improved fly or insect trap as composed of the box with a foraminous top and partition, or its equivalent, the tapering mouth or entrance frustum, the escape opening with its valve or damper and the receiver or glass bell, arranged together substantially as specified.

55,008.—Clothes Sprinkler.—William P. Gannett, Boston, Mass., assignor to himself and Isaac Gannett, Chicago, Ill.:
I claim the clothes sprinkler herein described, the same consisting of a water reservoir, provided with a valve, the air passage through the stem of which is so made that the opening of the valve establishes a communication through the air passages of the stem with the interior of the reservoir, and the closing of the same shuts off or closes such communication, substantially as and for the purpose specified,

55,009.—Rock Drilling Machine.—Walter Hyde (assignor to Deborah A. Ballou), New York City:
I claim, First, The eccentric gear, J K, in combination with the platform, A, handle, D, and hammer, E, constructed and operating substantially as and for the purpose specified.
Second, The slot, E, on the bracket, F, in combination with the eccentric gear, J K, and hammer, E, constructed and operating substantially as and for the purpose set forth.
Third, The curved rod G, and double cranks, H, in combination with the eccentric gear, J K, and hammer, E, constructed and operating substantially as and for the purpose described.

55,010.—Heddle Motion for Looms.—Barton H. Jenks and Robert B. Goodyear (assignors to Barton H. Jenks), Philadelphia, Pa.:
First, We claim giving the draw bars, J', a reciprocating motion of graduated degrees diminishing throughout the series by means of the cross bars, I' I'', and the slotted and removable frames, E' E'', substantially as described.
Second, We claim the combination of the supporting bar, X, with the draw bars, J', shaped substantially as described.
Third, We claim giving to the ratchet, S, which operates the cylinder, Q, a double-acting motion by which the operator can vibrate the lathe without making a mistake or losing a twill, substantially as described.
Fourth, We claim the combination of the ratchet, S, pawl, R', pin, R'', and incline, S'', substantially as described.
Fifth, We claim the lifting cross head, W, in combination with the loose cam, W', operated substantially as described.
Sixth, We claim the combination of the loose cam, W', with the crank, N, and clutch pieces, W3, attached to it, or their equivalents, substanttally as described.

55,011.—Loom.—Barton H. Jenks and Robert B. Goodyear (assignors to Barton H. Jenks), Philadelphia, Pa.:
First, We claim regulating the movements of the shuttle boxes and also the picking motions by two or more sets of pins on the same chain, when these motions are imparted from the chain through the intermediary means, substantially as described.
Second, We claim the combination of the box chain, P, lever O, the double arm, M, the forked swivel, J, and eccentric disk, H, or their equivalents, for operating the pick, substantially as described.
Third, We claim the combination of the knuckle lever, U, attached to the breast beam, v, with the stop rod, X, to stop the loom and so prevent the yarn from being broken, when the shuttles fail to leave the box, substantially as described.
Fourth, We claim the combination of the sliding rod, E, arm, G, sliding tappets, C' C'', and caps B' and B'', operating substantially as described.

55,012.—Magazine Fire-arms.—Nelson King, Bridgeport, Conn., assignor to O. F. Winchester, New Haven, Conn.:
I claim forming an opening through the frame relatively to the carrier block and magazine, and in combination therewith, so that the magazine may be charged through the carrier block from one side of the arm, substantially in the manner herein described.

55,013.—Apparatus for Preserving Dead Bodies.—Jacob Kinsman, Sen., assignor to himself and Frederick J. Nagle, Reading, Pa.:
First, I claim the combination of the perforated supporting plate, B, with the box, A, substantially as described, and for the purpose set forth.
Second, The combination of the perforated adjustable head supports, E, with the perforated plate, B, and the box, A, substantially as described, and for the purpose set forth.
Third, The combination of the neck box, O, provided with a cover, o', and exhaust pipes and stop cocks, O'', with the perforated plate, B, and box, A, substantially as described, and for the purpose set forth.
Fourth, The combination of the detachable part, N, with the box, A, substantially as described, and for the purpose set forth.
Fifth, The combination of the board or shelf, 1, with the hinged legs, H, and with the box, A, substantially as described, and for the purpose set forth.

55,014.—Furnace for Annealing Sheet Iron.—Joseph Malone, assignor to himself and George Wettengil, Temperanceville, Pa.:
I claim constructing a furnace for annealing sheet iron and other articles, having a fire-chamber at one end, and an annealing chamber, surrounded at top and bottom, and both sides with flues for the passage of the flame, hot air, and products of combustion, constructed and arranged substantially as, and for the purposes hereinbefore described.

55,015.—Seams for Sheet Metal Ware.—Peter H. Niles, Boston, Mass., assignor to himself and Augustus Russ, Cambridge, Mass.:
I claim the socket joint, e, formed by the articulation of the socket, a, and the bead, d, substantially and for the uses and purposes above described.

55,016.—Mode of Attaching the Sides of Sheet Metal to each other.—Peter H. Niles, assignor to himself and Augustus Russ, Cambridge, Mass.:
I claim the lips, b and c, interlocked so as to form the rivet joint, a, substantially and for the uses and purposes above described.

55,017.—Stove Pipe Damper.—Ephraim Parker, Marlow, N. H., assignor to Alfred A. Parker, Orange, Mass.:
I claim the above described arrangement of annuli, A B, and a concavo-convex disk, C, namely in a conic frustum, and with the convexity of the disk extending within the damper, in the manner and for the purpose as specified.
I also claim the damper as made with the series of annuli, and the disk arranged in a conic frustum, and with each ring or annulus concavo-convex, as set forth.

55,018.—Peat Machine.—Julio H. Rae, Syracuse, N. Y., assignor to himself and Edwin L. Buttrick, Milwaukee, Wis.:
First, I claim enlarging the corners or angles of the opening, R, through which the peat is received into the conveyer chamber, P, substantially as described, in combination with the conveyers, I.
Second, I also claim contracting the diameter of the condensing and delivering tubes for a portion of their length, and then enlarging their diameter towards their discharge ends, substantially as described.
Third, I also claim making the outer portions of the tubes, J, square or straight on their under sides, substantially as described.
Fourth, I also claim making the upper sides of the tubes, J, at their discharging ends of an elevated form, so that the peat discharged therefrom will shed falling water, substantially as described.
Fifth, I also claim the combination of the conveyers, I, with the condensing and delivering tubes, J, substantially as described.
Sixth, I also claim the arrangement and combination of the driving shaft, O, and its spur wheel, M, with the conveyers, I, and the pinions, N N, of the conveyer shafts, in combination with shaft, B, substantially.
Seventh, I also claim the arrangement and combination of the driving shaft, O, with the vertical shaft, B, and the wings and blades, C, the cutter arms, E, and the propeller, F, and the perforated steam pipe, "G," substantially as described.

55,019.—Horseshoe.—Henry Schreiner, Philadelphia, Pa. assignor to himself and Wm. H. Bowyer, Tamaqua, Pa.:
I claim a nailless shoe for horses and mules, consisting of the sole, A, clips, b c c', belts, d d', and nutted screw bolt, e, the same being constructed, combined together, and applied, as and for the purposes described.

55,020.—Stove Door.—Robert Simpson, assignor to Joseph Pratt and Charles C. Wentworth, Boston, Mass.:
First, I claim the arrangement in combination with the door, D, of the guide bars, x, damper, V, rack, R, pinion, W, and its shaft, H, passing through slot, P, of the damper, substantially as described.
Second, The arrangement in combination with door, D, of the twin buckle, F, bars, B, and stops, s, substantially as described for the purpose stated.

55,021.—Spring for Beds.—Lewis Smith, assignor to himself and Geo. F. Ryder, Foxboro, Mass.:
I claim the duplex spring composed of the ring, C, and the two springs, A B, formed and arranged substantially as described as represented.

55,022.—Pump.—E. L. Staples, assignor to James E. Rust, Nashville, Tenn.:
I claim connecting to the piston, B, of a pump, a chamber, B', open at its inner end, and connected to the piston by bars or rods, C, said chamber having a hollow piston rod screwed into its closed outer end, substantially as described.
Second, I also claim in combination, the pump cylinder, A, the piston, B, and the chamber, B', connected with it the hollow piston rod, G, and the side eduction pipe, I, substantially as shown.

55,023.—Cover for Sewing Machines.—Augustus J. Thompson, Malden, Mass., assignor to himself and A. B. Lincoln, Roxbury, Mass.:
I claim the sliding hanged cover in combination with a sewing machine table, when constructed and operating substantially as and for the purpose set forth.

55,024.—Rotrary Harrow.—Henry Thompson (assignor to himself, D. C. Haskell, and C. H. Haskell,) Rockland, Me.:
I claim the revolving harrow head, made of the series of rotary wings, B, their studs, c, the harrow teeth, a, and arms, A, or their equivalent, the whole being arranged substantially in manner, and so as to operate as described.

55,025.—Water Drawer.—John W. Wheeler, assignor to H. H. Wheeler and S. R. Boardman, Cleveland, Ohio:
I claim a water elevator as described having a circular curb, A, and spout, B, bucket, J, with valve, K, and tripping lever, M, windlass, G, with brake, U, lever, S, and hook, r, all combined, arranged, and operating in the manner substantially as set forth.

55,026.—Apparatus for Raising Sunken Vessels.—Thomas Whittaker, (assignor to himself and Wm. P. Simpson) Buffalo, N. Y.:
First, I claim the tube, n, in combination with the air cask, E, or its equivalent, constructed and arranged substantially as and for the purpose set forth.
Second, In combination with the cask, E, and tube, n, I also claim the pawls, o o, operating in the manner and for the purpose described.
Third, I also claim the combination and arrangement of the pendent bars, D D, provided with the curved arms, b b, guide frame, B B, with windlass, F, and guide rope, l, for lowering casks to submerged wrecks, constructed and operating substantially as set forth.

55,027.—Knitting Machine.—James G. Wilson (assignor to the Union Seamless Knitting Machine Company), New York City:
First, I claim providing the needles of that class of knitting machines in which stitch hooks are used to throw off the stitches, without any longitudinal movement of the needles or closing of their beards, with additional hooks or projections, b b, at their back, so constructed, arranged and operating in combination with the stitch hooks as to confine the last formed loops on the needles, while the previously formed loops are being taken off from the needles by the stitch hooks, substantially as herein described, whereby I am enabled to dispense with the operation of the pressers at the time of taking off the loops, and to take off the loops simultaneously for many immediately adjacent needles.
Second, Giving the pressers, v v, a movement in a vertical line only, but of such character that they are removed from between the needles and out of the way of the yarn guides and stitch hooks at the time the latter operates to throw off the loops.
Third, Making the stocks in the arms, V V', of the stitch hook bar, V, of curved form substantially as herein described.

55,028.—Rudder for Vessels.—Peter Dinzey, Island of St. Bartholomew, West Indies:
I claim the rudder, B, with its shaft, C, and pinions, e, in combination with the segment, D, the whole being arranged and operating substantially as and for the purpose specified.

55,029.—Sewing Machine.—James Hayes, London, England:
I claim the stud, I, in combination with the hooked instrument, H, for opening and holding the loop of the looper thread, in the manner herein represented and described.

55,030.—Apparatus for Obtaining Motive Power.—Robert W. Thompson, Edinburgh, Scotland:
I claim the obtaining and applying of motive power by means of pistons or diaphragms revolving in a cylinder in a continuous manner, but connected to an external shaft having a different axis from that of the cylinder, so that their velocities vary, that of one or more increasing whilst that of the other or others decreases, and vice versa, the parts being constructed and arranged, and working, substantially in the manner herein described.

55,031.—Reducing Wood Fibers to Paper Pulp.—Henry Voelter, Heidenheim, Kingdom of Wurtemberg, Germany:
First, I claim the use of mill stones, N N, constructed and operating substantially as described, for reducing particles of wood to paper pulp.
Second, The combination of the rake, H, projection, I, sieve, J, and pipe, K, and K', with the box, B, and stone, D', the whole being arranged and operating substantially as, and for the purpose set forth.
Third, The spring pawl, b, and ratchet, a, constructed and operating in combination with the shaft, F, and pulley, 9, substantially as and for the purpose specified.
Fourth, The elastic cushion or spring, d, in combination with the crosshead, 15, and rod, 11, for the purpose set forth.
Fifth, The block, c, formed substantially as described in combination with the stone, D', and boxes, G G', the whole being arranged and operating substantially as for the purpose set forth.
Sixth, The boxes or cross pieces, G G', constructed with parallel slides, for the purpose specified.
Seventh, The tanks, L L1, and, L2, with their gauze cylinders, R, and paddle wheels, W W', the whole being constructed and arranged for joint operation, substantially as and for the purpose set forth.
Eighth, The vibrating basket, P, arranged and operating in the tank, L, for the purpose described.
Ninth, The rotating comb, K, and the scraping plate, m, in combination with the cylinder, R, the whole being constructed and operating substantially as for the purpose specified.
Tenth, The hopper, V, with its sliding door, n, and rotating fluted cylinder, v, arranged in respect to the tank, L2, substantially as and for the purpose described.
Eleventh, The tanks, Y Y1 and Y2, with their gauze cylinders, R2, and R3, paddle wheels, W2 W3, sieve, v, rollers, y, and plates, z, the whole being constructed and operating substantially as and for the purpose set forth.

Twelfth, The bands, h h, of leather or other suitable, material secured to the rollers, y y, for the purpose specified.

55,032.—Petroleum Stove.—Oscar F. Morrill, Chelsea, Mass.:

First, I claim providing the perforated air-heating tube with a shield having an extended base and a contracted top, the shield surrounding the tube with their tops united and operating substantially as described.

Second, Also the base shield surrounding the wick tube and the opening through the reservoir top where this shield enters and discharges into the space between the perforated airheating tube, and its shield substantially as described.

Also the expansion of the wick tube, k, at its top into a cup, l, of such size, form, and location as to receive and steady the perforated air tube, m, holding it properly in place with reference to the wick, and also receiving any fluid overflow therefrom.

Also the combination and arrangement of the spunned wick tube wheels, r, on one side of the wick, with counteracting smooth-surfaced yielding presser rolls, q, on the other side of the wick, substantially as described.

55,033.—Apparatus for Cooking by Coal Oil Burners.—Oscar F Morrill, Chelsea, Mass.:

I claim the deflector, c2, placed within the cylinder, b, to give an upward tendency to the lateral currents of heated air, substantially as set forth.

I also claim placing an interceptor plate between the fuel reservoir and the flame chamber, as set forth.

I also claim making the interceptor plate, n, the wheel for regulating the hight of the wick, substantially as set forth.

Also the vapor passages, c', for conducting vapor from the reservoir into the cone.

Also in combination with such passages, the ring, b', for preventing lateral escape of such vapors.

Also supporting the plate, n, or wick tube, r, upon points or projections, v, to insulate the reservoir from the head of the flame, substantially as described.

Also the construction of the top of the tube, n, or the plate, r, with projections, t, to centralize and keep in position the outer disseminator when they are arranged in the manner described.

Also the conical or tapering tube for so supporting the inner disseminator, as to permit it to be adjusted, substantially as described.

Also placing in the inner chimney, S, a tube which is insulated from the oil reservoir, substantially as set forth.

REISSUES.

2,248.—Waterproof Fabric.—Ruben G. Allerton, New York City. Patented Jan. 23, 1866:

I claim the waterproof fabric formed in the manner specified.

2,249.—Magazine Fire-arm.—Joshua Gray, Milford, Mass., S. S. Bucklin, Providence, R. I., and William G. Langdon, Malden, Mass., assignees by mesne assignment to Joshua Gray, Milford, Mass. Patented Dec. 20, 1864:

First, I claim the rack, F, arranged below the sector, D, for the purpose described.

Second, Moving the cartridge-carrier from the magazine to the barrel, and vice-versa, by passing it through a longitudinal slot in the breech-pin and sliding the latter over it.

Third, So constructing the end of the cartridge lifter as to cover the post of the magazine when the piece is used as a breach-loader.

Fourth, The slot, L, to guide the cover, or end, K, of the cartridge carrier, as described.

Fifth, The cartridge extraction, M, in combination with the arm, N, provided with the knob, e, or its equivalent, as described.

Sixth, The cam, R, in combination with the hooked lever, S, or their equivalents, for the purpose of withdrawing the cartridge case without uncovering the magazine, when it is required to use the piece as a breech-loader.

Seventh, The guide pin, H, in combination with the groove, J, for stopping and guiding the breech pin as described.

Eighth, The combination of a breech-loader, a cartridge shell extractor and a convertible magazine stop, substantially as described.

2,250.—Mode of Melting and Aggregating Iron Chips, Turnings, Etc.—E. C. Huserick, Lake Village, N. H. Patented March 13, 1866:

I claim the within described process of protecting iron chips, shavings, turnings, or other fine particles of iron, and preventing them from being burned and blown away by mixing them with water or a solution of clay or earth or other material, in water, or with any liquid capable of producing the same result.

2,251.—Felted Fabric.—Moses A. Johnson, Lowell, Mass. Patented Jan. 5, 1864:

I claim the sheet felted fabric herein described having one or both surfaces coated with a film of sizing, as set forth, but the body of the fabric not saturated or impregnated with the sizing material.

2,252.—Writing Tablet.—George Munger, New Haven, Conn. Patented Sept. 27, 1859:

I claim a new article of manufacture, to wit: An argillaceous surfaced wood writing slate which is formed by uniting two or more layers of veneering or thin wood, and then coating the exterior surfaces of the compact mass with a composition of slate emery or other similar argillaceous material, substantially as and for the purpose set forth.

2,253.—Apparatus for Carbureting Air.—George Odiorne, Boston, Mass. Patented Nov. 1, 1864:

First, I claim so constructing and arranging a float in connection with a suitable air forcing apparatus as to invariably cause the air to be forced through the liquid hydrocarbon, in the manner herein described, that is to say, by dividing the volume of air into uniform streams which shall flow from or escape through apertures at the periphery of the float, as set forth.

Second, The air forcing apparatus herein described, the same consisting of a hollow drum having a series of buckets or chambers arranged upon the periphery of the same and communicating with the interior thereof, all as specified.

Third, I claim the combination of the air forcing apparatus and float arranged and operating with regard to each other as described.

2,254.—Surface Condenser.—Thomas Prosser, New York City. Patented Dec. 15, 1857. Antedated Oct. 31, 1854:

I claim a condenser consisting of two hollow slabs or other equivalent chambers connected together by concentric tubes and communicating with each other by means of the annular spaces formed by said tubes, said slabs and tubes being arranged within a cistern, and operating substantially as herein specified.

2,255.—Surface Condenser.—Thomas Prosser, New York City. Patented Dec. 15, 1857. Antedated Oct 31, 1854:

I claim a surface condenser constructed to obtain distilled water from the condensing water, by making the heat of the steam to be condensed, converts a portion of the condensing water into vapor, and afterward condensing such vapor by the cool in-coming condensing water, by means of a distilling condenser, substantially as herein described.

2,256.—Direct-action Engine.—Thomas Thatcher, Danville, Pa. Patented Dec. 1, 1863:

First, I claim the two tappet levers, J J', applied and combined with each other with the valve and with the plungers, C' C', substantially as herein described.

Second, The rim or casing, h h, around the exhaust post of the valve seat in combination with the two cavities, g and j, in the valve, substantially as and for the purpose herein specified.

Third, The arrangement of the cylinder, A, pump cylinders, B B', plungers, C C' and E, piston, F', and tubes as constructed and operating in the manner and for the purpose herein described.

DESIGNS.

2,323.—Goblet.—Charles Ballenger (assignor to McKee & Brothers), Pittsburgh, Pa.

2,324.—Wheel of a Harvesting Machine.—Amos Rank, Salem, Ohio.

2,325.—Trade Mark.—Samuel F. Stone (assignor to himself and Levi H. Stone), Providence, R. I.

NEW RATES OF ADV... ING.

FORTY CENTS per line for each and every ... able in advance. To enable all to understand how to calcu... 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, except on payment of one dollar a line each insertion, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

$10,000. I HAVE AMERICAN AND FOREIGN Patents, recently issued, on an article much in demand. The business is a monopoly. I desire to send models to the Paris Exposition, and will sell one half interest in my Foreign Patents, giving a party a rare opportunity to make money. Address for particulars, "O. W. T., Care W. B. & Co.," 53 Broadway. 23

FOR SALE.—THE RIGHT OF A FLY TRAP, PATented by N. P. Bassett, deceased, April, 1863. It is a simple thing, and needed in every family. Terms reasonable. For partitulars, address MRS. N. P. BASSETT, Fulton, N. Y. 23 1*

D. COGHLAN, MINING AND CIVIL ENGINEER, 57 BROADWAY NEW YORK, Room 33. Reports on Mines and makes, plans of the underground workings, Surveying of all kinds done, as well as Mechanical or other Engineering Drawings. Best references given as to long experience in the management of mining and amalgamating works, and of competency as a Civil Engineer. 23 2*

BRITISH PATENTS.—OWNERS OF GOOD ENGLISH Patents, can have them introduced by an engineer who will visit England for that purpose, on June 30. Address T. F. E., Box 1850, Philadelphia, Pa. 23 1*

MUSPRATT'S CHEMISTRY,— THEORETICAL, PRACTICAL, and ANALYTICAL, As applied to ARTS AND MANUFACTURES.

By Dr. Sheridan Muspratt, F.R.S.E., etc. 2 vols. 4to. Half-Russia or Half-Morocco..... $30 00
Cloth..... 25 00

For Sale by D. VAN NOSTRAND, 192 Broadway, New York. 23 1

TO LUMBERMEN.— We desire to call the attention of Lumbermen and others using Engines and Machinery, to our PORTABLE AND STATIONARY ENGINES, AND OUR DOUBLE AND SINGLE CIRCULAR SAW MILLS.

They embrace all the latest and best improvements. Our Boilers are made of the best Charcoal No. 1 Iron, thereby lessening the danger of explosion, and lasting much longer than those made of Iron now in general use; and all the material is selected with great care, and the workmanship is the very best. The Testimonials we have from parties using our Mills and Machinery, are such as will be very satisfactory to any one, that in point of finish and material, we have no superiors. Address, for Circulars and all information, MANSFIELD MACHINE WORKS, Mansfield, Ohio. 23 2*

FOR THE PAST 12 YEARS WE HAVE BEEN MAKing the Woodworth Planer, same Styles as those formerly made by J. H. Lester of Brooklyn, N. Y. Send for cuts. STEPTOE, McFARLAN & CO., Cincinnati, Ohio. 23 2

FOR SALE.—THE GENUINE FARRAR PLANER. We have on hand, and are receiving from the Eastern Manufacturers regularly, the 24 and 26-in. Planers. Persons in this city and adjoining States speak very highly of these Planers, and are constantly changing with us various styles of the "Woodworth" make for these as a facer, and giving largely to boot for the exchange. STEPTOE, McFARLAN & CO. Cincinnati, Ohio. 23 2

FOR SALE.—ONE OF J. A. FAY & Co.'s MAKE of Woodworth Planers, "Little Giant," is 24 inches wide, has been used about 8 months, is in good repair, will be sold low. Also, one double, 28 inches wide, same maker, used but little. Send for particulars. STEPTOE, McFARLAN & CO., Cincinnati, Ohio. 23 2

A RARE BUSINESS CHANCE. County and State Rights of a Patent Covering, Wiebe's Improved Mode of Advertising in City Railroad Cars, and other public places, are now offered for sale cheap. For circular containing full particulars, address FREDERICK WIEBE, Knoxville, Tenn., P. O. Box 104. 22 2*

PATENT PADDLE WHEEL.—ONE-HALF OF THIS valuable patent offered for sale, to enable the inventor to get it introduced, or the whole if desired. For further particulars address A. M. COMSTOCK South Coventry Conn. 22 2*

FOR SALE.—THE ENTIRE RIGHT AND TITLE OF my PATENT HOE, very low. Cannot attend to the manufacturing. Address SEYMOUR ROGERS, Pittsburgh, Pa. 22 2

CHARLES A. SEELY, CONSULTING AND ANAlytical Chemist, No. 26 Pine street, New York. Assays and Analyses of all kinds. Advice, instruction, reports, etc., on the useful arts. 22

FOR SALE.—A MILL SUITABLE FOR ANY SMALL Manufacturing purposes, situated in West Norwalk, Conn. Address [23 2*] H. B. MATHER.

A STRONG TOOL.—VERY SUPERIOR IRON PLANers, 4½x2; 6½x2½; 8½x3 feet. Send for Circular before purchasing. [23 5*] L. E. OSBORN & CO., New Haven, Conn.

WANTED.—A PORTABLE STEAM MULEY SAW MILL. Persons manufacturing such will please send a Circular to the Clerk of Jasper County, Carthage, Mo. 1*

WANTED.—A SITUATION TO RUN A STEAM ENgine, High or Low Pressure. Has had 10 years' experience, both building and running. Would go West or South. Good Reference. Address [1*] A. W. S., Woonsocket, R. I.

WANTED.—A PRACTICAL MECHANICAL ENGIneer to act as salesman in this city. One acquainted with water powers and mills preferred. Address P. H. Box 773, New York Post office. 1*

PEQUOT MACHINE CO., MYSTIC RIVER, Conn., Manufacture the most improved LOOMS FOR WEAVING TAPES, BINDINGS, WEBBING, RIBBONS, ELASTIC GOODS, AND ALL KINDS OF NARROW FABRICS.

Our Looms will run faster, do more work, are less liable to get out of order than other kinds, and are warranted superior to all others in every respect. Supplies of all kinds furnished for the same. 23 4

IMPORTANT TO COTTON AND WOOLEN SPINNERS. William C. Davol's patent mode of working the cam shaft, with other valuable improvements, on Sharp & Robert's Self-acting Mule. The above mentioned improvements can be seen on application to MARVEL DAVOL & CO.'S Machine Shop, Office on Pond street, Fall River, Mass. 23

SAWS! SAWS!! SAWS!!! WOODROUGH & McFARLIN MANUFACTURERS OF PATENT GROUND SAWS, Dealers in Files, Gummers, Belting, etc. Warehouse, No. ... OLD SAWS REPAIRED PROMPTLY. Works, Hamilton, Ohio.

ENGINEERING SCHOOL, ... Cincinnati, Ohio. 18 9* ... full equipment, and offers thorough ... vantage—the small cost of living. For Circulars address C. W. JONES, A.M. 21 12*

OXY-HYDROGEN STEREOPTICONS, OXY-CALCIUM STEREOPTICONS, DISSOLVING LANTERNS, MAGIC LANTERNS, Etc., Etc. A Large Assortment of American, European, and Foreign Photograph Views for the same!! A Priced and Illustrated Catalogue, containing 15 Cuts and 56 Pages, will be sent free by Mail on application. WILLIAM Y. McALLISTER, 728 Chestnut street, Philadelphia. 21 52

KENDALL'S $1 BAROMETER or Weather Indicator sent free for $1, Government money. Dealers supplied. Agents wanted. [21 4*] D. B. KENDALL, Box 188, Syracuse, N. Y.

PLANS AND SPECIFICATIONS Prepared for Marine, Railway, and Manufacturing Machinery, of every description. STEAM VESSELS AND MACHINERY, STEAM ENGINES, NEW AND SECOND-HAND, Bought and sold on Commisson. HOISTING ENGINES, STEAM FIRE ENGINES, STEAM, POWER, AND HAND PUMPS, SHAFTING, HANGERS, AND PULLEYS. Giffard's Injectors, Steam and Vacuum Gages, Blast Pressure Gages, Sewall's Salinometers, Reliance Damper Regulators, Water Gages, Hydraulic Jacks, Dimpfel's Patent Fan Blower. ROEBLING'S PATENT WIRE ROPE for sale. C. W. COPELAND, 171 Broadway, New York. 20 4

SHAPERS, HAND LATHES, PUNCHES, and DIES. Also, all kinds of Machinery made to order, by STOCKMAR & DUVINAGE, 580 Hudson street, N. Y. 21 4*

FOR SALE.—THE ENTIRE RIGHT, OR STATE Rights of "H. Bertolet's Cylinder Cock Apparatus for Steam Engines." Address ADALINE BERTOLET, Reading, Pa. 21 3*

VALUABLE REAL ESTATE IN RICHMOND, VA., FOR SALE OR LEASE.

We are authorized to sell or lease four half-acre lots in the heart of the business portion of Richmond, adjoining the celebrated Gallego Mills and Shoccoe Warehouse. An abundant water power can be obtained from the Basin of the James River and Kanawha Canal, which is very near the property. Almost any description of Manufacturing Establishment, in Richmond, would yield great profits at this time, and this property unquestionably offers the greatest advantages for such enterprises.

The Lessee or Purchaser could buy, at reasonable rates, a large quantity of valuable building materials now on the lots.

Liberal Terms will be extended to persons giving good security.

For particulars, apply to HARRISON, GODDIN, & APPERSON, Richmond, Va. 21 4*

LOW'S PATENT SHINGLE AND BARREL-HEAD Machine is offered as the BEST MACHINE IN USE. Is very Simple and Durable; Easy to Operate; Does Better Work than can be done on any other Machine, and More of it. Men who use it, say as follows:

Pelan & Randall, Dubuque, Iowa, say, "We average 20,000, with one man daily." C. K. & A. B. Worth, De Soto, Wis., say, "We average 18,000 to 22,000 daily." Hersey, Staples, & Co., Stillwater, Minn., say, "It saves 25 per cent. of sawing, and does better work." Wm. C. Childs, Kendallville, Ind., says, "We saw from 16,000 to 18,000 of hard wood per day." Topping Bros., & Co., Muscanda, Ill., say, "Your machine is incomparable as a Shingle or Barrel-head saw."

All the above are Single Saws. Hand Feed. We build Double Machines, and both Self and Hand Feed. Send for Circular, giving prices, and full description, and cut, to C. S. & S. BURT, Dunleith, Ill., Manufacturers, and Owners of Patent, or S. J. AHERN, 88 Wall street, New York, Wholesale and Retail Agent. 21 3

BIND YOUR OWN MUSIC, NEWSPAPERS, ETC. Use ADHESIVE BINDING TAGS (Heyl's Patent). Circulars and samples, etc., sent gratis. Address H. R. HEYL & CO., 113 South 4th street, Philadelphia, Pa 21 4

TOWERS' ALCOHOL PROCESS OF TANNING. Patented Dec., 1865; requires but one-third the time necessary by any other process. It will tan the heaviest hides in less than two months

It will make better leather and more of it. Calfskins tanned by it will average a quarter of a pound more weight than can be obtained by any known process. The leather is better. Everyone knows the preservative effect of alcohol upon all animal matter.

It is applicable either to limed or sweated skins or hides. From sweated skins can be made upper leather as pliable and sole leather as easily sewed, as any limed leather in the market.

No complicated or expensive machinery is needed. Any tannery may be adapted to the use of this process, for less than one hundred dollars.

Specimens of the leather and the operation of the process may be seen, and any further particulars obtained, at the office, No. 30 Hanover street, Boston. 13 L. FREDERICK RICE, Agent.

THE HAMILTON ECLIPSE SAW MILLS, —AND— PORTABLE ENGINES.

These Mills combine, in their Construction, Four PATENTED PRINCIPLES, Each very essential to the WELL WORKING Of Circular Saw Mills. They are fully illustrated in the Descriptive Circular of the Manufacturers. OWENS, LANE, DYER & CO., Located at Hamilton, Butler county, Ohio. 22 2*

WINTER'S IMPROVED CIRCULAR SAW MILL, with LANE'S PATENT SET AND FEED WORKS, the simplest and most effective device known. Labor-saving and time-saving.

The entire log, of any length, instantly and unerringly set throughout by the sawyer, with a single motion of the hand.

The world challenged to produce its equal. The patentee (Mr. Lane) will wager $10 000 that the mill can be made to cut from selected timber 30,000 feet of inch boards in twelve consecutive hours.

And this is by no means a limit to its capacity. What rival interest, or who else will accept? Open to all.

Pamphlets furnished. Address WINTER & CO., No 40 Broadway, N. Y. 22 3

TOPLIFF'S PERPETUAL LAMP WICK! For the use of Coal Oil Lamps, the most useful invention of the age. NEEDS NO TRIMMING, consumes less oil, and gives more light than the common wicks. Samples sent for 20 cents, or two for 30 cents. Address MURPHY & COLE, sole manufacturers, Jersey City, N. J.

N. B. To dealers, and those who wish to become agents, we offer liberal inducements. Traveling agents can easily make from $5 to $20 per day. Orders by mail promptly attended to. 22

"POWER-LOOM WIRE CLOTHS" AND NETTINGS, of all widths, grades, and meshes, and of the most superior quality, made by the CLINTON WIRE CLOTH COMPANY, Clinton, Mass. 19 52*

IMPROVED STATIONARY AND PORTABLE STEAM Engines and Boilers, also Saw Mills, Cotton and Hay Presses, Corn and Flour Mills, on hand and in process of construction. Marine Engines, Iron Steamers, Light-draft River Boats, Barges, Iron Bridges, Tanks, and general iron work constructed to order. Address T. F. ROWLAND, 9 26* Continental Works, Greenpoint, Brooklyn, N. Y.

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

GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, New York 1 tf

WIND MILLS—SELF-REGULATING, FOR PUMPing, Grinding Grain, and other purposes, from one to thirty horse power. Also, ORVIS'S AMERICAN FARM MILL for Grinding, manufactured by the EMPIRE WIND MILL MANUFACTURING COMPANY, 21 8 Syracuse, 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 WM. D. ANDREWS & BRO., 1 tf No. 414 Water street, N. Y.

M. BAILEY & CO., PROVISION BROKERS, NO. 40 West Fourth street, Cincinnati. Orders for Provisions, Lard, Tallow, Grease, Oils, etc., carefully and promptly filled. 1 33*

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

WHEELER & WILSON, 625 BROADWAY, N. Y.—Lock-stitch Sewing Machine and Button-hole Machine. 1tf

ERICSSON CALORIC ENGINES OF GREATLY IMPROVED CONSTRUCTION.—Ten years of practical working by the thousands of these engines in use, have demonstrated beyond cavil their superiority where less than ten horse-power is required. Portable and Stationary Steam Engines, Grist and Saw Mills, Cotton Gins, Air Pumps, Shafting, Pulleys, Gearing, Pumps, and General Jobbing. Orders promptly filled for any kind of Machinery. JAMES A. ROBINSON, 154 Duane street, cor. Hudson, New York. 10 1y

IRON CASTINGS AND STEAM BOILERS.—THE HINKLEY AND WILLIAMS WORKS, No. 416 Harrison avenue, Boston, are prepared to manufacture common and gun-metal castings, of from ten pounds to thirty tuns weight, made in green sand, dry sand or loam, as desired; also Flue and Tubular Boilers, and "Hinkley's Patent Boiler," for locomotive or stationary engines, warranted to save a large percentage of fuel over any boiler now in use. 13 26*

PATENT POWER AND FOOT-PUNCHING PRESSES, the best in market, manufactured by N. C. STILES & CO., West Meriden, Conn. Cutting and Stamping Dies made to order. Send for Circulars. 17 10*

LENOIR GAS ENGINES, FROM HALF HORSE TO Four Horse-power. Manufactured at the DRY DOCK IRON WORKS, No. 435 East Tenth Street, New York. 17 10*

WOODWORTH PLANERS, BARTLETT'S PATENT Power Mortise Machine, the best in market. Wood-working Machinery, all of the most approved styles and workmanship. No 24 and 26 Central, corner Union street, Worcester, Mass. 17 11* WITHERBY, RUGG & RICHARDSON.

STEAM GAGES—BATES'S PATENT—GOVERNMENT and City Standards.—The cheapest and best steam gages ever offered in this market. Also Water Gages, Marine Clocks, Registers, Etc. Model making and repairing promptly attended to. Call and Examine, or send for circular before purchasing elsewhere. KEEN BROTHERS, No. 218 Fulton st.

REFERENCES.—Messrs. Hopper and Douglas, U. S. Inspectors; Capt. Lord, M. P. Inspector; Messrs. Todd & Rafferty, No. 4 Dey street; New York S. E. Works, Twenty-third street, E. R.; Wash. I. Works, Newburgh. 20 tf

PORTABLE STEAM ENGINES—COMBINING THE maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 300 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & CO., Lawrence, Mass. 1 tf

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 unequaled. 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. 1 tf

STEAM ENGINES—WITH LINK MOTION, VARIABLE automatic cut-off, of the most approved construction; Mill Gearing, Shafting, Hanger, Etc. Address M. & T. SAULT, 7 26* New Haven, Conn.

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

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

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

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

IMPORTANT TO RAIL ROAD TRAVELERS.—THE PORTABLE RAILWAY HEAD-REST or POCKET-BERTH, Patented July 4th, 1865. SUBSTANTIAL, SIMPLE, COMPACT.

By means of the above invention, Railroad travelers may sleep at their pleasure, and ride days and nights continuously without experiencing fatigue. To Railway Companies, Railroad Agents, and Hotel Proprietors a liberal discount is made. Agents wanted in all the principal cities. Address JOHN R. HOOLE, Selling Agent, 19 13* No. 124 Nassau street, New York.

MODELS, PATTERNS, EXPERIMENTAL AND other Machinery, Models for the Patent Office, built to order by HOLSKE & KNEELAND, Nos. 528, 530, and 532 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN Office. 11 tf

THE AMERICAN TURBINE WATER WHEEL, PATented and manufactured by Stout, Mills & Temple, Dayton, Ohio, possesses new and valuable improvements, and remedies defects which exist in all other wheels classed under the name of turbine. Per cent of power equal to overshots guaranteed. For descriptive circulars address STOUT, MILLS & SEMPLE, Dayton, Ohio or Oliver, Bro. & Co., agents, 45 Liberty street, N. Y., where sample wheels may be seen. 18 8*

KEEP YOUR CARRIAGES AND WAGONS PROPERly washered thereby saving 50 per cent of the wear, and making them run easy and still. Use the Patent Washer Cutter, for cutting carriage washers, pump packing, etc. 18 10* KING & SMITH, Middletown, Conn.

$250 A MONTH MADE WITH THE BEST STENCIL TOOLS. For samples and prices address E. H. PAYN, Payn's Block, cor. Church and Cherry sts., Burlington, Vt. 18 tf

ROCKWOOD & CO., PORTRAIT, LANDSCAPE, and mechanical photographers, 839 Broadway, New York. This establishment received two Medals, the highest Premiums awarded at the last Fair of the American Institute, for mechanical photographs. Models, letters-patent, and drawings photographed. 19 3m

THE CELEBRATED "SCHENCK" WOODWORTH Planers, with new and important improvements, are manufactured by the Schenck Machine Co., Matteawan, N. Y. T. J. B SCHENCK, Treas. JOHN B SCHENCK, Pres't. 17 tf

GOULD MACHINE COMPANY, NEWARK, N. J. IRON AND WOOD-WORKING MACHINERY, STEAM FIRE ENGINES. SEND FOR A CATALOGUE. 13 13

AMERICAN PEAT COMPANY.—THIS COMPANY, having the right to operate under five patents, are now selling Machinery and Territorial Rights to the same, to manufacture fuel of the best description for steam or domestic use. 12 26* ALBERT BETTELEY, Agent, 42½ Kilby st., Boston.

TAYLOR, BROTHERS & CO.'S BEST YORKSHIRE Iron.—This iron is of a superior quality for locomotive and gun parts, cotton and other machinery, and is capable of receiving the highest finish. A good assortment of bars and boiler plates in stock and for sale by JOHN B. TAFT, sole agent for the U. S. and Canadas, No. 18 Batterymarch street, Boston. 1 23*

$1500 PER YEAR, paid by SHAW & CLARK, Biddeford, Me., or Chicago, Ill. 19 13*

$150 A MONTH! NEW BUSINESS FOR AGENTS. [19 13*] H. B. SHAW, Alfred, Me.

FAN BLOWERS, OF DIFFERENT KINDS AND sizes, in store for sale by LEACH BROTHERS, 12 13* No. 102 Liberty street, N. Y.

FOR THE BEST BRASS FINISHER'S LATHE, ARranged for turning, boring straight or taper holes, plain facing, and screw chasing, adapted to the manufacture of Globe Valves, Cocks, and other fittings, address 20 4* JOHN F. C. RIDER, South Newmarket, N. H.

PATTERN LETTERS AND FIGURES (METALLIC)—For Founderemen, Machinists, Pattern Makers, and Inventors, all sizes, at wholesale and retail, by 20 10* KNIGHT BROS., Seneca Falls, N. Y.

BRASS AND IRON GLOBE VALVES, STEAM AND Gas Cocks and Fittings of every description. Also, Steam Engines, Shafting Pulleys, and Hangers, Foot Lathes, Chucks, Slide Rests, Boiler Pumps, and Safety Valves, manufactured and for sale at the lowest prices, by JOHN F. C. RIDER, 20 4* South Newmarket, N. H.

STATE RIGHTS of Chappell's Patent Toilet Glass, for sale. "One of the most ingenious inventions of the age; is a complete arrangement, designed for examining the sides and back part of the head, back, and shoulders, and is particularly for the use of ladies while making their toilets. It consists of an adjustable mirror, so arranged as to make the compound reflection complete, thus obviating the necessity of having aid in dressing, etc."—From the Highland Democrat. Address 20 4* G. CHAPPELL, Peekskill, N. Y.

REYNOLDS'S TURBINE WATER WHEELS!

REYNOLDS'S PATENT SWEEPS THE FIELD! New Improvements; Low Prices; Does not Clog; Has no Complications of Gates or Costly Flume Work; Compact for Shipment; Great Water Saver; THE ONLY WHEEL THAT EXCELS OVERSHOTS. Gold Medal awarded by American Institute for Superiority. Agents wanted in every county. GEORGE TALLCOT, 21 13* Late TALCOT & UNDERHILL, No. 95 Liberty street.

CAMDEN TUBE WORKS (OFFICE AND MANUFACtory Second and Stevens streets, Camden, N. J.), Manufacturers of Wrought Iron Welded Tubes of all sizes; Feaders Taps and Dies Pipe Screwing Machines for both Hand and Power; Pipe Vises, Stocks, Dies, Taps, Reamers, Tongs, and all other tools used by steam and gas fitters. Also Upright Drill Presses for both hand and power, constantly on hand and ready for delivery. 22 4*

MANUFACTURERS OF TEXTILE FABRICS, DUTCHER'S PATENT TEMPLES, adapted to weaving all kinds of goods. Also, THOMPSON'S PATENT OIL CANS, for oiling Machinery; neat and economical. Furnished by 21 13 eow* E. D. & G. DRAPER, Hopedale, Mass.

TO DYERS AND INK MANUFACTURERS.—THE Cheapest form in which you can buy "Tannin," for making a Black Dye, or Ink, is N. Spencer Thomas's Extract of Hemlock Bark. It also colors a beautiful Tan Color. Price only Ten Cents per pound. Send for a Circular. Address the Manufacturer, N. SPENCER THOMAS, 21 cow tf Painted Post, Steuben county, N. Y.

FINE POWERFUL DOUBLE-LENS MICROSCOPES, of which Prof. Hosford, of Harvard University, says:—"It works well, and you have got it up very neatly." Free by mail for 65c. "The Square Lehs Microscope," 50c.; "Little Wonder," 40c. One of each for $1. J. EDWIN KING, Box 2,532, Boston, Mass. 10 9* eow

IMMENSE IMPROVEMENT IN STEAM.—W. C. HICKS'S PATENT STEAM ENGINES save 75 per cent in space, weight, friction and parts, with great economy in steam. Adapted to all uses. For circular address the HICKS ENGINE CO., 23 cowtf No. 88 Liberty street, N. Y.

MACHINERY.—S. C. HILLS, No. 12 PLATT STREET New York, dealer in Steam Engines, Boilers, Planers, Lathes Chucks, Drills, Pumps; Mortising, Tenoning and Sash Machines; Woodworth's and Daniels's Planers, Dick's Punches, Presses and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting Oil, &c. c

FOR WHEEL, FELLY AND SPOKE MACHINERY, Spoke Lathes, Hub Mortising and Boring Machinery, Etc., address J. A. FAY & CO., Cincinnati, Ohio. 5tfc

PRESSURE BLOWERS.

PRESSURE BLOWERS—FOR CUPOLA FURNACES, Forges and all kinds of Iron Works. The blast from this blower is four times as strong as that of ordinary fan blowers, and fully equal in strength to piston blowers, when applied to furnaces for melting iron. They make no noise and possess very great durability, and are made to run more economically than any other blowing machine. Every blower warranted to give entire satisfaction. Ten sizes, the largest being sufficient to melt sixteen tuns of pig iron in two hours. Price varying from $40 to $345.

FAN BLOWERS, from No. 1 to No. 45, for Steamships, Iron Mills, Ventilation, Etc., manufactured by B. F. STURTEVANT, 1 tf No. 72 Sudbury street, Boston, Mass.

ANDREWS' PATENT OSCILLATING ENGINES.—Double and Single Engines, from ¼ 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., 1 tf No. 414 Water street, N. Y.

SETS, VOLUMES AND NUMBERS. Entire sets, volumes and numbers of SCIENTIFIC AMERICAN (Old and New series) can be supplied by addressing A. B. C., Box No 773, care of MUNN & CO., New York. 5 tf

IMPORTANT TO MANUFACTURERS AND INVENTORS.—SMITH & GARVIN, No 3 Hague street, New York, Machinists and Model Makers, are now ready to make proposals for building all kinds of light Machinery, Manufacturers' Tools, Models, etc. Satisfactory reference given. 22 4*

SALE OF PUBLIC PROPERTY.

OFFICE OF ARMY CLOTHING AND EQUIPAGE, NEW YORK, May 17th, 1866.

WILL BE SOLD AT PUBLIC AUCTION AT DEPOT of Army Clothing and Equipage, corner Laight and Washington streets, New York city, on FRIDAY, June 1st, next, commencing at 10 o'clock A. M., as follows:

20,000 Spades, new.
1,000 Shovels, new.
20,000 Pickaxes, new.
20,000 Pickaxe Handles, new.

These goods are from the best manufacturers, and are in the original packages.

Samples of the above articles can be seen at the depot, and further information obtained.

Terms cash in government funds. Ten per cent down, and the balance before the goods are taken from the depot, which must be within three days of sale, under forfeiture of the goods and ten per cent.

22 2 Bvt. Brig.-Gen. D. H. VINTON, D. Q. M. General U. S. A.

THE GLORY OF MAN THE GIFT OF GOD.—THE Square of the Circle definitely solved, and other useful problems, all new designed for Colleges, Schools, and Mechanics, by JOHN MAY, 202 Chestnut street, Philadelphia, Pa.

☞ Price 50 cents per copy. Infringement on the Copyright forbidden by the author. 22 2*

STIMPSON'S SCIENTIFIC STEEL PENS.—PATENTed March 20th, 1866. Agencies wanted in every city of the Union. For Terms address WM. B. STIMPSON 21 3* General Agent, 37 Nassau street, Room 38, New York.

WAUGH'S COMBINED SQUARE AND CIRCLE Shears, the most practical Machine for Tinners in use. Address [21 4*] J. WAUGH, Elmira, N. Y.

MACHINERY FOR SALE.—ONE ENGINE LATHE, 18 feet bed, 28 inch swing, screw feed. One Atmospheric Hammer, Hotchkiss's Patent, nearly new. Address BULLARD & PARSONS, 1* Hartford, Conn.

CASTINGS—STOVE AND LIGHT MACHINERY. ALL varieties, on short notice and at low rates. Freehold Iron Foundery and Machine Shop, Freehold, N. J. Orders received by 22 4* OAKLEY & KEATING, 184 Water street, New York.

AMES IRON WORKS, OSWEGO, N. Y.—WE HAVE now manufactured superior Portable and Stationary Steam Engines, from four to forty horse-power, with all the modern improvements. Also, Steam Pumps and Payes' Patent Trip Hammers. Call for Samples, or send for Circulars, to JAMES JENKS, Detroit, Mich. J. C. RICHARDS, Chicago, Ill. SMITH & BEGGS, St. Louis, Mo. COMSTOCK & KINSEY, Savannah, Ga., 22 2* Agents.

OLMSTED'S PATENT FRICTION CLUTCH PULLEY Is adapted to any machine that runs with a belt, and especially to the driving of lines of shafting where it is desirable to occasionally stop a whole line without stopping the main line.

Its distinguishing features are simplicity, durability and adjustability, as it can be adjusted to set in motion heavy bodies gently, or to speed up instantly.

Parties wanting these Pulleys are invited to correspond with WM. M. BETTS, Sole Proprietor, Stamford Machine and Tool Works, 19 13 Stamford, Conn.

A RARE CHANCE FOR INVESTMENT.—FOR SALE —The patent right, for States, towns, and counties, for the best Ventilating Chimney Top ever invented. Numerous testimonials from proprietors of factories, foundries, steamers, hotels, etc., can be shown, attesting to its usefulness in creating draft, saving the expense of high chimneys, and a great saving of fuel. Pamphlets containing descriptive drawings and testimonials will be sent free, upon application by letter or otherwise to the patentee, B. A. HENRICKSON, 328 Kearny st., or J. E. Jeorgensen, 28 Third st., San Francisco. 18 7*

ANDERSON & SCHERMERHORN, PATENT AND Model Makers, Gearing Cocks, Valves and Engine. Patterns of every description. Rear No. 47 Ann street, second floor 21 4*

SMOKE BURNING—THE SOLARTYPE. PATENTED 1866.

This invention is applicable to all kinds of stoves, furnaces, and engines, consumes the smoke and gases of soft and hard coal, and saves from thirty to fifty per cent. of fuel. For State or County Rights apply to the Patentee. J. C. COCHRANE, 19 5* Rochester, N. Y.

LUMBER CAN BE SEASONED IN FROM TWO TO four days by Bulkley's Patent at an average cost of $1 per 1000 from the green. For circulars or information, address C. H. BULKLEY, 124 Superior street, Cleveland, Ohio. 20 5*

IMPORTANT TO MANUFACTURERS USING STEAM FOR POWER.

KELLEY & LAMB'S Improved Steam Engine Governor, the only Governor that will give the same speed, with high or low pressure of steam, or the Engine being light or heavy loaded,—is considered by those who have used it to have no equal, and is warranted to give satisfaction. Send for Circular. LAMB, COOK & CO., Proprietors. 20 26 Slatersville, R. I.

SAVE YOUR FUEL.—CARVALHO'S IMPROVED SUPERHEATER, (Illustrated on Page 98, SCIENTIFIC AMERICAN), furnishes PURE steam of any required temperature, for all purposes, saving 25 per cent. of fuel. It is easily attached to any boiler, and is very durable. Agents wanted. Call upon or address 20 3* HENRY W. BULKLEY, 57 Broadway, New York.

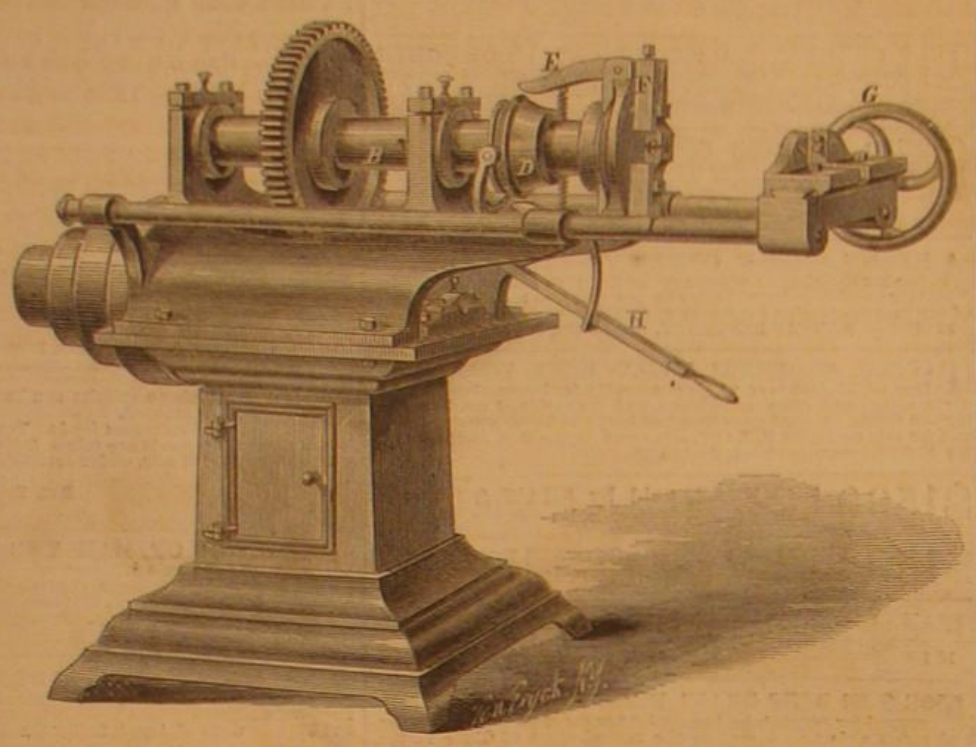
Improved Bolt Cutter.

If there be any that read this article who, in earlier days, have been compelled to cut bolts in a vise with stocks and dies, they may remember what meager results followed after a hard day's toil. A pitiful little heap that a man could carry in his pocket was all the reward of ten hours' tugging on the handles of the stock. It is good to think of these things sometimes when we pick up bolts and strip the threads off or trample them under foot as rubbish.

Many bolt-cutting machines have been introduced in the past few years, and there is room for more, although each one has its peculiar features.

In this engraving we have shown a new machine which is a good one. It is capable of cutting threads on bolts of any practicable length from twenty inches to twenty feet. This is a great advantage in many instances, especially in bolts for bridge work, bolts for the gallows frames of marine engines and similar structures.

It also runs back clear of the thread, thus avoiding the back set to the top of the thread, which is often given by the drag of the dies in backing off. It is easily and instantly set to take bolts of any size. In detail the machine consists of a framing, A, in which the revolving mandrel, B, works. This has the dies at one end, C, which are operated as follows:—



THOMAS & SEAMAN'S BOLT CUTTER.

When the machine is started, the cone, D, is shipped up so that the ends of the levers, E, resting on it are raised. These levers being fastened, or having a fulcrum on the die plate, depress the dies so that they may engage with the bolt to be cut; this is held between the jaws, F, operated by the hand wheel, C. It is easy to see that so soon as the bolt is cut the handle, H, when lifted, disengages the dies from the bolt so that it can be readily taken back without running on the thread, thus saving time and avoiding injury, as before explained. The mandrel, B, is hollow and allows the bolt to enter it while the carriage is drawn along with the guides, I.

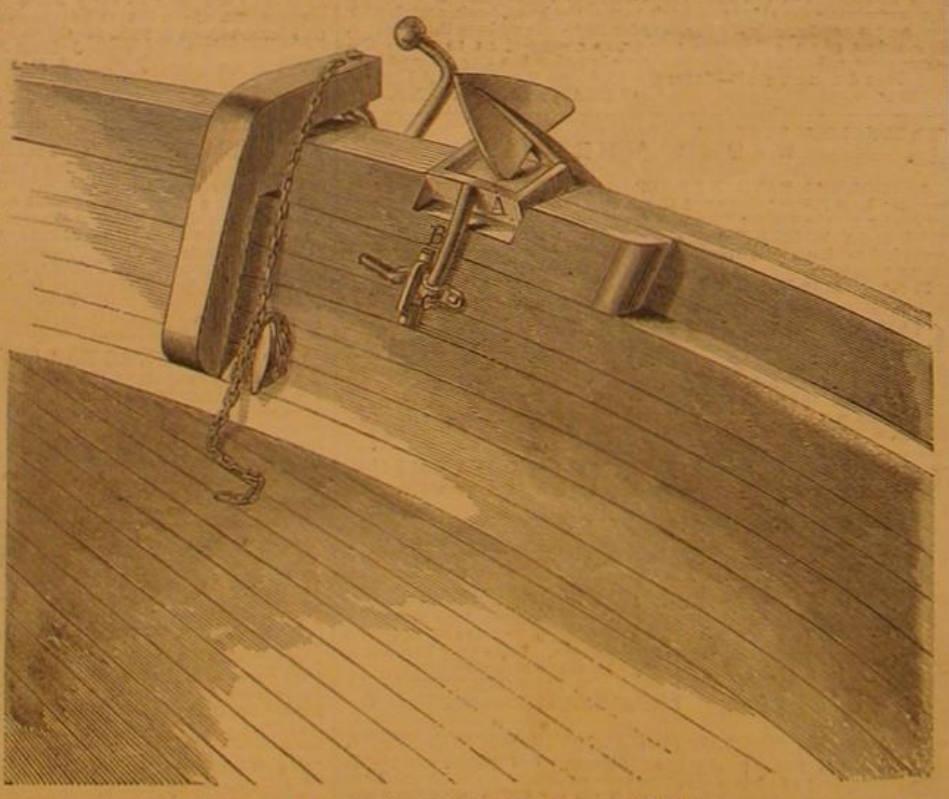
The base of the casting is occupied as a closet for the dies and other tools. It cuts at the rate of 1,000 $\frac{3}{4}$th bolts, two inches of thread, in ten hours, larger and smaller in proportion. Taps and dies from $\frac{1}{2}$ inch to $1\frac{1}{2}$ inches, also counter shifts and pulleys go with each machine. For further information address Thomas & Seaman, Box 1,476, Elmira, N. Y.

Improved Anchor Tripper.

The object of this invention is to drop an anchor from a vessel's bow without the trouble and labor of hoisting the flukes off the rail and swinging the anchor to cat-head which requires time; and the vessel, being in a sea-way, the chain often gets foul around the stock, and the anchor is always knocking and picking the bow to pieces.

With the advantage of the tripper the anchor is always ready and requires one man only to drop any anchor from the bow of a vessel without delay, which, in a close anchorage, is of great importance. It consists in so forming or arranging, on the upper edge and the inner side of bulwarks of a vessel's bow, a resting surface or support for the fluke of an anchor, that, when desired, by simply releasing or unfastening the said support, the anchor will readily fall by its own weight.

The invention consists in a casting, A, supported on gimbals and furnished with a projecting bar, B. The latter has a staple, C, which confines it in a certain position. The staple has a handle which permits to be wound up and down. When the casting is fixed, as shown in the engraving, the inclination of it is in-board, and tends to hold the anchor firmly by its fluke, but when the handle of the staple is pushed down, the projecting bar is set free, and the weight trips the casting, A, so that it permits the anchor to fall overboard.



GIBSON'S ANCHOR TRIPPER.

This invention was patented through the Scientific American Patent Agency on Dec. 5, 1865. State rights for sale. Address Clendenen Gibson, Port Richmond, N. Y. More & Chapman, ship chandlers, agents, No. 304 West street, New York.

We understand that Prof. E. L. Youmans has been appointed to the chair of chemistry in Antioch College, Ohio. Prof. Youmans is a live man, and will be a valuable accession to the college.

Of 177 lighthouses destroyed during the rebellion, 69 have been re-established.

Another New Developer.

Having read and tried most of the different new developers that have lately come to light, and not finding any of them equal to the following one, which I have used for some time in my gallery, I now send it to you for the benefit of the photographic fraternity. I claim for this developer the following (that is to say, as herein set forth! I don't intend to take out a patent)—Cheapness, the ease with which it is made, less time in the camera, no fogging, and an extra roundness to the picture when printed from the negative developed with it. It can be used immediately after being made, and it has the important improvement of preventing the collodion from cracking or peeling off. There is no necessity for dashing or wasting the developer by overflowing the plate with it, as most operators do; for this developer flows as even and free as any collodion. One ounce is abundance for a 4-4 plate.

FORMULA.

Just as I use it. Put one quart of water in a half-gallon or five-pound bottle; dissolve in it (after being pulverized) six ounces of protosulphate of iron; shake well until dissolved (any kind of water will do, but distilled is always preferable for mixing of chemicals in the business); then add to it twelve ounces of good cider or wine vinegar; shake it well; then add again to it one ounce of sulphuric acid; shake again well. Then put in another bottle or vessel one quart of water; add to it the white of one egg, or one ounce of the white; shake it, beat it, or mix it well up with the water; then pour it into the already mixed solution; shake it all then well up; filter it, and it is ready for use.

Recapitulation—Water, $\frac{1}{2}$ gallon; vinegar, 12 ounces; sulphuric acid, 1 ounce; albumen, 1 ounce. The cost of half a gallon or five-pound bottle of this developer will not be over 15 cents, when heretofore the alcohol alone, that generally was put in the old developer to make it flow, cost more than that amount; so I say, good-bye acetic acid and alcohol for developing purposes! I never produced as good negatives, in all respects, with the old developer as I now do with this present one; and I hope the time is not far distant when another new developer will be given to the world, by which the time of sitting will be all but instantaneous, so that we then can certainly catch expressions as well as pictures; for there is no doubt but what the latent image is made immediately when the plate is exposed to the rays of light through the camera. All we now want is, *the real developer.—Humphrey's Journal.*

MECHANICS

INVENTORS, MANUFACTURERS

The SCIENTIFIC AMERICAN is the largest and most widely circulated journal of its class in this country. Each number contains sixteen pages, with numerous illustrations. The numbers for a year make two volumes of 416 pages each. It also contains a full account of all the principal inventions and discoveries of the day. Also, valuable illustrated articles upon Tools and machinery used in Workshops, Manufactories, Steam and Mechanical Engineering, Woolen, Cotton, Chemical, Petroleum, and all other manufacturing and producing interests. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Electric, Chemical, and Mathematical Apparatus, Wood and Lumber Machinery, Hydraulics, Oil and Water Pumps, Water Wheels, Etc.; Household, Horticultural, 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 every body can understand and which every body likes to read.

Also, Reports of Scientific Societies, at home and abroad, Patent-law Decisions and Discussions, Practical Recipes Etc. It also contains an Official List of all the Patent Claims, a special feature of great value to Inventors and owners of Patents.

Published Weekly, two volumes each year, commencing January and July.

TERMS

Per annum.....$3 00
Six months..... 1 50
Ten Copies for One Year.....25 00

Canada subscriptions, 25 cents extra. Specimen copies sent free Address

MUNN & CO., Publishers.
No. 37 Park Row, New York City.

Messrs. MUNN & CO. have had twenty years' experience in procuring Patents for New Inventions. Inventors who may have such business to transact can receive, free, all needful advice how to proceed.

FROM THE STEAM PRESS OF JOHN A. GRAY AND GREEN

Scientific American.

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

Vol. XIV.—No. 24. (NEW SERIES.)

NEW YORK, JUNE 9, 1866.

$3 PER ANNUM IN ADVANCE.

Device for Raking and Loading Hay.

Painters, poets, and writers on rural subjects, delight to represent the life of the agriculturist as one of almost unalloyed pleasure; the labor is kept well in the shade. Haying, especially, is offered as one of the occupations abounding in hilarity with just enough of the primal curse to give zest to the enjoyment of the work. In this utilitarian age, however, we think that whatever can diminish manual labor and facilitate the work of the farm, bears with it the true poetry. The labor of cutting, curing, and gathering the hay crop is an onerous one, and every device or forwarding the work and diminishing the labor, should be encouraged, or, at least, noticed. The following is a concise description of a combination that appears to promise a diminution of the work of hay making.

This invention consists in the combination and arrangement of a series of toothed belts with a hay rake attached to the front of a wagon, for the purpose of raking and elevating hay upon the load. This device it so arranged that the driver can operate and control both the rake and elevator at the same time.

Fig. 1 is a geometrical perspective view of the machinery while in operation, and Fig. 2 is a perspective view of the elevating straps and frame upon which they work. In Fig. 1, A represents the body of the rack; B the frame to which the elevating straps are attached. C is one of the front wheels of the wagon, which is provided with toothed segments, the teeth of which mesh into a corresponding pinion, D, which is secured to the outer end of the lower drum over which the elevating straps pass. E is a rock shaft from which two arms, K K, extend up and receive levers or bars, F F, which are connected to the frame, B. Near the driver's seat is a lever, I, by which he can readily throw the gear wheels in and out of gear, the frame moving in the slots, L. The operation is as follows: As the team is driven across the field, the traction or segment wheel, C, puts in motion the pinion, D, upon the lower arm, which propels the toothed belts. These being located immediately in front of the rake teeth so that the hay is taken by the straps or belts and elevated and deposited upon the load. The hay is held to the teeth of the straps by means of other straps passing down in front of the elevating straps. The rake is operated by means of the curved brace, A, or lever. By detaching the wagon box the front portion may be used as a hay tedder, spreading the hay loosely and evenly upon the ground.

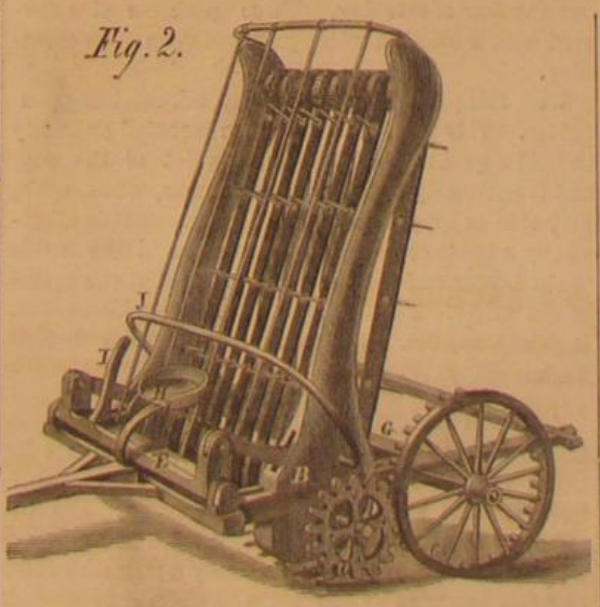
Patented through the Scientific American Patent Agency on May 29, 1866, by A. W. Hearny, to whom apply for further information at Doylestown, Pa.

Fig. 1



HEARNY'S HAY-RAKING AND LOADING DEVICE.

Fig. 2.



Healthful Effects of the Tomato.

The tomato is one of the most healthful, as well as the most universally liked of all the vegetables. Its healthy qualities do not depend on the mode of preparation for the table; it may be eaten three times a day, cold or hot, cooked or raw, alone, with or without salt, or pepper, or vinegar, or altogether to a like advantage, and to the utmost that can be taken with an appetite. Its healthful quality arises from its slight acidity, in this respect as valuable, perhaps, as berries, cherries, currants, and similar articles; it is also highly nutritious. The tomato season ends with the frost. If hung up in a well-ventilated cellar, with the tomatoes hanging to the vines, the "love apple" will continue to ripen until Christmas. The cellar should not be too dry nor too warm. The knowledge of this may be improved to great advantage for the benefit of many who are invalids, and who are fond of the tomato.

Petroleum lubrications do not seem to be the right thing. The Union Mills of Fall River, Mass., have just had 6,000 cases of calicoes thrown back on their hands, damaged by petroleum oil, which was used as a lubricator on the looms, and spattered on the cloth. All the washing and bleaching the fabric was subjected to at the print works failed to eradicate the petroleum and the consequence is a chemical "spotting" effect on the colors.

RECENT PHOTOGRAPHIC IMPROVEMENT.

Dr. Angus Smith, of Manchester, England, has lately communicated to the Photographic Society of Scotland, a process for removing the last traces of hyposulphites from photographic prints, and thereby rendering them entirely permanent. This he accomplishes by the use of peroxide of hydrogen, which converts the hyposulphites into sulphate, which latter are innoxious and soluble salts. The discovery seems to have made quite a stir among photographer on the other side the Atlantic. The *British Journal of Photography says*:—

"From the experiments which we have already made, we feel justified in asserting that no contribution toward the improvement of photographic silver printing, since the introduction of alkaline toning, is comparable in importance with that which we announced and partially described in last week's *Journal*. Dr. Smith, although, we understand, not a practical photographer, has done the art great service.

"It needs no experimental proof, at the present day to show that hyposulphites are the primary cause of the fading of photographic prints. We have been long ago conscious of this, and have been devising every sort of possible and impossible means of getting rid of them, without, however, having achieved all the desired success. We know, unfortunately too well, how the least trace of hyposulphite of soda left in a silver print, slowly but surely entails its destruction, by forming, with the silver, another very unstable hyposulphite, which is rapidly decomposed into sulphide of silver and sulphuric acid. The jaundiced appearance of such prints is but too familiar to every one, and their sudden transition into the "sere and yellow leaf" has done more to lessen the public estimation of photographic work than all other causes put together. Hence it is of the utmost consequence to the full development of our art to annihilate, once and for ever, our treacherous friend in need, hyposulphite of soda, as soon as it has fulfilled its useful mission, otherwise we shall find it our bitterest foe.

"It is very doubtful whether any amount of washing in cold water will remove the last traces of hyposulphite of soda from the texture of the paper on which the print is impressed. The hyposulphite seems to be so entangled with the size that without removing the one we cannot succeed in entirely getting rid of the other by mere ablution. But if, by the method suggested by Dr. Smith, we have it in our power to convert the noxious hyposulphite into an innoxious compound, namely, the sulphate, our whole process is accomplished; for be it observed, a particle of hyposulphite of soda may be locked up in a position from which water cannot displace it, but still, like other substances, it is suitable of chemical decomposition *in situ* by a susceptible reagent placed within chemical contact. This fact is well known, and it constitutes the whole sum and substance of Dr. Smith's discovery. We shall presently show that peroxide of hydrogen possesses, in a remarkable degree, the desired property of converting hyposulphites into sulphates. For this reason it must henceforth take the position of an indispensable chemical in the photographic laboratory.

"*Peroxide of hydrogen* (HO_2) is a very singular compound, discovered by Thenard in 1818. The method of preparation is so elaborate and complicated that we need only just sketch its outline here. Very few photographers or even chemists are in a position to prepare it economically for themselves; indeed, we only know one firm in London which has hitherto manufactured it commercially, and that apparently for medicinal purposes. It is produced when the peroxide of barrium, sodium, or potassium, etc., is acted on by any diluted acid which forms a soluble salt with the base. Peroxide of barium is generally employed. When it is dissolved in hydrochloric acid and water the excess of oxygen does not escape, but is absorbed by the water which it converts into peroxide of hydrogen. The protoxide of barium in solution is then precipitated by means of sulphuric acid. After filtration the same process is again and again repeated, until the water becomes saturated with oxygen. The solution is then purified by eliminating from it the excess of acids and of dissolved salts, and that is done by a long and troublesome series of operations.

"Peroxide of hydrogen is a powerful oxidizing agent, and it is in virtue of this property that its value will henceforth be recognized in photography.

It converts many of the protoxides into higher oxides, and several acids—the hyposulphurous, for instance—into those of a higher class. Dr. Smith's announcement that it converts hyposulphite into sulphate of soda, can easily be proved to be true; but we shall only here give the following striking experimental illustration of the fact, which any photographer can test for himself with the ordinary chemicals at his disposal.

"Dissolve in a wine glass any quantity of sulphate of soda, and add to the solution a few drops of tincture of iodine. The solution will remain permanently discolored, showing that sulphate of soda does not dissolve iodine. In another wine glass half filled with plain water, drop sufficient tincture of iodine to strike a permanent dark sherry color throughout the liquid; then add drop by drop a weak solution of hyposulphite of soda till the color is discharged, taking care to add as little excess of hyposulphite as possible. So far this experiment shows that iodine is soluble in hyposulphite of soda. Now fill up the glass with an aqueous solution of peroxide of hydrogen, and observe the effects. After a few minutes the iodine is no longer held in solution, and the liquid will resume the dark sherry color it had before adding the hyposulphite of soda. The explanation is as follows:—The hyposulphurous acid (S_2O_2) combined with the soda has been oxidized by the peroxide of hydrogen, and has passed into a higher sulphur acid, the sulphurous (SO_2), and then sulphuric (SO_3), still holding the same base (soda) in combination; and this salt, whether sulphite or sulphate of soda, we have seen, does not dissolve iodine. Moreover, it has no injurious action on photographic prints, even if left to dry in the interstices of the paper.

"The best method of applying peroxide of hydrogen to the prints will readily suggest itself. After they have been thoroughly well washed, so as to be cleared of all except the nearest trace of hyposulphite of soda, immerse say fifty of the card size in a quart of water containing one ounce of ten-volume strength of peroxide of hydrogen, and let them soak for an hour. One ounce of this solution contains (besides the oxygen, which is a necessary constituent of the water, and which is not available) ten ounces of volume of oxygen, which it is ready to part with to the hyposulphite, and thus convert it into a sulphite or sulphate. Perhaps a less proportion than this might be sufficient for the purpose, but it will require more extended experiment than we have as yet been able to bestow on the subject to determine the approximate proportions."

Scientific Steel Pens.

These pens are manufactured upon an entirely new principle, the inventor having discarded the quill shape as being unfit for a metallic pen, and made this pen with three arches or corrugations, the two corrugations on the back acting in opposition to the forward arch or bowl of the pen, thereby rendering and keeping the points or nibs square together, which enables the pen to glide over the paper without any fear of catching. These pens are also covered with a solution which prevents them from corroding.

With this pen is connected a new ink-retaining penholder. This pen holder has been invented expressly to hold a quantity of ink near the point of the pen, and is extremely useful to the penman, when using very thin or limpid ink. This improvement is effected by a blade or tongue, which slides in the inside of the holder, and can be drawn in or out at the option of the writer. For further information, address Wm. B. Stimpson, No. 37 Nassau street, Room 8, New York.

An aerial navigation society has been organized in London for the purpose of pushing forward the interest of their science, hoping thereby to rescue it from ridicule and preposterous caricature. The secretary of the society regards the balloon as a fulcrum from which with comparative safety a man may learn to fly as easily as he can learn to swim with a cork jacket. No one can deny this statement, but the great question to be determined is, can the balloon be made serviceable for purposes of navigation?

OUR SPECIAL CORRESPONDENCE.

Trial of Breech-loading Rifles for the Army.

WASHINGTON, May 22d, 1866.

The SCIENTIFIC AMERICAN has for several years urged the manifest superiority of breech-loading rifles for infantry soldiers over the muzzle-loading small-arms, and the experience of the last war pretty fully demonstrated the soundness of these views. This experience having determined our military authorities to adopt breech-loaders for infantry rifles as well as for cavalry carbines, a commission was appointed last year to make a series of trials of all breech loading rifles that might be offered by their inventors for competition, in order to select the one which should prove to be best adapted to army use. The trial was made at Springfield, Mass.; some sixty inventors submitted their guns for competition, and the result was a report giving the preference to the Peabody rifle. A second commission was then appointed, with Major General Hancock at its head, to make another trial in this city; that trial is now going on, and I made it my business yesterday to learn the manner in which it is conducted.

The commission is composed of the following named gentlemen, all officers of the United States Army:—Major Gen. Hancock, President; Brevet Major Gen. Buchanan; Brevet Brig. Gen. Hagan; Brevet Brig. Gen. Griffin; Brevet Col. Benton; Brevet Col. Porter; Brevet Lieut. Col. Owens; Brevet Lieut. Col. Parsons, Recorder.

I found all but two of these officers dressed in civilian's clothes while engaged in this duty. Major General Hancock is a stout, powerful-looking man, and impresses you as being the incarnation of force. He looks as if he would go through or over anything that might stand in his way. He is one of the born leaders of men, and is in exactly the right place, as the commander of armies. General Griffin looks like a Southerner—one of that considerable number of our West Point officers who have resisted the most subtle, seductive, and powerful temptation that ever drew a soldier from fidelity to his flag. Col. Benton is a short, thick-set, vigorous-looking officer; but the soul of the commission is Lieut. Col. Parson, the Recorder. He is a young man of light complexion, clear eye, loud voice, prompt military manners, and courteous address. The whole commission is a most perfect tribunal for the decision of the question submitted to its arbitration. With large experience and thorough understanding of the problem to be solved, with the consciousness that their award will be subjected to the intelligent and impartial criticism of all army officers, not only in this country, but throughout the civilized world, their decision, after their long-continued and laborious trials, must be accepted as of the very highest authority.

To illustrate the number of considerations to be taken into account in making the selection, General Hagan showed me one of the guns submitted for trial, the breech of which opened with a gate swinging on a hinge. When the cock was down—the only position in which it could be when the gun was discharged—the gate was securely closed, but when the gun was cocked the gate was very easily opened. Gen. Hagan said that the consciousness of this had an unfavorable effect on the mind and nerves of the soldier, causing him to shrink in firing the weapon.

The following rules have been published for the guidance of inventors submitting their guns for trial:—

PROGRAMME FOR BOARD ON BREECH-LOADING ARMS.

I. Each arm will be taken apart by the inventor, or his agent, and its construction and operation fully explained to the Board. At the same time a written description of the arm, setting forth its special merits, patent claims, etc., should be furnished for the records of the Board.

II. After a suitable number of arms shall have been examined, the Board will proceed to the Arsenal and test their working qualities, and for this purpose each gun will be fired by the person submitting it not less than one hundred times.

III. After all the arms have been submitted to this preliminary examination and test, the Board will select those deemed most suitable for the military service, and subject them to further test, in the hands of soldiers, by firing for range, accuracy, penetration, and rapidity, and for strength and endurance by firing increasing charges.

IV. The question of caliber will be determined by the Board after due consideration of the experiments made by this and foreign Governments on this subject. The Board, however, will verify, by actual trial, the conclusions arrived at.

V. Each person will state, in writing, the lowest price at which his arm will be furnished by himself, or the

rate per thousand at which he will allow the Government to make them. These proposals will be made separately on forms to be furnished on application, and will be directed, sealed, to the Recorder of the Board, and endorsed "Proposals for furnishing Breech-loading Arms," and will be opened at such time as the Board may direct.

After the hundred rounds fired by the inventor, the gun is taken by the Board, and without being cleaned, is fired first to test its strength. The powder used is fine-grained rifle powder. The gun is fired first with 65 grains of powder and 2 bullets, then with 70 grains of powder and 3 bullets, then with 75 grains of powder and 4 bullets.

It is then fired for accuracy at 200, 500, and 1,000 yards. In firing for accuracy the arm is secured in a clamp which has a sliding motion on ways to permit the recoil. The test for penetration is made by firing through a number of white-pine boards placed an inch apart, and each an inch in thickness; they are placed at a distance of thirty yards from the gun.

Among the inventors who were present to explain their guns to the Board were Governor Jackson, of Rhode Island, formerly of the Burnside Rifle Company, Dr. Maynard, of New York, and other gentlemen who had made the rifle, and especially breech-loading rifles, the subject of long study and experiment. The only objection made by these men to the trials was the extreme severity of the test for strength to which the guns are subjected. Governor Jackson said that the test of firing with four bullets was first adopted in examining the old muzzle-loading musket, on the ground that the soldier, in the confusion of battle, was liable to load his gun three or four times without firing it; but as it is impossible to get more than one charge into a breech-loader, he did not see the necessity of so severe a test for this style of arm. The reason assigned by the Board for this test is that cavalry carry their carbines with the muzzle down, and it is liable to become filled with mud. In reply to this, Governor Jackson says that if the muzzle is closed with mud, the barrel will burst, whatever the strength of the breech; he has tried the experiment of closing the muzzle with a cork, and the gun always bursts at the muzzle.

The inventors present seemed all to agree that no good shooting could be done by fastening the gun in a clamp; the proper way being to have a good double rest, and fire from the shoulder. I also put in the suggestion that for firing with any accuracy 1000 yards, a telescope is essential. No man can tell at this distance, by looking with the naked eye through the open sights of a rifle, whether the piece is, or is not, pointing at a barn door. In a trial for skill among rival riflemen, I approve of firing off-hand and with open sights, but in testing the gun, all errors of aim should be eliminated if possible.

When among men familiar with the subject, I always raise the question of the comparative accuracy of breech, and muzzle loaders. I found the men here all to agree that a good breech-loader is even more accurate than the American target rifle. Dr. Maynard said that Cyrus Bradley, of Otsego Co., N. Y., was ready at any time to bet that with his breech-loader he could beat any muzzle-loader, the barrel of which was not heavier than his entire gun. For this accuracy Dr. Maynard insists on the condition that the cartridge shall be of the right material, and shall be properly designed and made. Then, he contends, the axis of the bullet may be made to coincide more exactly and more surely with the axis of the barrel, than by swedging through Clark's false muzzle. I am now pretty well satisfied, though not fully, of the correctness of this position, and if it is sound, there can be no doubt that breech-loading rifles will rapidly supersede muzzle-loaders for sporting purposes, whatever may be the decision in regard to the army. A serious drawback from the pleasure of rifle shooting is the great amount of greasy and filthy labor in cleaning and loading the gun after every discharge. This is nearly all avoided in the breech-loader, and will be entirely avoided when inventors succeed in producing a cartridge that will effectually clean the gun at every fire.

G. B.

WEIGHTS AND MEASURES.

THE METRIC SYSTEM AND ITS EQUIVALENTS.

The bill passed by the House of Representatives to authorize the use of the metric system of weights and measures—now pending in the Senate—provides that the following tables shall be recognized in contracts and legal proceedings as the equivalents of the weights and measures of the metric system: Any apparent complexity of the system will disappear when it is observed that it depends upon a single unit—the meter—and that any denomination of measure can be expressed in meters, square meters or solid meters. The gram is the weight of a cube of water a hundreth of a meter on each side. For ordinary uses the words meter and gram are the only new words to be learned.

It should also be noticed that although the weights and measures are in value precisely the same as those used in Europe, the names have been so changed as to accord with the spirit of our language.

MEASURES OF LENGTH.

Metric Denominations and Values.	Equivalents in Denominations in use.
Myriameter	10,000 meters.	6·2137 miles.
Kilometer	1,000 meters.	0·6237 miles, or 3,280 feet and 10 inches.
Hectometer	100 meters.	328 feet and 1 inch.
Dekameter	10 meters.	393·7 inches.
Meter	1 meter.	39·37 inches.
Decimeter	1-10 of a meter.	3·937 inches.
Centimeter	1-100 of a meter.	0·3937 inches.
Millimeter	1-1000 of a meter.	0·0394 inches.

MEASURES OF CAPACITY.

METRIC DENOMINATIONS AND VALUES.		EQUIVALENTS IN DENOMINATIONS IN USE.	
Names.	Number of Liters	Cubic Measure.	Dry Measure.
Kiloliter, or stere	1,000	1 cubic meter	1·308 cubic yards.
Hectoliter	100	1-10 of a cubic meter	2 bushels and 3·35 pecks.
Dekaliter	10	10 cubic decimeters	9·08 quarts.
Liter	1	1 cubic decimeter	0·908 quarts.
Deciliter	1-10	1-10 of a cubic decimeter	6·1022 cubic inches.
Centiliter	1-100	10 cubic centimeters	0·6102 cubic inches.
Milliliter	1-1000	1 cubic centimeter	0·061 cubic inches.

			Liquid or Wine Measure.
			264·17 gallons.
			26·417 gallons.
			2·6417 gallons.
			1·0567 quarts.
			0·845 gills.
			0·338 fluid ounces.
			0·27 fluid drams.

MEASURES OF SURFACE.

Metric Denominations and Values.	Equivalents in Denominations in Use.
Hectare	10,000 square meters	2·471 acres.
Are	100 square meters	119·6 square yards.
Centare	1 square meter	1,550 square inches.

WEIGHTS.

METRIC DENOMINATIONS AND VALUES.		EQUIVALENTS IN DENOMINATIONS IN USE.	
Names.	Number of Grams.	Weight of what quantity of water at maximum density.	Avoirdupois weight.
Millier, or Tonneau	1,000,000	1 cubic meter	2,204·6 pounds.
Quintal	100,000	1 hectoliter	220·46 pounds.
Myriagram	10,000	10 liters	22·046 pounds.
Kilogram or kilo	1,000	1 liter	2·2046 pounds.
Hectogram	100	1 deciliter	3·5274 ounces.
Dekagram	10	10 cubic centimeters	0·3527 ounces.
Gram	1	1 cubic centimeter	15·432 grains.
Decigram	1-10	1-10 of a cubic centimeter	1·5432 grains.
Centigram	1-100	10 cubic millimeters	0·1543 grains.
Milligram	1-1000	1 cubic millimeter	0·0154 grains.

It is intended to start the *Great Eastern* on her second attempt to lay the Atlantic cable July 1st.

EDUCATION OF WORKINGMEN.

The grand movement now on foot, confined to no particular section of the country, for the reduction of the hours of labor, urges, among the best reasons for its success, that of giving the workingman more opportunities for mental culture. Without arguing either for or against the claim that the two hours thus proposed to be taken from each day's labor will be employed, even partially, in study, there is an obvious need for a better mental and theoretical education among our workingmen, especially mechanics. Those departments of industry are the best paid and highest valued into which enters most of the intellect—the brain labor.

The expertness necessary to guide the machinist's drill, turning chisel, or planing tool, to use the file or the cold chisel, or to wield the blacksmith's hammer, necessitates only a certain amount of practice; but above this animated machine, working under another's will, there is a position where guiding, and managing, and controlling brain exerts its wonderful power. Still farther we may look and see the scientific mechanic and the inventor, one the trusted and trustworthy means of achieving works which are destined to benefit coming generations, and the other a genius who, more than diplomats or statesmen, guides and controls the destinies of nations. These grades between the laborer and the thinker are necessary and will always exist. Machinery, well called "labor-saving," will more and more infringe upon the province of the muscle user, although it may never entirely dispense with his services. It cannot, however, more than trench upon the boundaries which defend the brain user; his position is one of comparative security.

Arguing from these premises, what ought to be the object of our delvers, our laborers, our musclemen? Evidently to qualify themselves to ascend another step on the ladder of improvement. Education of the reasoning faculties is the only means to that step; not book knowledge merely, but that alertness and discipline of the mental powers which is stimulated by study and maintained and strengthened by observation and practice.

Take a familiar example of the advantage of a knowledge of principles and the proper application of them to practice. A workman in a machine shop is required to cut on a shaft a thread of perhaps eight to the inch; the chart attached to all modern screw-cutting lathes gives him the gears for the spindle and the leading screw. The result is the required thread. But why? Somebody, he who planned the lathe, knew; why not he who uses it? How easy to know! The rules of arithmetic which enables the workman to calculate his wages by the day, the week, the hour, applied to this matter, would explain all. Suppose the leading screw which guides the cutter to be of a pitch of two to the inch; if it revolves at the same rate as the shaft to be threaded, the result will be a duplicate of the leading screw. But he desires to make four threads on the shaft to each thread on the screw. It is evident, therefore, that the latter should revolve only once, while the former rotates four times. Now the way is clear. If he places upon the spindle a gear of forty teeth that on the screw must contain just four times as many, or one hundred and sixty. So with any gear first selected, the proportions must be as four to one.

Simple as is this philosophy of relative motions, thus familiarly illustrated, it is well known that many machinists have never given it a thought. And it is a shame to some mechanics that they do not care to know "the reason why," but are content to worry through their week's work and receive their week's wages without having gained one iota of additional knowledge, beyond the mechanical expertness inseparable from constant practice. No appeal to professional pride or personal ambition can be of value to such men.

To the ambitious workingmen, of whatever branch of industry, we appeal to use their opportunities. A single half hour out of the twenty-four, devoted earnestly to the study of some department of knowledge applicable to their particular business, will result in one short year—if the mind is active to make application of the knowledge by observation and experience—in an improvement which will astonish them. They will notice it in an increasing interest in their work; what was before a distasteful drudg-

ery becoming a pleasant employment. They will see it in an increased appreciation of their services by an intelligent employer; for nothing is more annoying to an employer, manager, or foreman, than to be compelled to watch every movement of his workmen, from the fear that the job may be retarded, injured, or ruined. They will feel it in the growing consciousness of increasing independence, in the certainty of employment in dull times, in the opportunities for advancement, and in their fitness for higher and better positions.

MONITORS IN ENGLAND.

Our English exchanges continue to discuss the monitor question at great length. The *Engineering*, Mr. Colburn's new paper, and the *Engineer*, treat the matter by correspondence, by the burin of the engraver, and by leaders. Mr. John Bourne, whom all the engineering world is well acquainted with through his works, openly advocates them, and argues in their favor, condemning in strong terms those antique ships with top lofty sides and thin armor which constitute the naval force of European nations.

It must not be inferred that monitors meet with favor on all sides. Quite the reverse. The *Engineer* declares that "such ships as the *Dictator* are unseaworthy and objectionable as cruisers in every respect. Even Americans admit the fact. We must, in short, have free board. Of what should it consist? Of vessels of moderate size, apparently of thin, tough plates of the best possible iron, say three-fourths of an inch to seven-eighths of an inch from the upper edge of the armor plating up say twelve or fourteen feet;" and the editor goes on to say that this thickness of metal would not offer sufficient resistance to explode a fuseless shell, and that splinters dislodged by bullets and round shot would not do much damage to the crew if mantlets of rope or hide were suspended in-board. The *Engineer* also says it would appear that on the whole ships with unarmored upper works are safer than those with imperfect armor—a laborious conclusion to arrive at in a leading article of a column and a-half.

"Three wise men of Gotham went to sea in a bowl; if the bowl had been stronger this song would have been longer", and that is the predicament of our British friends. Two horns of a dilemma are presented, but they are both sharp and unpleasant: Either they must abandon the monstrous ironclads they have constructed at such immense outlay, and build others on approved plans, such as the monitors, or lose their boasted supremacy on the sea in case of a naval war.

On the whole, it is inferred by the journal which claims to lead in matters of this kind, that armored ships are of no particular utility when they are fourteen or fifteen feet out of water. No one familiar with the performances of our vessels would dispute this statement. We are quite well satisfied with the performance of our ironclad fleet, and the comments of the English press strengthens our confidence.

SALT AND SODA.

The *Tribune* of the 29th ult. records the fact that within the last ten days soda ash has gone up half a cent a pound, and laments that "there is not a single living, kicking, soda-ash factory in all our country." Although the *Tribune* is slightly mistaken about the existence of soda-ash factories in the United States; yet its complaint that we are dependent upon foreign countries for soda ash is well founded. The American soda ash is manufactured only incidentally or accidentally, and is so small in quantity that it does not affect the price or the consumption of the article. It is made here simply to use up materials about acid factories which otherwise might be wasted.

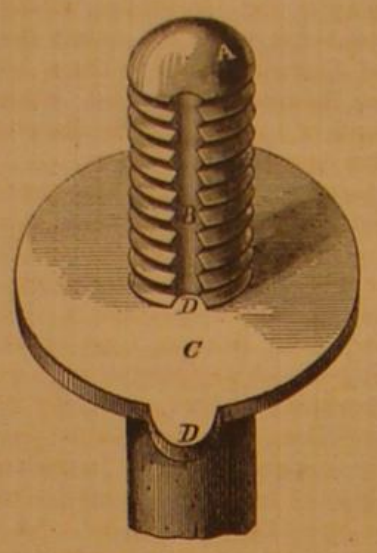
The present obstacle to the manufacture of soda here is the want of cheap salt; in this country salt costs eight or ten times more than in England. The other raw materials needed, sulphur, coal, and manganese, we have in great abundance, in fact, we are more favored than any other country. But there is plenty of salt in the sea, and we have plenty of places like the Jersey flats which might be used for its extraction.

Some of our readers may ask "what of it?" and "what is soda ash to us?" The soda ash manufacture implies more extensive manufacturing establishments than now exist on the continent. It does not concern soda ash alone, for about it clusters, as of necessity, the manufacture, at the same time, of acids, bleaching powder, and hyposulphite of soda.

Some of our most important arts are built on soda ash. Without it, no soap, no glass, no white paper. If the supply of soda ash should be interrupted for six months, what would become of us? As we have suggested above, our salvation, would be salt. The American people cannot do any thing more profitable than to find us salt for ten cents a bushel.

HICKMAN'S IMPROVED WASHER.

The annexed engraving represents a bolt with a longitudinal slit, and a washer with two lips, one of which enters the slit in the bolt and prevents the revolution of the washer, the other being bent up against



the nut to prevent the latter from becoming loosened. The object is to prevent the loosening or loss of nuts or burrs where exposed to jar or tremulous motion, and in many places will answer a very desirable purpose. Patented May 29, 1866, through the Scientific American Patent Agency, by G. G. Hickman, Coatesville, Pa., to whom address for further information.

How American Velvet is Made.

The machinery for the manufacture of American velvet was introduced into this country by the inventor, a Mr. Holt, of Cheshire, England, and its superiority in the matter of rapidity is said to be as great as that of the modern railroads over the old stage coach system. The method is as follows:—Grooved brass rods or wires were placed under the web which forms the pile, secured by threads woven into the warp. The weaver cuts the threads by means of a knife, held in the hand, the blade of which slides along the groove, dividing the pile into two rows of threads, thus giving a nap or pile of the depth of the rod inserted.

The manufacture, according to the patented method, is accomplished by weaving two warps or foundations, with a middle warp alternately rising into the upper and lower, being secured by two shuttles moving at once. The knife moves horizontally, in the same direction as the shuttles, and the two warps and the pile between are divided, and the naps are cut into equal lengths. Two piled fabrics—the exact counterpart of each other—are thus made at one time. The shuttles and knives are all impelled by the ordinary motions of the power loom.

The statement that 110 picks or threads are made in a minute (or nearly two every second) will give some idea of the rapidity of the manufacture. A man with a patented machine can make from fifty to sixty yards per week, while eight or ten yards would be a good week's work for the same person should he make use of the ordinary hand-loom. The saving of labor by this process over the wire-weaving method is estimated at from fifty to seventy per cent., while the fabrics are equal, and, in some respects, superior to those of foreign make. The looms are adapted to the manufacture of piled fabrics, such as silk plush, since an article of this nature for gentlemen's caps has become very popular as a substitute for fur. Tartan, or clan velvets, are also made.—*Commercial Bulletin.*

Stamp Your Receipts.—The importance of stamping receipts was recently determined in this city in a suit against a party who neglected to attach the required two-cent revenue stamp to seven receipts. The fine for such neglect is $200 for each and every offence, and the party sued was fined $1400. The example is worthy of remembrance.

An Extensive Salt Mine.

The New Orleans *Times* gives an extended account of what it considered the purest and most important natural deposit of salt in the world, located on the coast of Louisiana at Petit Anse Island. The deposit was known as early as 1698-99, out all knowledge of it appears to have been lost until after the commencement of the recent war. During that period, when the supply from other sources was cut off, the mine was discovered by residents of the interior who had resorted to the island for the purpose of procuring salt by boiling, and for two years nearly the whole of the trans-Mississippi region was supplied from that source, no less than two thousand pounds having been taken from it in three months. When the island passed into the hands of the Federal forces, the works, buildings, etc., were destroyed, but it has recently been purchased by New York capitalists, who, in developing the property, have found the salt rock from thirteen to twenty-two feet below the surface, extending over a great number of acres. Pits of over forty feet in depth have been sunk through the salt without finding any indications of reaching bottom. The salt formation is almost perfectly pure, chemical analysis showing that it contains about ninety per cent pure salt. The development of the property is being rapidly pushed, and the product has already reached two hundred thousand pounds per week, with a force of ten hands. This mine is regarded as forming a prominent part of the material resources of Louisiana.

Estimates about the Cotton Crop.

A good deal of interest is manifested in the probable amount of the cotton crop for 1866. Some writers have estimated it as high as 2,500,000 bales, but a correspondent of the Vicksburg *Journal*, who has recently visited several counties in different sections of the State, estimates the cotton crop at a fraction less than 1,500,000 bales.

A letter from Georgia, recently published, says:—

"The cotton crop of 1860 was 5,000,000 bales, which brought into the Southern States $175,000,000. South-west Georgia produced 110,000, receiving $3,500,000. The crop of the current year will range somewhere about 1,200,000, and south-west Georgia will yield at least 90,000 bales; hence, if cotton commands 25 cents per pound next fall, this favored section will obtain nearly $12,000,000, and consequently will be, by long odds, the richest district south of the Potomac. This country suffered comparatively nothing from the war; no enemy penetrated into this portion of the State; labor was uninterrupted; property was not destroyed or wasted, and a greater quantity of first-class land is now in cultivation than in 1860; and lastly, the planters are turning their attention exclusively to the production of cotton.

"In the present disordered state of Southern society, it is almost impossible to collect sufficient reliable data to ground an estimate upon, and I freely confess I am not able, by reasoning, to maintain the figures made elsewhere; but this we do know, an immense tract of our cotton-growing region is now idle, and that numbers of what were formerly most productive plantations, are now being worked with one-half of the customary force. Some of the papers say that the crops will be diminished one-third from this cause alone. Then there are three other causes operating in this direction—the scarcity of mules and horses; the scarcity of cotton seed; and the scarcity of labor."

How to Cure a Felon.—As we often see friends suffer with these very troublesome things, we publish the following cure for them, which we have heard highly recommended:—As soon as the parts begin to swell get the tincture of lobelia, and wrap the part affected with cloth saturated thoroughly with the tincture, and the felon is dead. An old physician says he has known it to cure in scores of cases, and it never fails if applied in season.—*Journal of Medicine.*

Prize for an Invention.—The French Government has issued a decree, published in the *Moniteur*, by which a prize of 50,000 francs, or $10,000, is to be awarded, within the next five years, to the person who shall discover a system by which the voltaic battery can be economically applied to heating or lighting purposes.

Correspondence

Ancient War Implements.

MESSRS. EDITORS:—I am not familiar with the history of the experiments and improvements in artillery, only having read somewhere, when a boy, that the first cannon was made of leather and the first balls of stone; and having a distinct opinion, during our late war, that grape out of smooth bore batteries at short range, would, upon an average, do more work than single bolts fired from rifled guns at ranges of one to five miles. But I have been under the impression that the advocates of the breech-loading system claimed it as a modern invention. Am I right or wrong in this supposition? There are, in the Museum of Northern Antiquites, at this place, two pieces of breech-loading ordnance, taken from a wreck in neighboring waters, which are at least three hundred and fifty years old The guns are of wrought iron, and the workmanship is evidently that of welding one flat ring on to another, which I had also taken to be quite a modern idea. I have heard it said that there is a pretty good pattern for a Colt's revolver in an old collection in Germany, but for this I cannot vouch.

The hatchets and arrow heads of the stone period found in the north of Europe, are many of them of the same pattern as those found all over the United States; the arrow heads being of inferior, and the flint knives and spear heads being of superior workmanship to any I ever saw in America. Did the inventive powers of savages run by necessity in the same channel in different continents? or were the patterns of these instruments and the unknown art of fashioning the hardest of stones inherited by tradition from the original diverging kindred families in Asia? Does the shape of implements of hunting and of war throw any light upon the question of the first peopling of America? From the bronze period there are in the same Museum specimens of curious spiral war trumpets cast in one piece, a work which it is said could not now be done any where but in Japan. Is this true that savages could cast metal into forms which a Yankee cannot, or is it only the innocent enthusiasim of an honest antiquary?

Y.

Copenhagen, Denmark, May 5, 1866.

[In reply to our correspondent we would say that his comparison between the smooth-bore guns firing grape, and the rifled guns discharging bolts, is based upon a wrong theory. One is intended for one purpose and the other for an entirely different one. Discharges of grape, from smooth bore guns, upon bodies of men at short range, is one of the most destructive agencies of warfare. Balls, bolts, or shells are rarely used at short range, from rifled guns, unless to pierce the sides of ships or breach the walls of fortifications. The object of the rifled bore is to obtain greater range and accuracy.

Breech-loading cannon are probably as old as any style of guns. It is difficult to assign the precise date to their use, but Benton in his "Ordnance and Gunnery" says: "Among the earliest cannon are found those which were loaded at the breech instead of the muzzle. One of the earliest methods was that of having a rectangular, horizontal opening at the breech to receive a sliding chamber containing the charge, the block being held in its place by a key inserted from the top of the piece."

The Colt's revolver, or rather the principle of its operation, is by no means modern. We have heard Col. Colt, himself, acknowledge this. At the time he invented his revolving arm he did not know that he was reviving one of the lost arts. Subsequently, however, he obtained a specimen of rude workmanship, which we believe dated back to the sixteenth century. The barrels or chambers in this machine were revolved by hand.

The similarity of the rude stone weapons and implements found in the north of Europe to those found on this continent, does not, in our opinion, argue a consanguinity of races or mutual intercourse. The same necessities of men in one locality would urge them to the adoption of similar means, to provide for those necessities, as those adopted by other tribes, however far removed; for God made of one blood all the nations that dwell upon the face of the earth. The spear, the bow, flints for arrow heads, and other articles, have been found indiscriminately among the savage tribes of all parts of the world, and in all ages.—EDS.

Crytography.

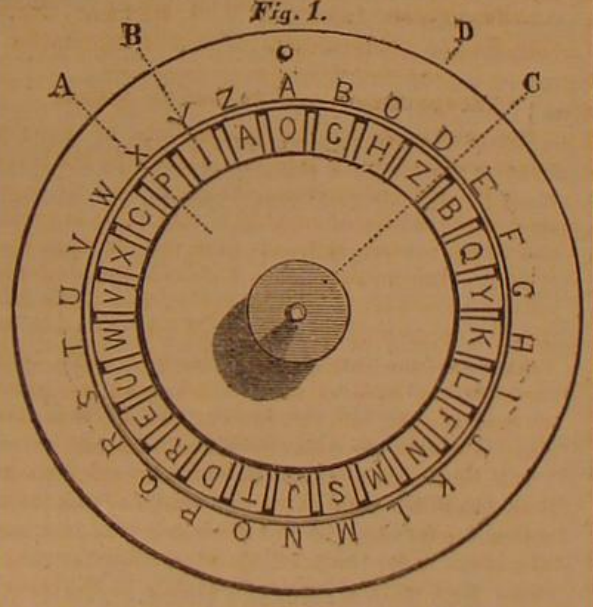
MESSRS. EDITORS:—In the SCIENTIFIC AMERICAN of May 5th appeared a very interesting article on cipher writing, and it struck me that a description of a little instrument I invented during the war, for producing unlimited numbers of cipher alphabets, might not prove uninteresting to the readers of your journal, especially as the Chief of the Signal Corps of the U. S. Army ordered fifty of the instruments, and for all I know, manufactured his ciphers during the war by them. They were never patented, and the Government received them at cost price.

With regard to ciphers, it will be well to remember, that owing to the constitution of our language, a given number of words will contain the same letters repeated a certain number of times, so that there is no cipher, however complicated, which, if used for any length of time, cannot be discovered, the clue being the repetition of the signs.

Besides this, a cipher cannot be produced without the effort of thought, *except mechanically*, and it is safe to conclude that what one mind can conceive another mind is capable of tracing out.

Having these considerations in view, during the first year of the rebellion, I set myself the task of producing a pocket apparatus which would be capable of producing ciphers perpetually without mental effort, and therefore without mental bias or sequence; thus the operator being able to produce 365 ciphers as easily as he before could make one, had no inducement to repeat the same cipher twice over; and as the little pocket disk in its operations followed no bias or rule, depending entirely on *chance* for its changes, the chances were very great against any discovery being made without the key in the possession of each communicating party.

Fig. 1.



The instrument consists of a brass disk, D, about the size of the illustration (Fig. 1), upon which an alphabet was indelibly stamped in a circle. Within this circle of fixed letters there was another circle of movable ones, B, fitting into little recesses opposite each fixed letter. The movable letters are represented separate from the disk in Fig. 2.

Fig 2.

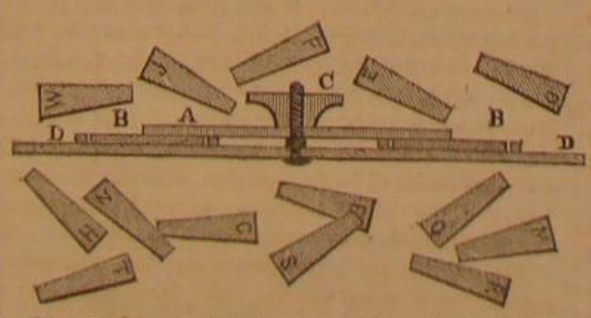


Fig. 2 represents also a section of the disk, in which D D is the disk, B B the movable letters in their recesses, held in place by the circular plate, A, and the nut, C.

To illustrate the mode of using the disk: suppose the movable letters to be put into the disk—the A opposite A, B opposite B, and so on, each fixed letter with a corresponding movable one opposite. We now wish to make a cipher—turn the disk over on the table, the letters will fall out with their faces downward. Now mix them up like a set of dominoes, and replace them at random in the disk; screw the cap down upon them, and the cipher is ready. Probably such an arrangement of letters as represented in Fig. 1 may be the result.

You wish to telegraph to headquarters "Early has entered Pennsylvania," it would not be necessary to use all the letters; you would use, say, EARLY HS ENTD PNSLVA. To transmit this by the disk as arranged in Fig. 1, you would use BOEMIRUBJWZ DJUMXO.

The system recommended was to form, by means of the disk, 37 ciphers, numbered 1 upward. Copies of these were to be furnished to each of the signal officers, with instructions to change every ten days. This afforded ciphers for a year—the date upon which the cipher was transmitted indicating at headquarters the arrangement or key to be consulted in translating, and *vice versa*—the disk being set according to the copy served as the key, and was always at hand. If any of the copies were lost, headquarters were to be at once apprised of the fact, so that a new set of ciphers might be manufactured. Thus, to produce a new cipher, the time only is required necessary to unscrew the nut, upset the movable letters, and replace them at random—the mind has no part in it; therefore, if not used too often, it will be impossible, by any rule, to find out the cipher in time to make use of it.

J. WYATT REID, Consulting Engineer.

New York City, May, 24, 1866.

The European Naval Excursion.

MESSRS. EDITORS:—If there is any thing this country should look upon with apprehension, it is the adoption of the monitor system by England or any other maritime rival. This subject is now being agitated in England by the most influential and scientific bodies. Already lectures of the most exhaustive character, accompanied by diagrams illustrative of our system, have been delivered before the Institution of Naval Architects and the Institution of Civil Engineers, before audiences composed of the highest dignitaries of the kingdom, attracted by the serious national importance of the subject.

Mr. John Bourne, the eminent English engineer, in a lecture before these scientific bodies, was so emphatic in his condemnation of the system adopted for their ironclad fleet as to cause great consternation among those who are responsible for it, while, on the other hand, so complete were his demonstrations of the correctness of the monitor system, that the supporters of the government plans were utterly discomfitted. Indeed, so prompt, decisive, and unanswerable were Mr. Bourne's replies to the interrogatories, which the members of these bodies are permitted to ask the lecturer, that even the Chief Constructor of the Navy, Mr. E. J. Reed, one of the most accomplished naval architects in Europe, was driven to the wall. Mr. Bourne concludes his demonstration with the following curt interrogatory, "Why then have we not got monitors? And what would our predicament be if such vessels were suddenly to confront us?"

Still further, we find that Mr. John Scott Russell, the builder of the *Great Eastern*, in his great work on naval architecture recently published in London, devotes much space to the discussion of the monitor system, and concludes with an endorsement fully as emphatic as Mr. Bourne's. Many others appear to have taken up and endorsed these views, for we find that for the last month, the columns of the London mechanical journals have been, to a great extent, occupied with correspondence backing up by even new arguments, the demonstrations of Messrs. Bourne and Russell.

To make a long story short, it may be briefly stated that opinion in England on this (to them vital) subject has reached such a pass that it seems only necessary for one of our monitors to anchor safely in the Mersey, to cause John Bull to commence at once a fleet of heavy monitors.

It seems that Mr. Assistant Secretary Fox, in the fullness of his wisdom has undertaken to complete this demonstration If Mr. Fox can assign any reason, or even a pretext for not only sending a monitor to England but crossing in her himself, we should really

like to hear it. We cannot afford to have a system, purely American, which has been proved through many a hard-fought battle, and in which consists our great naval strength, actually forced upon our great maritime rival, and that, too, simply because Mr. Fox has taken into his head that nothing short of a heavily-armed monitor will answer his purpose. If Mr. Fox really thinks it necessary for him to inspect the vents and breechings of foreign ordnance, and to place his fingers in the perforations in French and English ironclad targets, and that a national vessel should be detailed for this duty, we cordially approve of the plan; but, at the same time, we must be permitted to suggest that a "double rudder" would be the most appropriate vessel, both from their extraordinary speed and great maneuvering qualities. Either the *Winooski* or the *Eutaw*, if they can be spared from the dock trials and Potomac excursions, are well adapted for this duty.

PRO BONO PUBLICO.

Sawing Lumber.

MESSRS. EDITORS:—Having had much experience both in building and in running saw mills, having also acquired useful information upon this subject from others, I think I can justly claim to be "a practical sawyer," and I would like, for the benefit of those seeking information in relation to circular saw mills, to give some of my ideas, and in so doing take exceptions to some of those advanced by Mr. Churchill in your paper of May 12th.

We are beginning to think out here in "the virgin forests of the West," that we have better and more effective mills, and know better what is required in that line, than is known in the soft pineries and second-growth timber lands of the Eastern States; at any rate, we know that the directions to give the saw one-half inch range toward the carriage in 20 feet, and to give the mandrel one-eighth inch end play, although possibly beneficial under a certain condition of the saw, or perhaps in sawing a certain kind of a log, are not at all to be relied upon under innumerable other circumstances; it is frequently as necessary to give the saw lead or "range" from the carriage as toward it; in fact it is very desirable to be able to vary and change the lead of the saw at pleasure. I like to have a mill constructed so that I can change and control the lead by varying the line or angle of the mandrel in relation to the carriage, so as to correct any tendency of the saw to vary from the true line either way. The provision made for this in the Martin & Ashcroft patent mills is the best and only convenient one I have seen as yet.

In using these mills I have many times in a day had occasion to make this variation, and have often done it while the saw was cutting in the log, and always with the most perfect success in correcting any difficulty in the lead of the saw (it is done by simply turning a nut upon a screw connected with the back box of the mandrel). I have also in the use of these mills found great advantage in keeping the points of the teeth in good order, and preventing the lumber from being scratched by the edge of the tooth, by using the arrangement for throwing the saw away from the log in running back; it saves the edge of the tooth next the log from being worn off unequally, and the face of the saw from being heated by the log rubbing against it.*

With regard to the one-eighth end play, it is an old idea, and is about run out, out here. If a saw commences to deviate from the true line it will be very apt to continue to do so, (this was learned long ago in using the handsaw). The effect of allowing this deviation is to saw irregularly, and often seriously injures the saw. The right way is to have your saw cut perfectly free and on a true line, and if it commences to vary, correct it at once; have the log held firmly against the head blocks so that it cannot spring, if it has any tendency to.†

The idea that the teeth of the circular saw should have the same form as the sash saw, is, I think, a great mistake, because it is desirable in all cutting instruments to have them as keen and sharp as they will stand in use without bending or breaking, and it is found that teeth of the circular saw will stand to be much more hooking and pointed than the sash saw.

I find that the best adjustment of the saw for general purposes (have it true, of course, both edgeways and sideways) is to hold it by means of the saw guide exactly at right angles with the line of the mandrel. I swedge back and spread out the points of the teeth of the common plate saw sufficiently to make a firm, cutting edge, and also to cut perfectly free and clear the face of the saw (I do not bend the teeth sideways at all but depend upon upsetting and spreading). I keep the tooth gummed out and filed under as hooking as it will stand; this depends upon the kind of timber to be sawed; the proper line for this will be one drawn from the point of the tooth to a circle from one-half to five-eighths the diameter of the saw. I have found the freest and best cutting saws (requiring the least power) to be those made with inserted teeth; the reason is obvious; the edge of a forged tooth can be drawn out much thinner and sharper and will stand a finer edge than the rolled-steel plate can be made to.* An objection to these saws is a danger that the teeth may get loose and fly out, yet a great many of this kind are in use with, perhaps, as few accidents as from the use of ordinary machinery. I hope the importance of the saw mill interests will excuse the length of this article, and hold myself ready to verify the correctness of it by practical tests if necessary.

WM. RICHIE.

Thorntown, Ind., 1866.

*Saws of this kind are manufactured by Messrs. Spalding & Brothers of Chicago, by the American Saw Company of New York, by Woodrough, McParlin & Co., Cincinnati, Ohio, and probably by other saw manufacturers.

*The use of Martin's & Ashcroft's patent is owned by Messrs. Owens, Lane, Dyer & Co., of Hamilton, Ohio, who are extensively engaged in manufacturing them.

†A good device for this in many cases is an improved saw mill dog, patented by A. S. Petigrew, August 2, 1864.

NEW PUBLICATIONS.

A MANUAL OF BLOW-PIPE ANALYSIS AND DETERMINATIVE MINERALOGY, FIFTH EDITION. Wm. Elderherst, T. Ellwood Zell, Philadelphia, 1866.

This book is used as a text book in several of the colleges, and is the best book on the subject extant, at least in the English language. It will prove of great utility to chemists, miners, and mineralogists.

The blow pipe is an instrument easy to use for ordinary purposes and enables one to determine in the readiest manner the character of minerals. The highest skill in its use, however, requires great study and labor, and perhaps genius. Platner, who might be named the Paganini among blow pipers, could do about as much with a shilling blow-pipe as ordinary chemists with all their costly apparatus and chemicals.

The price of this book is $2,50 and in this city may be obtained of D. Van Nostrand, 192 Broadway.

DIFFERENTIAL CALCULUS.—With Unusual and Particular Analyses of its Elementary Principles, and Copious Illustration of its Practical Application. By D. John Spare.

We have received the above work from Messrs. Bradley, Dayton & Co., Boston. We do not doubt that it is a valuable mathematical work, but we would thank the publishers who send us books to be noticed, to forward them at their own expense, and not charge us for the privilege of noticing them.

THE IRON MANUFACTURER'S GUIDE.—This is the title of a volume of over 800 pages, royal octavo, compiled by J. P. Lesley, Secretary of the American Iron Association, under whose authority the work is issued. Two hundred and sixty-two pages are devoted to a full history of all the anthracite and charcoal furnaces, bloomeries, forges, and rolling mills in the United States, making it highly valuable as a book of reference to the manufacturer, dealer, and capitalist. The remainder of the volume treats of iron as a chemical element, an ore, and a manufactured article. It will be seen that the geologist, the mineralogist, the miner, and the manufacturer, have each somewhat of interest in the work. It is evidently a book of practical utility as well as of theoretical interest. Published by John Wiley, New York.

COAL, IRON, AND OIL.—This is the unpretending title of a work just published by Benjamin Bannan, editor and proprietor of the *Miner's Journal*, Pottsville, Pa. The book is compiled and edited by himself and S. H. Daddow, mining engineer, and is the most practical and exhaustive treatise on the subject that has come under our observation. The theories explaining the formation of coal and the generation of petroleum are somewhat novel, but appear to be based upon careful observation and analogy. We cannot but agree with the evident belief of the authors of this treatise, that the formation of petroleum, if not of coal, is not altogether and wholly an event of the past, but that the process is still going on, although perhaps not so rapidly as formerly.

The description of the great coal and oil basins of this country will be found valuable and interesting to the business man and general reader, while the statistics and information relative to these two great natural products, will arrest the attention of the practical man and the scholar. The manufacture of iron from the ore is treated in an eminently practical manner, making the work one of great value to mechanics and manufacturers. We shall take occasion to refer again to this treatise when time and space permit.

The volume is one of eight hundred pages and contains over two hundred engravings with numerous tables. It is a most valuable work, and one that deserves to be read by all intelligent men.

Report on the Cattle Plague.

The possible introduction of this dreadful scourge into our country cannot be contemplated without causing much uneasiness, when the fact is borne in mind that in England the plague has swept off sixty-five thousand cattle, valued at $4,500,000. A commission was appointed by the British Government to consider this subject, and the result has been any thing but conclusive. There has been a great deal of confusion about remedies, and medical treatment has been of no avail. It is, however, made clear by evidence that the proportion of recoveries is very largely increased "by judicious feeding with soft mashes of digestible food." Under this treatment, out of 503 cases, 191, or nearly 38 per cent, recovered. It is remarkable, moreover, that dividing these beasts into two groups, according as they belonged to large or small stocks, in the former 22 per cent, while in the latter 62 per cent, recovered. The explanation offered is that in smaller stocks fewer beasts are ill at once, there is less concentration of the poison, less crowding, and, not least, better nursing. An analysis of another group of 813 cases indicates still more conclusively the influence of feeding. Among cottagers' cattle, generally fed on mashed food, the recoveries were 73 per cent; in large stocks, where dry food was often given during convalesence, the recoveries were 57 per cent; with mixed food of mashes and hay they were 22 per cent; while among cattle fed entirely with dry food, and treated medically with drugs, the recoveries were but 13 per cent. The number of cases is too small for us to depend on these averages; but they are sufficient to establish the general fact. We may take it as ascertained that "powerful drugs of all kinds greatly highten the mortality of the Cattle Plague. . . . Perfect cleanliness, ample ventilation, constant disinfection of the air and discharges by tar acids, and the most careful feeding with soft mashes of the most digestible food—such, and such only, are the measures which our present experience sanctions for the treatment of the disease." Such a conclusion is quite in accordance with the congested state of the stomach which has been observed after death, and the commissioners believe that a similar restriction as to diet formed the most important part of the cure.

Storage of Gun-cotton.

Gun-cotton is now made into ropes for storage, and kept under water. When an order is received at the manufactory, a few hours suffice to send the cotton on its way. It has been found that by making the ropes with many air channels through the mass, the cotton explodes almost instantaneously, and is as violent in action as the strongest fulminates. Charges for guns are now made into two parts; an exterior composed of cotton of loose texture, the ignition of which starts the ball), and an interior of denser material, which supplies the gas necessary to keep up the constantly accelerating speed of the ball. The result is great gain in initial velocity. Compared with powder in an Enfield rifle the cotton gave a trajectory having an incurvation of $3\frac{1}{2}$ inches, the powder $3\frac{3}{8}$ inches in the first 100 yards.

SLATES.—The test of a superior slate is its ability to remain unbroken, after being made red hot in a furnace, and suddenly immersed in cold water, while at that heat.

NEW INVENTIONS.

The following are some of the most prominent of the patents issued on the 29th inst., with the names of the patentees :—

FORCE PUMP.—J. H. A. GERICKE, New Orleans La.—This is a force pump operating on the principle of a turbine wheel, designed for raising great bodies of water in short periods of time, as when draining low lands, pumping water out of ships, mines, and other low places.

STEAM BOILER.—A. J. SMITH, Greenville, Ohio.—This is a boiler in which the steam is formed in small quantities as required. It consists in combining a perforated interior boiler and induction water pipes with each other and with the outer boiler

SWIVEL SHACKLE.—T B. ROCHE, Folsom, Cal.—This shackle possesses many advantages over the ordinary swivel blocks—being much cheaper, works better, and the rope cannot possibly be twisted.

SELF-SEALING FRUIT CAN.—J. R. and N. E. LUPTON, Stafford, O.—By means of this invention fruit can be sealed air-tight by an improved stopper, so that the fruit can be kept sound and sweet for any length of time, and the stopper can be removed without injuring it.

LAMP-LIGHTER'S TORCH —C. D. WALTERS and JOHN WILSON, Harrisburgh, Pa.—This is a convenient apparatus for lamp-lighters' use; and consists of a torch formed by combining a lamp, a system of wrenches, and a match box with each other and with a handle.

ROLLS FOR WASHING AND WRINGING MACHINES.—S. F EMERSON, Seville, Ohio.—This invention consists of a hollow slotted cylinder of wood, on which the roller is made, the rubber being secured to the cylinder by wedges, bands, and ferrules, so that the rolls may be removed from, and attached to, the shaft of the machine when required.

LOWERING SHIPS' BOATS.—SAMUEL BROWN AND LEON LEVEL, San Francisco, Cal.—This invention is to provide a means whereby both the hauling parts of the tackles may be under the control of one person instead of two, as heretofore, and in such a manner that a friction brake may be employed to lower the boat fast or slow.

STEAM TRAP.—WM. FUZZARD, Chelsea, Mass.—This device consists in the arrangement of a buoyant stopper made of cork and placed in the exhaust chamber, which is provided with a suitable seat at its bottom, so that when steam passes into the exhaust chamber the buoyant stopper is depressed on its seat by its own gravity assisted by the pressure of the steam, but if water accumulates in the exhaust chamber, the buoyant stopper begins to float, and the water has a chance to escape.

SEWING MACHINE.—ALBIN WARTH, Stapleton, N. Y.—This sewing machine, by a single change in the mechanism, can be adapted so as to produce the loop or the chain stitch.

CUT-OFF FOR RAIN-WATER PIPES.—L. W. DOTY, Aurora, Ill.—This invention consists in the construction of a box of metal or other suitable material, with a partition extending up for a certain distance from the base, at the top of which there is pivoted or hinged a swinging gate, so arranged in regard to an induction pipe opening into the top of the box that the water entering the box may be thrown into either of two eduction pipes emanating from the bottom of the said box, and thus the water may be directed into different receptacles.

TURNING BOILER FLANGES.—EDWARD PAYE, New York City.—This invention consists in the use of a series of hammers in combination with cams or other suitable mechanism by which a reciprocating motion can be imparted to them, and with a suitable device for supporting the flue sheet in the required position so that by a succession of blows of the hammer the flange of the flue sheet is turned with little trouble and in a comparatively short time.

ATMOSPHERIC GOVERNOR.—BENJAMIN MACKERLEY, Paint, Ohio.—This governor by the compression of the atmospheric air in a cylinder or suitable receiver, a brake is applied, and by these means the speed of a motor of any desired description, but particularly such driven by animal power, can be regulated with the greatest care and accuracy.

COMBINED SCREW WRENCH AND HAMMER.—L. S. and E. G. HOYT, Croton Falls, N. Y.—This is an arrangement of a stationary and a hinged adjustable spring jaw on one end of a handle, to the other end of which a hammer is rigidly attached, so that a tool is obtained which serves the double purpose of a hammer and a screw wrench, and is cheap and very convenient.

CYLINDER BRUSH.—SILAS STUART, Sterling, Mass.—This brush relates to that class used in lathes for polishing metals; it consists in forming the holder for the bristles in sections but so that when joined together the bristles will present an unbrokon periphery, while a brush of any desired length may be formed by simply using more or less of the said holder sections.

WATER INDICATOR.—GEORGE LUTZ, of Lancaster, Ohio.—This invention is to simplify the construction and arrangement of the parts of a water indicator for steam boilers, to render it more effective in operation.

SKIRT SUPPORTER —WILLIAM BACHELLER, West Newbury, Mass.—This skirt supporter is worn around the waist just above the hips over which the skirts are placed and so supported as to be free from the hips, and so as to accommodate itself to their movement when the person wearing it is walking.

STRETCHING AND TACKING CARPETS.—F. M. OSBORN, Dover Plains, N. Y.—This is a novel combination of a carpet stretcher and a hammer for driving the tacks; they are so arranged with regard to each other and operated by a common lever handle, that when the carpet has been stretched the hammer will be brought down with sufficient force to drive the tack through the carpet into the floor.

SCREW-CUTTING MACHINE.—A. B. SIMONDS, Youngstown, Ohio.—By the combination and arrangement of the different parts of this machine, screws may be cut accurately and of any required length without changing gages or stopping it.

LEATHER-DRESSING MACHINE.—TYLER C. LORD, Portland, Oregon.—This invention relates principally to an adjustable table for scouring, finishing, and doing general table-work in dressing leather, together with other machinery, to be used for similar purposes, in connection with such table.

FRUIT GATHERER.—ELIZA H. NEWCOMB, New York City.—By the construction and arrangement of the several parts of this gatherer the operator is enabled to produce a shear cut by the resistance only of the stem of the fruit upon withdrawing the gatherer, thereby avoiding the necessity of great exertion on the part of the operator.

BEER PITCHER —W. P. AYRES, Nashua, N.H.—This invention consists in constructing a pitcher, or other vessel into which brewed liquors are drawn from the cask, with a partition plate dividing off a chamber in front of the spout, and in placing transversely across this chamber as well as across the main portion of the pitcher, perforated plates which serve as strainers or condensers, whereby the liquid may be poured out clear of foam; the pitcher is also provided with a tunnel-like mouth for the better guidance of the liquor into the pitcher.

CHURN POWER.—DAVID J. KNAPP, Fallsburgh, N. Y.—This is a means for operating churns with rising and falling dashers; it consists of a train of wheels having a spring for a motor, driving a pitman passing through a guide and connected with the dasher rods.

SHAFT COUPLING.—GEORGE L. BARRON, Bethlehem, Pa.—This is a shaft coupling, simple and easy of adjustment, which will hold the shaft securely coupled, It combines a shell, key, and set screws with the ends of the shafts to be coupled.

WEIGHING SCALES.—JACOB KING, Fort Wayne, Ind.—This invention consists in pivoting the scale pan to the short arm of a curved lever, the long arm of which is weighted. The lever is pivoted to the scale frame by a knife-edged pivoting pin, the latter also operates the index finger.

WATER COOLER.—J. M. BAIRD, Wheeling, West Va.—This invention consists of a tank with a cone-shaped bottom, set vertically in the ground a few feet below the surface. Its top is connected with a water pipe, and the apex of the cone-shaped bottom with the discharge pipe of the hydrant.

HORSE HAY FORK —T. H. ARNOLD, Troy, Pa.—This invention consists of bars, levers, and hooks or prongs, so arranged as to take nearly a vertical position when thrust into the hay, which may then be opened into the form of a harpoon to lift the hay, and which may be again closed to drop the hay where required.

TRACE BUCKLE.—ADAM HAGNY, Keokuk, Iowa.—This is a double-tongued trace buckle, so constructed that the trace itself may keep both tongues closed, and the two tongues may divide the draft strain of the race.

GRAIN CLEANER.—JOHN STEVENSON, Lionville, Ind., and JOHN J. CRIDER, Greenfield, Ind —This invention consists in so constructing the screen that by its revolution the grain can be thoroughly cleaned from cockle, cheat grass, etc., which seed find their way through the meshes of the screen.

HAY LOADER.—CHAS. GIBBS, Pittsfield, Vt.—This invention consists of a hay loader or fork pivoted to the side of the wagon frame, and so arranged with ropes, pulleys, levers, ratchet wheel and pawl that, by the advance of the wagon the hay will be raised from the ground and deposited on the wagon.

REAPER.—SEWELL GILLAM, New York City.—This improvement consists in dividing an ordinary sickle or cutter into the two sections, one working outside of the other, and each having a cutting front distinct and separate from the other, so that the weight of the sickle is divided, and then driving the different cutters or sections by different cranks placed at right angles to each other, so that the cutting labor is also divided—one crank being at its dead point when the other is at the center of its stroke.

STEAM BATHING APPARATUS.—J. YOUNG, M. D., Williamsburgh, N.Y.—This invention relates to an apparatus which enables persons to take a steam bath in their room without requiring a cumbersome mechanism, steam being generated in an ordinary tea kettle or any other suitable vessel, and injected into an annular chamber, which is placed under the chair occupied by the patient, said chair being situated within a light frame of wire or other suitable material, on which a sheet is hung so as to concentrate the steam escaping from the annular chamber on the body of the patient.

Notes and Queries

W. G., of Pa.—We thank you for your suggestion in regard to the proposed bill for taxing inventors. Remonstrances signed by inventors will do good—but inasmuch as they are much scattered as to locality it will not be easy to procure their signatures. We advise them to write letters of remonstrance to their U. S. Senators.

S. P. C., of N. Y.—Salt, heated with coal in a gas retort to a dull-red heat for five or six hours, is volatilized to the extent of about 60 per cent.

A. R. C., of S. C.—We are not acquainted with any machine for pressing Sea Island cotton in round bales, though we do not doubt that cotton presses can be modified to meet your wishes.

H. H., of Ohio.—You did not sign your name to your letter, therefore, we are unable to address you by mail. We prefer to give opinions respecting the novelty of inventions by mail, as such questions are not usually of general interest.

W. H., of Ill.—Your communication in regard to perpetual motion is received, but inasmuch as it does not contain any thing useful we decline to publish it. We say to you candidly that you are hunting a needle in the hay mow, and all your time and money will be wasted, and you will be a disappointed adventurer. We have said the same thing before hundreds of times.

E. T., of Ohio.—We are not aware that any reward is offered for the discovery of the principle of the Giffard's Injector

T. C. K., of Pa.—The boiler you describe, if properly set and having a good draft, ought to be sufficient to drive your engine. Much depends, however, on the construction of the boiler as to fire surface.

W. H. S., of N. J.—Many persons who are ignorant of the practical working of patented inventions, will insist that not one in a hundred is worth a farthing. There are thousands of inventors who are successfully engaged in the manufacture of their improvements, and the records of the Patent Office show that the sale and assignment of patents are very numerous.

H. H., of La.—Otis Tufts, of Boston, has secured patents for vertical railways or elevators for hotels. They are used in some of our largest hotels.

H. G. B., of N. Y.—We know of no better way to start rusty nuts than to put a few drops of kerosene in the end of the bolts, so that it will penetrate the threads, and the screw will immediately loosen.

J. H. P., of Ill.—The question you ask involves a complicated mathematical problem, and would require a good deal of time to prepare it.

T. P., Jr., of Me.—Byrnes's statement is as nearly correct as can be. Our correspondent must recollect that if the facts do not square with his theory, it is not seldom that a wide difference is detected between theory and practice. For all practical purposes the indicator card will exhibit the amount of friction in the steam engine.

A. G. C., of Ill.—The present issue of our paper contains a communication on filing saws, which, we think, has some good points. We have heretofore published considerable on this subject and can do no more than to refer our correspondent to our columns. We know of no better manual on the subject, than the one referred to by you. Your ideas on manuals for mechanics are sound and sensible. Next to personal instruction and practice, a plainly written manual by a practical man, is the best means of correcting false notions and reforming bad habits, These books cannot be too plainly written. Scientific verbiage, for the use of mechanics generally, necessitates a glossary.

Sub. of Pa.—Crude petroleum is utterly unfit for an unguent, and no preparation from it has yet been made that did not contain substances and elements very injurious to the hair.

A. B., of Md.—Queen Anne's "pocket-piece" is about twenty-five feet long and carries a ball (spherical,) of only eighteen pounds. We do not know the diameter at the breech, but from the style of guns made when this was cast, and the weight of the ball, it cannot be three feet. We have many guns much larger every way except in length. This nation has the largest guns in use in the world. There can be no question on this point.

F. B., of Pa.—Undoubtedly sufficient light for reading or observing objects could be concentrated from phosphoric vegetation, insects, etc., but *cui bono?* The cost of apparatus would be more than the benefit gained. The gigantic glow worm of the torrid zone is sometimes inclosed in a glass bottle and made to do duty as a lantern, and the sugar bugs, it is said, will light up a cane field at night so that a person can read.

A most extraordinary occurrence took place along the line of the Nashville and Decatur Railroad, between Columbia and Pulaski, lately, during a thunder storm. A full mile of the telegraph wires were melted, and divided over that whole distance into small fragments, irregular in shape, and many of them no longer than a buck shot or a small rifle ball. The fragments found along the whole distance, would not, if put together consecutively, make more than thirty feet in length. The glass insulators were bursted, and the poles shivered into fragments.

The most curious work at present going forward in Paris is the leveling the hill of the Trocadero, on the right bank of the Seine, opposite the bridge of Jena. One-fourth of the work is already completed. The ground is mined, and four mines are fired simultaneously by means of an electric battery. A surface of more than two acres is raised by each explosion, and wagons are ready on a temporary railway to carry away the earth thus loosened.

The Lansingburg (N. Y.) Gas Works has recently made some interesting experiments in the manufacture of gas from peat taken from a bed in this State. The peat used was air-dried without pressing, and then thrown into the retort. The gas was pronounced to be in every way equal to that made from the best coal. It gave a clear, white, and strong light, and stood the chemical tests well.

Nearly twenty-five hundred pounds of wax are now required yearly in sealing patents for inventions in Great Britain. This relic of barbarism is about the size of a large Dutch turnip and, is suspended to the parchment by a stout silk cord, and boxed in a tin case.

The Richmond *Republic* urges, as a practical measure of reconstruction, that the people of the South bend their energies to restore the waste places of the land, to build up agriculture, manufactures and commerce, and to unite themselves by railroads with all parts of the country.

Professor Agassiz, in a recent letter, reports the discovery of 1,400 new species of fish and animals, a number far greater than he had any reason to expect.

Portable Boring Machine.

It is not many years since it was the custom, in nearly all the machine shops in the country, to put on their large wheels, pulleys, etc., with four, six, eight, and sometimes twelve keys; and it is no small job—as the writer knows from actual experience—to cut the key seats in a cog wheel eight or ten feet in diameter, stake it on the shaft true, and fit the keys. And this mode of doing work prevails to a great extent at the present time, not because this is considered the proper way to do work, but because proprietors of small shops cannot afford to put up a lathe of sufficient capacity to do this kind of work, as it would involve an outlay of from three to six thousand dollars, and then perhaps they would not have work enough to keep it going one-fourth of the time.

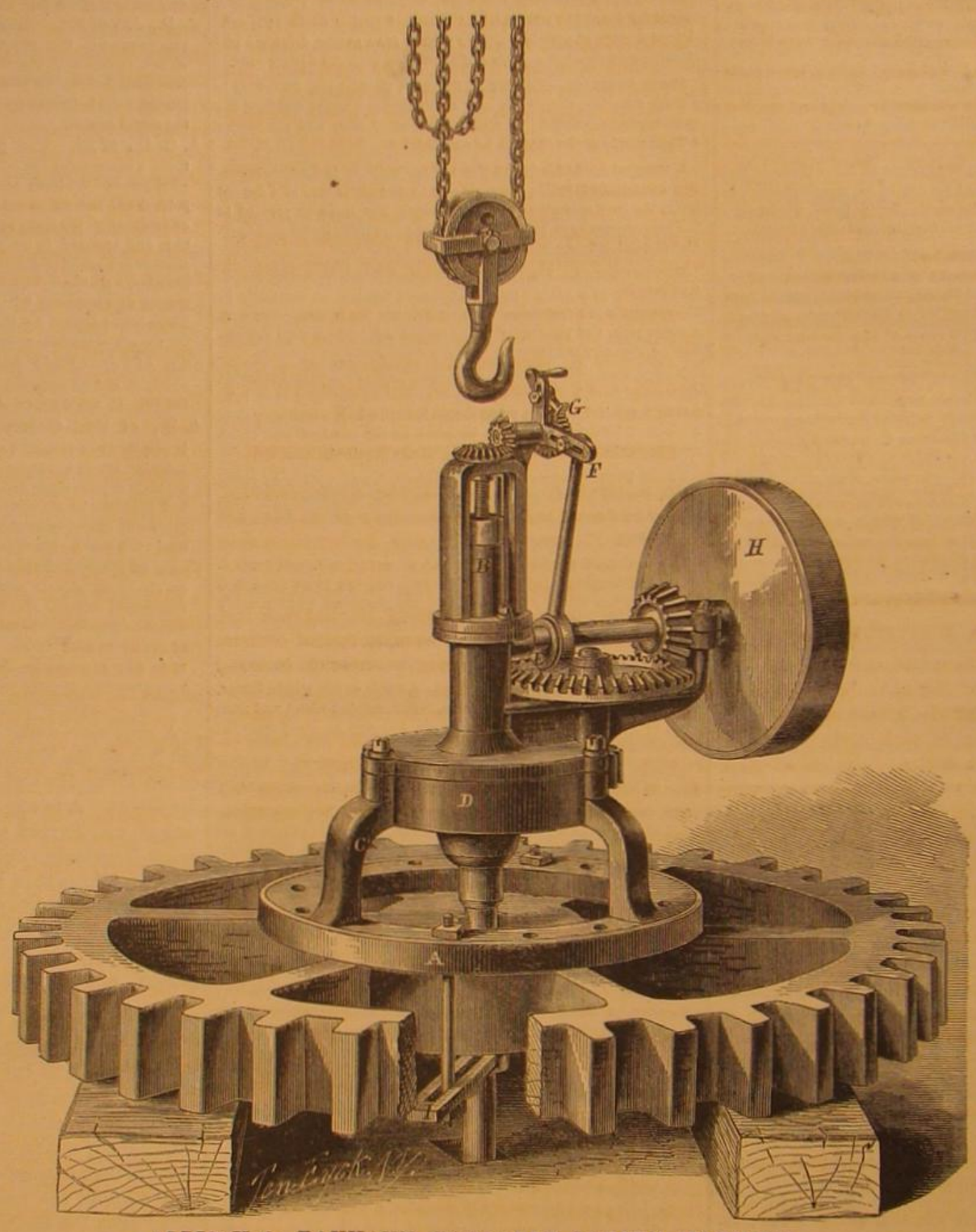
The machine here illustrated is designed to meet the wants of all, as it can be used with advantage and profit in both large and small establishments; it frequently happens, in large shops, that they make large fly wheels, spiders for cog wheels, or propellers, that would require a great deal of time and labor to move them into the machine shop and set them on a boring mill. In cases of this kind this machine can be taken to the work; and, if not convenient to power, can be run with small portable engine or man power.

One of these machines has been in use some time in a shop where they have a horizontal boring lathe, and it is used at all times in preference to the lathe, doing about double the work the lathe can do; the great advantage being in setting the machine ready for work, not requiring one-fourth the time that it takes to set the work on a horizontal lathe.

The engraving fully explains the construction and working of the machine. The base plate or ring, A, in Fig. 1, is turned—top, bottom, and edge—true with the spindle or boring bar, B B B, and has the legs, C, and box, D, cast on it to support the other parts of the machine. The feed is worked by the eccentric, E, and bell crank, F, having a slot so as to adjust the feed to the work; by throwing the small pawl, G, over, it will feed down or up. The pulley, H, is put on with set screw, so as to be changed for different size of hole. For boring deep holes the guide bar, I, is bolted on the under side of the wheel to be bored, so as to steady the bar. For boring large holes a cutter head is put on the spindle.

By using a differential pulley block to elevate the machine while changing the work, it makes a most simple, efficient, and neat arrangement for boring.

A patent is pending through the Scientific American Patent Agency. For further information or machines, address Allison & Bannan, Franklin Iron Works, Port Carbon, Pa.



ALLISON & BANNAN'S PORTABLE BORING MACHINE.

SPECIAL NOTICES.

Luther C. White, of Waterbury, Conn., has petitioned for the extension of a patent granted to him on the 7th day of Sept., 1852, for an improvement in the method of making lamp tops, rivets, etc. The petition will be heard on the 20th of August next.

Joseph Guild has made an application for the extension of his patent for an improvement in mortising machines, granted to him Nov. 30, 1852. The petition is to be heard on the 12th day of November next.

A Royal Locksmith.

A collector of artistic curiosities was recently exploring the store of a dealer in old iron, in the Rue de Meaux, at Petite Villette, France, when he remarked an elegant little lock, covered with rust, but bearing the inscription, *Lud. XVI. me fecit*, and which he purchased for three francs fifty centimes. He has since sold it for two thousand four hundred francs at a large curiosity shop in the Faubourg St. Germain, of which sum he immediately carried one thousand two hundred francs to the petty dealer in the Rue de Meaux.

Louis XVI. was, it is said, a very skillful amateur blacksmith. He was much ridiculed by the fashionable people of his time for soiling his hands with menial labor. But he did many things more foolish, and if he had attended more to his shop and his fellow craftsmen, the guillotine would not have been invented, and he would have been buried with his head still on his shoulders.

A Hint to Smokers.—M. Melsens, a French chemist, has found that tobaccocs from various countries contain nicotine in very different proportions. In tobacco from some parts of France there is 7·96 per cent of nicotine; while Havana tobacco contains only 2 per cent. He proposes to smokers a way of preserving them from the effects of the alkaloid, by putting into the tube of the pipe or cigar holder a little ball of cotton, impregnated with citric and tannic acids. As the smoke passes through the cotton, it will deposit the nicotine therein, in the shape of the tannate and citrate.

Bottled Caloric.

"Never despair," says Professor Jeannet, of Bordeaux; "your coal fields may fail, but acetate of soda will at any rate prevent your noble race from perishing during that gloomy British winter." This substance affords, in fact, says the Professor, a means of "storing up the solar heat." Its peculiarity is, that while it crystallizes when exposed, in solution, to a very slight degree of cold, it will cool without crystallizing if placed in a closed vessel. Cooling thus, it retains the greater part of the caloric which it had absorbed while being melted; and this caloric is given off the moment the bottle is uncorked or the jar uncovered. M. Jeannet has proved it. "One kilogramme of acetate, melted and then cooled down in a closed vessel to the freezing point of water, disengages, when crystallization is induced by uncorking, heat enough to melt 300 grammes of ice, or to raise 300 grammes of water from the freezing point to 79° centigr." Swift was not so very wild after all, then. Sunbeams from cucumbers would scarcely be stranger than solar heat from bottles duly placed "in a glass frame that the sun's rays may be concentrated upon them." Well may the *Union Medicale* call the path which M. Jeannet has struck out "a seemingly fantastic one." Still it clearly hopes for great results from the discovery, and seems to look forward to the time when there will be a brisk trade between England and the south of France in "bottled caloric," and when the Englishman, graduating his hospitality (as M. Kervigan tells us he does already in the matter of drinks) according to the quality of his guest, will, for an inferior, simply uncork a few bottles of the watery sunshine of his native island,—treat an equal to the strong but coarse caloric of Bengal—but if he has a lord at his table, will send down to his "heat cellar" for some of the "meilleur cru of the cote rotie"—warm but full of bouquet. *Nous verrons.* Any how, it is kind of M. Jeannet to try to console us under such a visitation as that which Mr. Jevons predicts, in the possible loss of our coal fields.—*Pall Mall Gazette.*

HUMORS OF BUSINESS.

Newspaper offices are frequently visited by very amusing letters, and though to many minds the details of our own office may appear as chiefly made up of dry facts and figures, we are, nevertheless, often relieved by the receipt of humorous correspondence. Thus, for example, we have now before us a letter from a patentee who wishes an illustration of his machine to appear in our columns. In a note to our artist he says very quaintly, "If you please, you may represent the driver with broad shoulders, bilious temperament, prominent Grecian nose, heavy moustache, short hair, full whiskers, trimmed short, broad brimmed hat turned up at the sides."

Another correspondent, with a view to secure special attention to a very modest request, with an air somewhat serio-comic, says of himself, "On weekdays I am farmer, glazier, and homeopathic physician, and on Sunday I am a preacher of the blessed Gospel." A useful man, most certainly.

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 on them will be promptly attended to.

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

☞ American and Mexican News Company, Mexico, are Agents for the SCIENTIFIC AMERICAN.

☞ Messrs. Trubner & Co., 60 Paternoster Row, London, are also Agents for the SCIENTIFIC AMERICAN.

VOL. XIV., No. 24..[NEW SERIES.]. *Twenty-first Year.*

NEW YORK, SATURDAY, JUNE 9, 1866.

Contents:

(Illustrations are indicated by an asterisk.

*Hearny's Hay-raking and Loading Device	391	Sawing Lumber	396
Healthful Effect of the Tomato	391	New Publications	396
Recent Photographic Improvements	391	Report on the Cattle Plague	396
Scientific Steel Pens	392	Storage of Gun Cotton	396
Our Special Correspondence	378	New Inventions	397
Weights and Measure	393	Notes and Queries	397
Education of Workingmen	393	*Allison & Bannan's Portable Boring Machine	398
Monitors in England	394	Special Notices	398
Salt and Soda	394	A Royal Blacksmith	398
*Hickman's Improved Washer	394	Bottled Caloric	398
How American Velvet is Made	394	Humors of Business	398
An Extensive Salt mine	394	Coal and a Substitute	399
Estimates about the Cotton Crop	394	Breech-loading Rifles for Sportsmen	399
Ancient War Implements	395	Educating other Nations	399
*Cryptography	395	Changes in Forms of Letters Patent	399
The European Naval Excursion	395	Patent Claims, 400, 401, 402,	403
		*Conner's Screw Wrench	404
		*Evans's Weather Strip	404
		*Ryerson's Churn	404

COAL AND A SUBSTITUTE.

In our last issue we referred to the subject of the anticipated exhaustion of the coal beds of Great Britain as having engaged the attention of Parliament, through the agency of such eminently practical men as John Stuart Mill and Mr. Gladstone. That there is some reason for the anxiety manifested by these gentlemen, at least so far as coal is concerned, there can be no doubt, but we do not subscribe to the opinion that, with the last ton of coal, goes the welfare of the toiling millions of England. Coal, either bituminous or anthracite, is not a condensed form of carbon. It is bulky, and in combustion leaves a large residuum of no value at all as a fuel. Already, even in this country, where the supply is apparently inexhaustible, invention is busy to provide a substitute for coal, or rather to procure a better and less bulky article of fuel. Of course the growth of our forests cannot be depended upon, as wood is more valuable for other purposes, and its bulky nature, even if it could outlast a hundred generations, would prevent it from ever superseding the fossil fuel now so generally used.

But there is another substance more generally diffused in all countries than either wood or coal, and one which is being continually formed. This is peat, which in some respects has qualities as a fuel far in advance of coal. It is now being manufactured by disintegration and compression, and put in use for stationary and locomotive engines. For many years it has been used in its crude state for domestic purposes in this country, and in Ireland it is the common fuel. The "bogs of Ireland" are immense receptacles or reservoirs of this substance—the debris of dead vegetation—and in Wales and many portions of England it abounds. It is not less common in this country, and since coal has ruled so high, attention has been turned to this substance, so plentiful and so easily obtained. It is said to give, weight for weight, a much greater heat than coal, and for foundery and smelting purposes, is superior, as being entirely free from sulphur.

The bogs, or meadows containing peat, are in many localities continually encroaching upon the firmer land. The movement of the immense masses of decayed vegetation in morasses between hills or on the slopes of mountain ranges, is analagous to that of the glacier—imperceptible but sure and certain. There are cases in England, in Scotland, and even in this country, where the bogs have pushed their boundaries, year by year, until large tracts of valuable farm lands have been overwhelmed and ruined. Here, then, are inexhaustible mines equal to those of coal, and having the advantage of being on the surface and easily wrought.

But the experiments in working petroleum as a fuel have not yet proved failures. There is but little doubt but this substance will be made to occupy an important position in the economy of domestic and manufacturing enterprise, so soon as its production in quantity sufficient will reduce its cost to a figure which will authorize its employment as a fuel.

Common pitch, from which the spirit of turpentine is distilled, has been tried in a pulverized state by a Russian naturalist, and is now being tested by the Russian Admiralty as a fuel for generating steam in the boilers of steam frigates. The result thus far, has been, report says, eminently satisfactory.

A French chemist claims to have realized the fable of bottling up sunlight by means of acetate of soda. He claims that by evaporation, after being confined, this substance will give out a strong heat. If he is successful our English friends of this generation may be able to carry in their pockets portable stoves for warming the outer man as many now carry stomach warmers.

Seriously, however, we cannot suppose that a diminution of the fuel now used can occur to such an extent as to threaten the prosperity of a great manufacturing nation without bringing with it a discovery which shall at least make good the loss.

BREECH-LOADING RIFLES FOR SPORTSMEN.

By reference to our Washington correspondence, it will be seen that at least one man is ready to bet that, with his breech-loading rifle, he can surpass in accuracy any muzzle-loader that can be produced—proving pretty conclusively that in the one thing needful—accuracy—breech-loading rifles have at last reached a point of excellence equal to that of muzzle-loaders. As they are greatly superior to muzzle-loading guns in convenience, ease, and rapidity of loading, and as they obviate the necessity of carrying into the woods a variety of apparatus—ramrod, powder horn, charger, percussion caps, and in the case of false-muzzle guns, mallet and driver—they will now, no doubt, be generally adopted for sporting purposes.

A very general defect in breech-loading rifles, made up to the present time, has been a want of sufficient weight in the barrel. For army purposes it is manifestly extremely desirable to have the arms of infantry soldiers made just as light as possible, the man being required to carry on foot a load of other things; but for any considerable range this lightness can be obtained only at the expense of accuracy. There is no use in offering to sportsmen a gun, however excellent in all other qualities, that is not absolutely perfect in accuracy. If there is anything which he regards with intolerable abhorrence it is a rifle that will not carry the bullet where it is pointed.

A very light rifle is peculiarly objectionable for those long ranges which are now in universal vogue. For those ranges it is necessary to have heavy elongated bullets and large charges of powder, producing a recoil which throws a light rifle out of position, and utterly destroys all accuracy of fire. The extent of the range is also diminished by lightness of the barrel. It was formerly supposed that one-half of the force of the charge was expended on the shot and the other half upon the gun, but Professor Treadwell has demonstrated that the portion of the force expended on each is in proportion to the distance which each is moved while the force is acting upon it—that is, during the passage of the shot along the barrel. This proposition was overlooked by a writer so well informed as Professor Silliman, and so recently as 1858. In his "First Principles of Philosophy," page 22, he says, "By the principle that action and reaction are equal (27), we know that when a musket is discharged the force of the explosion reacts upon the musket with the same intensity as it projects the ball. According to the principles of momentum, the weight of the gun, multiplied by the velocity of the recoil, must be equal to the weight of the ball, multiplied by the velocity of its projection, yet the recoil of the gun is received by the sportsman with perfect impunity, while the moving ball deals death or destruction to opposing objects."

Professor Treadwell's proposition results from the first principles of mechanics. Work is measured by the amount of the force and the distance through which it acts, regardless of time. It is somewhat surprising, therefore, that the proposition has been so generally overlooked.

The fatal want of accuracy, and the diminished range of very light guns, may be well worthy of consideration by our ordnance officers in determining the weight of our army rifles.

EDUCATING OTHER NATIONS.

Quite enough has been done, we think, in the improvement of other nations by our example alone, in originating, experimenting, and carrying to completion radical and valuable improvements in every department of mechanics, without carrying our schools to their doors and furnishing them with instructors gratuitously. Of course it cannot be expected that any national improvement, the operation of which must be open to the inspection of foreigners as well as our own people, can be kept a secret, but it is not necessary for the government to spend hundreds of thousands for the purpose of combating foreign prejudice and compelling a recognition of our superiority, when, if successful, the result will be merely to enable other nations to equal us, and thus relatively reduce our position.

The proposition of sending the *Miantonomoh* to Europe, in charge of Assistant Secretary Fox, ostensibly on a visit of ceremony to the Czar Alexander, but really to exhibit our progress in naval affairs to Europe, we do not really approve. It is unnecessary for us to go cruising about the world with a traveling show, in order to gain the respect of other nations. The game is not worth the powder. We know that we are the peer of any nation that boasts a navy, and if we desire to prove it we have only to refer to the achievements of our monitors during the past four years.

The resolutions of respect, sympathy, and congratulation, of which Mr. Fox will be the bearer, could as well be forwarded through our Minister at St. Petersburg, as sent in one of our largest monitors at an expense of at least one hundred thousand dollars.

Changes in Forms of Letters Patent.

We understand that Commissioner Theaker proposes some changes in the forms of patents issued to inventors. It is intended to reduce the size of the instrument from fifteen by twenty inches to ten by fifteen inches, thus rendering it of a more convenient size for mailing. The present large vignette of the Patent Office will be replaced by a much smaller view of the Patent Office, surrounded by small medallion engravings, representing the advancement made in machinery in the present century—all to be engraved in the highest style of the art, and printed on parchment paper. The seal of the Patent Office, instead of the words, "Seal of the Patent Office," will hereafter contain "United States Patent Office," and the sentence below it, "Countersigned and sealed with the seal of the Patent Office," will be omitted.

The specification for the patentee and the bound record in the Office will be printed instead of written as now. Another important improvement is in the manner of inserting the drawing, which is required to be ten by fifteen inches in dimensions. In the present form of patent the drawing cannot be newly inserted, but in the form proposed it can be adjusted with newness and precision. These changes can be made, the Commissioner thinks, without additional expense to the Government, and will render the patent a credit to the Office and to this Government, when sent abroad.

STEAM omnibuses are to be established in Paris to run from the Champ de Mars, the spot where the great exhibition is to be held, to the Place Bastile—making six halts. The distance is now traversed by horse omnibuses in one hour and twenty minutes. The steam company undertake to accomplish it in forty-five minutes including stoppages.

The Evening Post of the 25th ult., informs us that a Western gentleman has discovered the lost art of hardening copper. Will some one kindly inform us who lost it, how valuable it was, and if the finder got any reward?

Patent Claims

ISSUED FROM THE U. S. PATENT OFFICE
FOR THE WEEK ENDING MAY 29, 1866.
Reported Officially for the Scientific American

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

55,034.—Self-labricating Knitting Machine Burr.—Charles Allardice, Cohoes, N. Y. Antedated March 29, 1866:

I claim the shaft B, having its closed cup, b, in combination with the spindle, D, and its spiral grooves, a a, and the reservoir C, substantially as described, and for the purposes set forth in the above specification.

55,035.—Horse Hay Fork.—F. H. Arnold, Troy, Pa.:

A horse hay fork frame by combining the bars, A and C, the lever, D, and the prongs or hooks, E and F, the parts being constructed and arranged substantially as described, and for the purpose set forth.

55,036.—Machine for Cutting Cork.—Andrew J. Bailey, Charlestown, Mass.:

First, I claim the rotating knife, D, having its face in the form of an arc of a cylinder, and its edge parallel with its planes of rotation, when arranged in segments of a circle and operating in combination with the rotating mandrel, S, substantially as herein shown and described.

Second, The centering feeder constructed with elastic or self-adjusting grippers, for the reception of blanks of varying size, applied and operating in relation to the rotating mandles and opposite center, substantially as herein specified.

Third, The compound carriage, K M, having attached to it the mandrel which carries and produces the rotation of the cork in its rotation, and made adjustable relatively to the cutter wheel to vary the size and form of the cork, substantially as herein specified.

55,037.—Water Cooler and Purifier.—J. M. Baird, Wheeling, West Va.:

I claim a water cooler and purifier, formed by combining the tank, D, constructed and arranged as herein described, with the induction and discharging pipes, c and e, substantially as and for the purpose set forth.

55,038.—Method of Collecting and Separating Carbonic Acid from Mixtures of Gases.—James S. Baldwin, New York City:

I claim separating, purifying, and transferring carbonic acid gas from waste gases, by means of water, or its equivalent liquid, substantially in the manner, for the purpose herein set forth.

I also claim driving the pumps, or other machinery, by the waste gases evolved in this process, substantially as described.

55,039.—Method of Preserving and Storing Carbonic Acid Gas.—James S. Baldwin, New York City:

I claim the combination of vessel, A, with vessel, c, or the equivalent thereof, arranged and prepared substantially in the manner and for the purposes herein set forth.

55,040.—Method of Charging Water with Carbonic Acid.—James S. Baldwin, New York City:

I claim charging water, or other equivalent liquid, with carbonic acid, by inclosing solid liquid with solid carbonic acid, in the same vessel, or series of vessels, substantially in the manner and for the purpose herein set forth.

55,041.—Shoe.—Achilles Ballard, Dublin, Ind.:

I claim a shoe, the vamp, A, and quarter, B, of which are shaped and united substantially as set forth.

55,042.—Machine for Bending Horse Shoes.—Hazen J. Batchelder, Boston, Mass.:

I claim the benders, H H, made and arranged in combination with the spring, f, in manner and so as to operate with the former, A, substantially as described.

I also claim the combination and arrangement of the jaws, i k, with the former, A, combined, and to operate with the spring bending levers, H H, substantially in manner as described.

I also claim the combination as well as arrangement of the dischargers, h h, with the former, A, and the bending levers, H H.

55,043.—Pruning Shears.—Adam Baumann, Philadelphia, Pa.:

I claim the rod, D, and its special spring, h, combined with and adapted to the hooked portion and knife of pruning shears, substantially as and for the purpose herein set forth.

55,044.—Stereoscope.—Alexander Beckers, New York City:

First, I claim a concave mirror or reflector, combined with the stereoscopic box and movable reflectors, b and c, substantially as and for the purposes set forth.

Second, I claim the sheet metal clasp, i, attached to the wire frame of the picture holder, as and for the purpose set forth.

55,045.—Horseshoe.—Jacob Behel and John M. Buell, Rockford, Ill.:

First, We claim the curved clamp, F P, in combination with a shoe having recesses, E, and openings, A, with projections, B, and the nut, y, for securing and tightening the shoe, the parts being constructed and arranged for use, substantially in the manner and for the purpose set forth.

55,046.—Means for Operating the Doffer Comb of Carding Engines.—Anthony A. Bennett, Newark, Conn.:

I claim the arrangement with the comb shaft, B, and its oscillating slot ed arm, A, of the crank pulley, G, constructed as described, and its adjustable pin, D, in the manner and for the purpose set orth.

55,047.—Lock.—Wilson Bohannan, New York City:

First, I claim the arrangement of the catch or hook of the keeper, C, below the plate, a, and in rear of the base of the socket into which it enters in combination with the arrangement of the bolt, c, of the lock, substantially as and for the purpose described.

Second The construction of the hooked keeper, C, with a beveled nose, in combination with the beveled nose of the self-locking bolt, c, substantially in the manner and for the purpose described.

55,048.—Lock.—Wilson Bohannan, New York City, and Frank G. Johnson, Brooklyn, N. Y.:

First, We claim inclosing the grooved tumblers, g g, together with their springs, h h, within cells which are formed in the movable case, C, constructed substantially as described.

Second, The construction of the coiled case, C, with a hooked bolt, c, a groove for receiving the guard plate, D, and a notch for receiving the nose of the hasp, B, substantially as described.

Third, The movable cap, "g", in combination with the nose, c, constructed for receiving the tumblers, g g, substantially as described.

Fourth, The combination of the guard plate, D, and movable tumbler case, C', all constructed and arranged substantially as described.

Fifth, The combination of the notched cylindric case, C', 2, with the hasp, B, 1, the said parts being constructed and operating substantially as described and for the purpose set forth.

Sixth, The means substantially as herein described and shown for throwing the hasp open when it is unlocked, in combination with the tumbler, case, C, constructed and arranged substantially as described.

Seventh, The combination of the friction spring, S, with the movable tumbler case, C, for preventing this case from moving too freely when the hasp is unlocked, substantially as described.

Eighth, The construction of the tumblers with depressions in them for receiving and keeping in place, the springs, h h, substantially as described.

55,049.—Washing Machine.—J. E. Briggs, West Randolph, Vt.:

I claim the combination with the grooved board, B, of the perforated irregular pressing block, C, joint, G, and handle, D, when the parts are constructed and applied to a tub, A, in the manner and for the purpose specified.

55,050.—Snap Hook.—Charles B. Bristol, New Haven, Conn.:

I claim as a new article of manufacture, the hook and loop part, A and B, cast on a plane in combination with the tongue, c, and spring, g, when the parts are constructed, attached, and fitted for use, substantially as herein described.

55,051.—Portable Fence.—Albert Brooker, Atlissa, Iowa:

I claim a fence having posts, A B and D, with brace, C, and cross slats and rails as represented, all constructed combined and arranged substantially as herein specified.

55,052.—Reversible Lock or Latch.—Asa T. Brooks, New Britain, Conn.:

First, I claim a latch hub made in two or more parts, acting conjointly with each other, substantially as and for the purpose described.

Second, I claim the arrangement of the several parts in the manner substantially as described, by virtue of which the spring is made to act in the double capacity of actuating and holding the latch and slide respectively in place.

Third, I claim the combination of the latch bolts, b, spring, c, with or without the plate, d, slide, i, and two or more part hubs, substantially as and for the purpose described.

55,053.—Apparatus for Lowering Ships' Boat.—Samuel Brown and Leon Level, San Francisco, Cal.:

We claim a breaking block for running out even lengths of two or more ropes having an extra set of sheaves, c, which are capable of being moved to and from the real sheaves, a, by a breaking lever, F, the different sets, a c, of sheaves being secured rigidly to their pins, b d, substantially in the manner and for the purpose set forth.

55,054.—Lamp Chimney.—V. W. Brown, Camden, N. J., and D. Frankish, Philadelphia, Pa.:

We claim the chimney, A, having a portion at X, flattened or depressed, as and for the purpose described.

55,055.—Method of Blasting.—Nirum Cadwallader Birchville, Cal.:

I claim the use of compressed air in combination with all explosive substances, for the purpose of increasing the explosive force of said substance by the aid of a greater amount of oxygen, and assisting by the force of pressure, as well as by the expansion of the air from the heat generated by the explosion, said compressed air to be confined in a chamber with the explosive material, or when in a chamber or recess contiguous to it, to be let free at the time the explosion takes place, substantially as described and for the purpose set forth.

55,056.—Machine for Punching Paper for Telegraphs.—Edward A. Calahan, Brooklyn, N. Y.:

I claim a type wheel revolved by friction in combination with revolving stops and keys, and an apparatus, substantially as specified, for punching fillets of paper for composing telegraphic messages, as set forth.

Second, I claim the stoppage bar, 39, escapement, 33, and ratchet wheel, in combination with the shafts, B' and g''', as and for the purposes specified,

55,057.—Sash Supporter.—E. A. Campbell, William's Bridge, N. Y.:

I claim the lever sash supporters, f and i, formed with their ends wide in the manner shown, so as to be fitted upon fulcrum screws in recesses in the casing beneath the molding, as and for the purposes set forth.

55,058.—Farm Gate.—Jarvis Case, Springfield, Ohio:

First, I claim so constructing and arranging the rests or supports, r r, with shoulders, c c, in combination with the notches, n n, and post, A, that the gate may be readily placed on said rests or supports in its proper position in relation to the post, and moved forward to close the gate or swung round to fully open it, or if so desired, may be taken off the rests or supports and removed from the posts, substantially as described.

Second, I claim so constructing and arranging the rests or supports, r r, and adjustable piece, D, with the gate and posts, that when closed the gate is firmly held in place, or may be partially opened and still retained in its proper position, resting a portion of its weight on each post, substantially as set forth.

55,059.—Harvester Rake.—William J. and Rhutson Case, Pittstown, N. J.:

First, I claim the combination of a vibrating sweep rake, with a crane post rigidly secured to and turning upon the main frame by means of a system of levers forming a parallel rule joint, substantially in the manner described, for the purpose of enabling the rake to conform to the undulations of a hinged platform without the use of a connection between the rake and platform, as set forth.

Second, The combination with the rake, of the bevel gear, F, cam, f, tappet, o, rock shaft, G, and arm, P, as described, for the purpose of raising and lowering the rake.

Third, The combination of the rake and crane post by means of inclined arms, arranged and operating substantially as described, to enable the rake to strike close to the finger beam.

Fourth, The combination of the clutch lever, e, with the locking arm, e^2, when arranged and operating as described, for the purpose of simultaneously uncoupling the rake and locking its driving wheel.

Fifth, The guide, R, to support the rake after discharging the gavel.

Sixth, The arrangement between the cranks, g i, of the adjustable pitman, H, as described, for the purpose of varying the stroke of the rake, as set forth.

Seventh, The combination of the levers, K M, with the rake arms by the socket joints, l', as set forth.

Eighth, The combination of the rake head with a system of levers, substantially as described, for the purpose of locking the rake in a vertical position over the frame for transportation, as set forth.

Ninth, The combination, substantially in the manner described, of the hinged platform with the self-locking automatic rake so located upon the main frame as to enable the finger beam to be folded up for transportation.

55,060.—Harvester Rake.—P. Charles Chipron, Highland, Ill.:

I claim the combination of the teeth, e, curved wire teeth, f, and the rake head, E, arranged and operating in the manner and for the purpose herein specified.

55,061.—Fruit Basket.—W. Clement, Charleston, Ill.:

I claim a fruit box, constructed substantially as herein described

55,062.—Self-tilting Bucket for Wells.—Aaron J. Cook, North Branford, Conn.:

I claim the combination and arrangement of the shaft, C, drums, D and E, and the bucket, G, suspended on cords or chains of an equal length, the whole being constructed and arranged, substantially as herein described and set forth.

55,063.—Flour Packer.—Isaac Cook, St. Louis, Mo.:

I claim the use and combination of the packing tube, C, the connecting funnel, B, and the feed spout, A, with such flour packers as use a packing device which in packing rises out of the tube, C, and when otherwise arranged as set forth.

55,064.—Fastening for Garments.—William P. Cook, New York City:

I claim a fastening for garments and other articles, constructed and operating substantially as herein described.

55,065.—Open Coal Grate.—Clay Crawford, East Cleveland, Ohio:

First, I claim the magazine, B, in combination with an ordinary open fire place, substantially as and for the purpose set forth.

Second, In combination with the magazine, arranged in the open fire place as described, I claim the grate, D, having the bars inclined to throw the coal to the front, as shown and described.

Third, The air chamber, H, or its equivalent, arranged to operate in combination with the magazine, B, as set forth.

Fourth, The tube, E, arranged to operate in connection with the magazine, B, substantially as set forth.

55,066.—Screw Wrench.—John L. Christ, Harrisburg, Pa.:

First I claim the combination of A A', and B B', operating substantially in the manner described.

Second, The slotted rotating ferrule, D, serving also as a lock for the sliding jaw, A, and operating in the manner shown and described.

55,067.—Car Brake.—John Davis, Alleghany City, Pa.:

First, I claim applying brakes to wheels of railroad cars, so that said brakes become operative by the action and inaction of the locomotive and cars always operating with relation to the wheels, so that they will adjust themselves, and bring the proper force to bear on the wheels, when the locomotive becomes inoperative from any cause, or when any undue or improper action is imparted to the cars, said brakes being constructed and arranged substantially as herein described and set forth.

Second, So arranging the cranks, O and O', on the spring shaft, l, that it will require less power to hold the brakes off the wheels, than is required to draw them off, as herein described and set forth.

Third, The combination of the pawl, m, and ratchet wheel, n, with the shaft, l l', cranks O and O', and coil spring combined, arranged and operating substantially as herein described and for the purpose set forth.

Fourth, The combination and arrangement of the coil spring, l l, cranks, O O', rods, i k' k' levers 18 and 16, and shaft, x, with the rods, l l', and h h' brake bars, e, and brake, d, the whole being constructed, combined, arranged and operating, substantially as herein described and for the purpose set forth.

55,068.—Washing Machine.—George M. Denison, New London, Conn.:

I claim the elastic knobs, F, in combination with elastic ribs, G, on the surfaces of the rubber and bed, respectively, of a washing machine, substantially as herein set forth and for the purpose specified.

55,069.—Plow.—Liberty B. Dennett, Portland, Me.:

I claim the standard, C, supported by the wing or brace, F, extending from the standards to the rear of the mold board, the standard, C, being so placed as to offer no resistance to the stubble or grass as it falls over the mold board into the central cavity of the plow.

55,070.—Rock Drill.—Julius C. Dickey, New York City:

I claim the combination of the drill bits, A B and C, substantially as set forth.

55,071.—Apparatus for Distilling.—Silas R. Divine and Charles A. Seely, New York City:

We claim the apparatus and its modification, substantially as herein described.

We also claim the combination of the shell, A, with the pipe, B, and the gutter, C, substantially as described.

55,072.—Rain Water Cut-off.—L. W. Doty, Aurora, Ill.:

I claim the gate, E, and spring, d, in combination with the partition, D, arranged relatively with the induction pipe, B, and eduction pipes, C C'.

55,073.—Conposition for Lining Barrels.—Alpheus C. Dunn, New York City:

I claim a composition substantially as herein described of gum copal, boiled linseed oil, and an aqueous solution of soda or potash, either with or without glue.

55,074.—Construction of Finger Bar for Harvesters.—Rufus Dutton, New York City:

I claim forming the finger bars of harvesting machines from a metallic piece rolled or formed by suitable machinery, of sufficient width for two finger bars, and having the edges turned or rolled up, as described when such metallic piece or plate is made thinnest at its edge and increasing in thickness toward the center, substantially as and for the purpose set forth,

Second, Making in the center of such metallic plate a recess or thinner portion, for the purpose of facilitating the dividing or cutting such plate, substantially as set forth.

Third, Making the finger bar of harvesting machines wedge-shape, or increasing in thickness from the front toward the back side, and rolling or turning up its thinnest edge, substantially as and for the purpose set forth.

Fourth, The combination of the finger or finger bar, substantially as described, so that or by which the finger is braced and supported by the bar at the backjend of the under side of the slot of the finger, substantially as and for the purposes set forth.

55,075.—Lamp.—Michael B. Dyott, Philadelphia, Pa.:

I claim the air deflecting drip cup, E, constructed and arranged so as to operate in combination with the bowl, C D, and the shell A B, of a lamp, substantially as and for the purpose described.

I also claim the combination of the screen, F, with the said drip, E, and the opposite sides of the shell, A B, substantially as and for the purposes described.

55,076.—Beer Pitcher.—Winslow P. Eayrs, Nashua, N. H.:

I claim the arrangement of the divisional plate, B, perforated plate, C C' C'' D D' D'', as described, mouth, b b, in combination with the pitcher, A, constructed and operating in the manner and for the purpose herein specified.

55,077.—Roller for Wringer Machines.—S. M. Emerson, Seville, Ohio:

First, I claim the hollow slotted cylinder, A, constructed as herein described in combination with the wedges, D, and with the rubber, C, substantially as and for the purpose set forth.

Second, The combination of the central band, E, with the cylinder, A, wedges, D, and rubber, C, substantially as described and for the purpose set forth.

Third, The combination of the washers or ferrules, F, constructed as described with the cylinder, A, substantially as and for the purpose set forth.

55,078.—Numbering Stamps.—David Emonnot, New York City:

I claim the type-carrying wheels No. 6, the ratchet wheels, 7 and 9, the pawls, 10, 11, 11', and spring catch or trigger, 13, in combination with the guides, 17 and 19, and the spring mounted shaft, 15, operating together in the manner substantially as and for the purpose set forth.

55,079.—Furnace.—William Ennis, New York City:

First, I claim, in a furnace having a downward draft, the introduction of the steam above the grate in such a manner that it may pass downward through the burning fuel and through the grate, substantially as and for the purpose herein set forth.

Second, The tubular steam generating grate and the elevated steam chamber in combination with a chimney below the grate, substantially as and for the purpose herein set forth.

55,080.—Steering and Turning Apparatus for Vessels.—Caleb G. Forshey, Washington County, Texas:

First, I claim the application of a rotary steering apparatus to a portable frame, C, which is so constructed that it can be readily applied to or removed from the side of a vessel at pleasure, substantially as described.

Second, The construction of the supporting frame, C, so that it shall be self-holding when applied to the side of a vessel, substantially as described.

55,081.—Steam Trap.—William Fuzzard, Chelsea, Mass.:

I claim the buoyant stopper, C, in combination with the exhaust chamber, A, and a suitable seat, B, in said chamber, substantially as and for the purpose described.

55,082.—Turbinate Force Pump.—J. H. A. Gericke, New Orleans, La.:

First, I claim a turbinate wheel inclosed as shown, with three systems of vanes or paddles, D E F, substantially as described.

Second, The fixed case, H, over the tubinate wheel or engine which drives the water upward, fitted with three different systems of curved vanes to direct the water toward the center of the said case, substantially as described.

Third, Separating the column of water in the case, H, and above it from the turbinate wheel above described by means of a fixed plate, M, substantially as described.

55,083.—Hay Loader.—Charles Gibbs, Pittsfield, Vt.:

First, I claim the loader, P, constructed substantially as described, in combination with the hay frame of a wagon or cart for the purpose set forth.

Second, The combination and arrangement of the pulleys, S' W and U, the arms, O S and T, and the rope, R, with each other and with the hay frame, substantially as described and for the purpose set forth.

Third, The combination of the pulley, U, ratchet wheel, X, stop, B', spring pin, G', and pawl, A', with each other and with the whole of the wheel of the wagon or cart, substantially as described and for the purpose set forth.

Fourth, The combination of the levers, D' and F', the bar, E, pin, G', and spring, I, with each other and with the pawl, A, and hay frame, substantially as described and for the purpose set forth.

55,084.—Harvester Cutter.—Sewell Gillam, New York City:

I claim the arrangement of the pitman, a, and crank, d, pitman, b, and crank, c, in combination with the sickles, A and B, operating in the manner and for the purpose herein specified.

55,085.—Refrigerator.—John C. Gove, Cleveland, Ohio:

First, I claim the frame, D, with slats, G, slides, E and F, with spring, d, constructed, arranged, and used as and for the purpose herein set forth.

Second, The box, A, ice box, B C, with shutter frame, D, constructed in the manner, substantially as and for the purposes herein specified.

55,086.—Socket Joint for Oil Tools.—Robert Gracey, Pittsburgh, Pa.:

I claim the use of the swivel-head, d, key, g, and key seats, o and h, when used in combination with the male and female parts of the joint and the sleeve or band, c, the whole being constructed, arranged, and operating, substantially as herein described and for the purpose set forth.

55,087.—Cement Roofing.—William Green, Cleveland, Ohio:

I claim the herein described cement roofing made substantially as set forth, for the purpose specified, being a new article of manufacture.

55,088.—Buckle.—Adam Hagny, Keokuk, Iowa:

I claim an improved trace buckle formed by combining the two tongues, G and I, constructed and arranged as herein described, with each other and with the frame of the buckle, substantially as and for the purpose set forth.

55,089.—Toy Spring Gun.—Albert Hall, New York City:

The coiled wire, b, cord, plate, r, and spring, m', arranged and operating in relation with the barrel, B, and case, C', as herein shown and described.

55,090.—Sheep Rack.—Lester Hall, Richfield, Ohio:

I claim the arrangement of the grain trough, C, tubes or pipes, D, manger, E, and trough, L, with the adjustable rack, F, door, G, and frame, constructed as and for the purpose described.

55,091.—Portable Field Fence.—Manley Hall, Richfield, Ohio:

I claim the arrangement of the panels, or sections, A B C, and posts, D, so connected to said sections as to lock them together, in combination with the cross pieces, G, and stakes, d, in the manner and for the purpose set forth.

55,092.—Rotary Steam Engine.—Samuel G. Hall and Geo. W. Bugbee, Norwich, Conn. Antedated May 21, 1866:

First, We claim the valves, e, in the body of the piston wheel, B, in combination with the slides, D, substantially as and for the purpose specified.

Second, The friction rollers, h, and intervening blocks, i, in combination with heads, f, of the piston wheel and with annular grooves, g h, the cylinder head constructed and operating substantially as and for the purpose set forth.

Third, The annular grooves, g', in the heads, f, of the piston wheel, in combination with corresponding projections, l, rising from the quadrants composing said piston wheel, substantially as and for the purpose described.

Fourth, The thin layer of Babbitt's metal, or other suitable material, fitting steam-tight into the end of the cylinder, in combination with one of the cylinder heads, with adjusting screws, m m', substantially as and for the purpose specified.

Fifth, The pipes, p p', with branches, g g* q' q'*, in combination with the openings, t t t* t'*, in the valve, G, and with the valve chamber, F, and steam and exhaust pipes, r s, substantially as and for the purpose set forth.

55,093.—Wheel Cultivator and Gang Plow.—William Hammond, Marshall, Mich.:

I claim the employment, independently, or in connection with each other, of the bent axle, bearing levers, L, in combination with the fulcrum pins, F, and adjustable stop-gage plates, G, connected and arranged relatively to, and with the frame and wheels of a cultivator, or gang plow, substantially as and for the purpose herein specified.

55,094.—Car Ventilator.—George Hardy, Lawrence, Mass.:

I claim the vibratory ventor, E, constructed as described, and its combination and arrangement with a passage, c, leading into a car or structure to be ventilated, and with the guard, A, made and arranged with respect to the said ventor and passage, as hereinbefore explained.

55,095.—Shutter Fastening.—John Harrar, Philadelphia, Pa.:

I claim the combination of the coupling shanks, B and C, and their respective parts, the pin, p, throat, t, and holes, n n, with the shanks, A A, and their respective parts, the slits, S' S, rest holes, r r, and the arrangement of the spindle and its parts, D e i g h i m and K, to operate together, substantially in the manner and for the purpose herein set forth.

55,096.—Mode of Attaching Handles to Tools.—George W. Harris and Andreas Franz, New York City:

We claim the combination of the counter-sunk shoulders, B, the wedges or keys, figs 2 2' and 2', and the clamp or ring, R, as and for the purpose herein set forth.

55,097.—Blocks for Polishing and Glossing Watch Hands.—George Hastings, Waltham, Mass.:

I claim as my invention, the carrier, constructed substantially as described, and also the employment of such carrier, or its equivalent, in manner, and for the purpose, as herein explained.

55,098.—Machine for Raking and Loading Hay.—A. W. Heany, Doylestown, Pa.

I claim the arrangement of the frame, C, shafts, R F O, heads, H, teeth, I, rearwardly inclined, rotating straps, S, and teeth, T, all located at the front of a wagon, and operating in the manner and for the purposes set forth.

I also claim the heads, H, rod, J, and arms, K K, connected by a rod, L, in connection with the driver's seat, M, all arranged to operate in the manner substantially as and for the purpose set forth.

55,099.—Sawing Machine.—Luman F. Heath, Lansing, Mich.:

First, I claim the spring, q, constructed and operating in the manner and for the purpose herein set forth.

Second, The combination of the spring, q, the platform, p, the rods, t, and cross bar, M, for operating a saw in the manner herein described.

55,100.—Screw Wrench.—John Hegarty, Jersey City, N. J..

I claim the arrangement of the cross piece, A, fixed jaw, C, sliding jaw, D, and screw, E in relation with each other, and with the shank, B, substantially as herein specified.

55,101.—Stove Pipe Damper.—Milan Hicks, Richmond, Ill.:

I claim the band I, concave plates, A A', perforated plates, B B' and C, constructed and arranged substantially in the manner and for the purposes herein set forth.

55,102.—Lifting Jack.—Aaron Higley, South Bend, Ind.:

I claim the link, D', pivoted to the standard, A', and lever, B, hinged to said standard by the straps, E, and plates, C, and to the base, A, by the shaft, a, and staples, a', in combination with the rack, C, and bands, C', arranged as and for the purpose set forth.

55,103.—Knitting Machine.—Jonas Hinkley, Norwalk, Ohio:

First, I claim an eye pointed needle, (for carrying a thread or yarn), a work supporting comb, (on which which the work or fabric is set up or supported) and a looper or looping mechanism (by means of which the stitch or loop is taken from the needle and conveyed to or deposited on the comb), or the irequivalents, combined to operate for the production of knit fabrics, substantially in the manner set forth and specified.

Second, I also claim an organism or combination consisting of an eye-pointed needle, a work-supporting comb, and a looping mechanism, substantially and as described, and a traversing mechanism by which traversing movements of the said comb may be produced, essentially in the manner and for the purposes set forth and specified.

Third, I also claim an organism or combination consisting of an eye-pointed needle, and a work-supporting comb, and a looping mechanism substantially such as described, and a tension mechanism, by means of which a proper friction or tension is exerted on the yarn or thread while in the act of being knit, as and for the purposes set forth.

Fourth, I also claim an organism or combination consisting of a work-supporting comb and traversing mechanism, substantially such as described, and a slipping mechanism, by which the movements of the said comb may be reversed in the manner and for the purposes shown.

Fifth, I also claim an organism or combination consisting of a work-supporting comb, and its traversing mechanism, substantially such as described, and a detent mechanism, which operates to detain or hold the comb while the loop or stitch is being formed, in the manner and for the purpose sset forth.

Sixth, I also claim an organism or combination consisting of an eye-pointed needle, a work-supporting comb, and a looping mechanism, substantially such as described, and a cast-off mechanism, by which the loop is pushed from the tooth, in manner and for the purposes set forth.

Seventh, I also claim an organism or combination consisting of an eye-pointed needle for carrying the yarn being used, a work-supporting comb, on which the work is set up or supported, a looping mechanism, by which a loop or loops are taken from the needle and conveyed to or deposited on the comb, a traversing mechanism, by which traversing movements of the comb are produced, a shipping mechanism by which the traversing movements of the comb are reversed, a detent mechanism, by means of which the comb is held while the loop is formed, and a cast-off mechanism, by which the loop is pushed from the tooth of a comb, and a tension mechanism by which tension is applied to the yarn, the said instrumentalities, parts, or mechanisms being substantially as hereinbefore described, and combined and used for the production of knit fabrics, essentially in the manner set forth and specified.

Eighth, I also claim the combination of a work-supporting comb, substantially such as described, and a device by which the shipping mechanism may be automatically operated, essentially in the manner and for the purposes set forth.

Ninth, I also claim the combination of a work-supporting comb, substantially such as described, and an index mechanism or means, as explained (or its equivalent) for indicating at what point the movement of the comb will be reversed, substantially in the manner and for the purposes specified.

Tenth, I claim the arrangement or application of the rod, a2, with the comb teeth, in such a manner as to traverse therewith, substantially in the manner and for the purposes specified.

Eleventh, I claim a work-supporting comb, constructed with a rod, a2, and a rack and teeth, substantially as set forth and described.

Twelfth, I claim the combination of a work-supporting comb, substantially such as described, and a slotted or grooved end or piece of metal, S', or its equivalent, so arranged or disposed in relation to the comb, that the teeth of the comb may pass through the groove or slot, whereby the loops, especially in the vicinity of the needle, will be more securely kept upon the said teeth, substantially as and for the purposes set forth.

Thirteenth, I claim the bracket, t2, for supporting or holding the parts disposed in or upon the same, as constructed and arranged, substantially as described.

Fourteenth, I also claim a combination composed of an eye-pointed needle, or a work-supporting comb, substantially such as described, and a guard mechanism, by which the discharged loop is prevented from being carried too far from the comb, by the advancing needle, as described.

Fifteenth, I also claim a combination consisting of a work-supporting comb, an eye-pointed needle, and a looper, substantially as described, and the projecting piece, 6', or its equivalent, so arranged as to prevent the needle from being sprung upward by the action of the looper, substantially as described.

Sixteenth, I also claim a combination consisting of an eye-pointed needle, a work-supporting comb, a looper substantially such as described, and a spring finger, S2, for assisting in the conveyance of the loops from the needle to the tooth, as specified.

Seventeenth, I also claim the finger, S2, so constructed and arranged as not only to assist in conveying the loop as stated, but also to act as a part of the guard mechanism, substantially as and for the purpose set forth.

Eighteenth, I claim a guard mechanism, one part of which is a spring so arranged that it will yield to admit of the use of a large or small needle, as circumstances may require, substantially as shown.

Nineteenth, I claim the combination of the cast off, G, directly with the needle carrier, so as to be operated by it in the manner set forth and described.

Twentieth, I claim the combination of the tension spring, E, directly with the needle carrier, so as to operate with and be operated by it, substantially in the manner shown.

Twenty-first, I claim the combination of the arm or detent, H directly with the needle carrier, so as to be operated by it, substantially in the manner set forth.

Twenty-second, I claim the combination and arrangement of an eye-pointed needle, A, a tension mechanism or spring, E, a cast off, G, and a detent, H, or their equivalents so that any two or more of them will have but one carrier, substantially as set forth and described.

Twenty-third, I claim the extension of the tension spring, E, back to the pitman or rod, h, so that the same may also act to keep the said rod on the crank wrist, substantially in the manner shown and specified.

Twenty-fourth, I claim the needle carrier and loping mechanism, so combined and arranged with respect to each other that the looping mechanism will be operated by the needle carrier, substantially in the manner set forth.

Twenty-fifth, I claim the needle carrier as constructed with a cam-shaped slot; 12, or its equivalent, for operating the looping mechanism, substantially as shown.

Twenty-sixth, I claim the combination of the slot, i2, tri-armed lever, f2 stud, b2 looper rod, c2, cam groove, k2, cam groove, p2, projection, r2, and stud, q2, or their equivalents, for producing the compound movement of the looper, substantially as set forth and described.

Twenty-seventh, I claim a looping mechanism, considered or taken as a whole, constructed and operating substantially as set forth and specified.

Twenty-eighth, I claim the combination and arrangement of the socket, t, 20, or its equivalent, with the clutch shaft, or its crank for connecting the spool or bobbin to the said shaft, preparatory to filling it, substantially as described.

Twenty ninth, I claim a narrowing and widening mechanism, consisting of the row of holes, w, the pins, x' x' the slide rod, q' provided with projections, p' p' and z' to operate with the pins, x' x', and clutch lever, o', or their equivalents, substantially as set forth and described.

Thirtieth, I claim the application of the shipping pins, x' x', directly to the index plates y' y', substantially in the manner and for the purposes specified.

Thirty-first, I claim the means of holding or keeping the loop on the tooth until the needle has fairly entered the loop, such being effected by the looper itself, substantially in the manner set forth and described.

Thirty-second, I also claim a combination composed of an eye-pointed needle, a tension mechanism, a work-supporting comb and a looping mechanism, substantially such as described, and a yarn guide, arranged and used in the manner and for the purposes specified.

Thirty-third, I claim the peculiar construction of the eye-pointed needle, that is the bent or crooked form described, so that the old loop may have room to pass back under the tooth, when said needle is arranged, and used substantially in the manner set forth.

Thirty-fourth, I claim the arch, k', or its equivalent, arranged with respect to the comb, as shown, for supporting the plate, i, and bracket, t2, substantially in the manner set forth.

Thirty-fifth. And finally, I claim a knitting machine, composed of all the instrumentalities hereinbefore mentioned, or their equivalents, when constructed, combined and used substantially in the manner and for the purposes specified.

55,104.—Car Coupling.—William W. Hinman and William W. Neville, Jackson, Ill.:

We claim the frame or draw head, C, which contains the spring hooks, H H, secured within the frame, B, attached to the under side of the car, substantially as shown, to admit of the vertical and horizontal movement thereof, in connection with the vertically sliding frame, L, arranged as shown, or in any equivalent way, for the purpose of adjusting the frame or draw head, C, higher or lower, as may be desired.

55,105.—Nail Extractor.—J. H. Hogan, St. Louis, Mo:

I claim the combination of the handle, A, the slide, B, and the nippers, C, substantially as described and set forth.

55,106.—Beverage.—E. G. Holland, Union Springs, N. Y.:

I claim the aforesaid discovery of making wine, vinegar, and brandy, from the properties of the sumach drupes or berries.

55,107.—Screw Wrench and Hammer.—L. S. Hoyt and E. G. Hoyt, Croton Falls, N. Y.:

We claim the implement herein described, having at one end of its shank, A, a hammer, C, and at its other end a stationary jaw, B, in combination with the adjustable spring jaw, D, as a new article of manufacture.

55,108.—Carriage Plow.—A. Ingalls, Independence, Iowa:

I claim the lever, m, standard, E, rod, J, pulleys, n n', in combination with the chain or cord, I, guide plate, D, and plow arranged, substantially as and for the purpose set forth.

55,109.—Screw Wrench.—Joel C. Jackson, Rochester, N. Y.:

I claim the sectional screw rack extending from the bracket, c', of the moving jaw, c, and occupying a groove in the bar, b, in combination with the nut, g, surrounding said bar, b, contiguous to the socket, h, substantially as set forth.

55,110.—Process of Coloring Wood, Etc.—Barton, H. Jenks, Bridesbury, Pa.:

I claim the process substantially as described of injecting wood and other porous substances with coloring matter.

Also, The new manufacture of wood, prepared substantially as described.

55,111.—Mode of Treating Wood for the Manufacture of Carding Engines.—Barton H. Jenks, Bridesburg, Pa.:

First, I claim the construction of the cylinders and rollers of carding engines of wool, which is impervious to the action of moisture, substantially as described.

Second, Applying card clothing to the base or backing which is composed of a combination of wood and paraffine or other equivalent substances, substantially as described.

55,112.—Whiffletree.—Niles Johnson, Ripon, Wis.:

I claim the clevises, C' C' arranged with the doubletree and whiffletrees, as and for the purpose herein set forth.

55,113.—Buckle.—George R. Kelsey, West Haven, Conn.:

I claim the combination of the bow and lever, Figs. 3 and 4, when the two parts are constructed, put together and fitted for use, substantially as herein described.

55,114.—Amalgamator.—Washington Kendrick, New York City. Antedated May 14, 1866:

First, I claim the use for amalgamating and separating ores of a tubular heater, E provided with suitable pipes for injecting and discharging wet or superheated steam or hot air in combination with the tank, A, constructed and operating substantially as and for the purpose set forth.

Second, The agitator, F, in combination with the tubular drum, E, and tank, A, constructed and operating substantially as and for the purpose described.

55,115.—Adjusting Door Knob to Spindles.—Thomas Kennedy, Branford, Conn. Antedated May 20, 1866:

I claim the combination of the nut, D, and spindle, E, with the rose, G, and neck, F, constructed and arranged with the projections, a a, and notches, c c, substantially in the manner and for the purpose specified.

55,116.—Wool Press.—P. B. Killam, Alina, Mich.:

I claim the arrangement of the shafts having wheels or pulleys, or their equivalents, connected together by a chain or belt, knuckle jointed levers for raising and lowering the leaves of the table, in combination with any suitable device for holding the leaves in an upright position, substantially as herein described and for the purpose specified.

I also claim the combination of the fixed and movable guards when arranged together, and so as to operate in the manner and for the purpose specified.

I also claim the use of the catch buttons for holding one end of the binding cords for the twine as described.

55,117.—Bent Lever Scale.—Jacob King, Jr., Fort Wayne, Ind.:

I claim an improved lever weighing scales formed by combining the lever, F, scale pan, G, cog wheels, K and L, and index, J, with each other, and with the frame of the scales, substantially as herein described and for the purpose set forth.

55,118.—Picker House for Opening and Cleaning Cotton, Etc.—Richard Kitson, Lowell, Mass.:

I claim the hollow walls or flues, B B, and openings, C, in combination with the enclosed spaces between the beams, or their equivalents, the whole arranged substantially in the manner and for the purpose specified.

55,119.—Attaching Sole to Horseshoes.—A. H. Knapp, Coxsackie, N. Y.:

I claim the combination of the spring frame, S, lips, b, and web, C, applied relatively with the recessed shoe, A, in the manner and for the purpose herein specified.

55,120.—Churn Power.—David J. Knapp, Fallsburgh, N. Y.:

I claim the slide, G, fitted in suitable guides or a slot in a standard or support, H, with the pitman, F, passing through it, substantially as shown and described, in combination with the gearing and spring, all arranged to operate in the manner substantially as and for the purpose specified.

55,121.—Coin Holder.—Norbert Landry, San Francisco, Cal.:

I claim the arrangement of coins and medals upon a vertical inclined or horizontal axis, between or upon transparent substances, to be revolved at pleasure, for the purpose of displaying said coins or medals, substantially as herein described and set forth.

55,122.—Steam Engine.—Finly Latta, Cincinnati, Ohio.

I claim the arrangement of the direct steam passages in combination with steam cylinders of unequal diameter, in a steam engine, adapted to operate, as and for the purpose set forth.

55,123.—Medical Compound.—H. H. Lockwood, Madison, Wis.:

I claim as a new article of manufacture, the medicine herein described.

55,124.—Self-acting Decanter Stopper.—Louis Loeffler, East Cambridge, Mass.:

I claim the self-acting ball valve decanter stopper as made with the series of fingers applied to the valve seat tube, and so as to extend therefrom and about the ball, when in places substantially in the manner as hereinbefore specified.

55,125.—Leather Dressing Machine.—S. C. Lord, Portland, Oregon:

First, I claim the arrangement of the duplicate legs, c, cross bars, f, slotted arms, g, shaft, h, arms, l, connecting rods, m, lever, n, and notched bar, O, in combination with the table, A, and supporting legs, a, constructed and operating in the manner and for the purpose herein specified.

Second, The arrangement of the spring shoe, P P, having shackers, x x, and levers, u u, for raising or lowering the same, the whole being arranged together in a common frame, D, of a cross head, C, and operating as and for the purpose specified.

Third, In combination with the above the roller s2, with its standards, b2 b2, spring, c2, and lever, d2, arranged together substantially in the manner and for the purpose set forth.

Fourth, The combination of the hangers, and slides, B, with the cross head, C, and its frame, D, connected with the driving shaft through a pitman, rod, g2, so as to operate in the manner specified.

55,126.—Fastening Key in Locks.—S. B. Loughborough, Canandaigua, N. Y.:

I claim the employment or use of the safety bars, b, constructed substantially as and for the purpose herein shown and described, in combination with the clamping wedge, w, or its equivalent.

55,127.—Safety Valve.—Addison Low, Albany, N. Y.:

First, I claim the combination of the measuring valve, H, with the piston, F, for the purpose herein set forth.

Second, The combination of the piston, F, with the safety valve,

D, and the measuring valve, H, as and for the purpose described.
Third, The combination of the piston, F, lever, E, lever, G, and safety valve, D, as and for the purpose named.
Fourth, The combination of the measuring valve, H, with the piston, F, lever, G, and safety valve, D, as and for the purpose set forth.

55,128.—Fruit Jars.—Joshua R. Lupton and M. E. Lupton, Stafford, Ohio:

We claim an improved fruit can stopper, formed by combining an india-rubber or equivalent surface or lining with a wooden or metallic cap, constructed and applied substantially as herein described and for the purpose set forth.

55,129.—Farm Gate.—D. F. Luse, Spring Mills, Pa.:

I claim the shoulders or offsets, d d, and f f, in the bar, H, and post, A, so as to allow the pivoted rails, C D D, to shut by each other, in folding, substantially as and for the purpose set forth.

55,130.—Water Indicators for Steam Generators.—George Lutz, Lancaster, Ohio:

I claim the rod, I, incased within a tube, J, and hung at its lower ends to the float rod, G, and at its upper end hung to the crank arm, O, of the shaft, P, in combination with the sector rack, T, of shaft, P, interlocked with the pinion, Y, of the index spindle when arranged together, substantially in the manner described and for the purpose specified.

55,131.—Sash Fastening.—John Lydy, Georgetown, Ohio:

I claim the combination and arrangement of the pawls, D and D', the serrated plates, C and C', the plate, i, and the springs, a and a', substantially as herein described and shown, and for the purpose specified.

55,132.—Gages for Augers.—Samuel L. Syford, Portland, Me.:

I claim a gage for bits and augers composed of two pieces, A A, formed to fit the faces of the twisted blade of the bit or auger, so as to turn with the spiral twist, and adjustably united by set screws, substantially as and for the purpose set forth.

55,133.—Car Truck.—Theodore Lyman, Sandusky, Ohio:

I claim the combination of the braces, O P U V, and block, R, with the swing beam, D, of an ordinary railroad car truck, substantially as described and for the purpose set forth.

55,134.—Atmospheric Governor.—Benjamin Mackerley, Paint, Ohio:

I claim an atmospheric governor composed of a cylinder, A, with two pistons, B C, and brake, D, arranged substantially as and for the purpose described.

55,135.—Mop Handle.—Henry B. Malbone, Middletown, Conn. Antedated May 21, 1866:

I claim the cloth holder for mop handles herein described, when constructed and arranged substantially in the manner set forth.

55,136.—Hydrants.—Ruben A. McCauley, Baltimore, Md.:

I claim the combination with the elbow seat, c', of the chamber, d, the strainer and supporting disk, j'', spring, i, holding cup, h, elastic ball, g, and pipe, F, arranged and operating substantially as described and for the purpose set forth.

55,137.—Manufacture of Casks, Barrels, and Kegs.—Joshua Merrill, Boston, Mass.:

I claim the improved cask, substantially as described, having its joints made with tongues and grooves, substantially in the way and for the purpose hereinbefore described and set forth.
Also in combination with the joints of a tongue, d, and grooved cask a coating or stuffing of glue or simular gelatinous cement in the joints, substantially as hereinbefore described.

55,138.—Regulating the Draft of Furnaces.—Albert H. Mershon, Philadelphia, Pa.:

I claim the ash-pit door and draft door, the chain, H, pulleys, K K, and weight, with the door and index gage when combined and constructed substantially as and for the purpose herein described.

55,139.—Apparatus for Parlor Croquet.—William S. Messinger, Roxbury, Mass.:

First, I claim the wickets, f, or stakes, i, with their sockets, D or E, in combination with the cloth, B, perforated to receive them, substantially as set forth
Second, I also claim the perforated cloth, B, and frame, C', in combination with the wickets, f, and stakes, i, and their removable sockets, D and E, substantially as described.

55,140.—Cheese Hoop.—Henry W. Millar, Utica, N. Y.:

I claim a cheese hoop made of wood, hooped with iron bands, the inner surface whereof is lined with a metallic lining, as hereinbefore described, my invention consisting in the application of the metallic lining.

55,141.—Washing Machine.—John Miller, Russellville, Ky.:

First, The combination of the loose balled drum, with the loose balled frame constructed, arranged and operating substantially as set forth.
Second, The combination of the furnace trough, drum and frame, when constructed, arranged and operating as described, for the purpose set forth.

55,142.—Seeder and Cultivator Combined.—John Miller, Russellville, Ky.:

I claim the combination of a cultivator which furrows and forms the ridge, with a planter that plants, covers, and finishes the ridge with a smooth, flat surface, all in once passing over the ground, substantially as set forth.

55,143.—Street Lamp.—Jacob G. Miner, Morrisania, N. Y.:

First, I claim a cylinder, or its equivalent, when sustained, substantially as described.
Second, I claim the combination of cylinder frame and lid, for the purpose set forth.

55,144.—Auger.—Henry P. Moody, Newburyport, Mass.:

I claim the removable centring plug, D, in combination with the bit or auger, A, for the purpose set forth.

55,145.—Kettle Bottom.—Charles A. Moore, West Brook, Conn.:

I claim the above described improvement in kettle bottoms, formed substantially as specified, and for the objects set forth.

55,146.—Brick Machine.—Isaac Morley, Pittsburgh Pa.:

First, The reciprocating slide, I, and plunger, K, arranged and operating in connection with the hopper, A, as and for the purpose set forth.
Second, The combination and arrangement of the wheels, F and G, and the eccentrics, E for the purpose of operating the slide, I, and plunger, K, as shown and described.
Third, The frames, d, for the purpose of holding the molds in position while being filled and having the wire, b, arranged, as described, for cutting of the brick, as set forth.
Fourth, The wheel, B, constructed as shown, and arranged to operate in connection with wheels, C, as described, for the purpose of elevating and depressing the frames, d, at the required intervals.
Fifth, I claim the combination and arrangement of slide, I, plunger, K, and frames, d, to operate in connection, and at the proper intervals, substantially as herein shown and described.

55,147.—Ship Pump.—George Moulton, Jr., Bath, Me.:

I claim arranging the valves in or over the pump, tube, or pipe, in combination with an open top above the valve, and a piston working in an auxiliary cylinder, substantially as described, so that the pump may be sounded by removing the valves, without removing or disturbing the piston.

55,148.—Brick Machine.—Charles Murtha, Philadelphia, Penn.:

First, The intermittingly rotating cylinder, H H, provided with blades or knives, I, in connection with the endless carrier K, said parts being arranged in relation with a mud mill, substantially as and for the purpose set forth.
Second, The plate, M, suspended on pivots above the endless carrier, K, to operate in connection therewith, and the sanding device, substantially as and for the purpose specified.
Third, The intermittingly rotating block, P, provided with a series of radial molds having plungers, R, fitted within them, and arranged in relation with the endless carrier, K, substantially as and for the purpose set forth.
Fourth, The cap, S, operated in the manner shown, or in an equivalent way, and arranged in relation with the block, P, so as to impart an intermittingly rotating movement to the block, and at the same time serve to confine the clay molds while the clay is under pressure therein, substantially as set forth.
Fifth, The heating of the molds by steam, substantially in the manner and for the purpose as set forth.

55,149.—Surface Condenser.—Joseph Nason, New York City:

I claim the within described construction and arrangement of the plates, 1 2 3, etc., and coinciding holes, G H, etc., whereby one of the fluids is allowed to flow freely through the holes into and through alternate spaces, m m, etc., between the plates, and prevented from communicating with the intermediate spaces, h h, etc., while the other fluid is allowed to flow through said intermediate spaces, substantially in the manner and for the purposes herein set forth.

55,150.—Fruit Gatherer.—Eliza H. Newcomb, New York City:

First, I claim the employment in a fruit gatherer of converging blade, b b, applied to the frame or ring, A, and operated by the simple withdrawal of the fruit gatherer, substantially as described.
Second, I claim the combination of the ring, A, converging blades, b b, curved slats, m m, pins, n n, and spring, e, by means of which a shear action of the converging blades is obtained by the simple withdrawal of the fruit gatherer, substantially as described.
Third, I claim the combination of the hinged frame, A, either square or circular, with four points or more converging blades, b b, and springs, by means of which a shear action of the converging blades is obtained by the simple withdrawal of the fruit gatherer, substantially as described.

55,151.—Apparatus for Preserving Beer.—A. F. Neynaber, Philadelphia, Pa.:

I claim the method of preserving beverages or fermented liquors, as lager beer, ale, porter, etc., in air-tight india-rubber vessels, and discharging these liquors therefrom in parts, by means of compressing the vessel by weight, in such a manner as to avoid the admission of any air, substantially as set forth in the foregoing specification.
I also claim the construction of the beer keeper, by the application, combination, and arrangement of the india-rubber vessel, A, inlet, l, with plate, m, screw, n, and bar, o, outlet, j, with valve, k, tap, l, and presser, y, frame, B, with ring, a, presser, C, with pulleys, j' j', and stand, D, substantially in the manner and for the purpose as herein described
These claims I make jointly and separately.

55,152.—Grain Screen.—Harrison Ogborn, Richmond, Ind.:

First, I claim the crooked groove, S, in combination with the friction rollers or pulleys, n n, and arms, m m, when used for the purposes set forth.
Second, The perforated crank, c, shaft, b a, and hopper, A, in combination with the nest of screens, D E and P, and crooked groove, S, when arranged and operated substantially as set forth, and for the purpose specified.

55,153.—Composition for Stiffening Felt Cloth.—Patrick O. Rork, Norwalk, Conn.:

I claim the union of alum with a solution either of shellac and borax, shellac and sal-soda, or shellac and ammonia, for the purpose of stiffening hats, hat bodies, hats for ladies' wear, and other articles, in which a greater degree of stiffness is required than the material used possesses of itself.

55,154.—Carpet Stretcher and Hammer.—F. M. Osborn, Dover Plains, N. Y. Antedated May 22, 1866:

I claim the combination, in one machine, of a stretcher, w, and hammer, o, arranged and operating with regard to each other, substantially in the manner described, and for the purposes specified.
I also claim the arrangement of the stretcher, w, hammer, o, with the intermediate parts or devices, connecting them with a common lever handle, g, substantially as and for the purpose set forth.

55,155.—Subterranean Reservoir for Wells.—Alonzo Palmer and John Beau, Hudson, Mich.:

We claim the arrangement of the cylinder, A, shaft, B, disks, S and S', together with the agitators, d d, when used as and for the purposes herein specified.

55,156.—Stump Extractor.—Alonzo Palmer and Robert Gilliland, Hudson, Mich.:

We claim the beams, A A, supporters, B B, clevis, F, stays, D D, lever, E, braces, C C, pulley, I, cord, H, and tongue, G, arranged in the manner substantially as and for the purpose herein set forth.

55,157.—Ratchet Wrench.—William Pierson, Newark, N. J.:

First, I claim the lever-like catch, D, applied as described, with a spring, f, in a mortise in the stock, and in combination with a circumferential groove, d, in the exterior of the ratchet socket, the whole arranged substantially as herein described
Second, The screw, s, in combination with the catch, D, substantially as and for the purpose herein specified.

55,158.—Manufacture of Caustic Alkali.—Louis Prang Boston, Mass.:

I claim the mode herein described of combining any alkali with lime in such a way as to obtain a powder to serve when dissolved as caustic lye.

55,159.—Process for Manufacturing Glass.—Samuel Richards, Philadelphia, Pa.:

I claim the manufacture of merchantable glass from impure cullet and common fluxes by first melting them and straining the impurities out of them and then taking the product and mixing it with a small portion of ordinary batch, substantially as described.

55,160.—Medical Compound.—Margaret Richardson, Norristown, Pa.:

I claim a medicine for the cure of cholera and other bowel complaints, made of the ingredients herein described and in about the proportions specified.

55,161.—Washing Machine.—Charles Roberts, Lake Village, N. H.:

I claim a washing machine composed essentially of a concave of concentrically arranged rollers, I I, nearly touching each other, except a wider space at the top, for the introduction of the clothes, and having a cylinder, c, with elastic or yielding pressure bars, revolving inside thereof, the whole to be placed within a tub, or other vessel holding water or suds, substantially as herein specified.
I also claim giving the rolls, I I, a positive revolving motion nearly equal to and in the same direction as the pressure bar surfaces of the revolving cylinder by means of pinions, J J, on said rolls, and a driving cog wheel, H, on the cylinder, or its shaft gearing into said pinions, substantially as herein set forth.
I also claim the arrangement of the stationary bars, F F, and yielding pressure bars, E E, in the heads of the cylinder, c, substantially as herein described.

55,162.—Swival Shackle.—Thomas B. Roach, Folsom, Cal.:

I claim the swivel shackle, constructed substantially as herein described.

55,163.—Training Hop Vines.—Benjamin C. Rogers, Stockbridge, Vt.:

I claim the arrangement of stakes and lines, substantially as herein described, and as represented by the accompanying drawing.

55,164.—Machine for Cutting Succulent Roots for Feed.—Elbert J. Roosevelt, Pelham, N. Y.:

First, I claim the combination of the curved knife, E, attached to the projection, G, of the arch F, with the hopper C, the parts being constructed and operated substantially as and for the purpose herein recited.
Second, I claim the groove, M, for the entrance of the edge of the knife and the lip, N, under the groove, for clearing the throat or space under the edge of the knife, as herein described.

55,165.—Burglar Alarm.—A. J. Ross, Rochester, N. Y.:

I claim the portable burglar alarm, made up of the combination of the larm bell, C, and base plate, D, engaged and disengaged by simply changing the position, as described, and the cam plate, G, provided with a series of corrugations or cams, k k, for giving a succession of alarms, as herein set forth.

55,166.—Pad lock.—Cyrus W. Salader, Newark, Ohio Antedated May 24, 1866:

I claim securing the wards or guards, B, for the key, in the body of the lever, A, or its equivalent, in the manner and for the purpose substantially as set forth.

55,167.—Padlock.—Cyrus W. Salader, Newark, Ohio: Antedated May 24, 1866:

First, I claim the lever, S, or its equivalent, in combination with the lock bar, A, in the manner and for the purpose, substantially as shown and described.
Second, I claim the spring, B, or equivalent, in combination with the lever, S, and lock bar, A, in the manner and for the purpose substantially as shown and described.

55,168.—Heating and Ventilating Railroad Cars.—Thos H. B. Sanders, Philadelphia, Pa.:

I claim the arrangement of air pipes, P, and registers, R, with hot or cold air chamber, c' c', of stove, S, and fan B B, combined together as and for the purpose hereinabove described.

55,169.—Churn.—John F. Seaman, Cortlandville, N. Y.:

First, I claim the arrangement of bars, O and Y, in their connection with the lever, 2, and pendulum weight, L, for the purpose specified.
Second, I claim churning by an attachment to the bottom of a pendulum or pendulum-weight, as set forth, and for the purpose specified.
Third, I claim the arrangement of the springs, 2 and 3, as set forth and for the purpose specified.

55,170.—Carpet Holder.—E. Shopbell, Ashland, Ohio:

I claim the combination of the cleats and button, when used in connection with the carpet and mop board, as and for the purpose set forth.

55,171.—Screw Cutting Machine.—Amos B. Simonds, Youngstown, Ohio:

I claim the combination and arrangement of the dies, H, movable jaws, F, and stops, J, constructed and operated as described, with each other and with the head, d', of the shafts, D, substantially as and for the purpose set forth.
Second, The combination of the spring, M, with the arms, f', of the movable jaws, F, substantially as described, and for the purpose set forth.
Third, The combination of the sliding conical block, L, gage rod, R, arms, P and N, and connecting bar, O, with each other, with shaft, D, and with movable jaws, F, substantially as described and for the purposes set forth.

55,172.—Steam Generator.—Andrew J. Smith, Greenville, Ohio:

I claim an improved steam boiler, formed by combining the perforated interior boiler, B, and the water induction pipe, D d' E, with each other, and with the outer boiler, A, substantially as described, and for the purposes set forth.

55,173.—Machine for Cutting Smoking Tobacco.—H. M Smith, Richmond, Va.:

I claim the fine steel or iron comb, made single or with two edges to reverse, in combination with the fine steel teeth in the cylinder, and in combination with the screen, operating for the purpose and in the manner as above described and set forth.

55,174.—Grain Cleaner.—Geo. Stevenson, Lionsville, Ind., and John J. Crider, Greenfield, Ind.:

We claim the combination of the outer drum screen and the inner casing, K K, provided with a revolving brush, the whole constructed and operated substantially as described and represented.

55,175.—Cultivator.—Amos D. Stocking, Dowagiac, Mich.:

First, I claim the application of a swivel wheel, a, to the rear end of the frame of a cultivator, which is constructed substantially in the manner described.
Second, Keeping the shovel standards, E, in proper position during their passage through the soil by means of the transverse rods, h', and notches, i, combined with the forward braces, k, substantially as described.
Third, The pivoted board, G, or its equivalents, arranged transversely across the cultivator frame, and connected to the shovel standards, E, substantially as described.

55,176.—Rotary Brush.—Silas Stuart, Sterling, Mass.:

I claim the perforated corrugated toothed cylinder, A constructed and operating in the manner and for the purpose herein described

55,177.—Tobacco Cutter and Nut Cracker.—Howard Tilden, Boston, Mass.:

I claim a tobacco cutter and nut cracker, having the operating lever in the form of the tail of a dog, or other animal, and the jaws that hold the nut corresponding to the mouth of an animal, the operating mechanism, or its equivalent, being contained in the case, H, as herein described.
I also claim the combination of the transversing knife or cutter, operated as herein set forth, with the jaw, V, and the case, H, constructed as herein set forth.

55,178.—Apparatus for Collecting Floating Oil from Streams.—Hamilton E. Towle, New York City:

First, I claim the combination with the squeezing roller of an apparatus, constructed as herein described, of a swinging apron or scraper, actuated by means of a spring, or equivalent mechanism, and arranged and operating as and for the purposes herein set forth.
Second, In combination with the squeezing roller and swinging scraper, as described, I claim the employment of a second scraper, arranged and operating as herein shown and set forth
Third, In combination with the squeezing roller, I claim the lever arms, in which it has bearings, and the rods or bolts, by means of which the pressure of the roller may be regulated, the whole being constructed and arranged substantially as herein shown and described.

55,179.—Grain Cleaner and Separator.—B. T. Trimmer, Rochester, N. Y.:

I claim the special construction and arrangement of the machine, consisting essentially of the draught passages, d g h i', of the trunk, E, fan, C', shoe, H, beater chamber, G', and beater, M f, arranged and operating substantially as and for the purpose herein set forth.
I also claim the combination and arrangement of the passages, d g h i' uniting in a common discharge, having the turns or deflections, k t, and the pockets, m n, the whole forming a trunk that is connected with the top and bottom of the machine in such a manner as to form a circuit through substantially as described.
I also claim exhausting both the inside and outside of the beater cylinder by the single fan, C', operating above, the whole arranged substantially as herein specified.
I also claim distributing the grain falling into the passage, i, from the trough g, by the wall, w, and floor, x, the whole arranged and combined as described.
I also claim making the beater cylinder in sections, 1 2 3 etc., and using the same in combination with the grooves, a a, and space, b', of the heads, I I', so that said sections may be applied or removed without removing the outer casing of the frame, substantially as specified.
I also claim forming the disks, M M, of the beater with the star points, having opposite sides, g' h', for attaching the wings, f f, in opposite angles, substantially as described.

55,180.—Air-cooling Ventilator.—Friedrich Villard, Mount Eaton, Ohio:

First I claim the water grate, C D, constructed substantially as described, for distributing the water over a number of conductors.
Second, In combination with the distributing water grate constructed and adapted to operate as set forth, I further claim the two tanks, A G, and water elevator, J, for passing the water repeatedly over the evaporating surfaces, as explained.

55,181.—Quartz Mill.—C. Ph. Wagner, New York City:

First, I claim communicating an alternate reciprocating movement bodily to the lower end of the crushing jaws, I J, and at the same time a vibrating movement to the upper ends of said jaws, so as to produce a rubbing or guiding action and a crushing action combined employed for the purpose by means, substantially as described.
Second, Pivoting the lower ends of the vibrating jaws, I J, or their equivalents, to bearings which have a vertical vibration and communicating a lateral vibration to the upper ends of said jaws, by means, substantially as shown and described.

55,182.—Sewing Machine.—Albin Warth, Stapleton, N. Y.:

First I claim the combination of the rakes, v w, teeth or pins, b'', slip weight, a', and adjustable dog, b', arranged and operating in the manner and for the purpose herein specified.
Second, The elastic pad, l, in combination with the needle slide, C, pendulum, b, and needle, n, constructed and operating substantially as and for the purpose set forth
Third, The perforated flat oblong shuttle, S, in combination with the shoe, G, and needle, n, arranged and operating in the manner and for the purpose herein described.

Fourth, The combination of the curved tail piece, I', and shuttle S, for the purpose herein described.

Fifth, The false shuttle, S', with tongue, c2, and hook, d2, in combination with the shoe, G, and needle, n, constructed and operating substantially as and for the purpose described.

Sixth, The cavity, b2 d2', in combination with the hook, d2, and needle, n, as described, so that the loop can be brought in such a position as to allow the needle to pass through it on its subsequent descent.

Seventh, The cavity, c2', located as shown, in combination with the sole of the shuttle and the shuttle race, constructed and operating substantially as and for the purpose set forth.

Eighth, The tracer, y2, and adjustable cloth guide, M, in combination with the design wheel, z2, and with a sewing mechanism, constructed and operating substantially as and for the purpose described.

55,183.—Lamplighters' Torch.—C. D. Walters and John Wilson, Harrisburg, Pa.:

I claim as a convenient article of manufacture the lamplighter's torch, herein described, as represented.

55,184.—Grain Drill.—Levi N. Warren, Milwaukee, Wis.:

I claim the inclined metallic aperture plate, K, or its equivalent, the metallic sub tube, p, with flexible joint, the attachment of the ground tubes, q, to the falling bar, x, all in combination.

I also claim the combination of the detachment rod and lever in elevating the ground tubes and detaching the gearing wheels at one operation, substantially as described and shown, and for the purpose set forth.

55,185.—Cultivator.—Timothy W. Webb, Springfield, Ill.:

First, I claim the construction of the frame, the timbers, A A, and cross bars, or timbers, B B B, so notched and halved together on an angle that the face of the cross bars, B, will place the straight standards, C C C C, in the proper inclination for supporting and bracing the plows or cultivators, substantially as herein described.

Second, I claim making corresponding series of holds, e e, through the cross bars, B B B for the purpose of bolting and bracing the cultivator standards, C C C C, so that the cultivators may be changed to work either right or left and the spaces adjusted between them, as and for the purooses herein set forth.

55,186.—Tweer.—Joseph Weller, Washington C. H., Ohio:

First, I claim the construction of a tweer of an annular chamber, B, surrounding a central throat which communicates with the double conical chamber, G, substantially as described.

Second, The construction of the plunger, H, with a head, b', cylindrical portions, b1 b2, and a reduced stem, b3, in combination with the chamber, G, substantially as described.

Third, The conical ring, J', applied within the throat of the tweer in combination with a contrivance for cleaning the throat, substantially as described.

Fourth, The oscillating ring, J, provided with wings, e e, in combination with the plunger, H, substantially as described.

Fifth, Providing for giving a vertical, and also, an oscillating movement to the solid or hollow plunger, H, by means of a lever, K, substantially as described.

55,187.—Spring Bolt.—Gilbert D. Whitmore, Boston, Mass. Antedated May 20, 1866:

I claim the improved spring lock as made not only with the bolt-retaining mechanism or catches, g h, but with the handle, F, and the inclined or cammed slot, c, arranged together and with the bolt and the case and the spring of the bolt, substantially as described.

55,188.—Boots and Shoes. Henry Wight, East Cambridge, Mass.:

I claim the within-described constructions of a boot or shoe consisting of the peculiar formation of the edge of the sole and the connection therewith of the vamp as shown with its edge turned outward, the sole and vamp being united by suitable fastenings driven through the upper into the sole at the bottom of the groove, also the employment of substantially the staple-formed fastening described in combination with the construction above claimed.

55,189.—Clinching Iron.—Daniel H. Williams, Antwerp, N. Y.:

I claim the above-described cylindrical clinching iron, having groove, A A and B B, substantially as set forth.

55,190.—Pipe Wrench.—William W. Mills, Janesville, Wis.:

I claim the combination and arrangement of the toothed jaw, F, sleeve, D, spring, A, jaw, B, screw rod, F, all constructed and operating in the manner and for the purpose herein specified.

55,191.—Thill Coupling.—A. and G. Woeber, Davenport, Iowa:

First, I claim the construction of a slot, a, in thill iron, C', in the rear, and obliquely to the bolt, and the application of India-rubber, a', therein as arranged whereby the eye of the thill iron is thus made to have a bearing on the slip without any addition or device to either one or the other or heretofore, substantially in the manner and for the purposes as herein set forth.

Second, The application of the key, E, and strap, D, as arranged in combination with the bolt, c, substantially in the manner and for the purpose as herein set forth.

55,192.—Thill Coupling.—A. and G. Woeber, Davenport, Iowa:

First, We claim the application of a double-slotted key, E, as constructed and arranged in connection with the strap, g, as constructed and applied in combination with the grooved slide of the clip, B, and bolt, F, substantially in the manner and for the purpose as herein set forth.

The combination of the key, E groove, f, and bolt, F, with the adjustable slotted metallic spring, D, substantially in the manner and for the purpose as herein set forth.

55,193.—Ordnance.—Lemuel Wellman Wright, Thorndike, Mass. Antedated May 16, 1866:

I claim an improved cannon or piece of ordnance as made with the breech, f, the central tube, a, and one or more series of tubes or concentric cylinders, arranged and combined substantially as specified, the whole being united or braced together in the manner substantially as set forth.

55,194.—Steam Bath.—J. Young, M. D. Williamsburgh, N. Y.:

I claim the arrangement within the cage, B, which supports the inclosing sheets, of the perforated steam chamber, A, with deflector plate, c, substantially as described and represented.

55,195.—Combination of Lenses for Photographic Purposes.—Joseph Zentmayer, Philadelphia, Pa.:

I claim a doublet made of uncorrected meniscus lenses of different spherical curvatures, arranged concentrically or nearly so, substantially in the manner and for the purpose specified.

Second, I claim the arrangement of a series of uncorrected meniscus lenses of different spherical exterior any two of which series when set concentrically form a corrected, or nearly corrected doublet, substantially in the manner as specified.

55,196.—Supporter for Ladies' Skirt.—William Bachelder, West Newbury, Mass., assignor to himself and J. Bradbury, Charleston, Mass.:

I claim a skirt supporter, A, made of sheet metal or other suitable material, and in two parts or sections, secured together by a hinge having each of its wings or leaves fastened to the supporter sections in such a manner as to allow a vertical play or motion thereto, substantially as herein described, and for the purpose specified.

55,197.—Buckle Clasp.—Francis D. Ballou, Abington, Mass., assignor to Alfred B. Ely, Newton, Mass.:

I claim the buckle clasp, substantially as and for the purpose described.

55,198.—Shaft Coupling.—George L. Baum (assignor to himself and Herman A. Dobster), Bethlehem, Pa.:

I claim an improved shaft coupling formed by combining the shell, E, key, D, and set screws, F, with the ends of the shafts to be coupled, substantially as described and for the purpose set forth.

55,199.—Machine for Upsetting Wagon Tires.—Edward Cook (assignor to himself and Bradford Jones), Valparaiso, Ind.:

I claim in combination with the movable section, I, and the immovable section C, united by the long screw, H, the inclined clamps, K, D, and the anvil and clamping bars, M N, the whole arranged to operate substantially as herein described and represented.

55,200.—Vise.—Peter Crowl (assignor to himself and H. H. Finley), Boonsville, Pa.:

I claim, in combination with the movable jaw, A, having a rack upon the side of its stock, the ratchet, F, dog, D, lever, M, and springs, P and N arranged and operating substantially in the manner and for the purpose set forth.

55,201.—Machinery for Printing Railroad Tickets.—William T. Cushing (assignor to Sanford Harann & Co.), New York City.

I claim in machinery for printing railroad tickets and other articles, the feeding roller, substantially as described, in combination with a series of pressure rollers or separate adjustable stocks, substantially as described, whereby tickets of different thickness can be printed at the same time and by the same machine.

Second, I also claim the one platen for receiving two series of forms of types in combination with two adjustable beds, substantially as described, whereby the two series of impressions are obtained by the movement of one platen alone.

55,202.—Sawing Machine.—Branch W. Durkee, Livonica, N. Y., assignor to himself and J. Barns, West Lakeville, N. Y.:

First, I claim the arrangement in an adjustable frame of one, or more vertical, with one or more horizontal saws, substantially in the manner and for the purpose set forth.

Second, The combination of vertical and horizontal saws in an adjustable frame with the driving drum arranged and operating in the manner and for the purpose set forth.

Third, The combination and arrangement of the main carriage with the toggle lever mechanism and weight to render its reciprocating motions automatic, substantially as set forth.

55,203.—Blacking for Leather, Harness, Etc.—Thomas James (assignor to himself, John McCrellish, John Rogers, W. H. James, and C. H. White), Medford, Mass.:

I claim the within described improvement in blacking for leather composed of the materials specified, mixed in the properties, substantially as set forth.

55,204.—Cupola and other Furnaces.—Philip W. Mackenzie, Jersey City, N. J., and Charles W. Isbell, New York City, assignors to the Smith & Sayre Manufacturing Company, New York City:

First, We claim the two or more separate chambers, i i, arranged one above another around the lower portion of the furnace, and each communicating with a separate tweer, or series of tweers, for conducting the air into the same furnace at different levels, substantially as herein set forth, for the purpose specified.

Second, In combination with such air chambers, we claim the valves, u u, forming separate communications with the blast pipe for the purpose of admitting the air, and controlling or stopping the admission thereof to the several chambers, substantially as herein described.

55,205.—Apparatus for Preparing Peat.—Samuel Marden (assignor to himself and Dustin Lancey), Newton, Mass.:

First, I claim the combination and arrangement of the corrugated or grooved breakers, q, in connection with the perforated bowl at the bottom of the hopper.

Second, I claim the revolving chambered cylinder, x, combined with the compressing plunger, u, and the expelling plunger, l', substantially as and for the purpose described.

Third, I claim the combination of the lever, d', the pitman, J, the tripping lever, l', and the vertical slider or actuator, e, connected with the cylinder, x, as above arranged and described.

Fourth, I claim the combination and arrangement of the forked lever, q', as connected with the frame, A.

55,206.—Potato Digger.—F. M. Morley, New York City, assignor to himself and J. W. Mount, Medina, N. Y.:

First, I claim a rotating cylindrical screen, F, entirely open through its center and free from obstructions, in combination with the digger or shovel, E, substantially in the manner and for the purpose set forth.

Second, I claim the combination of the shovel, E, frame, A, and crank axle, N, substantially in the manner and for the purpose described.

Third, I also claim the standards, O, having rotative adjustment on the crank axle, N, to regulate the depth of digging, substantially in the manner and for the purpose specified.

Fourth, I also claim the combination of the shovel, E, frame, A, and pivoted draft pole, C, substantially in the manner and for the purpose set forth.

55,207.—Carpenters' Plane.—George Muller (assignor to himself and Henry Joseph Bang), New York City:

I claim the sliding box, E, with clamping screw, I, and the forked prize piece, F, in combination with the cup plate, D, and bit, C, together with placing the same in the throat, a, or forward end of the plane stock, substantially as and for the purposes set forth and described.

55,208.—Clothes Dryer.—William W. S. Orbeton, Haverhill, Mass., assignor to himself and George W. Campbell, Bradford, and George P. Russell, Haverhill, Mass.:

I claim the combination of the wheel, A, the adjuster, D, the pulley, S, the posts, H and P, or their equivalents, and endless line, o, with the lever, h, and its rope, r, the whole being arranged so as to operate as and for the purpose set forth.

I also claim the adjuster, D, constructed substantially in the manner as set forth, and provided with a clamping screw and nut and a journal, d, respectively applied to the post, H, and wheel, A, the whole being arranged in manner, and so as to operate substantially as set forth.

55,209.—Machine for Turning Boiler Flanges.—Edward Paye (assignor to himself and Cornelius H. Delamenter), New York City:

First, I claim the use, in a machine for turning boiler flanges, of a series of hammers, F', acted upon by a cam, b, so that the flanges are turned by a series of blows, as set forth.

Second, Making the hammers adjustable on their shanks by means substantially as herein described, or any other equivalent means, so that the same can be adjusted for flues of different diameters.

Third, The arrangement of a revolving cam, and cam grooves in combination with the hammers, F, said hammers being constructed and operating substantially as and for the purpose described.

Fourth, The arrangment of a center in the bottom ring, l, substantially as and for the purpose set forth.

Fifth, The clamp composed of two rings, u l, in combination with the hammers, F', constructed and operating, substantially as and for the purpose described.

Sixth, The cam levers, w, in combination with the rings, l and u, and with the swivel bar, r', constructing and operated, substantially as and for the purpose set forth.

55,210.—Stove Pipe Thimble.—James F. Severance (assignor to himself, Eleazer C. Bennett and Oliver H. Wade), East Bridgewater, Mass.:

I claim the arrangement and application of two or any other suitable number of adjustable slides, C C, made substantially as set forth, or their equivalents, with the pipe thimble composed of the plate, A, and the tube, B.

I also claim the combination and arrangement of the cover, F, with the pipe thimble and its adjustable slides, C' C', applied to it in manner and so as to operate, substantially as specified.

I also claim the combination and arrangement of the damper with the pipe thimble and the adjustable slides thereof.

I also claim the combination of the damper, the pipe thimble, the adjustable slides, with the cover, the whole arranged substantially as specified.

55,211.—Mode of Driving Spindles in Spinning Frame.—James Sutherland (assignor to himself and Joseph M. Mumford), East Hampton, Mass.:

I claim the combination of the drum, A, spindles, a a b b, and bands, c c, the whole arranged and operating in the manner and for the purpose herein described.

55,212.—Drop Light Fixture.—S. B. H. Vance and E. M. Smith (assignors to Mitchel, Vance & Co.), New York City:

First, we claim the arrangement of an adjustable drop light, D, centrally between two or more curved pipes, B, of a stationary chandelier operating substantially as shown and described.

Second, The shield, r n, constructed and arranged in combination with the drop light, substantially as herein set forth for the purpose specified.

Third the non-conducting block, r, in combination with the drop light burner, b, and handle, E, substantially as herein set forth, for the purpose specified.

55,213.—Bending Fore and Aft Sails.—William Woodbury (assignor to himself and Mellen Bray), Chelsea, Mass.:

I claim the two jacket ropes, c d, in combination with the sail, D, and mast hoops, a, arranged and operating substantially as set forth.

I also claim, in combination with the above, the rings, l, or their equivalents, operating substantially as and for the purpose described.

55,214.—Medical Compound.—Ellen V. Conway, (executrix of the estate of James H. Conway, deceased,) Richmond, Va.:

I claim the compound or cough mixture, as herein described.

55,215.—Method of Attaching Shoes to Horses.—Thomas Henry Ince, Westminster, London, England:

I claim the mode herein described of attaching a horse shoe by screws, whose heads shall be sunk within the body of the mental, as shown and described, and which penetrate the hoof in a direction parallel, or nearly so, with the outer wall thereof, but without piercing the latter.

55,216.—Preserving Timber—Frederick Ransome, Ipswich, Kingdom Great Britain:

I claim treating timber for the purpose of preserving the same with a solution of silicate of soda or potash, and afterwards with a solution of chloride of calcium or other soluble salt of an alkaline earth or chloride of aluminium or iron, substantially as described.

55,217.—Cigar Machine—G. Albert Reiniger, Stuttgart, Kingdom of Wurtemburg:

First, I claim the adjustable screw clamp, d, in combination with the flexible apron, b, and table, A, constructed and operating substantially as and for the purpose described.

Second, The spring hook, j, in combination with the table, A, apron, b, and roller, a, constructed and operating substantially as and for the purpose specified.

55,218.—Feed Water Injector.—John Robinson and James Gresham, Manchester, Great Britain:

We claim injectors where the internal nozzles, e' and f' are actuated by a toothed rack and pinion, and are arranged and combined with the external nozzle, c and f, and the steam nozzle, c, substantially as hereinbefore set forth.

REISSUES.

2,257.—Machine for Pressing Bonnets, Bonnet Frames, Etc.—W. E. Doubleday, Brooklyn, N. Y., and J. Stewart, NewYork City (assignees by mesne assignment of William Osborn, deceased). Patented Aug. 19, 1854. Reissued Feb. 17, 1857. Again March 27, 1860:

First, I claim manufacturing, stretching, or shaping, by means of heated dies, the whole of the bonnet tram (or similar article to be worn upon the head), at one operation, substantially as specified.

Second, Manufacturing by stretching, forming or shaping, by heated dies, the flaring face piece and side crown, of a bonnet, or similar article to be worn on the head, jointly at one operation, substantially as specified.

2,258.—Manufacture of Spoons.—Charles Parker and Russell B. Perkins (assignees of Russell B. Perkins), Meriden, Conn. Patented April 1, 1862:

We claim a spoon, the bowl and handle of which are united, substantially as described.

2,259.—Harvester.—Lewis E. Reese, Phillipsburgh, N. J. Patented April 10, 1860:

First, I claim the combination, with a series of revolving, rising and falling rake and reel arms, pivoted to a rotating shaft, from which they derive their motion, of a guide which so controls the motion of the rake arms as to cause them to descend into the standing grain in advance of the finger beam, to press the grain back against the cutting apparatus, to sweep across the platform, and discharge the gavel at the rear end thereof, and then to rise and move forward in an elevated position out of the way of the falling grain, without projecting beyond the stubble side of the machine, and leave an unobstructed space on the machine upon which the driver may ride.

Second, A combined reel, and rake with its arms so constructed that they shall have a revolving motion around their shaft, and a rotating motion around their own axes, for the purpose of turning their teeth downward when raking off, and upward when moving forward.

Third, The combination of the rake arms with the guide by means of the overlapping projections, stays or rods, i, substantially in manner described, for the purpose of holding the rake to the guide during its entire circuit.

Fourth, The combination of a revolving rake having its arm hinged to its shaft at the inner end with a guide located between the rake head and its pivot, whereby I cause the rake to descend into the uncut grain in advance of the finger beam, to press the stalks back against the cutting apparatus, to sweep across the platform in a horizontal circular path, and discharge the gavel, and then to rise and move forward in an elevated position out of the way of the falling grain, without projecting beyond the main frame, or passing over the head of the driver.

2,260.—Horse Hay Fork.—Seymour Rogers, Pittsburg, Pa. Patented Jan. 24, 1865:

First, I claim in hay elevators which combine a penetrator and rod, with a barb or barbs, attaching such barb or barbs to the rod or lever by which they are operated, substantially as herein described.

Second, So constructing the hay elevator, substantially as herein described, as that the rod or lever to which the movable barb or barbs are attached, or are set and discharged shall serve as the handle by which the elevator is suspended and supported.

Third, The notches, e and f, in the rod, D, in combination with the cap, C, and the cam, H, substantially as and for the purpose herein before set forth.

2,261.—Car for Transporting Petroleum.—James and Amos Densmore, Meadville, Pa. Patented April 10, 1866:

First, I claim the two tanks, B B, or their equivalents, when constructed and operating in combination with an ordinary railway car, substantially as and for the purpose set forth.

Second, The two tanks, B B, or their equivalents, when set directly, or nearly so, over the car trucks, and when constructed and operating in combination with an ordinary railway car, substantially as and for the purpose set forth.

Third, The frame, C C C C, the bolts 1, 2, 3, and 4, and the cleats, H H H H, when constructed and operating in combination with tanks, B B, and an ordinary railway car, substantially as and for the purpose set forth.

Fourth, The steps, F F, the manholes and man heads, D D, the faucets, E E, and the run-way, G, when constructed and arranged in combination with tanks, B B, and an ordinary railway car, substantially as herein set forth and described.

DESIGNS.

2,324.—Trade Mark for Lead Pencils.—Lemuel H. Fiersheim, Chicago, Ill.

2,324.—Pitcher.—Ernest Kaufman, Philadelphia, Pa.

2,325.—Spoon or Fork Handle.—G. I. Mix, Wallingford, Conn.

2,326.—Cook Stove.—George T. Spicer, Providence, R. I.

2,327.—Chandelier.—James F. Travis (assignor to Mitchell Vance & Co.), New York City.

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

NEW RATES OF ADVERTISING.

FORTY 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, except on payment of one dollar a line each insertion, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

NOTICE TO ADVERTISERS.

Owing to the long list of Patent Claims, the space allotted for advertisements is very much reduced. We have therefore to ask the indulgence of some of our advertising patrons for the omission of their advertisements. Those which are left out this week will appear in the next issue.

IRON PLANERS, JUST FINISHED, FOR SALE.—

One	20-foot	Bed	48x48 inches.
One	12 "	"	36x36 "
Two	8 "	"	30x30 "
Two	6 "	"	24x24 "
Two	4 "	"	20x22 "

All New and First-Class Tools, for sale Low and ready for immediate shipment, by
24 4] J. B. FULLER,
8 Dey street, New York.

NYE'S IMPROVED DAMPER.—THIS ARTICLE, JUST patented, is one of great practical utility, which every consumer wants, and which has been pronounced by the most scientific and practical men to be superior to anything of the kind before produced—being adapted alike to the Stove Funnel and Chimney Flue, and must meet an immense sale throughout the country. State, County, and Town Rights for sale. Apply to either of the undersigned.
S. R. NYE, } Barre, Mass.
F. G. BATES, }
WM. H. HAMILTON, Petersham, Mass.
or H. CARRUTH & CO.,
23 4 46 Hanover street, Boston.

THE PHRENOLOGICAL JOURNAL FOR JUNE—Contains Portraits of Hon. Solomon Foot, Thomas Jefferson, Aaron Burr, Constance Emily Kent, Jenny Lind, a Group of Moquis or Utah Indians, with upwards of twenty illustrations and sketches of character; also Practical Physiognomy, Love and Lovers, Marriage and Divorce, Celibacy, Revelation and Science, Your Likeness, Strong Men, Hints to Preachers and Sextons, Physical Culture, True Politeness, How to Talk, Fashions, etc. $2 a year, or 20 cents a number. A new volume,—the 41th,—begins with the next number. Address,
FOWLER & WELLS,
24 2 389 Broadway, New York.

$10,000 WORTH OF PUMPS, HYDRAULIC RAMS, etc., of every description. Best makers in store, and will be sold at a large discount, by
J. B. FULLER,
24 4] No. 8 Dey street, New York.

WANTED.—1 SELF-ACTING DRAWING FRAME, for Spinning Wool—120 spindles. 1 set double cylinder Wool Cards, to prepare wool for spinnig on the above—30 inch. 6 Looms, for weaving Woolen Cloths, Tweeds, Jeans, etc. Shearing and Dressing machinery for dressing the cloth. 2 Copper Kettles for dyeing—100 gallons each, all to be of the best quality. Address, with prices, terms, etc., F. E. HARRISON, Andersonville, South Carolina.
May 19, 1866. 24 2

WANTED.—A FIRST-CLASS COACH BODY MAKER. Address Box 357, Cincinnati, O. 1*

GREAT ECONOMY IN FUEL IS OBTAINED BY CARVALHO'S IMPROVED STEAM SUPERHEATER. Priming is prevented, and PURE Steam furnished to the Engine. Highly superheated steam, of any temperature, for Manufacturing or Chemical purposes, produced when required. Is easily attached and very durable. Address HENRY W. BULKLEY, 57 Broadway, N. Y.
24 4*

TO INVENTORS.—
J. B. TURCHIN & CO., Patent Office 92 and 94 Dearborn street, Chicago, Ill. Patents procured, etc. Branch Office in Washington. Direct Agencies in Europe. Unusual facilities to procure and sell Patents in France, and particularly in Russia. 24 2*

UNION IRON WORKS, RHINEBECK, N. Y.,—Manufacturers and Dealers in Cotton and Woolen Machinery of every description. Card Clothing, Belting, etc. New York Office 91 Maiden Lane. 24 4*

MACHINERY AND MACHINISTS' TOOLS, ALL kinds, including the LEONARD & CLARK PREMIUM LATHE. Also, Steam Engines, Saw Mills, Wood Cutting Machinery, etc., etc. Steamboat and Machinery Repairing at the
24 1] QUASSAICK MACHINE SHOP, Newburgh, N. Y.

BURGLAR ALARM AND FOG SIGNAL.—DR. VANDERWEYDE will sell a part or the whole of his Patent and Improvements for a new Alarm, worked solely by the flame of common street gas, being loud like a steam whistle. It is the cheapest, best, and simplest Fog Signal and Burglar Alarm, protecting any extent of property. It may also be attached to clockworks intended to awaken persons more effectively than any thing existing. Address, for more particulars, 1714 Girard Avenue, Philadelphia, Pa. 24 1

$10,000. I HAVE AMERICAN AND FOREIGN Patents, recently issued, on an article much in demand. The business is a monopoly. I desire to send models to the Paris Exposition, and will sell one half interest in my Foreign Patents, giving a party a rare opportunity to make money. Address for particulars, "O. W. T., Care W. B. & Co.,"
23 53 Broadway.

D. COGHLAN, MINING AND CIVIL ENGINEER, 57 BROADWAY NEW YORK, Room 33.
Reports on Mines and makes, plans of the underground workings, Surveying of all kinds done, as well as Mechanical or other Engineering Drawings. Best references given as to long experience in the management of mining and amalgamating works, and of competency as a Civil Engineer. 23 2*

FOR SALE.—A MILL SUITABLE FOR ANY SMALL Manufacturing purposes, situated in West Norwalk, Conn. Address [23 2*] H. B. MATHER.

TURNING TOOLS.—MY SUBSTITUTE FOR THE slide rest meets with approval from practical men. It is intended for small lathes and light work; will bore out any hole six inches in diameter and two and a half inches deep; will face flanges, turn a piece in the chuck, or round out a curve. Price $10.
EGBERT P. WATSON, Box 773, New York.

FOR SALE.—ONE OF J. A. FAY & Co.'s MAKE of Woodworth Planers, "Little Giant," is 24 inches wide, has been used about 8 months, is in good repair, will be sold low. Also, one double, 28 inches wide, same maker, used but little. Send for particulars. STEPTOE, McFARLAN & CO.,
23 2* Cincinnati, Ohio.

INCRUSTATION FRAUDS.—THE NUMEROUS IMItations of Winans' Anti-Incrustation Powder should induce caution in purchasing. It is the only salt that does not cause foaming, and is the cheapest, as one half-pound, to running foot of boiler, removes old deposits. Spurious articles and imitations cause foaming and consequent explosions.
H. N. WINANS,
1* 11 Wall street, New York.

CIRCULAR  SAWS,
WITH EMERSON'S PATENT
MOVABLE TEETH.

Require less power, less skill, less files—saw smoother and better, cut less kerf—the saw always retains its original size. Send for descriptive pamphlet, containing information of value to all parties interested in lumber and sawing of any description.
Address AMERICAN SAW COMPANY, No. 2 Jacob street, near Ferry street, New York. 24 1*

GODDARD'S BURRING MACHINE WORKS,
Office, No. 3 Bowling Green, New York,
manufacture the
Patent Steel Ring and Solid Packing
BURRING MACHINES,
Patent Mestizo Wool-burring Pickers, Shake Willows, Wool and Waste Dusters, Gessner's Patent Gigs, Etc.
Orders respectfully solicited, and prompt attention given, by addressing C. L. GODDARD,
12 tf No. 3 Bowling Green, N. Y.

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.

ATMOSPHERIC TRIP HAMMERS.
Persons intending to erect, or those using hammers, are invited to call and examine Hotchkiss's Patent Hammer, made by CHARLES MERRILL & SONS, No. 556 Grand street, New York. They are very simple in construction, require less power and repairs than any other hammer. The hammer moves in vertical slides; each blow is square and in the same place. For drawing or swaging they are unequaled, and many kinds of die work can be done quicker than with a drop. They are run with a belt, make but little noise, and can be used in any building without injuring the foundation or walls. The medium sizes, for working 2 to 4 inch square iron, occupy 28x56 inches floor room. Send for circular giving full particulars. 6 tf

---

ENGINE LATHES, NEW AND SECOND-HAND, 16 to 48 inch swing, 5 to 26 feet bed, first-class tools. Scroll and Screw Chucks, all sizes, Stubbs' Twist Drills and sockets, Stocks and Dies, Ratchets, Hammers, and all kinds of Machinists' Tools, in store, at the lowest rates, by J. B. FULLER,
24 4] No. 8 Dey street, New York.

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. 4 1y

---

JUST PUBLISHED—THE INVENTORS' AND MECHANICS' GUIDE.—A new book upon Mechanics, Patents and New Inventions. Containing the U. S. Patent Laws, Rules and Directions for doing business at the Patent Office; 112 diagrams of the best mechanical movements, with descriptions; the Condensing Steam Engine, with engraving and description; How to Invent; How to Obtain Patents; Hints upon the Value of Patents; How to Sell Patents; Forms for Assignments; Information upon the Rights of Inventors, Assignees and Joint Owners; Instructions as to Interferences, Reissues, Extensions, Caveats, together with a great variety of useful information in regard to patents, new inventions and scientific subjects, with scientific tables, and many illustrations. 108 pages. This is a most valuable work. Price only 25 cents. Address MUNN & CO., No. 37 Park Row N. Y. 15 tf

---

CHARLES A. SEELY, CONSULTING AND ANAlytical Chemist, No. 26 Pine street, New York. Assays and Analyses of all kinds. Advice, instruction, reports, etc., on the useful arts. 22

A STRONG TOOL.—VERY SUPERIOR IRON PLANers, 4½x2; 6½x2½; 8½x3 feet. Send for Circular before purchasing. [23 5*] L. E. OSBORN & CO., New Haven, Conn.

SAWS! SAWS!! SAWS!!!
WOODROUGH & McPARLIN
MANUFACTURERS OF
PATENT GROUND SAWS,
Dealers in Files, Gummers, Belting, etc.
OLD SAWS REPAIRED PROMPTLY.
Works, Hamilton, Ohio.
Warehouse, No. 10 West Second street, Cincinnati, Ohio. 18 9*

ENGINEERING SCHOOL, FRANKLIN, N. Y., HAS full equipment, and offers thorough instruction. Special advantage—the small cost of living. For Circulars address
21 12* G. W. JONES, A.M.

OXY-HYDROGEN STEREOPTICONS, OXY-CALCIUM STEREOPTICONS, DISSOLVING LANTERNS, MAGIC LANTERNS, Etc., Etc.
A Large Assortment of American, European, and Foreign Photograph Views for the same!! A Priced and Illustrated Catalogue, containing 15 Cuts and 56 Pages, will be sent free by Mail on application.
WILLIAM V. McALLISTER,
21 52 728 Chestnut street, Philadelphia.

TO LUMBERMEN.—
We desire to call the attention of Lumbermen and others using Engines and Machinery, to our
PORTABLE AND STATIONARY ENGINES, AND OUR DOUBLE AND SINGLE CIRCULAR SAW MILLS.
They embrace all the latest and best improvements. Our Boilers are made of the best Charcoal No. 1 Iron, thereby lessening the danger of explosion, and lasting much longer than those made of iron now in general use; and all the material is selected with great care, and the workmanship is the very best. The Testimonials we have from parties using our Mills and Machinery, are such as will be very satisfactory to any one, that in point of finish and material, we have no superiors. Address, for Circulars and all information,
MANSFIELD MACHINE WORKS,
23 2* Mansfield, Ohio.

FOR THE PAST 12 YEARS WE HAVE BEEN MAKing the Woodworth Planer, same Styles as those formerly made by J. H. Lester of Brooklyn, N. Y. Send for cuts.
STEPTOE, McFARLAN & CO.,
23 2* Cincinnati, Ohio.

FOR SALE.—THE GENUINE FARRAR PLANER. We have on hand, and are receiving from the Eastern Manufacturers regularly, the 24 and 26-in. Planers. Persons in this city and adjoining States speak very highly of these Planers, and are constantly changing with us various styles of the "Woodworth" make for these as a facer, and giving largely to boot for the exchange.
STEPTOE, McFARLAN & CO.
23 2* Cincinnati, Ohio.

BOLT, SPIKE, AND RIVET MACHINES.—2,000 Bolts of any length, with head of any shape used in the trade, made from iron round or square iron, or under that size, are made per day of ten hours, by one man and boy, on Hardaway's Improved Bolt Machine.
Our Spike Machine, for simplicity, durability, quality, and quantity of work turned out, is unequaled.
Our Rivet Machine is simple, durable, and does good work.
Shop and Territorial Rights for sale by Assignees of Hardaway & Sons.
WHITE & BUTTERWORTH,
P. O. Box No. 792, Baltimore Md.,
17 tf Office No. 2 Exchange Building.

PORTABLE AND STATIONARY STEAM ENGINES, 5 to 250 Horse-Power, New and Second-hand, with or without Boilers, of all kinds, ready for immediate delivery. Shafting, Belting, Pulleys, Hangers, Mill Machinery of all kinds, in store and for sale low, by J. B. FULLER,
24 4] No. 8 Dey street, New York.

GOVERNORS.

THE GILLESPIE GOVERNOR COMPANY, OF BOSton, are now manufacturing
GILLESPIE'S PATENT HYDRAULIC GOVERNOR,
for Water Wheels of every description.
After a test of five years's service, this Governor has proved itself far superior to any other hitherto in use. Of sufficient power and velocity to run the gate from open wide to close shut in from ten to twenty-five seconds, according to the size of the wheel, yet so extremely delicate in its action, and under such perfect control, that while it moves the gate instantly at any call, it will not run by.
Every Machine guaranteed to give entire satisfaction to the purchaser, or no sale.
TIMOTHY S. HOLTON, Selling Agent
of Water Power Department, 13 Kilby street, Boston, Mass.
Also Manufacturers of
GILLESPIE'S GOVERNORS FOR MARINE AND STATIONARY STEAM ENGINES.
Office 13 Kilby street, Boston, Mass.
JOHN S. ROGERS, Treasurer.
For sale in New York by J. E. STEVENSON, 40 Dey street, and GEO. TALCOTT, 69 Liberty street.

REFERENCES:

FISHER & NORRIS Trenton, N. J.
FRANKLIN MANUFACTURING CO., Paterson, N. J.
STEWART & CO., So. Easton, Pa.
STEPHEN SANFORD, Amsterdam, N. Y.
JAMES HUNTER & CO., North Adams, Mass.
JACKSON & CO., Nashua, N. H.
BELKNAP MILLS, Laconia, N. H.
L. W. FAULKNER & SON, Lowell, Mass.
METHUEN CO., Methuen, Mass.
WADE & WALWORTH, Lawrence, Mass.
H. K. KENT, Pittsfield, Mass.
SAMUEL ROBINSON & CO., Lawrence, Mass.
HARRIS WOOLEN CO., Putnam, Conn.
TURNER & CLARK MFG. CO., Wolcottville, Conn
TROY MILLS, Fall River, Mass.
E. C. WILSON & CO., Medway, Mass.
H. SAYLES & SON, Pascoag, R. I.
COLLINS CO., Collinsville, Conn
ARLINGTON MILLS, Lawrence, Mass.
REED & BARTON, Taunton, Mass.
E. DAVIS & SON, Lawrence, Mass.
THOMAS GOODALL, Troy, N. H.

☞ A few of the many testimonials which the Company has received, in regard to the operation of their Governors, were published May 19, 1866, in No. 21 of this paper, to which reference is made.
23 tf

THE HARRISON BOILER—A SAFE STEAM BOILER. This new Steam Generator, combines essential advantages in Absolute Safety from explosion, in first cost and cost of repairs, durability, economy of fuel, facility of cleaning, and transportation, not possessed by any other boiler.
It is formed of a combination of cast-iron hollow spheres,—each 8 inches in external diameter, and ⅜ths of an inch thick, connected by curved necks. These spheres are held together by wrought iron bolts with caps at the ends. The form is the strongest known; its strength to resist internal pressure very great—unweakened as it is by punching or riveting, which lessens the strength of the wrought iron boiler plate about forty per cent. Every boiler is tested by hydraulic pressure at 400 pounds to the square inch. It cannot be burst under any practicable steam pressure.
Under pressure which might cause rupture in ordinary boilers, every joint in this becomes a safety valve. No other steam generator possesses this property of relief, under extreme pressure without injury to itself, and thus preventing disaster.
It is not affected by corrosion, which soon destroys the wrought-iron boiler. Most explosions occur from this cause. It has economy in fuel equal to the best boilers, arising from the large extent and nearness to the fire of its heating surface, as also from the waved line of this surface, which, thoroughly mixing the gases, induces better combustion, and breaking the flame, causes the heat to be more effectually absorbed than in the ordinary tubular or cylinder boiler.
It gets up steam quickly, and with little fuel. It produces superheated steam without separate apparatus, and is not liable to priming or foaming.
It is easily transported, and may be taken apart so that no piece need weigh more than eighty pounds. In difficult places of access, the largest boiler may be put through an opening one foot square. It is readily cleaned inside and out. Under ordinary circumstances, it is kept free from permanent deposit by blowing the water entirely out, under full pressure once a week. It requires no special skill in its management. Injured parts can be renewed with great facility, as they are uniform in shape and size. When renewed the entire boiler remains as good as new. The greater part of the boiler will never need renewal, unless unfairly used.
A boiler can be increased to any extent by simply adding to its width, and being the multiplication of a single form, its strength remains the same for all sizes. It has less weight, and takes less than one-half the ground area of the ordinary cylinder boiler, without being increased in hight.
Any kind of fuel may be used under this boiler, from the most expensive to refuse coal dust.
Drawings and Specifications free of charge. For descriptive circulars or price address JOSEPH HARRISON, JR.,
Harrison Boiler Works, Gray's Ferry Road,
18 13* Adjoining U. S. Arsenal, Philadelphia.

TOOL AND HORTICULTURAL CHESTS.—
FOR SPRING TRADE.
A full Assortment of Tool Chests, all sizes, from $2 up to $110. Manufactured and for sale by
GEORGE PARR, Buffalo, N. Y.
Send for Circular. 21 tf

THE MOST VALUABLE MACHINE FOR BUILDERS and Carpenters, Furniture, Carriage, Agricultural Implement, Sash and Door, Waived and Straight Moulding, 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 20 good mechanics, called the Variety Moulding and Planing Machine. We own 9 patents covering the valuable inventions for machines with upright mandrels. 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.
These machines are manufactured for America and Europe, only at the Hamilton Machine Works, No. 211 East Twenty-second street, New York. All communications addressed there will receive prompt attention. Agents solicited. Send for circular giving full description
15 13

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

"POWER-LOOM WIRE CLOTHS" AND NETTINGS, of all widths, grades, and meshes, and of the most superior quality, made by the CLINTON WIRE CLOTH COMPANY, Clinton, Mass. 10 52*

IMPROVED STATIONARY AND PORTABLE STEAM Engines and Boilers, also Saw Mills, Cotton and Hay Presses, Corn and Flour Mills, on hand and in process of construction Marine Engines, Iron Steamers, Light-draft River Boats, Barges, Iron Bridges, Tanks, and general iron work constructed to order. Address T. F ROWLAND, 9 26* Continental Works, Greenpoint, Brooklyn, N. Y.

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

GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, New York 1 tf

WIND MILLS—SELF-REGULATING, FOR PUMPing, Grinding Grain, and other purposes, from one to thirty horse power. Also, ORVIS'S AMERICAN FARM MILL for Grinding, manufactured by the EMPIRE WIND MILL MANUFACTURING COMPANY, 21 8 Syracuse, 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 WM. D. ANDREWS & BRO., 1 tf No. 414 Water street, N. Y.

M. BAILEY & CO., PROVISION BROKERS, NO. 40 West Fourth street, Cincinnati. Orders for Provisions, Lard, Tallow, Grease, Oils, etc., carefully and promptly filled. 1 33*

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

WHEELER & WILSON, 625 BROADWAY, N. Y.—Lock-stitch Sewing Machine and Button-hole Machine. 1tf

ERICSSON CALORIC ENGINES OF GREATLY IMPROVED CONSTRUCTION.—Ten years of practical working by the thousands of these engines in use, have demonstrated beyond cavil their superiority where less than ten horse-power is required. Portable and Stationary Steam Engines, Grist and Saw Mills, Cotton Gins Air Pumps, Shafting, Pulleys, Gearing, Pumps, and General Jobbing. Orders promptly filled for any kind of Machinery. JAMES A. ROBINSON, 164 Duane street, cor. Hudson, New York. 10 1y

IRON CASTINGS AND STEAM BOILERS.—THE HINKLEY AND WILLIAMS WORKS, No. 416 Harrison avenue, Boston, are prepared to manufacture common and gun-metal castings, of from ten pounds to thirty tuns weight, made in green sand, dry sand or loam, as desired; also Fine and Tubular Boilers, and "Hinkley's Patent Boiler," for locomotive or stationary engines warranted to save a large percentage of fuel over any boiler now in use. 13 6*

PATENT POWER AND FOOT-PUNCHING PRESSES, the best in market, manufactured by N. C STILES & CO., West Meriden, Conn. Cutting and Stamping Dies made to order. Send for Circulars. 17 10*

LENOIR GAS ENGINES, FROM HALF HORSE TO Four Horse-power. Manufactured at the DRY DOCK IRON WORKS, No. 435 East Tenth Street, New York. 17 10*

WOODWORTH PLANERS, BARTLETT'S PATENT Power Mortise Machine, the best in market. Wood-working Machinery, all of the most approved styles and workmanship. No 24 and 26 Central, corner Union street, Worcester, Mass. 17 11* WITHERBY, RUGG & RICHARDSON.

STEAM GAGES—BATES'S PATENT—GOVERNMENT and City Standards.—The cheapest and best steam gages ever offered in this market. Also Water Gages, Marine Clocks, Registers, Etc. Model making and repairing promptly attended to. Call and Examine, or send for circular before purchasing elsewhere. KEEN BROTHERS No. 218 Fulton st.

REFERENCES.—Messrs. Hopper and Douglas, U. S. Inspectors; Capt. Lord, M. P. Inspector; Messrs. Todd & Rafferty, No. 4 Dey street; New York S. E. Works, Twenty-third street, E. R.; Wash. I. Works, Newburgh. 20 tf

PORTABLE STEAM ENGINES—COMBINING THE maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 300 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & CO., Lawrence, Mass. 1 tf

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 unequaled. They are compact, require little power, and are not liable to get out of order. For descriptive pamphlet address 1 tf W. D. ANDREWS & BRO., No 414 Water street, N. Y.

STEAM ENGINES—WITH LINK MOTION, VARIABLE automatic cut-off, of the most approved construction; Mill Gearing, Shafting, Hanger, Etc. Address M. & T. SAULT, 7 26* New Haven, Conn.

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

IRON PLANERS, ENGINE LATHES, DRILLS AND other machinists' tools, of superior quality, on hand and finishing, for sale low. For description and price address NEW HAVEN MANUFACTURING COMPANY New Haven, Conn. 11tf

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 no gum. The "Scientific American," after several tests, pronounces it "superior to any other they have used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No 61 and 63 Main street Buffalo, N. Y.

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

IMPORTANT TO RAIL ROAD TRAVELERS.—THE PORTABLE RAILWAY HEAD-REST or POCKET-BERTH. Patented July 4th, 1865. SUBSTANTIAL, SIMPLE, COMPACT.

By means of the above invention, Railroad travelers may sleep at their pleasure, and ride days and nights continuously without experiencing fatigue. To Railway Companies, Railroad Agents, and Hotel Proprietors a liberal discount is made Agents wanted in all the principal cities. Address JOHN R. HOOLE, Selling Agent, 19 13* No. 124 Nassau street, New York.

IMPORTANT TO MANUFACTURERS AND INVENTORS.—SMITH & GARVIN, No 3 Hague street, New York, Machinists and Model Makers, are now ready to make proposals for building all kinds of light Machinery, Manufacturers' Tools, Models, etc. Satisfactory reference given. 22 4*

PATTERN LETTERS AND FIGURES (METALLIC)—For Founders men, Machinists, Pattern Makers, and Inventors, for lettering Patterns, etc. All sizes wholesale and retail. 20 10* KNIGHT BROS., Seneca Falls, N. Y.

THE AMERICAN TURBINE WATER WHEEL, PATented and manufactured by Stout, Mills & Temple Dayton, Ohio, possesses new and valuable improvements, and remedies defects which exist in all other wheels classed under the name of turbine. Per cent of power equal to overshots guaranteed. For descriptive circulars address STOUT, MILLS & SEMPLE, Dayton, Ohio or Oliver, Bro. & Co., agents, 45 Liberty street, N. Y., where sample wheels may be seen. 18 8*

KEEP YOUR CARRIAGES AND WAGONS PROPERly washered, thereby saving 50 per cent of the wear, and making them run easy and still. Use the Patent Washer Cutter, for cutting carriage washers, pump packing, etc. 18 10* KING & SMITH, Middletown, Conn.

$250 A MONTH MADE WITH THE BEST STENCIL TOOLS. For samples and prices address E H. PAYN, Payn's Block, cor. Church and Cherry sts, Burlington, Vt. 18 tf

ROCKWOOD & CO., PORTRAIT, LANDSCAPE, and mechanical photographers, 839 Broadway, New York. This establishment received two Medals, the highest Premiums awarded at the last Fair of the American Institute, for mechanical photographs. Models, letters-patent, and drawings photographed. 19 3m

THE CELEBRATED "SCHENCK" WOODWORTH Planers, with new and important improvements, are manufactured by the Schenck Machine Co., Matteawan, N. Y. T. J. B. SCHENCK, Treas. JOHN B SCHENCK, Pres't. 17 tf

GOULD MACHINE COMPANY, NEWARK, N. J. IRON AND WOOD-WORKING MACHINERY, STEAM FIRE ENGINES. SEND FOR A CATALOGUE. 13 13

AMERICAN PEAT COMPANY.—THIS COMPANY, having the right to operate under five patents, are now selling Machinery and Territorial Rights to the same, to manufacture fuel of the best description for steam or domestic use. 12 26* ALBERT BETTELEY, Agent, 42½ Kilby st., Boston.

$1500 PER YEAR, paid by SHAW & CLARK, Biddeford, Me., or Chicago, Ill. 19 12*

$150 A MONTH! NEW BUSINESS FOR AGENTS. [19 13*] H. B. SHAW, Alfred, Me.

FAN BLOWERS, OF DIFFERENT KINDS AND sizes, in store for sale by LEACH BROTHERS, 12 13* No. 102 Liberty street, N. Y.

REYNOLDS'S TURBINE WATER WHEELS!

REYNOLDS'S PATENT SWEEPS THE FIELD! New Improvements; Low Prices; Does not Clog; Has no Complications of Gates or Costly Flume Work; Compact for Shipment; Great Water Saver; THE ONLY WHEEL THAT EXCELS OVERSHOTS. Gold Medal awarded by American Institute for Superiority. Agents wanted in every county. GEORGE TALLCOT, 21 13* Late TALCOT & UNDERHILL, No. 95 Liberty street.

CAMDEN TUBE WORKS (OFFICE AND MANUFACtory Second and Stevens streets, Camden, N. J.), Manufacturers of Wrought Iron Welded Tube of all sizes; Peace's Improved Gas Pipe Screwing Machines for both Hand and Power; Pipe Vises, Stocks, Dies, Taps, Reamers, Tongs, and all other tools used by steam and gas fitters. Also Upright Drill Presses for both hand and power, constantly on hand and ready for delivery. 22 4*

PRESSURE BLOWERS.

PRESSURE BLOWERS—FOR CUPOLA FURNACES, Forges and all kinds of Iron Works. The blast from this blower is four times as strong as that of ordinary fan blowers, and fully equal in strength to piston blowers, when applied to furnaces for melting iron. They make no noise and possess very great durability, and are made to run more economically than any other blowing machine. Every blower warranted to give entire satisfaction. Ten sizes, the largest being sufficient to melt sixteen tuns of pig iron in two hours. Price varying from $40 to $345.

FAN BLOWERS, from No. 1 to No. 45, for Steamships, Iron Mills, Ventilation, Etc., manufactured by B. F. STURTEVANT, 1 tf No. 72 Sudbury street, Boston, Mass.

ANDREWS' PATENT OSCILLATING ENGINES.—Double and Single Engines, from ¾ 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., 1 tf No. 414 Water street, N. Y.

SETS, VOLUMES AND NUMBERS. Entire sets, volumes and numbers of SCIENTIFIC AMERICAN (Old and New Series) can be supplied by addressing A. B. C., Box No 773, care of MUNN & CO., New York. 5 tf

MODELS, PATTERNS, EXPERIMENTAL AND other Machinery, Models for the Patent Office, built to order by HOLSKE & KNEELAND, Nos. 528, 530, and 532 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN Office. 11 tf

A RARE CHANCE FOR INVESTMENT.—FOR SALE.—The patent right, for States, towns, and counties, for the best Ventilating Chimney Top ever invented. Numerous testimonials from proprietors of factories, foundries, steamers, hotels, etc., can be shown, attesting to its usefulness in creating draft, saving the expense of high chimneys, and a great saving of fuel. Pamphlets containing descriptive drawings and testimonials will be sent free, upon application by letter or otherwise to the patentee, B. A. HENRICKSON, 325 Kearny st., or J. E. Jeorgensen, 28 Third st., San Francisco. 18 7*

STEAM BOILERS CLEANED AND KEPT CLEAN.—N. SPENCER THOMAS'S Extract of Hemlock Bark. Cheapest and Best article ever discovered for removing and preventing scale in Boilers. Acts like a charm. Price only Ten Cents per pound. Send for circular. Address the Manufacturer, N. SPENCER THOMAS, 20 eow tf Painted Post, Steuben Co., N. Y.

CLOCKS FOR TOWERS, OFFICES, ETC., ALSO Glass Dials for illuminating. Address 7 13eow*] JOHN HERRY, Oakland Works, Sag Harbor, N. Y.

SCHOOL OF THE MASSACHUSETTS INSTITUTE OF Technology, Boston.—A professional school for the Mechanical, Civil, or Mining Engineer, Practical Chemist, Builder, and Architect; also provides a general education founded upon the Sciences, Modern Languages, and Mental and Political Philosophy. Requisites for admission:—Arithmetic, Algebra, Geometry, English Grammar, Geography, and the rudiments of French. Examinations for admission, June 4 and Sept 20. Special students admitted to partial courses without examination. For catalogue apply to 6 13eow* WM. P. ATKINSON, ry Secreta

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. S. C. HILLS, No. 12 Platt st. d

STIMPSON'S SCIENTIFIC STEEL PENS.—PATENTed March 20th, 1866. Agencies wanted in every city of the Union. For Terms address WM. B. STIMPSON 24 2* General Agent, 37 Nassau street, Room 38, New York.

WAUGH'S COMBINED SQUARE AND CIRCLE Shears, the most practical Machine for Tinners in use. Address [21 4*] J. WAUGH, Elmira, N. Y.

CASTINGS—STOVE AND LIGHT MACHINERY, ALL varieties, on short notice and at low rates. Freehold Iron Foundery and Machine Shop, Freehold, N. J. Orders received by 22 4* OAKLEY & KEATING, 184 Water street, New York.

OLMSTED'S PATENT FRICTION CLUTCH PULLEY is adapted to any machine that runs with a belt, and especially to the driving of lines of shafting where it is desirable to occasionally stop a whole line without stopping the main line.

Its distinguishing features are simplicity, durability and adjustability, as it can be adjusted to set in motion heavy bodies gently, or to speed up instantly.

Parties wanting these Pulleys are invited to correspond with WM. M. BETTS, Sole Proprietor, Stamford Machine and Tool Works, 19 13 Stamford, Conn.

ANDERSON & SCHERMERHORN, PATENT AND Model Makers, Gearing Cocks, Valves and Engine. Patterns of every description. Rear No. 47 Ann street, second floor 21 4*

LUMBER CAN BE SEASONED IN FROM TWO TO four days by Bulkley's Patent at an average cost of $1 per 1000 from the green. For circulars or information, address C. H. BULKLEY, 124 Superior street, Cleveland, Ohio. 20 5*

IMPORTANT TO MANUFACTURERS USING STEAM FOR POWER.

KELLEY & LAMB'S Improved Steam Engine Governor, the only Governor that will give the same speed, with high or low pressure of steam, or the Engine being light or heavy loaded,—is considered by those who have used it to have no equal, and is warranted to give satisfaction. Send for Circular. LAMB, COOK & CO., Proprietors. 20 26 Slatersville, R. I.

IMPORTANT TO COTTON AND WOOLEN SPINNERS. William C. Davol's patent mode of working the cam shaft, with other valuable improvements, on Sharp & Robert's Self-acting Mule. The above mentioned improvements can be seen on application to MARVEL DAVOL & CO.'S Machine Shop, Office on Pond street, Fall River, Mass. 23 4*

PEQUOT MACHINE CO., MYSTIC RIVER, Conn., Manufacture the most improved LOOMS FOR WEAVING TAPES, BINDINGS, WEBBING, RIBBONS, ELASTIC GOODS, AND ALL KINDS OF NARROW FABRICS.

Our Looms will run faster, do more work, are less liable to get out of order than other kinds, and are warranted superior to all others in every respect. Supplies of all kinds furnished for the same. 23 4

TOWERS' ALCOHOL PROCESS OF TANNING.

Patented Dec., 1865; requires but one-third the time necessary by any other process. It will tan the heaviest hides in less than two months

It will make better leather and more of it. Calfskins tanned by it will average a quarter of a pound more weight than can be obtained by any known process. The leather is better. Everyone knows the preservative effect of alcohol upon all animal matter.

It is applicable either to limed or sweated skins or hides. From sweated skins can be made upper leather as pliable and sole leather as easily sewed, as any limed leather in the market.

No complicated or expensive machinery is needed. Any tannery may be adapted to the use of this process, for less than one hundred dollars.

Specimens of the leather and the operation of the process may be seen, and any further particulars obtained, at the office, No. 30 Hanover street, Boston. 21 13* L. FREDERICK RICE, Agent.

WINTER'S IMPROVED CIRCULAR SAW MILL, with LANE'S PATENT SET AND FEED WORKS, the simplest and most effective device known. Labor-saving and time-saving.

The entire log, of any length, instantly and unerringly set throughout by the sawyer, with a single motion of the hand.

The world challenged to produce its equal. The patentee (Mr. Lane) will wager $10 000 that the mill can be made to cut from selected timber 20100 feet of inch boards in twelve consecutive hours.

And this is by no means a limit to its capacity. What rival interest, or who else will accept? Open to all.

Pamphlets furnished. Address WINTER & CO., 22 3* No 40 Broadway, N. Y.

TOPLIFF'S PERPETUAL LAMP WICK!

For the use of Coal Oil Lamps, the most useful invention of the age. NEEDS NO TRIMMING, consumes less oil, and gives more light than the common wicks. Samples sent for 20 cents, or two for 30 cents. Address MURPHY & COLE, sole manufacturers, Jersey City, N. J.

N. B. To dealers, and those who wish to become agents, we offer liberal inducements. Traveling agents can easily make from $5 to $20 per day. Orders by mail promptly attended to. 22

PLANS AND SPECIFICATIONS Prepared for Marine, Railway, and Manufacturing Machinery of every description.

STEAM VESSELS AND MACHINERY, STEAM ENGINES, NEW AND SECOND-HAND, Bought and sold on Commission.

HOISTING ENGINES, STEAM FIRE ENGINES, STEAM, POWER, AND HAND PUMPS, SHAFTING, HANGERS, AND PULLEYS. Giffard's Injectors, Steam and Vacuum Gages, Blast Pressure Gages, Sewall's Salinometers, Reliance Damper Regulators, Water Gages, Hydraulic Jacks, Dimpfel's Patent Fan Blower, ROEBLING'S PATENT WIRE ROPE for sale. C. W. COPELAND, 20 4 171 Broadway, New York.

SHAPERS, HAND LATHES, PUNCHES, and DIES. Also, all kinds of Machinery made to order, by 21 4* STOCKMAR & DUVINAGE, 530 Hudson street, N. Y

VALUABLE REAL ESTATE IN RICHMOND, VA., FOR SALE OR LEASE.

We are authorized to sell or lease four half-acre lots in the heart of the business portion of Richmond adjoining the celebrated Gallego Mills and Shoccoe Warehouse. An abundant water power can be obtained from the Basin of the James River and Kanawha Canal, which is very near the property. Almost any description of Manufacturing Establishment, in Richmond, would yield great profits at this time, and this property unquestionably offers the greatest advantages for such enterprises.

The Lessee or Purchaser could buy, at reasonable rates, a large quantity of valuable building materials now on the lots.

Liberal Terms will be extended to persons giving good security.

For particulars, apply to HARRISON, GODDIN, & APPERSON, 21 4* Richmond, Va.

BIND YOUR OWN MUSIC, NEWSPAPERS, ETC. Use ADHESIVE BINDING TAGS (Heyl's Patent). Circulars and samples, etc., sent gratis. Address H. R. HEYL & CO., 113 South 4th street, 21 4 Philadelphia, Pa

KENDALL'S $1 BAROMETER or Weather Indicator sent free for $1, Government money. Dealers supplied. Agents wanted. [21 4*] D. B. KENDALL, Box 188, Syracuse, N. Y.

CONNER'S SCREW WRENCH.

That so simple an implement as the common screw wrench should be made the subject of a number of patents, is perhaps surprising; but whenever strength and facility of handling can be secured by an alteration, such alteration is an improvement and is worth patenting. The implement now under consideration appears to be a strong and well-made article. It is fully described below.

This improvement consists in forming with the hub or outer jaw of the wrench, and projecting at right angles from its inner face, a hollow cylindrical tube having a slot extending the whole length, in which slides and is guided the movable jaw.—The heel of the movable jaw is made in a tubular shape, and fits in the said cylinder.



In the engraving, A represents the outer jaw, and B the inner jaw. C is the handle; D the screw that moves the inner jaw. The shank of the screw, D, is rigidly secured to the handle, C. A screw thread is cut through the inner portion of the movable jaw, through which the screw, D, passes, and by which it is moved. The end of the screw passes through the outer jaw and is allowed to turn freely in position, so that the inner jaw is readily moved back and forth on the screw.

This invention was patented February 6, 1866, through the Scientific American Patent Agency by T. J. Hennessey, to whom it was assigned by J. C. Conner, the inventor, before the issue.

Further information may be obtained by addressing Mr. Hennessey, No. 81 Beaver street, New York.

Remarkable History of a Torpedo Boat.

General Maury's report of the defence of Mobile narrates the eventful history of a torpedo boat as follows:—"It was built of boiler iron, was about 35 feet long, and was manned by a crew of nine men, eight of whom worked the propeller by hand. The ninth steered the boat and regulated her movements below the surface of the water. She could be submerged at pleasure to any desired depth, or could be propelled upon the surface. In smooth still water her movements were exactly controlled, and her speed was about four knots. It was intended that she should approach any vessel lying at anchor, pass under her keel, and drag a floating torpedo, which would explode on striking the side or bottom of the ship attacked. She could remain submerged more than half an hour without inconvenience to her crew. Soon after her arrival in Charleston, Lieut. Payne, of the Confederate navy, with eight others, volunteered to attack the Federal fleet with her. While preparing for their expedition the swell of a passing steamer caused the boat to sink suddenly, and all hands, except Lieut. Payne, who at the moment was standing in the open hatchway, perished. She was soon raised and again made ready for service. Lieut. Payne again volunteered to command her. While lying near Fort Sumter she capsized and again sunk in deep water, drowning all hands except her commander and two others. Being again raised and prepared for action, Mr. Aunley, one of the constructors, made an experimental cruise with her in Cooper River. While submerged at great depth, from some unknown cause, she became unmanageable, and remained for many days at the bottom of the river with her crew of nine dead men. A fourth time was the boat raised, and Lieut. Dixon, of Mobile, of the 21st Volunteers, with eight others, went out of Charleston harbor in her, and attacked and sunk the Federal steamer *Housatonic*. Her mission at last accomplished, she disappeared forever with her crew. Nothing is known of their fate, but it is believed they went down with the enemy."

EVANS'S WEATHER STRIP.

This invention relates to an attachment which may be readily adjusted to the sills or lower portions of French window or door frames, so as to prevent wind or rain from passing under the sash or door, as shown in Fig. 1, in which A represents a strip rabbeted or grooved upon the under side, which is fitted to a tongue or projection upon the upper side of the sill, as shown in the transverse view, Fig. 2. At the outer edge of the strip is a rabbet or projection, extending up a suitable distance above the lower edge and outside of the sash, C. When it is desired to close the joint underneath the sash, the eccentric lever, D, is turned up, which brings the eccentric portion of the lever against the upper side of the sill, which raises the strip against the bottom of the sash and the rabbeted portion snugly against the inside of the sash, thus rendering the joint proof against wind and rain. These attached strips may be made of either wood or

Fig. 1

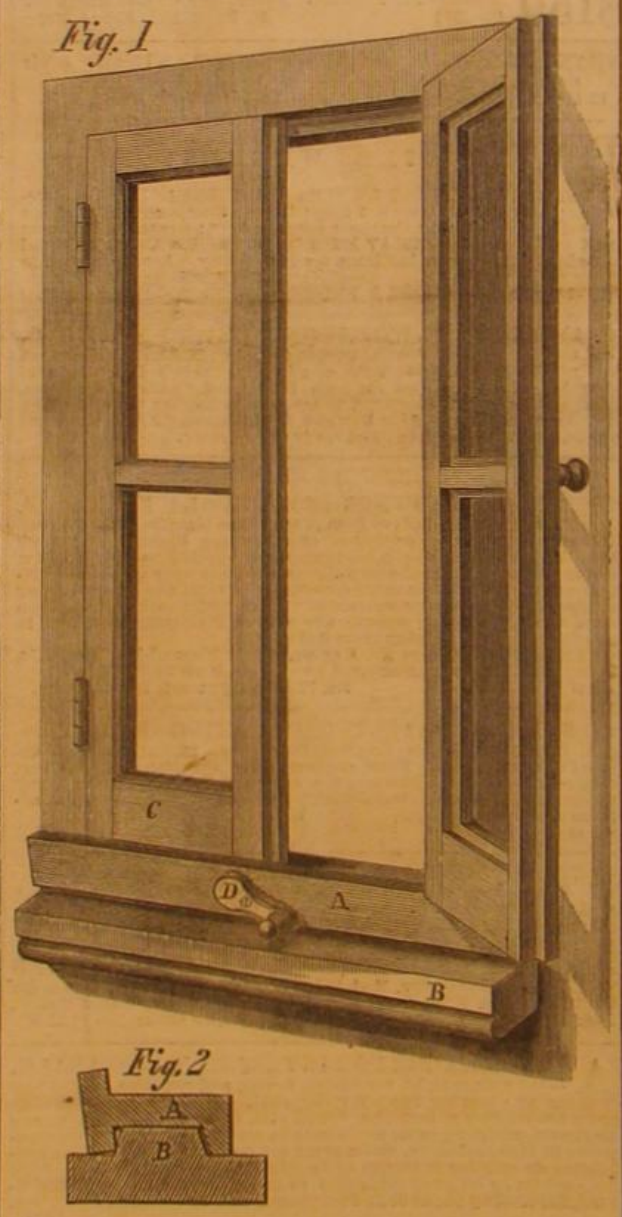


Fig. 2

metal, and when properly constructed, will be found of vast benefit to those who use the casement window.

Rights for the sale and use of this invention may be obtained of Edmund C. Evans, Cabinet, Pa. It was patented March 13, 1866. [See advertisement in another column.]

RYERSON'S CHURN.

This invention consists in the combination and arrangement of gear wheels with the dasher of a churn and their supports.

In the accompanying engraving, Fig. 1 is an end elevation, and Fig. 2 a side elevation of the same. A represents the barrel of a churn, of common construction, upon the top of which is secured by means of hooks and eyes, the cover to which the supporting frame, G, and inclined guides or braces, A A are attached. To this frame, G, are attached the spur or driving wheel, B, which meshes into a corresponding pinion, C, both of which run in suitable bearings. Upon the inner end of the shaft of the pinion, C, is a crank wheel, O, to which is attached the pitman, I, which is connected to the upper end of the dash handle, E. The pitman may be connected at any point of the dasher handle, E, and adjusted to any desired position by means of thimble or band and set screw, J. At the outer end of the shaft of the spur wheel, B, is a crank, H, by which the churn is operated.

Fig. 2

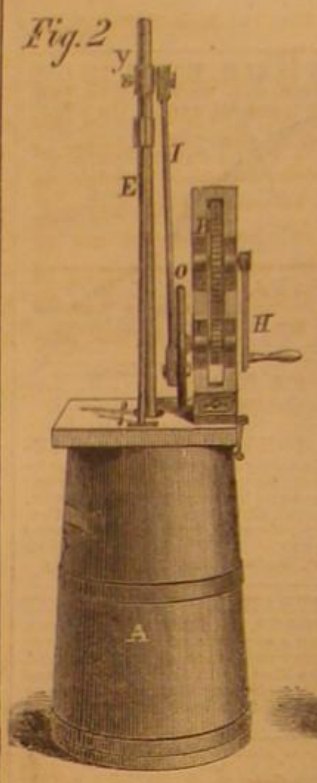
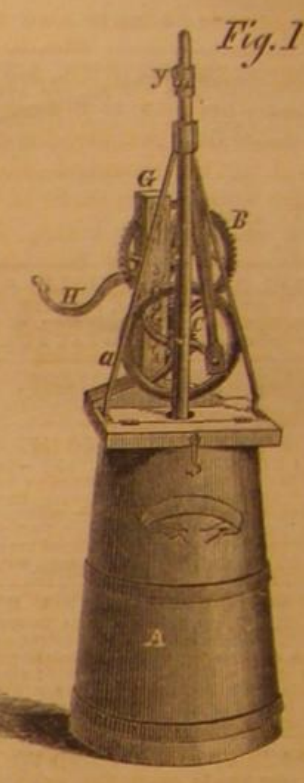


Fig. 1



It is claimed by the inventor that this churn is easy, rapid, and perfect in its operation.

The invention was patented Feb. 27, 1866. Further information may be obtained by addressing the inventor, Ira J. Ryerson, Box 30, Princeton, Ind.

THE whole army of Prussia has been placed in marching order, and the soldiers are chiefly supplied with bre ech-loaders on the needle principle. The Austrian army is supplied with excellent muzzle-loaders.

MECHANICS

INVENTORS, MANUFACTURERS,

The SCIENTIFIC AMERICAN is the largest and most widely circulated journal of its class in this country. Each number contains sixteen pages, with numerous illustrations. The numbers for a year make two volumes of 416 pages each. It also contains a full account of all the principal inventions and discoveries of the day Also, valuable illustrated articles upon Tools and machinery used in Workshops, Manufactories, Steam and Mechanical Engineering Woolen, Cotton, Chemical, Petroleum, and all other manufacturing and producing interests. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Electric, Chemical, and Mathematical Apparatus, Wood and Lumber Machinery, Hydraulics, Oil and Water Pumps, Water Wheels, Etc.; Household, Horticultural, 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 every body can understand and which every body likes to read.

Also, Reports of Scientific Societies, at home and abroad, Patent-law Decisions and Discussions, Practical Recipes Etc. It also contains an Official List of all the Patent Claims, a special feature of great value to Inventors and owners of Patents.

Published Weekly, two volumes each year, commencing January and July.

TERMS

Per annum.....$3 00
Six months.....1 50
Ten Copies for One Year.....25 00

Canada subscriptions, 25 cents extra. Specimen copies sent free Address

MUNN & CO., Publishers,
No. 37 Park Row, New York City

Messrs. MUNN & CO. have had twenty years' experience in procuring Patents for New Inventions. Inventors who may have such business to transact can receive, free, all needful advice how to proceed.

FROM THE STEAM PRESS OF JOHN A. GRAY AND GREEN

Scientific American.

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

Vol. XIV.---No. 25. (NEW SERIES.)

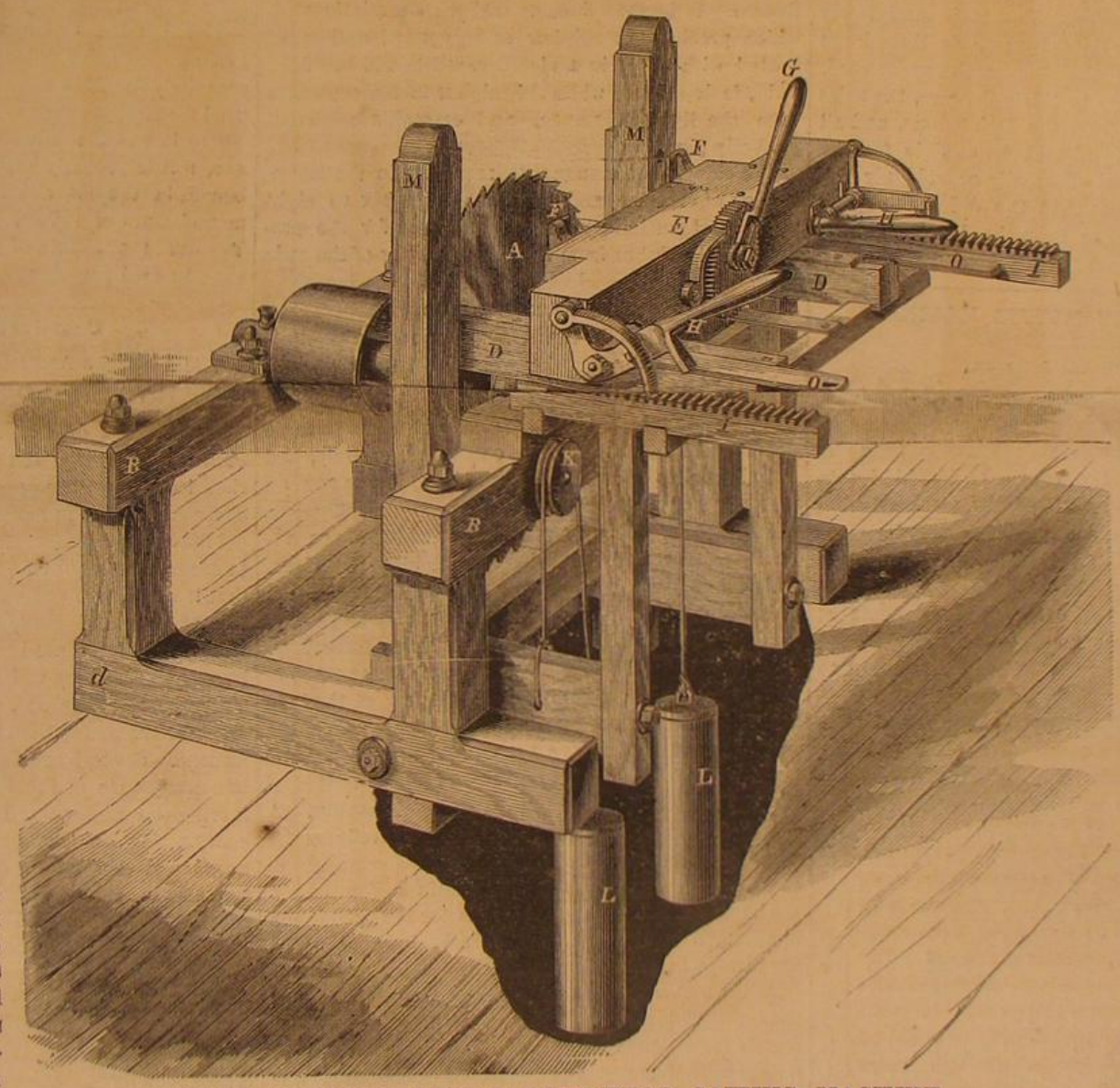
NEW YORK, JUNE 16, 1866.

$3 PER ANNUM IN ADVANCE.

Improved Shingle and Barrel-head Sawing Machine.

No department of industry, in a comparatively new country like ours, is of more general utility and importance than that pertaining to the manufacture of wood into the thousand-and-one forms of usefulness which wood can be made to assume. Slate has not, even in our large towns, yet usurped the use of shingles for roofing purposes, and the covering of buildings with tin or patent roofing is confined in its employment. In the newer and the more rural portions of the country where the material is easily and cheaply obtained, and water or steam power can be advantageously employed, shingles will continue for a long time to be the favorite material for roofing and weather boarding. The increased demand for short sawed lumber for barrel headings, fruit boxes, etc., makes every improvement in the preparation of lumber for such purposes an important matter.

The improvement illustrated in this article demands the attention of all interested in the above branches of business.



LOW'S SHINGLE AND BARREL-HEAD SAWING MACHINE.

A is a 36 or 40 inch saw, upon a substantial frame, B *b*, and is rotated by means of a band around the pulley, C. M M are the two slide posts on which are bolted the V-shaped vertical slides having opposite guides upon the bolt gate, or carriage, D D, which is counterbalanced by weights, L L, suspended by a five-eighth cord over the shives or pulleys, K K, (one not shown). E is a head block fastened down to the top of the bolt gate by means of gibs and sliding to and from the saw on the slides shown at O O, and is actuated or fed by the latch and pawl handles, H H, and feed rack, I I. G is the handle which operates the dogs at each end of the block shown at F F. There are two wedges, one located on each side of each slide post, in order to keep the bolt carriage perfectly in line with the saw in moving up and down.

In operation, the weights, L L, are sufficiently heavy to keep the bolt gate or carriage elevated above the saw, near the points, M M. The bolt or block is laid upon the top of the carriage, and the dogs, F F, are forced into the end by means of the lever, G, and held there by a latch. The handle, H (shown as raised), is now pressed, when it feeds the block forward over the saw, and at the same time pushes the balanced bolt gate down, the saw cuts up through the block, and straight with the grain, and makes a shingle. Remove the pressure of the hand and the bolt gate rises and is ready for another cut. By moving both handles, H H, at once, straight pieces are sawed, or without taper, for barrel heads, box stuff, etc.

The advantages claimed are simplicity, by which any person capable of keeping the saw in order can run one of these machines as well as a thorough mechanic, sawing from 1,700 to 2,500 shingles per day of eleven hours; the use of a thinner saw than generally employed, thereby saving material by less waste in the "kerf," a bolt being used entirely, one of only three-quarters of an inch thickness at one end by two and three-quarters at the other, having actually been cut with the machine into five No. 1 shingles; absence from danger in operating, and the advantage of sawing always with the grain. For further information, certificates, etc., apply to C. S. & S. Burt, Dunleith, Ill., or to S. J. Ahern, No. 88 Wall street, New York.

Torpedo Experiments in England.

Some torpedo experiments were recently made at Portsmouth, England, on a vessel moored in one of the many small lakes which intersect the shoals of that harbor. The vessel selected for the purpose of the experiment was the old wooden frigate *America*, a vessel that has been "used up" over and over again as a target ship for all kinds of shot and shell fired from the gunnery ship *Excellent*, and also as a target ship for carrying armor plates on her broadsides, when under trial, by the sixty-eight pounder and other guns.

The *America*, when moored in position for the experiment, had at high water about four feet of water under the keel (consequently lying high and dry at low water) and lay over a very pretty nest of torpedoes, which had been laid down in accordance with the wishes of the committee. Thirteen of these were fired in all, twelve being under the ship's bottom, and one projecting from a long spar over the stem of a ship's launch, and under and in contact with the ship's bows. Of the twelve under the bottom of the ship four were charged with sixty pounds of gunpowder, two with fifty pounds, two with forty pounds, one with thirty pounds, two with twenty pounds, and one with ten pounds of gun-cotton.

The charges in every instance were inclosed in cylinders made from one-eighth inch iron, with flat ends. The torpedo held in contact with the ship's port bow by the projecting spar over a boat's stem, was charged with ten pounds of gun-cotton, considered equivalent to thirty pounds of gunpowder, was inclosed in a similar iron case to the others, and was held in contact with the ship's port bow about six feet below the water line, the bow of the launch being not more than four feet clear of the bow of the ship. The torpedoes under the ship's bottom were laid at various distances and depths, the furthest off being fifteen feet and the nearest two feet six inches.

The signal was given soon after noon, and the discharge of the twelve torpedoes under the bottom of the ship immediately followed, succeeded in about thirty seconds by that of the single one suspended from the boat's spar under her port bow. The first explosion lifted the ship a good three feet above the surface of the water, fore and aft, an immense body of detached water at the same time shooting upward to a great hight all around her, and falling on her upper deck, together with innumerable pieces of splintered wood torn from the ship's hull by the force of the explosion.

The explosion of the bow torpedo, which immediately followed upon that of the main body, produced, comparatively speaking, a still greater display than did the united twelve under the ship's bottom. The column of water thrown up by the explosion was lifted to a much greater hight than in the preceding instance, and the actual effect produced on the ship appeared to be more decisive.

Thus, while there could be no doubt that the twelve torpedoes under the ship's bottom had sufficiently damaged her to insure her sinking, still no sooner had the bow torpedo been fired than the ship at once dipped her bows deeply in the water with an apparent inclination, had there been depth of water sufficient to raise her stern in the air, to go down

bow foremost. The vessel's keel was on the mud, and the water inside her up to the beams supporting the planking of her main deck in about eighty seconds from the time of the firing of the first torpedoes.

The greatest apparent damage visible immediately after the explosion of the torpedoes, as the ship lay on the mud, with the water inside her level with the hight of water outside, was forward, where, to some distance abaft the fore hatchway, the keel of the vessel was evidently broken in two, the deck there being settled down at various angles, and the beams broken by the collapse and severance of the vessel's frame.

Inside the ship the real amount of the damage was something frightful to look at. Every part of the ship appeared to have been shaken out of place in a most extraordinary manner, and forward, the unsafe state of the decks, with huge pieces of splintered beams quivering overhead, made it a matter of considerable peril to venture there. This was, perhaps, not altogether the effects of the shock given by the explosion of the torpedoes. The explosion had been the immediate cause of the damage, but the latter may have been completed by the vessel striking the ground heavily with her keel in the "send" of the water, when she fell again from her lifting up by the explosion. The main and lower decks of the ship now lie driven up in three huge transverse furrows from the after-hatchway forward, at angles at from twenty to thirty degrees, the sides of the ship stand away from the deck beams, and all is perfect wreck. It is almost impossible for any vessel to have been more effectually or suddenly destroyed, at the same time that the difference in the appearance of the damage from the inside and the outside of the ship is most remarkable.

UTILIZATION OF REFUSE MATTER.

For the Scientific American.

In a country like ours overflowing with the riches "a penny saved is a penny earned."

The experience of the last decade has fully demonstrated the fact, that treasures lie hidden in the so-called worthless refuse of our manufacturing industry; in proof of which assertion may be mentioned the dazzling aniline colors which come from the very source that supplies oil of almonds or nitrobenzole, used in the almost endless requirements of the toilet. There are a great many matters despised and thrown away by manufacturers which ought to be preserved.

We will direct our attention to the utilization of waste in the manufacture of

SODA AND CHLORIDE OF LIME.

In order to utilize the bulky waste matter from the manufacture of soda and of chloride of lime, the liquid acidulous offal from the production of chloride of lime is exposed to rest for a sufficient period of time to deposit such solid bodies as are suspended in the same. They are next withdrawn into tanks and there mixed with the exhausted residue from the manufacture of soda, in sufficient quantities to neutralize the free chlorine, and to reduce the chlorates of iron and manganese to chlorides. During this operation sulphur is deposited, and may be collected, while small quantities of sulphureted hydrogen are formed, which are conducted into a mass of hydrated oxide of iron, and are there absorbed.

The liquid thus freed from chlorine, but still acidulous, is run into other vats and neutralized with the refuse of the soda manufacture. The sulphureted hydrogen, arising in considerable quantities, is burnt in such a manner as to produce water and sulphur, or water and sulphurous acid.

The waste in the manufacture of soda consists of sulphuret of lime and lime, in the proportion of two of the former to one of the latter. Exposed to the air this sulphuret of lime is changed into bisulphuret and caustic lime. This may be illustrated by the following formula—

$$2\,(Ca\,S)+O=Ca\,O+Ca\,S_2.$$

The bisulphuret next becomes oxidized to hyposulphite of lime, as shown in the following formula—

$$Ca\,S_2+3O=Ca\,O,\,S_2\,O_2.$$

This salt in turn is changed again, on drying, into sulphite of lime and sulphur, as shown in the following formula—

$$Ca\,O,\,S_2\,O_2=Ca\,O,\,S\,O_2+S.$$

This sulphite is again rapidly oxidized into sulphate of lime, the remaining sulphur changing anew some sulphuret of lime into bisulphuret, and sometimes even into polysulphurets. The sulphuret of sodium suffers similar changes. Heaps of this material, when exposed to the rain, are to a great extent dissolved by it, producing a yellow or orange-colored alkaline liquid, containing the sulphurets and hyposulphites of lime and soda. This liquor, injurious to animal and vegetable organism, may be advantageously made into hyposulphites and sulphur, by exposure to the sun in thin layers, where it becomes oxidized, or by treatment with sulphurous acid gas. It may also be used for the precipitation of chlorides of manganese and iron, when the precipitate will consist of sulphurets, mixed with sulphur, or of polysulphurets, which may be burned to advantage for the manufacture of sulphuric acid. This manner of utilizing the refuse matter is employed by Kopp, who recently mentioned it to the French Academy.

In some parts of Germany, a slightly different plan is pursued. The refuse matter is oxidized by exposure of air for several weeks, when it is exhausted, the resulting liquors possessing a strength of 10 to 15° Baume. It is then decomposed with muriatic acid, which precipitates sulphur and gypsum, and being heated with water in a closed vessel to 230° or 240° Fah., is deposited, while the sulphur melts, separates from the limy substance, and crystallizes almost perfectly pure.

The chloride of manganese, resulting in the manufacture of chlorine, and which contains six to eight per cent of muriatic acid, may be used for the production of sulphur from the refuse matter of the soda manufacture.

UTILIZATION OF BLOOD.

Among the offal—the accumulation of which is much dreaded during the warm season, especially with an apprehended epidemic at our doors, blood [illegible] produced in enormous quantities in our populated cities, and liable to rapid decomposition, ought to be consumed entirely, and not allowed to contaminate the air by being run off through the gutters of our streets.

In Chicago, where over a million of hogs are annually slaughtered, the blood runs into the river, which has gained for it the unenviable reputation of being the most intolerable disgrace of a large city, rendering it not only filthy but exceedingly unhealthy. In that city, in place of being a continuous source of annoyance and necessitating the digging of the lake tunnel for the procuring of pure drinking water, the wasted blood might have been productive of capital large enough to pay for the tunnel itself, if it had been used and disposed of in a rational manner. A small portion of blood is used by sugar refiners for clarifying, though it frequently becomes annoying in summer, when it turns putrid within a few hours.

The use of the blood proposed is for the production of albumen and prussiate of potash, both of which are always in demand, commanding a fair price, and which we now import from Europe, while we have the facilities for supplying more than our own demands for those articles. Blood was tried in Europe for the manufacture of prussiate of potash, but was not liked on account of its liquid state, which necessitated tedious evaporations. It was also tried for the manufacture of albumen, but the product was always black, owing to the incomplete separation of the coloring matter, and therefore only fit for clarifying purposes, possessing a comparatively small value.

The process given below was recently patented by A. H. Hirsh, of Chicago, Ill., and produces a very thorough separation, keeping the liquid albumen light colored, and concentrating the nitrogenous solid coloring matter of the blood into a firm substance, which by itself, or mixed with other animal offal, may be turned advantageously into prussiate of potash. For this purpose the blood, as it runs from the slaughtered animals, is collected in large tanks and is there stirred with water, charcoal, and chemicals, preventing the emission of offensive odors, which renders the manufacture possible in cities even during the warm season. The liquid is allowed settle, or it is passed through a centrifuge, which retains the coloring matter and other solid parts of the mixture, while the serum passes through the centrifuge. As a matter of course, it requires some practice to select the proper filtering cloth for the centrifuge fine enough to prevent the emission of coloring matter, and coarse enough not to be clogged by the albumen. The pure serum is then evaporated in a vacuum pan or a peculiarly constructed evaporator, which in a short time renders the albumen dry and brittle, and preserves its color, so that it closely resembles the albumen prepared from eggs. The colored solid part of the blood is then placed into so-called carbonizers, where it is transformed into animal charcoal, and is then treated with iron and potash in proper equivalents to produce the prussiate of potash by calcination.

The calcined salt is purified by repeated crystallization. The process also uses the blood cake for the same purpose, without carbonizing it, and employs, during calcination, gas water as an additional source of nitrogen, which increases the quantity of the resulting cyanide. The blood produces on an average six per cent of albumen, and four of the prussiate, although the relative quantity of the two products changes with the kind of blood employed. After exhausting the calcined prussiate, sulphurets of iron and potash remain as a residue, which may be turned advantageously into sulphuric acid.

The albumen is largely employed in animalizing fabrics, to render colors fast, but must, of course, especially for light colors, be pure. It may also be used for clarifying sugar in place of blood or eggs, where it has the advantage of being unaffected by age, if it is properly kept dry, which is especially of benefit in the hot climate of the South, where the manufacture of refined sugar is being established. The use of prussiate of potash, for the production of the so-called prussian blue, of ink, is well known.

Cast-iron Projectiles.

The American Army Ordnance Bureau has adoped, as the lowest limit of tensile strength in cannon projectiles, 24,000 lbs. to the square inch. This, says a correspondent of the American *Army and Navy Journal*, precludes the possibility of making shot or shell from the casting of a cupola furnace, unless charcoal is used in smelting the iron, and will compel founders to resort to the reverberatory furnace to secure the required strength. It is believed now that if any future orders are given for the manufacture of shot and shell, only the very best quality of gun iron will be used—that is, cold blast charcoal iron—and that they will be required to be cast from a reverberatory furnace, which will produce iron of a much better quality than when remelted in an ordinary furnace. Several accidents occurred during the war in consequence of the breaking of projectiles before leaving the gun, caused by the simple force of the gases acting on the worthless iron, breaking it into fragments. At least one officer lost his life by standing too near the range of the gun, when a fragment of a shot, thus broken and thrown out of the range, struck him in a vital part.

The journal above quoted observes that it is very plain that this statement is true enough if cast-iron projectiles shall continue to be used against ironclads; but, of course, against wooden vessels there is no necessity for any finer iron than has heretofore been employed. It is, however, pretty clear that if the Americans are going to adopt the heavy charges of powder necessary to produce decisive results in ironclad warfare, they must use steel for projectiles, a fact which experience has abundantly proved. What their iron founders need to do now is to put up some of Bessemer's converters, and then they will have projectiles really worth discussing.—*Mechanics' Magazine.*

THE TURRETS.—We understand that the Admiralty have resolved, in order to test as fully as possible in times of peace the turret principle, as fitted with the revolving tables and wheels on Captain Coles's plans, to fire a steel bolt at one of the turrets at short range from the Armstrong 10-inch or 300 pounder rifled 12-tun gun, now on board the iron armored frigate *Bellerpohon*. The day is not yet fixed for the experiment. This suggestion was made some time since, in the debates on the navy estimates, and it is indeed time it was carried out.—*London Engineering, May* 18.

BRIDGE BUILDING—THE BRIDGE OF THE HARTFORD, SPRINGFIELD AND NEW HAVEN RAILROAD OVER THE CONNECTICUT.

Brown & Gross, of Hartford, have published a pamphlet giving a description of the new iron bridge over the Connecticut River, at Warehouse Point, on the line of the Hartford, New Haven, and Springfield Railroad. The pamphlet contains also a brief history of iron bridges. The bridge replaces a wooden structure on stone piers, and was built on the old piers with the addition of several new ones in the same line, so that the present structure occupies the exact site of the former one, and during the seven months of its construction no delay of trains was caused by the work. This is remarkable when the magnitude of the work is considered. The bridge is 1,524½ feet in length, composed of 624 tuns of wrought iron, the flooring only being of wood. In its construction 175,000 rivets were used. The cost was $264,784 63, and it is capable of bearing a strain of two and a half tuns to the foot. The iron work was made in England by Fairbairn & Co., of Manchester, and the London Engineering and Iron Ship Building Company. The plans and designs were by James Laurie, Civil Engineer, of Hartford, Conn. It is the largest work of the kind in this country.

The subject of bridges, those which are incombustible, is as important a one as any that can engage the attention of our practical men. Wooden bridges seldom pay for the cost of their construction. On railways their tenure of life is only ten or twelve years. In time of peace these bridges are constantly exposed to destruction by fire—accidental sparks from the locomotive, or the stumps of cigars thrown from smoking cars; and their lightness gives the wind a tremendous power to unseat them. In this case (over the Connecticut) a wooden bridge was thrown bodily from the piers in October, 1846. The danger of weakening by decay adds to the insecurity of wooden bridges. Frequently, also, their location, remote from dwellings where the incipiency or progress of a fire cannot be observed, renders wooden bridges for railways really expensive structures.

For this class of bridges cast iron is unfitted, as no cast-iron bridge can sustain its own weight when suspended between piers at the distance apart that is often necessary on railroads, unless it is arched. Frequently it is impossible to provide springing points for the arches at a sufficient distance below the roadway to give a level surface for the rails. For ordinary travel, cast iron can be used in the construction of bridges, but most engineers prefer, for railroad purposes, wrought iron.

On our railroads, both the roadways and the bridges, have been built more to accommodate a present demand than to provide for future requirements. The result is, that a large portion of the earnings of the roads have been required to repair or replace work, which, if properly performed at the outset, would have remained *en permanence*. The system is a foolish and wasteful one. If the roads reaching from the loyal States into the South, during our war, had been provided with substantial wrought iron structures, much less damage would have been inflicted upon them than where the application of a match, with some combustible material, would insure the destruction of a connection between the two banks of a river.

The delay and inconvenience to travel is another reason why the bridges on our railroads should be of a permanent character. The annoyance and trouble caused by the burning of the Coscob bridge, on the New York and New Haven Railroad, a few months ago, is fresh in the minds of all. We hope the construction of the Connecticut River bridge will serve as an impetus to our railroad companies to replace the present wooden structures with permanent works; the country needs them, and the best interests of the railroad companies demand them.

When gunpowder is heated nearly up to the point of decomposition, previously to ignition, the force of its explosion is greatly increased. It is stated that a temperature of 160°, Fah., increases the force of the explosion one-fifth, while a temperature of 400° nearly doubles it. This may in some measure account for the fact that highly heated guns are liable to burst, if the charge has been allowed to remain in the chamber a sufficient time before firing.

New Method of Copying Pictures.

The last number of the *British Photographic Journal* comes to us with a specimen illustration of a novel mode of copying and reducing pictures, which is remarkable for the excellence and accuracy of the reproductions. Upon a single sheet, equal in size to a page of the *Journal*—which is a trifle less than a page of the Scientific American—we have an original lithograph picture reduced to a very small compass, followed by three *fac similes*, each of different dimensions, and each comprising the printed matter of an entire page of the *Journal*. One of these pages is reduced from a superficies of 73 inches down o 3⅓ inches, yet every word in the page may be easily read.

The following is the process:—

"A sheet of india-rubber of the thickness of cardboard is fixed by the edges to a suitable frame, the mechanism of which is so constructed as to cause, by the simple operation of turning a handle, the web of indi-rubber to be expanded equally in every direction and to any extent. Of the very ingenious mechanism employed for this expansion it is unnecessary for us to speak; let it suffice to say that the action is very uniform and under control. The four sides of the frame to which the elastic web is attached, recede from or approach to each other by manipulating the adjusting screw in one corner. If, when the elastic sheet is expanded, an impression be printed on its surface by means of transfer ink, it is obvious that when the sheet is allowed to contract to any given extent, and the print be then "set off" or transferred from the rubber to a new and polished stone, the resulting picture will be a perfect and reduced *fac simile* of the original. This reduction is much more perfect than could be produced by any artist, no matter how accomplished he be; and coarsely executed work, such as that of the commonest wood engraving, may thus be made to rival the finest steel engraving, so far as fineness in the lines is concerned.

"Impressions from wood engravings and type become exceedingly valuable by means of the Pentagraph, as these, [illegible] exquisite results, and can be altered to suit every purpose without reference to original size; thus effecting immense saving in labor and time, as evidenced in the present illustration.

"The practical value of this invention to a lithographic establishment, may be briefly stated in a few words; for instance, a bill-heading, after being once engraved, and transfers made or impressions taken upon the elastic transfer medium, can be altered and transferred to stone to fit any size of paper. Show cards can be reduced to print as business cards. Transfer impressions taken from wood engravings or type, reduced and transferred to stone, yield printed copies as fine as engravings; crayon, or chalk drawings, when drawn to an enlarged scale and printed on elastic transfer medium, and reduced when transferred and printed from stone are superior to any thing that could be done by the ordinary mode, and this is the only process by which duplicate transfers of chalk drawings can be accomplished that yield impressions superior to the original drawing. Engravings executed to a medium size may be used for obtaining reductions and enlargements, also contorted or metamorphosed, and used for any desired purpose, without the expense of engraving duplicates for each size. Manufacturers using various sized package lables or tickets may have their show cards reproduced as labels for each packet, as suitably as if engraved for the purpose, but possessing this great advantage, that each label, though different in size, presents the same character, thereby rendering imitations difficult and more easily detected."

MISCELLANEOUS SUMMARY.

The London *Mechanics' Magazine* says that Captain Coles has selected Messrs Laird out of six firms suggested to him for building his new cupola ship. These gentlemen have already built six of this class of vessels. There are now nineteen turret ships built or building.

Dolomite, or magnesian limestone, calcined at a lowered heat and powdered, and then made into a paste, forms under water a stone of extraordinary hardness.

Tight Alcohol Barrels.—Barrels or casks designed to be filled with alcohol, may be made tight by the application of the following solution: Dissolve in a water bath 1 pound of leather scraps and 1 ounce of oxalic acid, in 2 pounds of water, and dilute gradually with 3 pounds of warm water. Apply this solution to the inside of the barrel, where, by oxidation, it will assume a brown color and become insoluble in alcohol. This coat closes all the pores of the wood and does not crack or scale off.

Cure for Hydrophobia.—The Leeds (England) *Times* says that the nitrate of silver rubbed into the wound made by the teeth of a mad dog will certainly cure hydrophobia, or prevent all injurious consequences of the wound. It should be applied as soon after the accident as may be. In six weeks the virus is disseminated through the system and then hope is gone. Youatt says he has been bitten eight or ten times and always cured himself by this means.

Losses of the South.—Robert Tyler, in a recent letter, estimates the losses of the Southern States as a result of the war, at the enormous sum of $3,500,000,000, which includes the item of $1,700,000,000 for emancipated slaves. He thinks that in the whole history of war such an immense loss has never been so suddenly and completely suffered by a country containing not more than six millions of people responsible for government and property.

The presence of a mineral adulteration of flour or meal may be readily detected. A small quantity of the suspected flour is shaken up in a glass tube with chloroform. All mineral adulterations will collect at the bottom, while the flour will float on the liquid. In this country, where the comparative cheapness of flour makes adulteration unprofitable, this test may not be valuable; yet the fact may not be without interest.

The small steel chain that winds round the fusee of a watch is about 8 inches in length and contains about 500 links riveted together. Modern invention has as yet discovered no substitute for this chain. The links are punched out by girls from plates of steel and riveted one to the other.

An iron ore of peculiar character has been discovered in Ireland. It has much the appearance of plumbago, leaving a greasy stain when rubbed between the fingers. It was unacted upon by the blow pipe, and contained no carbonaceous matter. Its composition is, ferric oxide, 90·5; matter insoluble in HCl and NO_5, 9·5.

The London *Engineering* says that in the Paris exposition but 70,000 square feet of space can be allotted to British exhibitors, while the applications are for upwards of 300,000. In the case of the Americans, Messrs. William Sellers & Co., of Philadelphia, have applied for more space than the whole quantity allotted to the United States.

The sugar lands which lie along the banks of the navigable streams in Louisiana are now chiefly devoted to cotton. During the war a good deal of the necessary machinery was destroyed, and much of the plant cane was lost. The planters have not had the necessary means to renew their material, and consequently sugar ceases for the time being to be a staple product of Louisiana, notwithstanding the fact that she was once the third sugar-exporting country in the world.

Gunpowder Marks.—Dr. Davies, in a recent number of the London *Lancet*, states that he has found the following treatment most successful: smear the scorched surface with glycerin, by means of a feather, then apply cotton wadding; lastly, cover with oil silk. In one case the discoloration was very great, the patient looking more like a mummy than a living being. It entirely subsided in a month by the above treatment.

Northern capital is pouring into East Tennessee and especially into Knoxville and Chattanooga. New houses and factories are springing up, and farms are being purchased by farmers and army officers. Several extensive steam saw mills, iron founderies, and a large cloth manufactory, are projected at Chattanooga.

A new textile plant has been discovered in Mexico. Its fibers are extremely long, having the appearance of those of hemp, but are much finer. By chemical means it may be reduced to perfect whiteness and the waste may be worked into a pulp for paper.

NITRO-GLYCERIN AGAIN---HOW TO MAKE IT SAFE.

BY PROFESSOR CHARLES A. SEELY.

The public interest in nitro-glycerin is still kept fresh by more terrific explosions;* the wonderful power of the new agent of destruction has now been felt in all quarters of the globe. Nitro glycerin has already cost us millions of property and nearly a hundred lives—very valuable, indeed, must it prove, to be worthy of such sacrifices. Would it not be well to banish it at once and forever? Should not even the possession of it, under any circumstances whatever, be made by statute, a penal offense? I confess that I should answer yea, unhesitatingly and heartily, were I convinced that the nature of nitro-glycerin cannot be understood, and that its power to destroy cannot be controlled.

In an article on this subject in the SCIENTIFIC AMERICAN of May 5th, I made the assertion that the dangers from nitro-glycerin are preventable, and that sure means were known by which its transportation and storage could be made safe. I shall now describe the most perfect of the plans proposed, and I ask that those who are interested in the subject will carefully weigh them.

First, Mr. Nobel proposes to dilute the nitro-glycerin with wood naphtha. These two liquids mingle in any proportion, and the explosibility of the mixture may be reduced to any desired extent. Probably a mixture containing about 25 per cent of naphtha could not be made to explode by percussion, or gradual heating. When the nitro-glycerin is required for use, water is added to the mixture and takes from it the naphtha, while the pure nitro-glycerin sinks to the bottom. This plan is, however, liable to serious objections. 1st. The expense of the naphtha and loss of nitro-glycerin in washing with water. 2d. The volatility of the naphtha: whenever the mixture is exposed to air some of the naphtha escapes and the nitro-glycerin might be left unprotected. 3d. It is probable that there would be a chemical action between the substances. 4th. The naphtha and the vapor from it are very combustible mixture.

Second, It has been proposed by several persons quite independently of each other, to keep the nitro-glycerin mixed with sand, or other inert substance which should serve as a conductor of heat, in the same way as the glass powder in Gale's gunpowder mixture. This plan would greatly increase the weight and bulk of packages, and great loss would be sustained by reason of the adhesion of the nitro-glycerin to the sand.

Third, Dr. Henry Wurtz proposes to make a thorough mechanical mixture or emulsion of the nitro-glycerin with a saline solution of the same specific gravity. A solution of nitrate of zinc, lime, or magnesia, will probably be found to be suitable. When the nitro-glycerin is needed for use, water is added to the mixture when the oil subsides and may be drawn off. Further experience seems to be needed to determine how long the mixture may be maintained without spontaneous separation.

Fourth, I have proposed to prepare the nitro-glycerin more carefully, in order that it shall be perfectly freed from acid; and to prevent any future accumulation of acid, I propose to keep suspended in the oil a small quantity of a substance in powder which shall neutralize any acid which may be generated, and which of itself shall have no action on the oil. This method is offered as an efficient prevention of spontaneous decomposition. The amount of neutralizing powder required is very little—60 grains to the lb. of oil might be sufficient. The quantity is so small that it would not interfere with the use of the oil, and need never be removed from it.

In actual practice one or more of these plans may be combined. The fourth is compatible with all the others, and should be used with all the others; nitro-glycerin should not be kept in storage unless it is free from the danger of its most formidable property—the liability to spontaneous change.

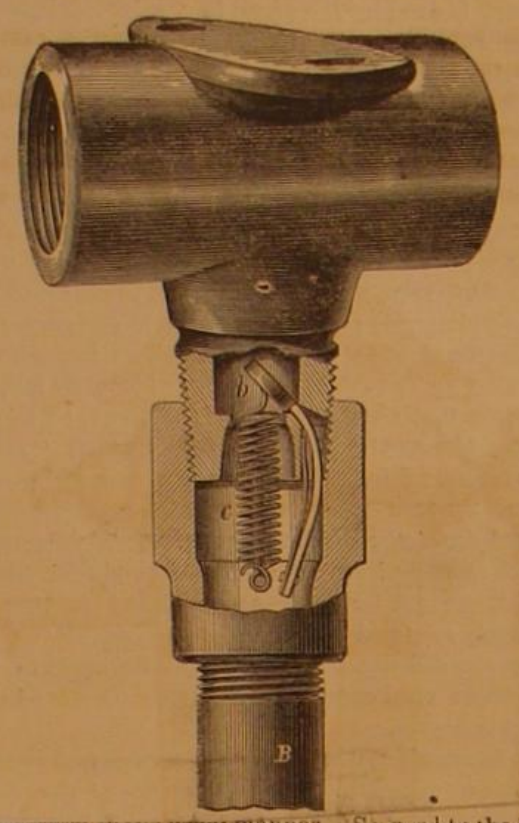
In conclusion I can say that I have as yet had no reason to modify the opinions which I expressed in my communication of May 5th, and that I still hold that the manufacture, transportation, and use of nitro-glycerin may be carried on with safety. I believe all the careful and thoughtful readers of this article will agree with me.

*In Australia and England.

JACOB'S SAFETY GAS VALVE.

This device is intended as an automatic preventive of the escape of gas into a room from an open pipe caused by the accidental or intentional detachment of the parts. In making repairs on the pipes supplying a building, the gas-fitter screws on a cap to the open end of the pipe; but this invention is intended to obviate the necessity of this, but more especially to protect the inmates of a room from fire or strangulation in case of an accidental rupture of the parts of a pipe.

In the engraving, A represents a T or nipple on the ceiling of a room to which the drop pipe, B, is



connected in the usual manner. Secured to the inside of the joint is a small valve, *b*, connected to a spring shutting in a slot on the thread of the nipple. When the connecting pipe is detached the spiral spring, *c*, closes the valve firmly against the orifice, preventing the escape of gas. When the thimble connecting the T and pipe is screwed on, it shuts the side spring which projected beyond the thread and closes it into the slot, thus overcoming the resistance of the spiral spring and keeping the valve open.

This invention was patented through the Scientific American Patent Agency on May 22, 1866, by Auguste Jacobs, No. 171 West 28th street, New York.

New Music Hall.

Messrs. Steinway & Sons, the celebrated pianoforte makers, are now erecting, on East Fifteenth street, a splendid Music Hall adjoining the rear of their ware rooms, which will, when completed, be an ornament to the city. The corner stone was laid on the 26th ult. by Mayor Hoffman, with appropriate ceremonies. It is to be 123 feet deep and 75 feet wide and 43 feet high.

The basement walls are granite, three feet thick, the first story walls two feet eight inches, and the walls of the concert hall 28 inches thick from floor to ceiling, with heavy supporting columns, all laid in cement. There are two center walls, running the entire length of the building from the foundation, directly under and supporting the beams of the concert hall floor, each wall 20 inches thick. The stage will be placed at the end fronting Fifteenth street, and the main entrance will be from Fourteenth street; but there are also two doors of exit, each seven feet wide, on either side of the stage, leading directly into Fifteenth street—thus allowing the hall to be emptied in a very short space of time. Fronting Fifteenth street, and along the westerly side of the hall, an additional building is being erected, containing the artists' dressing-rooms, even with the stage. The upper story will contain the wind chests, and some of the heavy work of the organ. There will be two galleries (one above the other) at the end of the hall toward Fourteenth street, which will extend on either side of the hall about one-third of its length only. The hall will be finely decorated, and lighted and ventilated in the best possible manner. It will be heated with steam, the steam generator being located outside of, and some distance from, the building. The front, on Fifteenth street, is being built of the finest Philadelphia front brick, with brown stone trimmings and finely ornamented pillars and caps. Connecting with the main hall is a large room in the second story of the front building, twenty-five feet wide and eighty-four feet deep, affording room for 400 persons, so that there will be ample and comfortable sitting room for 2,500 persons. The fine organ from St. Thomas's Church, of thirty-two stops, has been purchased, and will be fitted up to serve temporarily until the grand organ is finished. On the whole, it will be one of the finest and most elegant Concert Halls in the country, worthy alike of its proprietors and of the metropolis.

CIPHER WRITING.

An Ohio correspondent sends us a table for cipher writing, which is one of the oldest forms of secret communication. It consists of the alphabet arranged in parallel lines, horizontal and vertical, the only secret being an understanding between the two parties as to the key word or words, which may be changed indefinitely; as for instance, the first words or address of a communication being located over the table as a key to correspond with the letters in the body of the epistle. It makes a pleasant pastime, and can, perhaps, be turned to account in important matters. The value, however, depends entirely on previous agreement between the parties in communication.

This subject seems to have awakened considerable interest, and we were about to prepare a brief article in relation to it when we received the communication published below. Mr. Round is the only correspondent who has succeeded in translating the cipher message of our Norfolk correspondent, published in our issue of May 26th. His translation is *verbatim et literatim*. Probably our readers will find the task he sets them a most onerous one, as he seems to be a master in the occult art of cryptography. [EDS.

WESLEYAN UNIVERSITY, Middletown, Conn., May 28, 1866.

MESSRS. EDITORS:—I notice in your issue of the 26th, a rebel message in cipher. Translated it reads as follows:—

"The President deems it advisable that you should be charged with the military operations on both banks of the Mississippi, and that you should endeavor as promptly as possible to cross that river with as large a force as may be prudently withdrawn from your present Dept. You will accordingly extend your command to the east bank of the Miss., and make arrangements to bring to this side such of your present force as you may deem best."

I had never met this particular cipher before, but the general principles upon which the rebel ciphers were founded have been long known at the Signal Bureau at Washington, having been first discovered by Geo. H. Stone, now a student at this University, then belonging to the Signal Detachment of the Department of the South.

Your correspondent promises us a cipher which cannot be translated. By all means let us have it. Such things are very rare, particularly if they are simple enough to be of use.

Your correspondent remarks that he has never seen a cipher in public print which could not be translated. I would refer him to a challenge message which Col. A. I. Myer, formerly of the Signal Corps, published last winter in the *Army and Navy Journal*. It remained before the public three months untranslated, although a reward of $50 was offered for its solution.

To test the skill of your readers I append a short message, for which I challenge a translation, by any one who has not been connected with the Signal Corps. Perhaps Mr. D., of Chicago, who knows so much about signaling, will deign to give us the key.

TZLDUJL—TRJLYLY—JYRLLYR—INGLYWL—YINGBSX—VXIOLUJ—PJXAWPB—OICBWKM—YXIDTIC—RWCLTVN—QLTIING—LYKRYXD—IEZVFEQ—XIIFQCT—BOBTION—JKZBGHW—PJ&IZTI—ONSCSPQ—VNVZAXF—XRMTXIB—LETIONR—BYBYYHY—LYXVZAA—NDPVFRT—YJIFLNH—VMSOQWS.

Accompanying this you will find the translation.*

GEO. C. ROUND,
Late Lieut. and Signal Officer, U. S. A.

[The translation is reserved.—EDS.

GLEANINGS FROM THE POLYTECHNIC ASSOCIATION.

The subject of roofing was again taken up, but no new facts elicited. The merits of the so-called plastic slate roofing were discussed at some length and decided to be no better than other similar compositions. Mr. Hirsh mentioned the use of liquid glass in Europe in the preparation of felting for roofing, which rendered it comparatively fire-proof.

NITROUS OXIDE.

Dr. Wright then referred to the unscientific manner in which the nitrous oxide had been applied at a previous meeting and in which it was being used by a number of physicians, the same being contaminated by carbonic acid after a few respirations by the patient, whose unconscious state was, in such a case, as much due to asphyxia, as to the anesthetic. This was plainly shown by the leaden hue of the face, the rigidity of the muscles, and all the other symptoms of asphyxia, presenting themselves in a greater or lesser degree in the common application of the gas. The Doctor cited cases, where the ill effects of this treatment had been felt for days and even weeks. The breath of a gentleman, taking a few gallons of the gas in this method, was passed through lime water and an abundant precipitation of the carbonate showed the great amount of carbonic acid, produced by a few inspirations. He then exhibited an instrument which prevents the reinhalation of the carbonic acid. It consists simply of a short tube or mouth-piece, which is screwed on to the gas bag, and which has two india-rubber valves. One of these opens from the bag into the tube and admits the gas into the lungs at every inhalation, while the same current of gas closes the other valve, on the side of the mouth-piece mentioned, the latter, opening at every exhalation, giving free egress to the carbonic acid, while the same current closes the valve communicating with the bag. In this manner the play of the valves continues similar to those in bellows. The Doctor next showed an instrument, by which, with the addition of the first, the gas is breathed through the nose, when the mouth may be left entirely or partially open. An experiment with the application of the gas in this manner showed that the insensibility was produced as effectually as in the old method, while none of the signs of asphyxia, mentioned before, were present. The mouth in this case can be opened at pleasure without the use of a cork or piece of rubber, the muscles not being rigid, and the patient, although aware of what is going on, is not sensitive to pain.

Dr. Richards next presented an instrument, invented by Dr. Richards, of London, and used for freezing any part of the body to insensibility to pain by means of a spray of ether. The instrument consisted of a four-ounce bottle, having a small tube reaching close to the bottom, and surrounded outside of the bottle, where it is bent under an angle by a somewhat wider tube, ending at about the same place with the narrow inner tube, into a small opening. This wider tube is connected with a short rubber tube, having two rubber balls at its end. In using the instrument the bottle is filled partly with ether and the balls compressed in the hand. They, acting like a common rubber syringe, blow air into the bottle, while part of it passes through the wider tube mentioned. The air in the bottle forces a stream of ether through the narrow tube, which, on leaving the orifice, is mixed with the air, coming from the surrounding wider tube on the same spot, and is thus blown in a spray upon the part to be treated. The rapid evaporation of the ether, aided by the air current, freezes the parts within a few moments to perfect insensibility. The Doctor related some very astonishing operations which were safely performed by this method.

ELECTRIC FORCES.

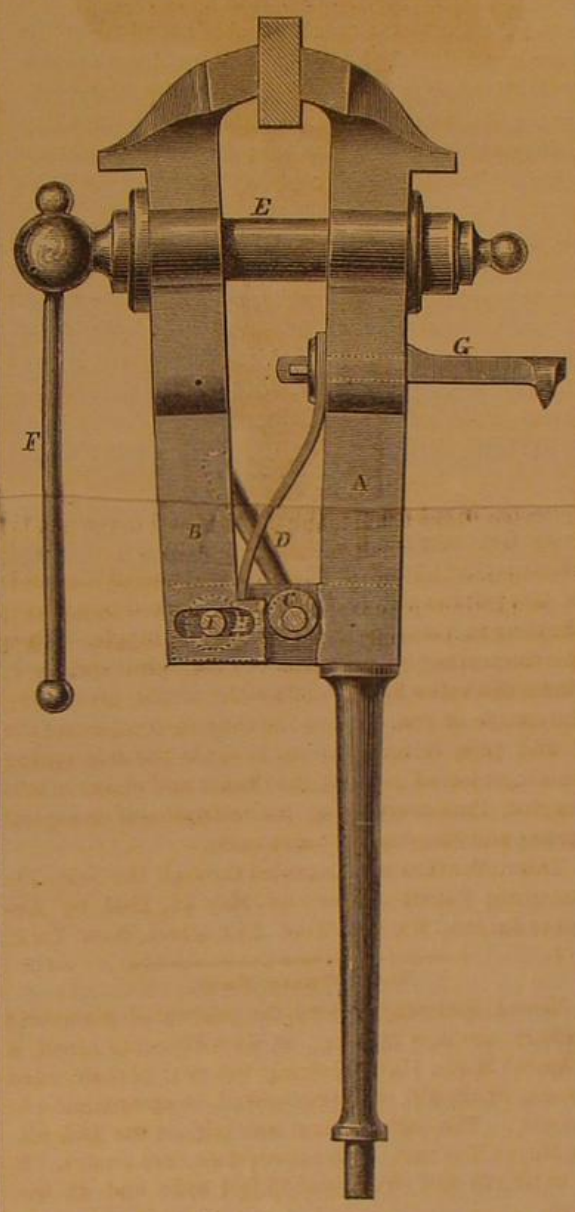
Dr. Bradley then referred to his remarks at the previous meeting, that the tangents of electric forces were in proportion to the strength of the current, and said, upon actual experiments he found, that this rule laid down in our books did not coincide with practical results. He was led to believe that a common helix acted only in one direction powerfully upon the magnetic needle, while its influence ceased or was changed with the deflection of the needle according to its distance from the current. He therefore made a coil or helix so large that the needle, in all its positions, was at an equal distance from the helix, and therefore influenced in the same manner. It consists of a brass disk, on the top of which several needles, made of clock-spring steel, are laid parallel to each other, corresponding to the periphery of the disk, so that the outer needles are smaller than the inner ones, forming a grate of needles. In experimenting with this instrument he found, in a great many experiments, that the rule proved correct, the needle being acted upon in the same manner as it is by the magnetism of the earth, which, by its enormous size, acts evenly upon the compass in all its positions.

The meeting then adjourned until September next.

JONES'S BENCH VISE.

This invention consists in providing a cam or eccentric at the lower end of one of the jaws of a vise, so that an increased power may be obtained independent of the screw.

In the engraving A and B represent the jaws of a vise of common structure, except at the lower end



of the jaw, B, is a slot, H, which slides back and forth upon the pin or bolts, I. E is the screw, and F the lever by which it is worked. G is the strap by which the vise is secured to the bench. C is a cam or eccentric provided with a lever, D. When an article is placed between the jaws, and the screw, E has been turned up by means of the lever, F, to its full capacity; then, by turning down the lever, D, by the action of the eccentric upon the lower end of the jaw, B, it is thrown out, and the article in the jaws is held more firmly than by the action of the screw alone.

This invention was patented through the Scientific American Patent Agency, by Richard Jones, on the 3d of April, 1866.

Further information relating to this invention may be obtained by addressing the assignees, Jones & Bromley, No. 127 Marshall street, Paterson, N. J.

Experiments on Iron.

A system of experiments for testing the strength of iron has been inaugurated att he Scott, Pa., Iron Works, by able scientific officers of the United States army, with a view of obtaining an iron of sufficient strength for battering shot. These tests have fully demonstrated that no iron can be had of a suitable strength for railroad car wheels which has been remelted in an anthracite or coke cupola furnace. In fact, the best charcoal iron assumes all the appearance of anthracite iron by such remelting, and the strength of the metal is reduced from the breaking weight of the pig, usually about twenty-four thousand pounds per square inch, to that of eighteen thousand pounds, the usual standard of anthracite iron, while remelting the same iron in a reverberatory furnace would have increased its strength to thirty thousand pounds to the square inch. The apparent excellence of some car wheels made at this establishment has induced the writer to suggest this mode of remelting the iron as the reason.

Manufacturing and Business Items.

NEW LOCOMOTIVE WORKS.—Pittsburgh, situated almost in the center of the coal and iron district of Pennsylvania, and justly celebrated for its numerous and important manufactures, has at last awoke to the fact that locomotives can be manufactured there as well as in Philadelphia. A lot on Beaver street, in the borough of Manchester, having a frontage on the Ohio, is being rapidly transformed into a manufacturing center for the building of locomotives. The extent of the concern may be estimated from the fact that it is expected to turn out seventy five locomotives per year. Cost of buildings, machinery, etc., about $300 000. The superintendent is John A. Wright, of Philadelphia.

THE manufacture of ladies' and gents' kid gloves, as many of our readers are aware, is carried on largely at Gloversville, N. Y., by some 15 or 20 manufactories. Flour, salt, alum and the yolk of eggs are used. Thousands of dozens of eggs are consumed in the process, and this fact may account for the high price of this article of food. The whites of the eggs are used for chemical and other purposes.

THE *Charleston Courier* mentions one district of South Carolina that contains more than forty saw mills in operation, a large cotton factory at Vaucluse, one at Graniteville, a porcelain factory at Kaolin, a paper mill at Bath, while another cotton factory is building which will accommodate and use nearly a thousand looms; "all of these factories are worked in an area of twelve square miles."

THE Boston and Sandwich Glass Company has a capital of $500,000, and employs at the works in Sandwich about 450 hands. It was established in 1824, and has one of the largest glass manufactories in the country. The works of the company cover several acres of ground, and include two buildings for smelting, each of which contains double sets of cupolas, charged with ten furnaces each.

A LOCOMOTIVE on the Hartford and New Haven Railroad was recently fired with peat found along the line of the road. The experiment was highly successful, the engine drawing several heavy laden cars at fast speed. A company has been formed in New London, Conn., for the manufacture of peat on a large scale.

A SITE has been secured for the projected rolling mill at Milwaukee, Wis. The purchase comprises 100 acres at the mouth of Deer Creek. The mill is to be finished within a year. The yearly expenses of this establishment will be $600,000, and its operatives, with their families, will form a village of 2,000 people.

A LARGE cotton factory, called the "Manassas Factory," has been built at Carrollton, Miss. It contains one hundred and eighty thousand spindles, thirteen hundred looms, and will go into operation July 1. The company owns seventeen hundred acres of land contiguous to the factory, and well wooded.

THE proprietors of the Fort Pitt cannon foundery, Pittsburgh, intend sending a big twenty-inch cannon from that city to the Paris exhibition. It will be 22 feet long, 5½ feet diameter at the breech, and will weigh 50 tuns. When completed it will be mounted on an excellent iron carriage weighing 8 tuns, and will be accompanied with specimens of balls, shells, and cartridges. The cost of this monster will be about $30,000. It requires 100 tuns of melted iron to cast one, and fourteen days to cool it off properly.

A LARGE nail factory is now in process of erection in Thamesville, Conn.

Correspondence

Petroleum and its Products.

[The importance of the subject treated in the annexed article, its valuable suggestions—valuable to life and property—and the indisputable ability and reliability of the writer, will be our excuse for transferring the whole paper to our columns. It was prepared for the SCIENTIFIC AMERICAN by Prof. P. H. Vander Weyde, M.D., late Professor of Chemistry in Girard College, Philadelphia.—EDS. SCI. AME.]

Allow me to give you some information on this subject additional to that contained in your number of May 19th, last. The kinds of petroleum most adapted for distillation have a specific gravity of 0·82 to 0·68, corresponding to 40° to 46° of Beaume's hydrometer. Most petroleum oils are of this kind. The heavier kinds are not profitable for distillation, containing a less percentage of volatile products; but when the specific gravity is as low as 32° or 30° they are considered unfit for the production of kerosene, but are used for lubricators, and it has lately been found that some of the oils of Western Virginia of 28°, corresponding with a specific gravity of 0·89, are the best lubricators. The heaviest oil I have tested was from Mecca, Ohio. It indicated 24° or 0·91 specific gravity. When oils are heavier than this it is due to earthy or mineral impurities in suspension.

The odor of the two last-named oils is the least offensive; in fact, when crude, not disagreeable. The most disagreeable and offensive are from Kentucky and Canada. Their odor is so strong as almost to exclude them from use. When the oils are distilled at a very low temperature, say below 100° Fahrenheit, and rectified, rhigolene comes off, indicating on Beaume's hydrometer 90° to 97° or about 0·6 specific gravity. When the temperature is raised to—

170°	we have	Gasoline	80° to 90°	0·63 to 0·61
280°	" "	Naphtha	70° to 80°	0·67 to 0·63
300°	" "	Benzine	60° to 70°	0·73 to 0·67
400°	" "	Kerosene	50° to 60°	0·78 to 0·72
500°	" "	Kerosene	40° to 50°	0·82 to 0·78
600°	" "	Kerosene heavy	40° to 50°	0·82 to 0·78
700°	" "	Solid paraffine and illuminating gas.		
800°	" "	Solid paraffine and illuminating gas.		

When the temperature of the still is above 500° the product is not as well fit for illuminating purposes—destructive distillation has set in, indicated by the large quantity of gas produced; and the distillate was formerly recommended as a lubricator; it possesses a very offensive odor and taste. At present most distillers use the lighter portions of it in the kerosene, and the heavier portions in the crude oil.

Petroleum has unjustly been condemned by some as a lubricator, because they had unfortunately only tried this last product of the destructive distillation, which being itself nothing but a condensed vapor, is volatile, will evaporate, leave the machinery dry—principally where exposed to heat—and is evidently entirely unfit for a lubricator.

It is the rule among distillers to run the still moderately slow at the end of the operation, which means to be careful not to raise the temperature too high, and by doing this the distillate is less heavy, and a great deal more may run in the kerosene and increase its percentage, which, when amounting to 70 per cent of the crude oil, is considered very fair.

There is another objection to those high temperatures—the destructive distillation is accompanied by the production of much paraffine, which being solid, and condensing in the coils, may stop them up, principally in winter, and has sometimes caused the explosion of the still.

Gasoline, naphtha, benzine are, as such, in the crude petroleum, the distillation only separates them from it; but as soon as we apply a higher temperature, say 400°, we decompose the petroleum and create new products, of which kerosene may be considered one. This may be verified by pouring the products of the distillation back in the remaining tar—an offensive mixture will be obtained very different from the original oil.

The tar drawn off after the distillation is accomplished, is usually mixed with melted rosin, and sold as a lubricator for coarse machinery, wagon grease, etc.

The heavy crude oils from Western Virginia and Kentucky, spoken of above, and which are very valuable lubricators, may be improved and adapted to delicate machinery by refining them by another process, of which filtration is the principal feature. Heat and acids destroy the lubricating qualities.

The difference between benzine and benzole is this: the benzine from petroleum varies during the distillation continually in specific gravity, it has no constant chemical composition, it is rather a mixture of different naphthas of different degrees of volatility and specific gravity. Benzole obtained from coal tar, on the contrary, is a well defined chemical combination of constant specific gravity, and sharply defined projection of its constituent elements. The benzine from petroleum contains, often, small quantities of true benzole, as is evident by the chemical reaction of nitric acid upon it, producing the characteristic bitter almond odor of nitro-benzole.

In closing, I will remark that at present the kerosene is the most profitable product of the distillation of petroleum, and that the benzine and naphtha are much less in price simply because there is more produced than needed in the market, notwithstanding those substances are most valuable chemical agents. There is no doubt, however, that as soon as some universal application is discovered for those substances, for instance a simple safe lamp to burn them in, they suddenly will rise in price and be esteemed highly by distillers, who at present are compelled to sell them for what they can get.

It has been found that retailers have bought the cheaper benzine and mixed it with the kerosene, and sold the mixture for pure kerosene. This explains the cause of the explosion of some petroleum lamps.

P. H. VANDER WEYDE, M.D.

Philadelphia, Pa. June 1, 1866.

The Manufacture of Taps for Cast and Wrought Iron.

MESSRS. EDITORS:—I have read with much interest the several articles on taps in your paper, and would like to make some comments on some of the ideas that have been presented, but do not wish to take up your space or time. I generally have two classes of taps; sometimes a third, when the work of the shop demands it. Each would be different in construction. First, taps for running through or always going one way, for nuts, etc. For tapping nuts I make a tap with a shank as long (according to size) as can be and resist torsion—from eight to fifteen inches. Whatever the size, I make four cuts or scores, a very little under on the cutting edge. I polish smooth after cutting the thread and never file back in the thread. On the thread I file back (in the longitudinal cuts) to the bottom, leaving from one-sixteenth to one-thirty-second on the full thread, bringing it to a sharp edge as I go down the taper to the end. The cuts should be large enough to hold the chips without clogging. With such a tap I have tapped twenty thousand half-inch nuts before it lost its size, running two hundred revolutions per minute. Second, taps for general work to be used with wrenches; I use the taper and plug as usual. All taps should have four cuts or scores, no more and no less. A three-sided tap is not easily measured. In all taps that require backing out, I make a semicircular or concave cut, making it a little deeper in the taper than the plug, as that has more chips than the plug. Filing back in the thread is ruinous to any tap that has to back out, as it gives the chip a chance to roll back, and, like a wedge, push off the tooth. The square tap to me is very objectionable, as it jams more than it cuts, and, especially in cast iron, is likely to start the thread from its base, and make a weak thread. I have seen one-half the thread come out with the tap where the square one is used. With such a tap as I have described, one plug is sufficient. I have had about eighteen years' experience with taps and I find that the above forms have served me the best.

The third class I speak of would be a separate set for wrought iron, where the work of the shop would demand it. I should give them the same general shape as those for cast iron, with this difference, I should give them a little deeper and sharper cut. Wrought iron is not so apt to drag a tap as cast iron.

A. M. W.

Springfield, Mass.

[This subject is not yet exhausted. With some reservations we agree with our correspondent. His idea of making four scores or longitudinal cuts, is a correct one. As he says, the difficulty of measuring a tap having only three scores is a great one, a remark that applies equally to those containing five scores; and even in shops where the taps for different departments of the work run in sets and are sized, the necessity for measuring sometimes occurs. We hardly approve of polishing a tap after it is cut. We have the same objection to this that we have to filing and polishing journals after turning. The turning tool, properly managed, is the best finisher. Polishing with emery, which is but a crude manner of grinding, will more or less impair the sharpness of angles on which the tap, especially, depends for much of its efficiency. If the steel is properly annealed and the tool is kept in proper order while cutting the thread, the result will be much more satisfactory than the use of the polishing stick. The concave score for taps which run both ways, as those for tapping a hole only partially through the substance, is the best form. As little of the full thread should be left in this case as is consistent with strength. This must be determined by experiment. The practice of filing back these double-acting taps is, in our opinion, a ruinous one.—EDS.

Incompetent Engineers.

MESSRS. EDITORS:—As I am constantly observing in my SCIENTIFIC AMERICAN, letters and editorials in regard to the theory and facts of boiler explosions, I would like to give you some information and opinions upon the subject of engineering as practiced in the Southern States.

Here, if any where, an engineer should be more competent than at the North; as he is, by the force of circumstances, dependent more upon his own resources, seldom having a large shop with a competent staff of managers to fall back upon, he must often lay out and superintend his own work and repairs. Machinery breaks down, or boilers burst, and people are injured or killed; if an investigation is had, a good and sufficient reason is given how and why the accident (?) occurred, and the matter drops. I believe the blame, in the majority of cases, lies with the engineers, because they are ignorant, or careless, or for the reason that, to keep their situations, they run defective boilers and machinery contrary to their own judgment, or good boilers, etc., with less men than necessary, thereby over-working themselves and being too much fagged out to bestow proper watchfulness and attention.

Employers are also criminal, inasmuch as they often prefer incompetent men because they work for less pay, or employ too few, so that they are overworked, or perhaps they affect "hot engineers." I know slow ships on this coast making two and a-half round voyages, and running three thousand miles per month, having only two engineers, who are expected not only to run the engines, but to keep them in order. It is, indeed, self-evident that they have very little rest, unless they trust to a fireman or greaser.

Inspectors are also greatly to blame for giving certificates to incompetent persons, without any examination. This I know that some do, merely on the recommendation of two competent engineers, who, in all cases that I know of, were interested. One case is of recent occurrence near here, in which certificates as above were given to two colored men, who went on a high-pressure boat for very low wages, and returned from the first trip with all three boilers burned out. The owners found they were "saving a penny and paying a pound;" but even if pecuniary matters had been satisfactory to them, had they, or the inspector any right to endanger the lives and property of others? I believe the true preventive for these accidents (?) is to come to the conclusion that engineers should be steady, sober, and attentive men, of good common sense and some education and experience, to employ only such, give them remunerative wages and not work them too hard. I also think that all engineers, (whether marine, stationary, or locomotive) should come under the same rule, and be required to pass an examination and hold a certificate.

I hope, if you coincide with me, you will ventilate these ideas, and thus by means of your valuable SCIENTIFIC, help to raise the science of engineering

to its proper position, and thereby benefit the whole universal nation.* MARINE ENGINEER.

Charleston, S. C.

[The ideas and suggestions of our correspondent are valuable. They apply not only to marine engineers but to the runners of stationary and locomotive engines. Too little attention has been paid to the proper qualifications of engineers, and, we may add, their services are too lightly valued. No person employed on a steamboat or ship, a train of cars, or in a manufactory, occupies a more responsible position than an engineer. On him depends, more than on any other person, the safety and protection of life and property. His incompetency may render null all regulations and preventives designed for safety. It is of the first importance that he should not only be practically acquainted with the machine which transmits the enormous power of steam, but that he should understand the nature of the element employed, and possess a good discriminating judgment and an aptness to provide for contingencies and to prevent and remedy accidents.

The rivalry between competing lines of travel, the desire to excel, operates against the proper education of engineers. Safety should be the first aim of an engineer, then the efficiency of his engine, then rapidity of operation. We hope to see the day when recklessness in engineers will be deemed criminal, and the agent and the principal, both, be held to strict legal accountability.—EDS.

NEW INVENTIONS.

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

CHOPPING KNIFE.—JAMES SHEPARD, Bristol, Conn.—This invention consists in the employment of two circular cutters, mounted on a suitable shaft, to which is secured a shank or arm, provided with a handle for operating the cutters. The Patent was issued April 24, 1866.

DISEASES IN HORSES.—H. H LOCKWOOD, Madison, Wis. (Issued May 29, 1866.)—A very large amount of capital is invested in horse-flesh, in this country, and with the best of care and provision against accidents, it is a very precarious sort of property. The organism of the horse is almost as delicate as that of the *genus homo*, and demands corresponding attention. The art of the veterinary surgeon, therefore, is an important and valuable one, and any discovery tending to reduce the loss in equine property by disease, is so much added to the wealth of the country. To horsemen and farmers—to all who possess that valuable animal, the horse—a cure for spavins, ringbones, curbs and splints, which is reliable and safe, is a great desideratum. Our attention has been called to "Lockwood's Infallible Remedy," for this purpose, which is recommended to us on high authority, as effectual and certain—the cure generally being accomplished in twelve, or at most, twenty-four hours.

WEED KILLER.—GEO. P. ALLEN, Woodbury, Conn. (Issued April 25, 1866.)—This is a much-needed implement for onion culture, as well as for crops sown in drills, and effectually cleans walks of grass weeds, etc. The cutting blade is made zig-zag, and sharpened on both edges, like saw teeth. The attachment of this blade to the handle somewhat resembles a garden rake, with the blade fastened to the ends of the teeth. The end teeth serve as guides to show the operator how closely he may hoe to the crop without injuring it.

CLAMP.—P. F. HULBERT, Chatham, N. Y.—This invention relates to a clamp for molders' flasks, and consists in combining with the usual flask-clamp a cam-shaped lever, so that when the clamp is applied to the flask, by turning the said cam-lever in the proper direction, the flask will be firmly clamped and held together.

SHADE-CORD HOLDER.—G. W. NELL, Philadelphia, Pa.—This invention relates to a shade-cord holder, composed of a roller secured to a square rod, which slides up and down in a suitable case, and is provided with a screw shank, screwing into a tubular button, turning freely in the bottom of the case, being constantly depressed by the action of a spring, in such a manner that the cord, passing round the roller, is subjected to a certain tension by the spring, which can be increased and decreased by turning the tubular button, and by these means the tension of the cord can be so regulated that the shade is sustained in any position in which it may be brought.

SMOKING PIPE.—RENE MASSON, Tremont, N. Y.—This invention relates to a smoking pipe, in which a globe or vial of glass, or other suitable material, is secured to the stem between the bowl and the mouth-piece, in combination with a tube extending from the stem down into the globe, and with a partition above the tube, so that when the globe is filled with water the smoke is compelled to pass down through it before it reaches the mouth-piece, and a pipe is obtained which combines the advantages of the Persian narguillet in a small compass.

FENCE.—ALONZO W. OLDS, Green Oaks, Mich.—This invention consists of a fence, each of the braces or stakes of which are secured to both the uprights and the standards that hold the overlapping ends of the rails in place, which has a wire, connecting the uprights and the top rails of the fence, and which has a short stake, connected with the long stake, and with the bottom of the fence.

CARRIAGE SPRINGS.—G. S MANNING, Springfield, Ill.—This invention consists of the S-shaped spring, either with or without strengthening leaf or leaves, connected to the axle and to the supporting arms of the carriage body.

CHURN.—S. T. W. POTTER, Scott, N. Y.—This invention consists in a novel construction of the dasher employed for agitating the cream in a churn for producing butter.

MACHINE FOR CUTTING OFF BOLTS, ETC.—D. D. ROBINSON, Niles, Michigan.—This invention consists in a cutting machine formed by combining and arranging the eccentric levers, jaws, and plates with each other, for the purpose of causing the jaws to move equally in operating.

DETACHING BOATS FROM THEIR DAVITS.—THOMAS HUNTINGTON, New Rochelle, N. Y.—This is an improved means for detaching ships' boats from their davits by the simultaneous detachment of the hooks of both the front and rear tackle blocks from the boat, so that the latter may be set free upon the water without the liability of being swamped or capsized in a swell or sea.

CLOTHES-WASHING MACHINE.—JAMES HERVEY JENKINS, Yorkville, N. Y.—The object of this invention is to obtain a clothes-washing machine which will be adapted for operating upon all kinds or qualities of clothes, and thoroughly cleanse the same, without injuring them in the least.

COMBINED DRILL AND FERTILIZER.—GEO. E. COOPER, Baltimore, Md.—This is a novel arrangement of devices for dropping seed and fertilizing substances—and also stopping the dropping when the tubes are raised out of the ground.

SWAGE FOR SHARPENING SAW TEETH.—J. E. EMERSON, Trenton N. J.—The shank has a groove made in it transversely through the end intended to operate upon the tooth, in which a pin is inserted with several notches corresponding to the width and shape of the tooth required. The dies operate upon the underside and two edges of the tooth; the upper side of the tooth is operated upon by the projecting jaw of the stock.

FORGING, SHEARING, AND PUNCHING DEVICE.—J. E. EMERSON, Trenton, N. J.—The improvement in this case consists in the arrangement together, in one tool, of an anvil, punch and shearing device.

STEAM BOILER.—J. A. CAMPBELL, St. Louis, Mo.—This is an improvement in steam generators, and consists in the combination of devices, consisting of a coil of pipes placed in the furnace, and leading from thence to the reserve water chamber, placed above the generator. Over the latter is placed another water chamber communicating with the other by means of a pipe provided with a valve controlled by a float in the lower chamber, this float and valve control the amount of water admitted to the reserve water chamber. This second chamber is also connected with the coils of pipe in the furnace, so that the pressure of steam is the same in it as in the reserve water chamber, and is also connected with still another water chamber placed above it by pipes which the feed water passes.

SNAP HOOK.—WM. BELLAIRS AND OLIVER D. BARTO, Atkinson, Ill.—This invention consists of a double hook, the inner part of which slides in a channel in the outer part, and which is so formed that, when in use, it closes and locks the opening in the outer part through which the ring is inserted, being held forward in such a position by a spring.

CARTRIDGES.—AMOS S. BLAKE, Waterbury, Conn.—This invention consists in so making cartridges for breech-loading fire-arms as that the part which contains the powder and ball is separate and detached from that which contains the fulminate.

HORSESHOES.—HARRISON ARMSTRONG, Sparta, Wis.—This invention consists in an improved method of making the calks for horseshoes and of welding them on to the shoes. The calks are prepared in blank by rolling out a bar of steel into proper form, with one edge sharp.

HOE.—EDWIN PITSON AND WILLIAM W. BRIGGS, Mattaville, N. Y.—This invention relates to hoes which are provided with teeth of triangular form, and it consists in constructing the hoe in a novel manner whereby several advantages are obtained.

FLOORING JACK.—AARON LOYD, Mattoon, Ill.—This invention is designed for placing flooring together, as the boards are being laid; it consists in the employment of a lever having a bifurcated head, each fork carrying a serrated cam for clasping the joist, the lever being provided with a tongue for crowding up the boards, and a prop for holding the device rigidly while the boards are being nailed

WATER COOLER AND FILTER COMBINED.—H. T WOODMAN, Dubuque, Iowa.—This invention consists in the combination of a filtering device with a water cooler so that the water used may be filtered before it is allowed to pass into the drawing-off chamber of the apparatus.

ARTIFICIAL FUEL.—CHARLES SAFFRAY, M. D., New York City.—This is a process for aggregating coal dust or waste coal by mixing the same cold with pitch or rosin reduced to a fine powder, so that when the mass is compressed and slightly heated the pitch or rosin fuses and forms a cement which firmly unites the particles of coal and a fuel is obtained which can be used with great advantage in locomotive or other steam boiler furnaces or in any furnace where a steady and powerful heat is desired.

SHEEP RACK.—D. F. SEXTON, Whiting, Vt.—This invention consists in arranging the troughs of a sheep rack within a suitable frame so that they can be run up or down in the framework, and thus be raised when it is desired to fill them with feed, and afterward run down, the sheep being, the meanwhile, prevented from annoying the operator. Also in so placing strips for dividing off the spaces of access to the troughs for each sheep that the opening through which the animal's head may be thrust shall be greater at the top than at the bottom, whereby the sheep are not so likely to waste the feed.

MEDICAL COMPOUND.—GUSTAVUS BODE, Milwaukee, Wis.—Certain ingredients, which will constitute an electric magnetic agent, are mixed together and applied in a belt, pad, or the like, for the cure of rheumatism, neuralgia, and other nervous diseases.

MACHINE FOR PICKING COTTON.—JOHN GRIFFIN, Louisville, Ky.—The inventor of this machine for picking cotton has already secured several patents for the same object. In this one he secures more power in the picking apparatus; the device is more readily manipulated, so that the work will be less, and prevents the choking or clogging of the cotton in the tube.

CHURN DASHER.—A. KIRLIN, Rock Island, Ill.—This invention consists in forming the staff of the dasher of a churn hollow, and so arranging an air pump therein that, as the dasher is moved up and down, air shall be drawn through the dasher staff and forced into the bottom of the churn, passing and circulating through the cream.

SHIPS' PUMP.—LEBBEUS SIMKINS, Brooklyn, N. Y.—This invention relates to a ship's pump which connects by suitable gear wheels and shafts with the capstan, so that motion can be imparted to the plunger of the pump by turning the capstan, and the operation of the pump is materially facilitated.

SHOVEL AND TONGS.—R. D. BRADLEY, Preston, Md.—This invention consists in so forming a pair of tongs, that a shovel being attached to one leg, the instrument can be used for both shovel and tongs. Ordinary tongs can be thus furnished.

DREDGE ROLLER FOR OYSTER BOATS.—C T. BELDIN, Baltimore Md.—This consists of a flange attached to the roller so as to catch and carry the spurs or teeth of the oyster rake and to enable the dredge to be readily handed over the side or gunwale of the boat.

TIRE BENDING MACHINE.—D. BALLOU Havanna, N. Y.—This is a wheel revolving by means of a lever suitably connected and winding upon its periphery—the iron bar intended for the tire—the iron being firmly pressed against the wheel by the friction roller, which revolves on an elastic bearing below.

Notes and Queries

A. C. T., of Mass.—Your own observation, if you will notice the movements of a vessel driven by a propeller, would show you the fallacy of your implied supposition. The propeller is generally placed about or near the center of gravity, and could not exert a perceptible influence on the movements of the vessel from side to side. Your perpetual-motion idea is unworthy your attention. Look at your diagram and you must see that your weights, in whatever position, whether sixes or nines, just balance each other.

C. B. J., of Mass., sends us an article explaining his idea of a speaking machine. It is ingenious and perhaps possible of attainment. When the machine should be completed, however, and in successful operation, its value would be that merely of a curiosity. The subject of the article is not of sufficient general interest and value for publication.

H. K. B., of Va., desires to find a preventive to the ravages of worms (the teredo probably) on wood immersed in salt water. He says the palmetto is proof against their attacks. Possibly some of our correspondents can give the desired information. We had supposed that nothing but sheathing with metal would preserve timber in salt water from the worm. If there is a preparation efficient as a defense against these destroyers, it is a valuable discovery.

E. I. M.—of——.—Any new and useful substance used in a boiler for the prevention of incrustation is patentable. Nitroglycerin is made by pouring drop by drop, or in minute quantities, one equivalent of glycerin into nine of sulphuric and three of nitric acid, stirring the mixture during the operation.

O. B. D., of Vt.—When linseed oil is boiled a longer time than for ordinary varnish, it becomes thicker and more adhesive. We suppose such an article is what you want

E. Q., of N. Y., says that in some small steam engines the piston is solid with annular grooves on its periphery, the piston being packed by condensed steam. He asks if the same principle cannot be applied to the packing of the rod. In reply we would say that engines, large as well as small, have been and are now built in this city with a solid piston and glands without packing, and are running successfully. The annular groove is no benefit, but a detriment.

J. E. B., of Mass., who asked a very ancient question and to whom, being a Yankee, we replied by asking another, May 26, sends us a complete and sensible answer to his own query. Also J. E. B., of Conn., writes correctly on the same subject. Neither of the gentlemen, however, answer our question.

A. C. R., of Ohio.—Others beside yourself have failed to make good meerschaum from carbonate of magnesia and soluble glass. But it is certain that meerschaum is a silicate of magnesia, and that a fair article can be made artificially. We would not encourage any one to trouble himself much with the subject unless he has plenty of leisure and acquaintance with chemical principles.

J. P., of N. J.—A solution of cyanide of potassium will probably be found useful in restoring old galvanized iron to something like its original brightness. As a general rule, however, mechanical are better than chemical means for brightening metals.

K., of Mass.—The carbon elements of Bunsen's battery are commonly made of what is known as gas carbon, *i. e.*, the carbon deposited from gas in the gas retorts. This carbon is ground fine, made plastic with gum water, molded into shape, and then baked.

E. H., of N. Y.—The anastatic process is what you want for transferring old engravings to a lithographic stone. It consists, in brief, in softening the ink by an alkali, and then by great pressure in contact with the stone, a new printing surface is obtained.

SPECIAL NOTICES.

Horace T. Robbins, of Boston, Mass., has petitioned for the extension of a patent granted to him on the 14th day of September, 1853, for an improvement in Shuttle-guides to Looms. The petition will be heard on the 27th of August next.

Robert Knight, of Cleveland, Ohio, has petitioned for the extension of a patent granted to him on the 21st day of September, 1852, for an improvement in Machinery for Beveling the Edges of Skelps or Metallic Strips, etc. The petition will be heard on the 3d of September next.

Edward A. Palmer and Adolphus J. Simmons, of Clayville, N. Y., have petitioned for the extension of a patent granted to them on the 7th day of September, 1852, for an improvement in Whiffletree Hooks. The petition will be heard on the 20th day of August next.

Improved Patent Annular Oven.

By the usual methods of burning pottery, bricks, and lime, it is well known that there is a large amount of waste heat, and consequently a waste of fuel. Since the earliest ages, the process and the means employed to render durable the products of the ceramic art have been of the simplest nature—only the application of heat in a common kiln or oven. Although improvements have been made from time to time, the great desideratum of a continuously acting kiln has not heretofore been attained. Much time, fuel, and heat has been wasted in the delay of removing one charge and introducing another. The oven under consideration is intended to supply that want.

The annular or ring oven is used to burn common brick, drain-tiles, fire-brick, lime, all kinds of pottery-ware, to roast ores, to burn minerals, etc., and works without interruption.

The principles on which the operation of this burning apparatus is based, are very simple, though so entirely different from all kinds of existing kilns and furnaces, that an especial explanation is required. Fig. 1 is a vertical section, Fig. 2 is a plan, half of it in horizontal section. The annular form is adopted for these kilns because it affords the greatest solidity, but this can be varied to admit of local circumstances. The kiln consists of a circular channel, *a a*, which receives the objects to be fired, introduced through doors, *b b*, in the outside wall. Flues, *c c c*, lead from the hearth of the kiln to the smoke chamber, *e e e*, which surrounds the base of the chimney, *d*. The communication of each flue can be cut off at will, by means of a cast-iron, bell-shaped damper, *f f*, Fig. 2. An intercepting slide can be lowered in grooves, *g g*, built into the walls of the kiln, immediately after each flue, so as to separate it at any distinct or equi-distant compartment. The fuel passes through apertures, *h h*, which are constructed in the arch, and falls through channels formed by the objects to be burned to a chamber in the hearth of the kiln, from which a certain number of small flues radiate to produce a free current from fire to fire.

In describing the manipulation of this kiln, we take as example the kiln erected in Carbon Cliff, Rock Island, Ill. This kiln, which is in full operation, has 12 compartments to which there are 12 entries or doorways, *b b*, also the same number of flues, *c c c*, communicating with the smoke chamber, *e e*, and just as many openings, *g g*, in the arch for the reception of the large intercepting damper slide; thus the kiln can be divided at any one of the 12 parts. For a better distinction, these compartments may be numbered from 1 to 12, of which two, No. 12 and 1, we will suppose, are separated by the intercepting slide. The objects to be burned may be brick or tiles, etc., and the fire in full operation; the doors leading to the compartments, 1 and 2, being open—No. 1 for filling it with fresh goods, and No. 2 for taking out those burnt and already cooled. The compartments 3, 4, 5, and 6, which are filled with burned goods, are gradually cooled by the air entering through the doors of No. 1 and 2, and as it passes on through warmer, at last glowing ware, it will result that the kiln fires are supplied with atmospheric air almost as hot as the kiln itself. In compartment No. 7, the fire is burning, and when its contents have reached the desired temperature, No. 8 will have arrived at such a degree from the absorption of the waste heat, that the fuel introduced from the top of No. 8 is instantly inflamed. The compartments 9, 10, 11, and 12, will be dried off and heated one after another by the waste heat, which passes through and expands itself on the contents of these compartments, and on its arrival in No. 12, meeting with the obstruction of the slide, it is conducted by the small flue, *c*, to the chimney, with its temperature so lowered that it will only just support the draft. No. 1 being now filled, the slide between 12 and 1 is taken out and lowered again between 1 and 2. The damper of the flue to No. 12 is now closed and that of No. 1 lifted; the door of No. 1 is closed and that of compartment 3 opened, the contents of which will be sufficiently cooled to be taken out, while No. 2, which is emptied, can be filled again. The fire now being advanced to No. 8.

In this manner it is possible to burn bricks, lime, tiles or pottery ware, etc., without any interruption, filling and emptying the kiln at the same time; and it will be understood that in this kiln, at the same time, ware is burnt, gradually cooled and heated, and ware put in and taken out.

Practical men know very well what a great loss of heat occurs in the ordinary mode of burning bricks, lime, etc.; this great loss arises in a two-fold way. First, during the burning of objects like bricks, lime, etc., the air which has passed through the fuel, or among the heated bricks, etc., and the smoke, including gaseous products generally, pass away from the kiln to waste, at a very high temperature, even at a red heat, during a considerable part of the process. Second, when the bricks, etc., are raised to the high temperature required to burn them and render them permanently hard, the great store of heat which they contain is entirely thrown to waste, while they are left to cool. Both mentioned losses of heat are avoided in the kiln we here introduce. The advantages of this oven may be summed up as follows:—The heat of the cooling articles is not wasted but supplies caloric to the atmospheric air necessary to combustion, thus economizing fuel; thus all the heat is utilized, and at least sixty per cent of the fuel used in ordinary kilns is saved. The state of the fire and the condition of the work can be ascertained at any and all times. Charging and discharging can be done at the same time without interrupting the continuity of the work. Convenience of access to the ovens, and facility for repairs while in operation. The use of the cheapest fuels, as combustion is carried on at a very high temperature. Total absence of smoke, owing to perfect combustion of the gases, and freedom from injury to the goods by sudden changes of temperature.

Fig. 1

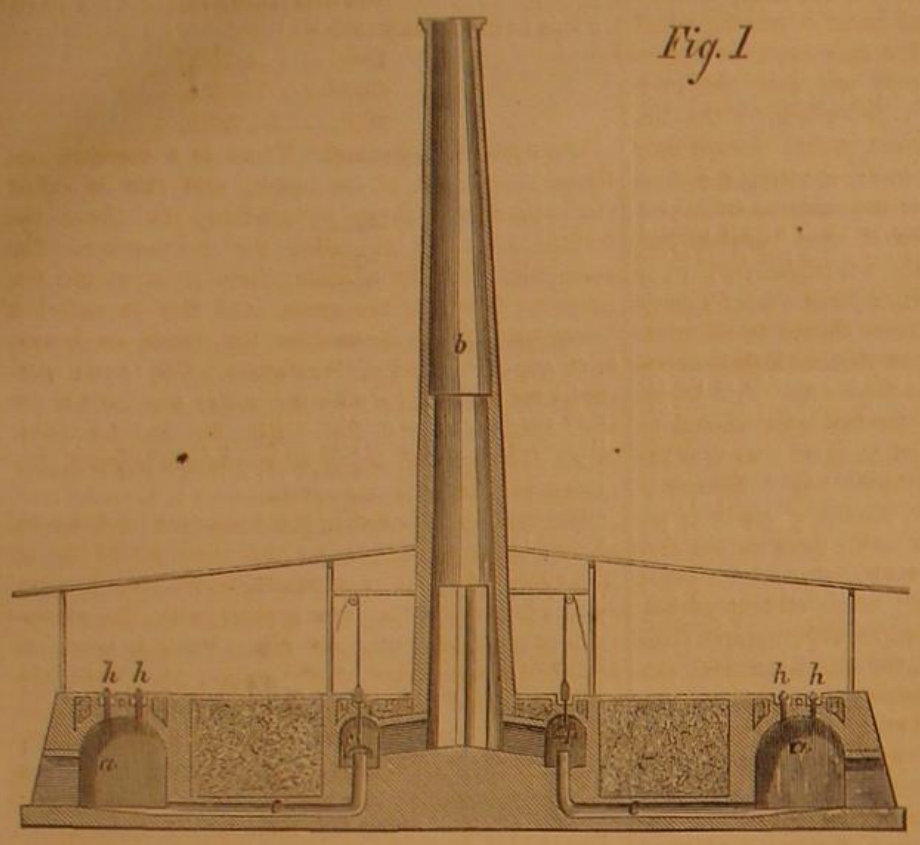
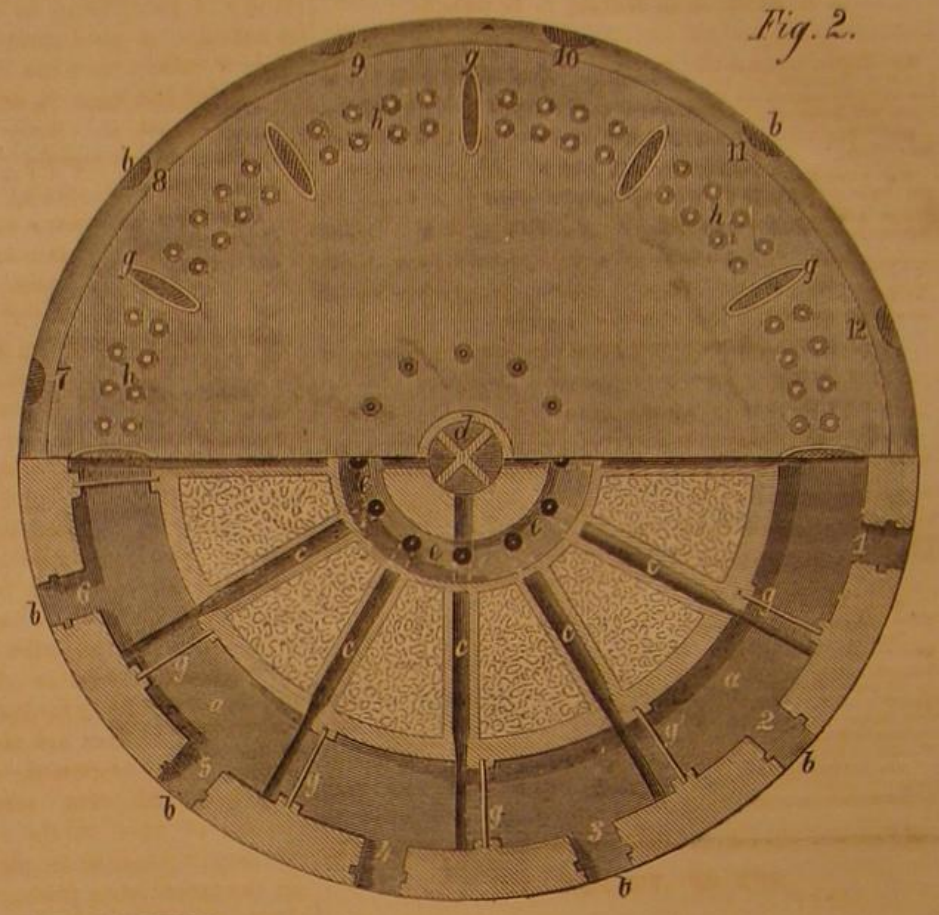


Fig. 2.



HOFFMAN'S ANNULAR OVEN.

It is equally well adapted to roasting ores, burning lime, cement, and bricks, tiles, etc. More than two hundred of them are in use in Europe. One can be seen in operation at the Argillo Works, Carbon Cliff, Rock Island, Ill., and all information can be obtained of G. L. Dethless, 319 Third street, New York City, or of C. E. Glacius, 322 W. Madison street, Chicago, Ill. Patented through the Scientific American Patent Agency, June 13 1865.

NEW PUBLICATIONS.

"Summer Rest."—Ticknor & Fields, Boston.

Gail Hamilton has in the press of her publishers a new volume specially adapted to summer reading, and bearing the taking title of "Summer Rest." Most of the articles in this volume are now for the first time printed, and will be found equal to any of the author's most brilliant essays. "Halicarnassus" appears again on the carpet; and his exploits in the way of gardening and other domestic matters are made very amusing. Gail Hamilton is never dull. Possessed of a sharp and ready wit, speaking boldly, and that too upon topics wherein women have been supposed to have but little interest, she has already gathered about her an audience, which, by its hearty appreciation of her writings, attests the truth of many of her convictions. The success of her various volumes of essays has been without a parallel; in fact, she is the most successful writer of the day.

Grapes and Wine.—Published by G. E. & F W. Woodward, No. 37 Park Row, New York.

This volume was written by George Husman, of Missouri, a practical wine maker. He treats upon the propagation of the vine and the choice of varieties best adapted to produce wine. He also devotes a chapter to the methods of manufacture, which gives a clear idea of the processes necessary. The book is well illustrated, and is a valuable work.

American Annual Cyclopedia for 1865.

Upon completion of the "American Encyclopedia," Messrs. Appleton & Co., of this city, began the publication of the "American Annual Cyclopedia." Vol 5, for 1865, is now being issued. It embraces the final military operations of the late war, the change in the Administration of the Government, debates in Congress in relation to the Southern States, Report of Gen. Grant, measures taken by the Government in regard to Freedmen and Emancipation, details of internal affairs of the country, and resumption of Commercial relations with the South, relations with foreign nations, with articles upon Cholera, Cattle Disease, Astronomy, Chemistry, Geographical Explorations, Biographies of eminent men, and a great variety of other topics. This volume contains 850 pages with portraits of Lincoln, Johnson, and Farragut, and is exceedingly valuable as a work of reference and instruction.

It has lately been discovered by a German chemist that a most beautiful scarlet or purple dye may be produced from theine. This substance occurs in the leaves of a species of horse-chesnut and holly, which grow in Brazil, as well as in tea.

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 on them will be promptly attended to.

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

☞ American and Mexican News Company, Mexico, are Agents for the SCIENTIFIC AMERICAN.

☞ Messrs. Trubner & Co., 60 Paternoster Row, London, are also Agents for the SCIENTIFIC AMERICAN.

VOL. XIV., No. 25..[NEW SERIES.]. *Twenty-first Year.*

NEW YORK, SATURDAY, JUNE 16, 1866.

Contents:

(Illustrations are indicated by an asterisk.)

*Low's Shingle and Barrel-head Sawing Machine	407	Manufacturing and Business Items	411
Torpedo Experiments in England	407	Petroleum and its Products	412
Utilization of Refuse Matter	408	The Manufacture of Taps for Cast and Wrought Iron	412
Cast-iron Projectiles	408	Incompetent Engineers	412
Bridge Building.—The Bridge of the Hartford, Springfield, and New Haven Railroad over the Connecticut	409	New Inventions	413
New Method of Copying Pictures	409	Notes and Queries	413
Miscellaneous Summary	409	Special Notices	413
Nitro-Glycerin Again.—How to make it Safe	410	*Hoffman's Annular Oven	414
*Jacob's Safety Gas Valve	410	New Publications	414
New Music Hall	410	End of Volume XIV	415
Cipher Writing	410	Steam a Means of Economy	415
Gleanings from the Polytechnic Association	411	Adoption of the Metric System	415
*Jones's Bench Vise	411	Medicated Pads	415
Experiments on Iron	411	Patent Claims 416, 417, 418, 419, 420	
		*Bunn's Esquimaux Refrigerator	422
		Asbestus	422
		Ballooning in England	422
		Prospectus	422

END OF VOLUME XIV.

With our next number will close Vol. XIV. of the New Series, at which time a large number of subscriptions will expire. We hope our subscribers will all promptly renew, and we would repeat what we have before said, that a Club of ten persons can have the paper at $2 50 each.

The SCIENTIFIC AMERICAN for the past six months has abounded in valuable information. To say nothing of our own editorial labors, we think the valuable contributions of our correspondents have amply repaid all our readers. The past is an index of the future character of our journal.

SYSTEM A MEANS OF ECONOMY.

Those who have been connected with the business of large manufacturing establishments, or have assisted in the management of corporations where employes were numbered by hundreds and their expenses have counted by hundreds of thousands yearly, readily recognize and value the observation of a rigid and minute system of attention to detail and care for the "little things." A carelessness in one single matter, affecting the use and waste of the most insignificant article employed by these concerns, would seriously affect the annual balance sheet.

What is important to these cannot be unimportant to the smaller fry, whose limited profits are made by a close calculation of the coppers. The small mechanic who employs from three to thirty hands is seriously interested in the matter of saving in little things. It is painful sometimes to visit a small shop and note the waste and extravagance, the want of careful foresight and judicious economy, which is robbing the proprietor, year by year, of that which his labor and enterprise has fairly earned. A machinist will have in use oilers which pass a stream sufficient to lubricate the journals of a marine engine; or he will, for the want of adjusting a pulley or lining a shaft, cut and wear a belt worth ten or twenty dollars, or destroy a set of boxes. The scrap iron is swept up and thrown upon the dust heap; long bolts fitted with nuts are cut in two, instead of forging one for the purpose required. The grindstone is gouged and scored for want of a little care, necessitating its razing once a week or once a month when it should have been kept in order for six months. We might go on and enumerate many more of these senseless and careless leaks, which, in the aggregate, make a fearful raid on the proprietor's pocket, but we will mention only one other, not so apparent, though hardly less serious.

Want of order loses shop owners a great many dollars annually. The old saw "a place for every thing and every thing in its place" is not improved by having "a good many places for every thing." Some workmen have the bad habit of leaving a tool where they last used it, and a lazy habit of forgetting all about it. Such men will cost half their wages to their employers. A job which, if the implement required was at hand, would occupy only thirty minutes, requires an hour, counting the time spent in looking for the tool and that spent in putting it into shape for use; for it often happens that tools thus left everywhere are not taken care of in other respects. In every well-ordered shop, in every one which is run for profit, there should be an unvarying rule that every tool or implement should be returned to its place as soon as done with. If it is one in frequent or general use, the last user should be compelled to see that it be left in good shape for the next man. As the military books say "this rule is general," and no exception should be made to it. Racks for drills, shelves for taps, drawers for files and chisels, location for hammers, are found in every shop; but often the drills are stubs without points, the taps are broken or clogged with "gurry," the files are worn out or broken, the chisels cracked, etc. But if these matters are tolerably well attended to, others may be neglected. There should be a box to receive all old bolts, screws and nuts; they are "handy to have in the shop." Another for cast-iron scraps, another for pieces of wrought iron, saving the forger often from cutting a bar; another for old brass and copper, and one for steel scraps.

These little things are well worthy the attention of the foreman and the employer. No good workman will object to stringent rules in this respect. He knows it is of immediate advantage to him in saving annoyance and profanity, and is of future advantage by giving him a habit of order affecting his whole life. No employer who has introduced and honestly tested this system of economy and order could be induced to lapse into old habits of easy-going heedlessness.

ADOPTION OF THE METRIC SYSTEM.

In the year 1860, we threw out the suggestion that some member of Congress might render a great service by introducing a bill for the adoption in this country of the French system of weights and measures, and after six years of urging, we have now the satisfaction of seeing the step taken, Hon. Mr. Kasson, of Iowa, having secured the honor of its authorship. In this result we recognize a new proof of the wide influence of the SCIENTIFIC AMERICAN; though we are not so ignorant of the history of the movement as to claim for ourselves the exclusive credit. Nearly all learned societies in this country and Europe have advocated the adoption of the metrical system; it has worked its way into nearly all scientific periodicals and books; the movement is, in fact, urged forward by the combined intelligence of the civilized world. Great Britain has recently passed a law similar to ours, and it is understood that in both countries these permissive laws are preliminary to enactments requiring the use of the system. It has already come into use in the principal countries of Europe, and will doubtless soon be the only system of weights and measures in commercial and Christian countries.

The advantages of the system over the present complicated and incongruous tables of weights and measures, are even greater than the advantages of our decimal currency over the old English system of pounds, shillings, and pence. When once adopted we shall all wonder that we went without it so long.

The difficulties in the way of its adoption are two—the necessity of learning it by the people, and the sacrifice of value in the measures and scales now on hand. Both of these difficulties are far less than would first appear.

The system can be fully mastered and learned by any one in thirty minutes. First, it is necessary to learn the meaning of the four units—

Meter, the unit of length.
Liter, the unit of capacity.
Gram, the unit of weight.
Are, the unit of area.

Then it is necessary to learn the meaning of four Greek numerals and three Latin. The Greek are—

Deka.....10.
Hecto.....100.
Kilo.....1,000.
Myria.....10,000.

The Latin prefixes are—

Deci.....1-10th.
Centi.....1-100th.
Milli.....1-1000th.

The system is decimal. There is a measure ten times the length of the meter, and this is called the dekameter, there is another 100 times the length, and this is called the hectometer. The same way with the weights; there is a weight ten times as heavy as the gram, and this is called a dekagram; there is another 100 times as heavy, and this is called a hectogram. The same prefixes are applied to all the units—the Greek for the multiplies, and the Latin for the fractions. When the meaning of eleven words are learned, the system is completely mastered.

The sacrifice of value in the measures and scales at present in use will be far less than would be at first supposed. All platform balances will be perfectly adapted to the new system with the exception of the beam and the pea. Manufacturers of scales—Fairbanks and others—would doubtless make new beams and peas, and offer them at fair rates to the present owners of scales, who could readily apply them. Ordinary balances would merely require a new set of weights. A peck measure could have a little strip taken off the top, reducing its depth about one ninth, when it would become the measure of a dekaliter. Box-wood rules, steelyards, and some other measures, would become worthless, but the sacrifice of property in this way would be so gently distributed over the community, that it would be scarcely felt. The table printed in our last number may be found valuable for future reference.

Medicated Pads.

Among the patents recently granted is that to Dr. Hulse, of this city, for a compound for medical pads, to be worn upon the person, as a preventive against cholera and miasmatic diseases. The pad is a neat little article composed of cloth, provided with pockets or compartments containing odoriferous ingredients, well known for their utility in the above classes of diseases. We are so well satisfied with the valuable qualities of this simple improvement that we have introduced it in our establishment, every person in our employ being supplied therewith. The improvement is to be had at the leading drug stores.

BRIGHT ANNEALED WIRE.—A correspondent, referring to an article heretofore published in this paper on annealing wire, says, that large wire as well as small, can be annealed and still retain the brightness it possessed, after passing through the drawing dies. The process is to pack the coils in cylindrical cast-iron pots with double lids, the outer one resting on a projection or rim half an inch below the top of the pot, leaving room between the outside of the inner lid and the inside of the outer, for dry sand to exclude the atmosphere. The pots should not be opened until quite cool after the heating process, otherwise the atmosphere will so far oxidize the surface as to turn the color to a blue or black.

WHAT IS SALERATUS?—Wood is burnt to ashes, these are lixivated, and lye is the result. Lye is evaporated by boiling, black salt is the residuum. The salt undergoes purification by fire, and the potash of commerce is obtained. By another process we change potash into pearlash. Now put these in sacks and place them over a distillery mash tub, where the fermentation evolves carbonic acid gas, and the pearlash absorbs it and is rendered solid; the product being heavier, whiter, and drier than the pearlash. It is now saleratus. How much such salts of lye and carbonic acid gas one can bear and remain healthy, is a question for a saleratus eater.



ISSUED FROM THE U. S. PATENT OFFICE
FOR THE WEEK ENDING JUNE 5, 1866.
Reported Officially for the Scientific American.

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

55,219.—SNAP-HOOK.—Elijah A. Andrews, New Britain, Conn.:

I claim the combination of the latch, e, within and flush with the back of the recess, d, relative to the opening, g, with the pad, i, spring, n, and loop, c, substantially as and for the purpose described.

55,220.—HORSE-SHOE.—Harrison Armstrong, Sparta, Wis.:

I claim forming a spur on the calk by driving a portion of the ledge downwards, substantially as and for the purpose described.

55,221.—LOW-WATER DETECTOR.—John Ashcroft, Brooklyn, N. Y.:

I claim, 1st, The combination of the pipe, G, connected to the boiler below the proper water-line, the discharge passage, H, and the fusible disk, C, with the screw-valve, D, arranged substantially as and for the purpose herein set forth.

2d, The bearing-piece, F, in combination with the fusible disk, C, and the connections, G and H, arranged as specified so that the communication between the boiler and the said fusible part cannot be closed until after the fusible part has yielded to the temperature, as herein specified.

55,222.—TUYERE.—Abel T. Atherton, Lowell, Mass.:

I claim the combination of the cistern, b, tuyere iron, f, pipe, c, and packing, e, constructed and arranged substantially as set forth.

55,223.—DOVETAILING MACHINE.—Juan S. L. Babbs, New Albany, Ind.:

I claim in combination with the conical cutters and the carriage by which the stock is presented to the action of the cutters of a secondary carriage or stock-holder, arranged to operate substantially as set forth.

55,224.—TIRE-BENDING MACHINE.—D. Ballou, Havanna, N. Y.:

I claim the combination of the wheel, D, with its holder, N, or its equivalent, the ratchet, G, H, lever, F, and spring-pressure roller, J, K, L, substantially as described and represented.

55,225.—COOKING STOVE.—A. C. Barstow, Providence, R. I.:

I claim, 1st, The construction of stoves of otherwise ordinary or suitable arrangement for admission of interchangeable collars or closing caps for the flue and boiler holes, substantially in the manner herein described, dispensing with the use of rivets or other means of permanent attachment.

2d, The combination with a stove of otherwise ordinary or suitable construction of a hot closet arranged underneath the body of the stove, substantially as shown and set forth.

3d, In a stove provided with a hot closet underneath the body thereof, I claim in lieu of the usual legs forming a base around the stove to inclose the said closet, in the manner and for the purpose set forth.

4th, The employment in combination with a stove of otherwise ordinary or suitable construction of a movable fire-pot or pan having a closed bottom and holes at the sides, substantially as and for the purposes set forth.

55,226.—BREAKING AND TRAINING BRIDLE.—William O. Bartlett, New York City:

I claim an improvement in bridles by attaching a cord or strap to the same, so constructed that by pulling on the reins a pressure is produced downwards on the sensitive part of the animal's neck, and upward in his mouth, substantially as herein described.

55,227.—CRADLE.—William Bedle, Keyport, N. J.:

I claim the weighted arm, G, the brake, I, and clock mechanism, D, E, F, or their equivalents, when in combination with the cradle, A, substantially as and for the purposes described and set forth.

55,228.—DREDGE ROLLER FOR OYSTER-BOATS.—Chas. T. Belbin, Baltimore, Md.:

I claim the arrangement on the roller, d, of the ledge or flange, c, and the handle, e, as and for the purpose described.

55,229.—SNAP-HOOK.—William Bellairs and Oliver D. Barto, Atkinson, Ill.:

We claim the combination of the outer hook and the inner hook with its arms, H, projection, D, and dovetail-slide, F, spring, E, and shank, B, arranged and operating in the manner and for the purpose herein specified.

55,230.—METHOD OF TURNING BRIDGES.—William N. Berkeley, Cedar Rapids, Iowa:

I claim, 1st, In combination with a revolving pedestal, B, the employment of the stationary sheave, D, and track, E, with the friction-roller, H, and chain, or its equivalent, a, arranged and operating substantially as herein specified and shown.

2d, The combination of the revolving pedestal, B, sheave, D, track, E, roller, H pulley, I, and chain, a, arranged and operating substantially as shown and described.

3d, The employment of the adjustable pulley, I, when arranged with the roller, H, and chain, a, as and for the purposes set forth.

55,231.—METHOD OF TURNING BRIDGES.—William N. Berkeley, Cedar Rapids, Iowa:

I claim 1st In combination with the revolving pedestal, B, the employment of the circular stationary bearing, D, the shafts, F G, and friction-wheels, H, I, arranged and operating substantially as and for the purposes specified.

2d, In combination with the above, I claim the arrangement of the levers, M, N, and connecting-bar, O, as and for the purposes set forth.

55,232.—MACHINE FOR SCUTCHING FLAX.—Henry Black, Lewisburg, Ohio:

I claim the use of a reel with swords attached, which operate transversely upon the flax-apron, a movable scutching-board; the reel, with the swords and the movable scutching-board, all being my own invention, they are for all which I claim a patent.

55,233.—METALLIC CARTRIDGE.—Amos S. Blake, Waterbury, Conn.:

I claim, as an improvement in cartridge-cases, the perforated cap, B, with its oblong opening, F, arranged to operate with the case, A, so that by the expansion of the metal in explosion of the powder a portion of the case, A, will be forced into the opening in the cap, B, and the two parts be held together substantially as described.

55,234.—MEDICAL COMPOUND.—Gustavus Bode, Milwaukee, Wis.:

I claim a medical compound, of the ingredients herein specified, and in about the proportions named, intended as a remedy for rheumatism, neuralgia, and other nervous diseases.

55,235.—COFFER-DAM.—James Braidwood, Wilmington, Ill.:

I claim, 1st, The making them of sections that may be fitted within each and operated and detached from each other, substantially as herein recited.

2d, The elastic valve surrounding the points of union of the sections, and made tight by the outward pressure, as described.

3d, The detachable mechanical means or devices for forcing down the sections by pressure upon the surface, as set forth.

55,236.—SAIL.—Hiram Brown, Cape Elizabeth, Maine:

I claim, 1st, In conjunction with the supplementary reefing-yard, the use of the band, D, to attach the sail to the center-yard, as described for the purposes set forth.

2d, The combination of the spilling lines, arranged as specified, with the eyelets, i, i, with the supplementary reefing-yard, as described.

55,237.—STEAM GENERATOR.—James A. Campbell, St. Louis, Mo.:

I claim, 1st, The combination of the reserve water-chamber, E, the pipe, M, N, the stopper, J, the regulating-nuts, L, L, L, L, and the float, I.

2d, I claim the combination of the furnace, K, the coil of pipe, A, B, C, the float, I, the regulating nuts, L, L, L, L, the reserve water-chamber, E, and the pipes, M and N.

3d, The combination of the coil of pipe, F, G, H, with the reserve water chamber, E.

4th, In combination with the reserve water chamber, E, and steam chamber, D, I claim the chamber, O, the pipes, R, S, T, U, and the cocks, P, Q, V, W.

55,238.—MACHINE FOR JOINTING STAVES.—Aaron Casebeer, Pipesville, Pa:

I claim a stave-holder with the arc gauges, marked A, A, with screws, B, B, B, by means of which a beveled joint for any circumference may be made.

55,239.—YARN-DELIVERY APPARATUS FOR BRAIDING MACHINES.—G. F. Chambers and S. Robinson, Worcester, Mass.:

We claim, 1st, The combination with standard, C, and sliding-weight, P, of a friction lever having a projection, h, as and for the purposes set forth.

2d, The combination with friction lever, G, of slide or stop and tension weight, D, and spring, j, substantially as set forth.

55,240.—SEPARATING HYDRO-CARBONS.—Robert A. Chesebrough, New York City:

I claim the application of steam in a closed receptacle to bone-black or other filtering media, for the purpose of extracting the hydro-carbon oils remaining therein after filtration, whether the steam is made in the receptacle or conducted therein.

55,241.—KNITTING MACHINE.—William W. Clay Philadelphia, Pa.:

I claim, 1st, The combination of the needles, C, carriers, D D′, a jacquard apparatus, and the within-described devices, or their equivalents, whereby the needles can be transferred from one carrier to another by the operation of the jacquard apparatus, for the purpose described.

2d, The guides, L, L′, in combination with the within-described devices or their equivalents, and with a jacquard apparatus for the purpose specified.

3d, The bars, K, K′, K″, with their thread-guides, L L′ and recesses, n, in combination with the adjustable plate, O, and spring-catch, h, or its equivalent, the whole being arranged and operating as and for the purpose set forth.

55,242.—BOTTLE-FILLER.—Theodore Cochen, Williamsburg, N. Y.:

I claim, 1st, Placing a valve at the discharging end of the siphon, and operating the same by an automatic movement, said valve consisting of the aperture, P, the packing-ring, u, the sheath, R, r, and spring, v, or their equivalents, substantially as set forth.

2d, The peculiar arrangement of the parts which produce a uniformity of supply and discharge, viz.: the valve, D, valve-stem, F, nut, I, and float, G, when in combination with the reservoir and siphon, substantially as and for the purposes set forth and described.

55,243.—COMBINED DRILL AND FERTILIZER.—George E. Cooper, Baltimore, Md.:

I claim, 1st, In combination the hopper having two compartments, D, D2, the reciprocating rod, E, E, provided with two or more pins, e, e e2, e2, to each of the holes, the pins being arranged so as to project horizontally over the seed apertures, and with pins, e1 projecting upwardly as and for the purpose set forth.

2d, In combination with the above, I claim the cam, F, lever, G, studs, H, H, and pins, h, the whole being arranged and employed substantially as and for the purpose herein set forth.

3d, The combination of the lever, J, bar, I, link, K, pivoted crank, L, and slides, M, M, for the purpose of closing and opening the discharge apertures of the hopper simultaneously with the raising and lowering of the drill tubes.

55,244.—LOCK.—Walter Corbett and William Burns, St. Louis, Mo.:

We claim, 1st, The combination and arrangement of the bridge, B, and wards, a, a*, and key-hole bushes, a′, as above recited.

2d, The tumblers, C, when constructed with the toothed notches, c, and the notches, c′, and also in connection with the post b3.

3d, The combination of the stop, G, with the above-described lock, as and for the purpose set forth.

4th, The construction of the bolt, D, with two notches, E and E′, as and for the purpose set forth.

5th, The combination and arrangement of the various parts of this lock, viz.: the bridge, B, the wards, a′ and a*, and key-hole bushes, a′, the tumblers, C′, the port, b3, and the stop or catch, G.

55,245.—ANIMAL TRAP.—George G. Cottrell, Sharon, Conn.:

I claim, 1st, The double ridges or holding jaws, M′, N′, M2, N2, arranged to operate substantially as and for the purpose herein specified.

2d, The knife edges or narrow bearings, D′, E′, arranged substantially in the manner and for the purpose herein set forth.

3d, The spits formed on the pan, D, substantially in the manner and for the purpose herein set forth.

55,246.—HORSE HAY-FORK.—C. N. Culver, Bowling Green, Ohio:

I claim the arrangement of the levers, H and I, in combination with the hook, G, ring, a, links, p, and forks, A, A, operating in the manner and by the means substantially as described.

55,247.—INNER SOLE.—Lyman Daggett, Boston, Mass.:

I claim the flexile inside water-proof elastic sole, as made with the supporting projections extending from its lower surface, and with passages around and between such, and holes leading therefrom up through the sole, the whole being substantially as described.

55,248.—FRUIT JAR.—Reuben M. Dalbey, Springfield, Ohio:

I claim, 1st, The lugs or projections, a, having notches on their under surfaces, as and for the purpose set forth.

2d, In combination with a jar having the serrated projections, I claim the yoke, B, and the cam-headed lever, D, arranged to operate as shown and described.

55,249.—MANUFACTURE OF WHITE-LEAD AND SALTPETER.—Clarence Delafield, Factoryville, N. Y.:

I claim, 1st, The application of a jet of steam to a solution of the nitrate of lead or to a solution of the carbonate of potash (or their equivalents for this purpose), or to the united or combined solutions of nitrate of lead and carbonate of potash (or its equivalent for this purpose), for the purpose of aiding in the production of the white lead of commerce, substantially as set forth.

2d, The production of saltpeter or nitrate of potash as the residue of white lead manufactured after the process, substantially as described.

3d, Raising the temperature of the solutions of the nitrate of lead and the carbonate of potash after their union or combination, either by the use of hot steam or by the application of other heat, to aid in the production of the white lead of commerce, substantially as described.

55,250.—WIND-POWER.—Michael Depue, Mattoon, Ill.:

I claim the combination and arrangement of the sliding canvas door, K, with the drum, C, L, B, substantially for the purpose set forth.

55,251.—MEAT-CUTTER.—Joseph Derr, Oley, Pa.:

I claim the construction, arrangement, and combination of the cutters, H and I, and cleaners, J, when operated as herein described and for the purpose set forth.

55,252.—ABDOMINAL SUPPORTER.—Ellen Dexter, Quincy, Ill.:

I claim the combination of the apparatus, substantially as described, with the pad, h, the former so constructed as to envelop the entire abdomen and sustain it both vertically and horizontally, and operating in such manner as, while the pad exerts a special pressure immediately above the "os pubis" on the "pelvic viscera," the lateral displacement of the same is prevented by the pressure of the supporter, and the adjacent parts of the abdomen are restrained from enlargement consequent on the pressure of the pad.

55,253.—PROCESS FOR PULPING WOOD.—John W. Dixon, Philadelphia, Pa.:

I claim, 1st, The circulation of a highly-heated solution of lime in water or of magnesia in water, or a mixture of lime-water and magnesia under pressure, through a mass of woody fibrous material contained in a digester as a process of preparatory process for making paper pulp.

2d, The above process, in combination with a circulation of highly-heated fresh water under pressure through the immersed mass, either as a precedent or subsequent operation to the one first claimed.

55,254.—TATTING SHUTTLE.—A. Dobrowsky, Shasta, Cal.:

I claim as a new article of manufacture a tatting shuttle, composed of two sides, A, A, center-piece, B, and pin, C, extending beyond the sides, A, A, at one or both ends, as shown and described.

55,255.—LAMP FOR VEHICLES.—S. P. Dodge, Boston, Mass.:

I claim, 1st supporting the lamp upon springs, c, in combination with the posts, d, and sockets, e, substantially as described.

I also claim the perforated cylinder, h, extending down into the oil chamber and surrounded with fibrous material, as and for the purpose substantially as set forth.

55,256.—FIELD AND GARDEN CULTIVATOR.—Edward L. Dorsey, Union, Ind.:

I claim, 1st, The rod, E, arranged and used as and for the purposes set forth.

2d, The reversible and adjustable plows and rakes, M, N, secured to the axle, K, said axle being attached to the upright, B, by means of an adjustable plate, H, arranged and used as and for the purposes set forth.

3d, The block, R, with the plows, P, arranged in the manner substantially as herein specified.

4th, The guides, w, arranged and used as and for the purpose herein set forth.

5th, The plow-beam, A, with guide-wheel, F, upright, B, and shovel, M, in combination with the axle, K, wheels, L, L, shovels, M, N, and block, R, when used as and for the purposes specified.

55,257.—STEERING APPARATUS.—Sidney M. Dumont, Frank Dupraz, and G. Dickason, Vevay, Ind.:

In the described combination with the double cone-shaped pilot-wheel hub, A, A′, we claim the compensating sheave-pulleys, C, C′, as described and for the purpose specified.

55,258.—ATTACHING HOOP-SKIRT WIRE.—John E. Earle, New Haven, Conn.:

I claim a shoulder formed upon one or both ends of the wire so that the two ends may be secured together, substantially as herein set forth.

55,259.—GATE.—Robert R. Earnest, Springfield, Ohio:

I claim a gate having its horizontal bars pivoted at each end, as shown, in combination with the brace, c, pivoted at its lower front end, and having its notched end arranged to operate in connection with the loops, f, and block, O, as set forth.

55,260.—LADY'S MUFF.—Thomas Eckert, New York City:

I claim as a new article of manufacture a muff constructed with an air-chamber, a, hoop, c, and inflating valve, b, as and for the purpose specified.

55,261.—APPARATUS FOR SEPARATING METALS FROM ORES.—John H. Elward, Polo, Ill.:

I claim, 1st, The process herein described for separating the precious metals from ores, and amalgamating them as set forth.

2d, The combination of a cupola a series of saturating vats, and an elevator, substantially as and for the purpose set forth.

3d, The combination of a cupola with a heating chamber having crushers and scrapers, arranged and operating substantially in the manner and for the purpose set forth.

4th, The combination of a furnace, lead bath, and reservoir, arranged and operating substantially as and for the purpose set forth.

5th, The stirrers, L, combined with the guide-trough, K, substantially as and for the purpose set forth.

6th, Passing the products of combination escaping from the cupola and heaters, through an exhaust-pipe kept charged with moisture, into a reservoir of water substantially in the manner and for the purpose set forth.

55,262.—SWAGE FOR SHARPENING SAW-TEETH.—James E. Emerson, Trenton, N. J.:

I claim, 1st, A swage for sharpening the teeth of saws, provided with a guiding-groove, h substantially in the manner described and operating for the purpose set forth.

2d, The manner, substantially as herein described, of forming and sharpening the teeth of saws, and securing uniformity in their width and thickness by means of a pin, adjustable transversely through the punch, as described, having dies to be used successively in combination with a punch or swage as set forth.

55,263.—FORGING, SHEARING, AND PUNCHING DEVICE.—J. E. Emerson, Trenton, N. J.:

I claim an anvil shears, and punching-machine, arranged, combined, and operating substantially in the manner and for the purpose set forth.

55,264.—Wood-bending Machine.—Owen Evans, Alliance, Ohio:

I claim, 1st, The arrangement of the staple, h′, form, B, and plate, n, in combination with the head, E, block, F, clasp, I, and key, d′, as and for the purpose substantially as set forth.

2d, The construction of the lever, L, guide, P, arm, p, in combination with the catch, J, and head, E, as and for the purpose substantially as described.

55,265.—Sofa and Crib.—E. E. Everitt, Philadelphia, Pa.:

I claim, 1st, The combination of the box or frame, A, the adjustable frames, C, C, and cushions, D, D′, the whole being constructed and arranged for joint operation, substantially as and for the purpose set forth.

2d, The combination of the cushion of a sofa bedstead, and a frame, E, hung to the cushion so as to be turned beneath or outwards at right-angles to the latter, substantially as and for the purpose set forth.

3d, The combination of the above and a leaf, F, or equivalent device for supporting the frame, E, at any required angle to the cushion, for the purpose set forth.

55,266.—Hoop Skirt.—Marks Fishel, New York City:

I claim, 1st, Embracing the hoops of skirts within holes in tapes or analogous material of a single thickness, when the holes are produced without removing or cutting any of the fabric and fit around the hoops, substantially in the manner and for the purpose herein set forth.

2d, Combining with tapes punctured by the hoops as shown, the clasps, D, embracing the hoops and performing the double function of preventing the moving of the hoops in the tapes and of preventing the twisting or doubling of the tapes, as herein specified.

55,267.—Instrument for puncturing Fabrics and introducing Flat Skirt-wire therein.—Marks Fishel, New York City:

I claim the sharp-pointed needle, C, having a form flattened and hollow at the large end, smoothly rounded throughout, adapted to be used in inserting the flat springs through close material, substantially in the manner and for the purpose herein set forth.

55,268.—Stove-pipe Thimble.—Charles H. Fitch, Auburn, N. Y.:

I claim, 1st, The top-plate, D, and bottom or end plate, G, with the cylinders, A and B, constructed and combined as and for purposes set forth.

2d, Closing the ends of the cylinder, A, under the bottom and over the top, in the manner and for the purpose above described.

55,269.—Stock for Broom-heads.—A. D. Forbes, Rockford, Ill.:

I claim the combination in a broom-head of the malleable iron clamp with the wrought-iron stem, when formed and united substantially in the manner and for the purpose described.

55,270.—Horse-shoe Nail.—Thaddeus Fowler, Seymour, Conn.:

I claim as a new article of manufacture a horse-shoe nail in which the point of junction of the body with the head is more dense or stiffer than the body portion of the nail, the point is beveled upon one side (without being spread widthwise) and the head has a projection in the central parts, for the purpose and as set forth.

55,271.—Car Coupling.—Edward J. Frazier, Peoria, Ill.:

I claim the grooved pendulated key when suspended in a slotted opening as described, in combination with the coupling-pin as specified, for the purposes set forth.

55,272.—Planing Machine.—Andrew Fuller, Milford, N. H.:

I claim the method herein described of working lumber across the grain, by the use of one or more rotary cutters or scrapers fixed or secured in the cutter-head, G, so that their planes shall pass through the axis of motion of the head, G, in combination with a table or platform to support the lumber to be fed to the cutter, the whole being arranged and operating as shown in Fig. 2 of the accompanying drawings.

55,273.—Apparatus for amalgamating Gold and Silver with Lead.—H. L. Fulton, Chicago, Ill.:

I claim the arrangement in combination of the amalgamating vessel, B, its partition, D, the hollow cylinder, A, with its helical shaft, C, its hopper, E, its spout, F, and its opening, G, in the manner and for the purposes specified, substantially as described.

55,274.—Brick Machine.—Benjamin M. Gard, Champaign county, Ohio:

I claim, 1st, Making the bottom of the clay tub of a conical form when used in combination with a tapering screw for forcing the clay into the mold underneath the tub, in the manner and for the purpose herein described.

I also claim a sectional plate, d, held to its place by wooden pins that will break when a stone gets jammed in by the screw, and give way, thus preserving the machine from greater damage, as described.

I also claim making the scraper-shank adjustable, in combination with the pivoting of the scraper on said shank, as and for the purpose described.

I also claim, in combination with the pressure-plate, g, on the top of the table, the rise, h, in the track, o, underneath said plate, for the purpose of giving the clay additional pressure over what it receives from being packed in by the screw, substantially as described.

I also claim, in combination with the mold, a locking and unlocking mechanism, that is automatically operated, for locking and unlocking the lid of the mold at stated intervals, as set forth.

I also claim, in combination with the pin, j, having a bolt-head on its top, the cam, K, on the under side of the lid, so that the rounded surfaces may meet without liability of the lid jamming the bolt, and thus preventing it from falling into its proper position, as described.

55,275.—Smith's Tongs.—John C. Gardner, Hingham, Mass.:

I claim the combination with a pair of tongs of a segmental strip, B, and pawl, D, substantially as and for the purpose specified.

55,276.—Cracker Machine.—W. M. Garrison, New York City:

I claim, 1st, The combination of the cutting-bars, F, with the grooved rollers, C, D, substantially as herein set forth for the purpose specified.

2d, The combination of the conducting-tubes, I, with the cutting-bars, F, and the recessed endless platform, H, substantially as herein set forth for the purpose specified.

3d, The sliding-frame, L, carrying the dotters, T, and arranged in relation with the recesses, r′, of the endless platform, H, substantially as herein set forth for the purpose specified.

55,277.—Rock Drill.—Stephen F. Gates, Boston, Mass.:

I claim a rock drill, when made with cutting edges, arranged substantially as and for the purpose specified.

55,278.—Horse Hay-fork.—Edward Gilliam, Allegheny, Pa.:

I claim the rod, A, provided with the head-piece, B, furnished with slots, e and o, when used in combination with the lever, D, rod, C, and barb or prong, 3″, the whole being constructed, combined, arranged, and operating substantially as herein described and for the purpose set forth.

55,279.—Plow.—Theodore Gilson and Nicolas Martin, Port Washington, Wis.:

We claim the land-side, D, in combination with the flanges, G, b, and share, C, as and for the purpose specified.

55,280.—Lamp.—R. A. Goodyear, New Haven, Conn.:

I claim the construction of the drip-cup attached to the metal cup which covers the fluid vessel or reservoir, as and for the purpose shown and described.

55,281.—Churn.—Benjamin Graham, Lyons, Iowa:

I claim the beater, B, the screen, P, and the shield, S, all for the purposes as above set forth.

55,282.—Machine for bending Wood.—Darwin A. Greene, New York City:

I claim, 1st, The short links, E1, E2, short arms, D1, D2, shaft, d, and stols, a, arranged as represented, relatively to each other and to the lever, D, and yoke, C′, or their equivalents, substantially as and for the purpose herein specified.

2d, The hinged arm, J, shaft, g, spring, H, and handle, G, arranged in operation in connection with the lever, D, and its connections, substantially in the manner and for the purpose herein specified.

55,283.—Device for picking Cotton.—John Griffin, Louisville, Ky.:

I claim, 1st, The tube, D, with the cylinders, E, F, and plates, a, within cylinder, E, in combination with the cylinders, N, O, piston, c, and plunger, e, with the tubes, Q, R, S, the tubes, Q, R, communicating with an exhaust-chamber and tube, S, provided with an orifice, e*, and to be opened and closed by the thumb of the operator, substantially as and for the purpose set forth.

I further claim the piston, K, working within the cylinder, L, and connected with the flap, H, as shown, and the cylinder, L, communicating with the cylinder, F, substantially as and for the purpose specified.

55,284.—Capping Wood Screws.—Charles T. Grilley, New Haven, Conn.:

1st, In the manufacture of capped screws, I claim placing the screw which is to be capped in an inverted position, or head downwards, together with its cap, in the closing die, constructed and arranged as described, so that the cap, while held in its proper relation to, may be closed on the screw without disfiguring or closing up the nick in the cap, as herein shown and set forth.

2d, In machinery for capping screws, as described, I claim providing the closing die with a punch, whereby the ready adjustment of the cap to the screw may be effected as herein shown and set forth.

3d, In machinery for capping screws, as herein set forth, I claim the combination of the closing die and center-punch with the recessed plunger or drop, for joint operation, as described, so that the cap may be adjusted to and closed in the screw while the nick in the cap is kept open, as shown and set forth.

4th, In combination with the closing die, provided with a center-punch, I claim the yielding support, as herein shown and described and for the purposes set forth.

5th, In combination with the closing die and center-punch and yielding support, as described, I claim the employment of a screw for adjusting and holding in place the center-punch, as herein shown and set forth.

55,285.—Water-spreading Nozzle for Fire-engines.—William Gurley, Troy, N. Y.:

I claim, 1st, The placing of a spreader for the nozzles of engines, pumps, etc., within a plate, so that the spreader may be adjusted over the orifice of the nozzle, or moved off from it bodily or entire, by the movement of a single part, D, substantially as shown and described.

2d, A spreader composed of a series of frustums of cones placed one within the other, and arranged so as to form a single or entire part, substantially as shown and described.

55,286.—Self-inserting Faucet.—Samuel N. Haight, Bedford Station, N. Y.:

I claim the combination of the open space, E, with the sloping cutting edges, b, b, and the channel or groove, c, of the arched and detachable cutter, substantially as and for the purpose described.

55,287.—Churn.—Alexander W. Hall, New York City:

I claim the combination of a swinging or vibrating dasher with the swinging body of a churn in such manner that, by the act of moving the body in one direction, the dasher is moved in an opposite direction, substantially as herein set forth for the purpose specified.

55,288.—Step Ladder.—Horace P. Hammond and William A. Hathaway, North Kingston, R. I.:

We claim the link, D, provided with a series of notches, a, a, a, in combination with the stud pin, b, or its equivalent, and the frame of a step-ladder, substantially as described for the purpose specified.

55,289.—Transmitting Motive-power.—Thomas Hanson, New York City:

I claim giving the required reciprocating motion to a pump or pumps for raising water by means of pistons working in separate cylinders and having water or other non-elastic fluid interposed as a medium for communicating the motions, substantially as described.

55,290.—Carpet-bag Frame.—George Havell, Newark, N. J.:

I claim, 1st, The combination of the "frame" of carpet, traveling, and other similar bags of three pieces, when combined and arranged substantially as set forth.

2d, The particular form of the central piece, E, when constructed in the manner and for the purpose set forth.

55,291.—Lamp Chimney-cleaner.—Ezra T. Hazeltine, Warren, Pa.:

I claim the herein-described instrument for cleaning lamp chimneys by adhesion of an intervening fibrous substance, consisting of a pad, A, of india-rubber or its equivalent, rod, C, and handle, B, constructed and operating substantially as set forth.

55,292.—Bronchial Troche.—Samuel C. Henszey, Jr., West Chester, Pa.:

I claim the use of muriate of ammonia as compounded with certain other parts or ingredients herein named, or the component parts as combined, compounded, and made into a troche or lozenge, substantially in the manner and for the purpose as herein specified.

55,293.—School Desk and Seat.—George W. Hildreth, Lockport, N. Y.:

I claim, 1st, The lever, a, moving upon the pivot, c, between the center of the lever and the back end thereof, when said lever (or seat) is sustained in a sitting position, by the back end of the lever, bearing against the stop, d, on the frame, as herein specified.

2d, The tapering pivot, c, with the corresponding socket in a, bolt, f, and jamb-nut, g, as and for the purpose described.

3d, The spring, i, and stops, d, d, for the purposes herein specified and shown.

55,294.—Method of making Molds for Castings.—James G. Holt, Chicago, Ill.:

I claim, 1st, The devices, arranged and combined substantially herein described, for regulating the descent of the plunger, with respect to the hight of the flasks in which the molds are d e, for the purpose set froth.

2d, The combination of the projections, k2, with the follower of the press, for forming the branch sprue holes, k1, substantially as described.

3d, The combination of the press and its follower with the opening, H1, and flask, H, all constructed as described in the manner shown, so that molds for axle skeins and boxes may be pressed, substantially as set forth.

4th, The perforated follower, B, in combination with the sectional flask, H, H′, and patterns, h, h, for the purpose substantially as described.

55,295.—Machine for preparing Axle-skein Molds.—James G. Holt, Chicago, Ill.:

I claim, 1st, The machine constructed and operating substantially as herein described for cutting, sleeking, and packing the walls of sand-molds for casting axle-skeins, which molds have been previously prepared by patterns, substantially as described.

2d, The means, substantially as herein described, whereby said molds, which have been prepared by patterns substantially, as described, are subject to the operation of rotary and vertically moving and laterally sliding tools, which are adapted for finishing said molds, substantially as set forth.

3d, Providing the tool, F, which finishes the molds, with one or more movable cutters, constructed and operated substantially as described, for producing the undercutting in the molds, substantially as described.

4th, The combination of molding tools, F, with a vertically sliding frame, C, and also with devices which will admit of these tools being rotated about their axes for finishing molds, substantially as and for the purpose described.

55,296.—Mode of preparing Molds for Hub-boxes.—James G. Holt, Chicago, Ill.:

I claim, 1st, Making the interior form of a sand-mold for hub-boxes by means substantially as herein described, the said means being constructed and operating substantially as set forth.

2d, The combination of movable plates, J, and sliding plate, F, with a tapering tool, F, for finishing sand-molds for hub-boxes, substantially as described.

55,297.—Cider Mill.—S. J. Homan, Walden, N. Y.:

I claim the adjustable knife, E, operating in combination with the scrapers, C, of the cylinder, B, in the manner and for the purpose herein specified.

55,298.—Sash-fastening.—William W. Hosford, New Britain, Conn.:

I claim the combination of cams, k, e, with the plate, a, spring i, and arm, O, arranged and operating substantially as and for the purpose described.

55,299.—Construction and Manufacture of Printing-type.—Thomas S. Hudson, East Cambridge, Mass.:

I claim the said manufacture of printing-type, made substantially as described, viz.: by the combined processes of stamping the letter or figure from a plate or piece of metal, and subsequently reducing the same in manner and for the purpose set forth.

55,300.—Construction of Printing-wheels, etc.—Thomas S. Hudson, East Cambridge, Mass.:

I claim the new manufacture of the printing or type-wheel prism, cylinder, or plate, consisting of the supporting part, B, and the printing band or chain, A, made with concavo-convex types, and applied to such part, B, substantially in manner as described.

55,301.—Rotary Engine.—Robert Hughes, Dangerfield, Texas:

I claim, 1st, The construction of the stationary head, E, with curved point, G, and its steam channels, D and T, as herein described.

I also claim the construction of the valves, K, arranged in the valve-box, L, as herein described.

I also claim the arrangement and combination of the valves, K, center-head, E, cam G, and channels, D and T, to operate in a cylinder as a rotary-engine, whereby to utilize the exhaust steam, and operating other machinery as herein set forth.

55,302.—Clamp.—P. F. Hurlbert, Chatham, N. Y.:

I claim the combination of the angular bar, A, and serrated cam lever, arm, c, admitting of operation to the right or left, for the purpose herein specified.

55,303.—Detaching Boats from their Davits.—Thomas Huntington, New Rochelle, N. Y.:

I claim the hooks, B, suspended or fitted in the plates, A, in combination with the arms, e, attached to the shaft, C, all being applied to the boat, and arranged to operate substantially in the manner and for the purpose set.

55,304.—Harvester.—John Jann, New Windsor, Md.:

I claim, 1st, The arrangement of the lever, H, bars, I, I, slides, F, clutches, E, ratchet, D, and springs, K, as and for the purposes specified.

2d, The slotted bar, O, in combination with the pivot-bolt, M, for making a stiff joint between the cutting apparatus and its connections.

3d, The combination of the double bar, N, hook, Q, slotted link, R, segments, S, pinion, U, and lever, T, all arranged and operating as described.

55,305.—Portable Door-fastener.—E. H. Janney and E. J. Hamilton, Fairfax, Va.:

We claim, 1st, The short stationary pivots of the case, A, in combination with the slotted swinging and sliding hooked holdfast, B, substantially as described.

2d, The combination of the oblique slots, short pivots, hooked holdfasts, B, and stop, d, in construction of a portable night-lock, substantially as described.

3d, The combination of the notches, S, and shoulder, k, in the construction of the portable night-lock, substantially as described.

55,306.—Washing Machine.—James Hervey Jenkins, Yorkville, N. Y.:

I claim, 1st, The arrangement of the cylinder, B, and spring-plate, C, rollers, M, M, and board, O, as and for the purpose herein specified.

2d, The revolving hollow brush-cylinder, P, provided with brushes at its exterior and interior surfaces, and open at one end, substantially as and for the purpose specified.

3d, The arrangement of the pressure-rollers, M, M, spring, k, perforated board, o, and case, A, for the purpose specified.

4th, The arrangement of the pounders, I, rod, K, and crank, g, suitably operated, in combination with the perforated box, J, within the partition, h, in the manner and for the purpose herein specified.

5th, The arrangement of the treadle-frame, F, slotted upright bar, G, crank, e, and shaft, D, constructed and operating in the manner and for the purpose herein described.

55,307.—Rock Drill.—Lemuel P. Jenks and Geo Arthur Gardner, New York City:

We claim, 1st, Suspending the machine bearing-slide, M, upon the same center with the disk, M, in combination with the arrangement whereby the slide, N, can be fastened at any angle, substantially as described.

2d, The standard-block, H*, in combination with the gibs or friction pieces, J, J, when the same is used with rock drills, and constructed substantially as shown, for the purpose of giving universality of motion, horizontally, all substantially as described.

3d, Regulating the feed of a rock drilling machine toward the rock, according to the extent of penetration of the drill into the same, by the arrangement constructed and used substantially as described.

4th, The arrangement of a screw-shaft and nut, for the purpose of raising and lowering the machine, when used with rock drills, and constructed substantially as described.

55,308.—Stop-motion for Knitting Machines.—Edward Kay, Philadelphia, Pa.:

I claim, 1st, The machine as a whole, composed of the parts combined, arranged, and operating substantially as set forth.

2d, The pin-wheel, M, the sliding-plate, O, and the lifting-plate, P, combined and arranged substantially as set forth.

3d, The sliding-plate, O, the lifting-plate, P, and the shifting-lever, R, combined and arranged as herein specified and described.

4th, The sliding-plate, O, the shifting-lever, R, and the spring, S, combined and arranged substantially as set forth.

55,309.—Row-lock.—James B. Kelly, Kendallville, Ind.:

I claim, 1st, The combination of the circular plates, B and C, having rollers interposed between them, with an oar, D, substantially as described.

2d, Constructing the base-plate, B, with a central stud, a, for receiving, centering, and keeping in place the movable plate, C, to which the oar is affixed, substantially as described.

3d, Constructing the anti-friction rollers, G, G, with flanges, c, c, on them, in combination with the annular projections on the plates, B and C, substantially as described.

55,310.—Washing Machine.—William Kelly, Saranac, Mich.:

I claim, 1st, The rod, g, with ratchet, j, in combination with the slotted plates, m, and rubber, E, the whole constructed as and for the purpose herein set forth.

2d, The shaft, P, furnished with double cranks in combination with rods, L and T, in connection with plates, K, and tub, B, the whole constructed and operating in the manner and for the purpose herein specified.

55,311.—Buckle.—George R. Kelsey, West Haven, Conn.:

I claim the combination of the frame (Fig. 3) with the tongues (Fig. 4) when they are constructed, attached, and fitted for use, substantially as herein described and set forth.

55,312.—Plow.—Martin Kennedy, Boston, Mass.:

I claim, 1st, The handle, C, having the wedge-shaped opening, p, at its lower extremity in combination with the pins, o, sole, A, standard, B′, and bolt, e, for attaching the handle to the plow, substantially as described.

2d, The hooked beam, D, in combination with the standards, B, B′, and bolts, a and h, for attaching the beam to the plow, substantially as described.

3d, The hinged mold-boards, M, M, constructed with their surfaces turned in at the bottom as described, and hinged to front standard, B, in combination with the hinged plates or pieces, m, m, and piece, d, for adjusting the mold-boards to any angle, the whole being constructed and operated in the manner and for the purpose set forth.

55,313.—Churn-dasher.—A. Kirlin, Rock Island, Ill.:

I claim the combination of the double dasher-shaft, in combination with the pump-rod, when arranged together substantially as and for the purpose described.

55,314.—Stump Extractor.—William Langdon, Langdon Station, Pa.:

I claim the eccentric short arm of the lever of the first kind In connection with the chain and hook, substantially as described.

55,315.—Machine for pressing Lead Pipes.—Robert Layng, New York City:

I claim the bridge, g, attached to the end of the lead cylinder and sustaining the core-holder, f, in combination with the ram, e, formed with an opening or mortise through which said bridge passes, substantially as and for the purposes specified.

55,316. — Broom-head. — Josephus Liget, Posey Township, Ind.:

I claim the handle, D, provided with the mortise, E, and the set-screw, C, in combination with the socket, A, all arranged substantially as set forth and described.

55,317.—Collar and Neck-tie Supporter.—C. L. Lockwood, New York City:

I claim a plate or retainer, adapted for confinement in front of a shirt collar, a bow or tie, and devices whereby the bow may be secured to or detached from the retainer, the whole being constructed and adapted to each other, substantially as described.

55,318.—Rotary Pump.—Henry Maas, Homestead, Iowa:

I claim the disk or ring, C, having a series of plates, J, hung in and to the same, when arranged within a casing having an outlet and inlet opening thereto, in such a manner that it can be rotated, and the said casing is so constructed as to operate the said ring-plates, J, substantially in the manner and to accomplish the purpose described.

55,319.—Carriage Spring.—G. S. Manning, Springfield, Ill.:

I claim, 1st, The S-shaped springs, D, either with or without the strengthening leaf or leaves, K, constructed and connected to the axle and to the supporting arm of the carriage-body, substantially as described and for the purpose set forth.

2d, The connection, J, constructed as described in combination with the supporting arms, H, I, substantially as and for the purpose set forth.

55,320.—Churn.—David Marshall, Genoa, N. Y.:

I claim, 1st, The arrangement of the spindle, F, cam-wheel, I, and slider, J, when made substantially as specified and used for the purpose set forth.

2d, The sleeve, K, ring, L, and elastic rings, M and M, when made and applied as herein specified.

55,321.—Tobacco-pipe.—René Masson, Tremont, N. Y.:

I claim, 1st, The pipe, e, extending down near to the bottom of the globe, B, when the same is applied in combination with the bowl and stem of a smoking-pipe and with the chamber, C, substantially as and for the purpose described.

2d, The plug or stop-cock, f, in combination with the channels, c, d, chamber, C, globe, D, and with the bowl and stem of a smoking-pipe, constructed and operating substantially as and for the purpose described.

55,322.—Gate.—Henry Maxell, Canton, Ohio:

I claim, 1st, The gate, A, with the arm, K, pivoted to the block, g, and upright, L, by means of the L-shaped bar, E, when arranged and used substantially as and for the purpose herein set forth.

2d, The bars, B and B′, with the slotted bar, C, when used to slide in the slots of the uprights of the fence for the purposes of opening and closing the gate, A, substantially as specified.

55,323.—Water-wheel.—Thomas McAuley, San Francisco, Cal.:

In combination with the water-wheel described, I claim the discharge-nozzle, N, arranged outside of the wheel and the dash-board, D, for joint operation, substantially as described.

55,324.—Apparatus for carbureting Air.—S. T. McDougal, New York City:

I claim, 1st, The combination of the float, E, and the valve, D, with the carbureter, A, for the purpose of regulating the admission of oil thereto, substantially in the manner herein described.

2d, In combination with a carbureter, containing a series of pans arranged one above another, I claim the valve, N, when operated by means of the wire, P, or its equivalent, substantially as and for the purpose specified.

55,325.—Motive-power.—J. McKnight and Wm. S. Deisher, Reading, Pa.:

We claim, 1st, The hub, C, the ratchet-wheels, E, E, cams, F, F, wheels, G, G, collars, D, D, and shaft, B, arranged and used in the manner and for the purpose herein specified.

2d, The arrangement of the cams, F, F, the chains, f, f, and the springs, g, g, within the frame, A, substantially as and for the purpose herein specified.

3d, The rods, h and i, the arms, j, j, the shaft, k, and the bar, e, arranged and used as and for the purpose herein specified.

55,326.—Gate-latch.—James W McLean, Indianapolis, Ind.:

I claim the latch, A, with projections, D and E, when constructed and operating substantially as and for the purposes set forth.

55,327.—Lumber Register.—Francis McManus, Ellenburg Center, N. Y.:

I claim the barrel, n, with pawls, n′, n2, ratchet-wheel, l, and suitable train of wheels, connecting the axes, a2, b2, c2, d2, e2, etc., in combination with the cord, m, spring, o, and stationary cap, p, constructed and operating substantially as and for the purpose specified.

55,328.—Gas Generator.—John McWilliams, Pittsburg, Pa.:

I claim the arrangement of the stove, A, gas-generator, C, furnished with a conformed bottom, e, rack, f, pipes, b and g, and vessel, m, arranged, constructed, and operating substantially as herein described and for the purpose set forth.

55,329.—Manufacture of Shoe-binding.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim the improvement in the manufacture of shoe-binding, substantially as described.

55,330.—Slitting Machine.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim, 1st, The combination with the rotary cutters of the stationary and the pressure-guides or guide-surfaces by which the strip is maintained in position, as presented to the action of the cutters.

Also, in combination with such cutters, the fingers extending between the cutter-blocks and keeping the material in position during the action of the cutters.

Also, combining with such rotary cutters the draw-rolls, operating substantially as set forth.

55,331.—Sorting Machine.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim, 1st, The combination with contact surfaces, between which the strip of leather is placed or passed, of an index mechanism operated by the movement of the movable contact surface, substantially as set forth.

Also, the employment of the feed-rollers in combination with the index mechanism, one of the rollers operating the index by its movement, substantially as set forth.

Also, overhanging the rollers which feed the material and operate the index mechanism.

Also, making the rollers or the roller-frame adjustable as to hight, so as to set the index-pointer to the starting-point of the dial.

55,332.—Machine for winding Shoe-binding, Tape, etc.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim, 1st, The employment of the independent cheeks or disks, for supporting the tape or ribbon as it is being wound, in combination with the removable arbor, i, upon which the coil is formed, substantially as described.

Also, the removable and slit arbor forming the core or spindle upon which the coil is wound.

Also, the employment of a measuring wheel driven by contact of the rotating coil, when such coil is formed and supported between disks, substantially as described.

Also, so connecting the measuring wheel with the mechanism by which the coil is wound that the rotation of the coil shall be automatically stopped when the determined length is wound, substantially as set forth.

55,333.—Apparatus for drying Hides.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim, 1st, A series of sliding panels, arranged within a drying chamber or case and made movable with respect to an opening or door in such case, so that each panel as it is brought opposite such opening may be wholly or partially withdrawn from the casing for the attachment and removal of the skins.

Also, in combination with the series of panels, and the movable rails which support the same, we claim a stationary frame having ways upon which each panel is guided and supported as it is slid from the drying chamber.

Also, the radial arrangement of the movable series of panels in the drying chamber, substantially as set forth.

Also, the combination with the stationary case and movable system of sliding panels, of heating pipes or their equivalents, substantially as set forth.

55,334.—Gluing Press.—M. H. Merriam and E. L. Norton, Charlestown, Mass:

We claim, 1st, In combination with the platen and its bed, a guide-piece upon each side of the platen, for bringing the strips to be united into line, substantially as set forth.

Also, the employment of an identifying mark upon each of a series of platens, as and for the purpose specified.

Also, hanging the platen so that it may swivel to accommodate the acting face of the plated to the surface of the strip beneath it, substantially as set forth.

55,335.—Gluing and Cementing Machine.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim the combination of the cement-containing vat, the rotating cement cylinder, and the scraper, operating together in the manner and for the purpose substantially as set forth.

55,336.—Cutting Machine.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim, 1st, The arrangement of the cutter-blocks to slide upon their shafts when they are kept in relative position by a spring or springs upon the end of one or both of the cutter-shafts, substantially as described.

Also, the combination of two series of tapes holding the skins in position and feeding them to the action of the cutters, with two series of disk-cutters, which divide the skins into strips, substantially as set forth.

Also, the combination with cutters which divide the skins of a series of tapes conducting the material to and carrying it in strips from the action of the cutters.

Also, the employment of the auxiliary tapes which, in connection with the main tapes, keep all the strips in position until the skin is cut entirely through.

Also, hanging the drums around which the upper tapes pass upon swinging frames, so that pressure of the upper tapes upon the skins is maintained, substantially as set forth.

55,337.—Potato-digger.—W. D. Miller, Enon, Ohio:

I claim, 1st, The combination of a laterally adjustable mold-plow with the gatherer of a potato-digging machine, substantially as described.

2d, The combination of the rake, D, with the plow and gathering devices of a potato-digging machine, for the purpose of gathering the vines, substantially as set forth.

3d, The combination of the mold-plow, a, rake, and a revolving fork or gatherer, for the purpose of digging potatoes, and substantially as set forth.

4th, In combination with the beam of the plow of a potato-digging machine, the cross-head, I, and frames, J and K, for the purpose of permitting an adjustment of the plow vertically or laterally, substantially in the manner set forth.

5th, The runners, R, in combination with the drag-frame which carries the revolving fork or gatherer of a potato-digging machine.

55,338. — Automatic Boiler-feeder. — William Moore, Kokomo, Ind.:

I claim, 1st, The swinging nozzle or its equivalent, constructed and arranged substantially as described.

2d, The combination of the swinging nozzle with the shaft, B, arranged in the support, R, with the pivot, L, substantially as described and for the purpose set forth.

3d, The combination and arrangement of the nozzle, a, shaft, B, and whistle, S, all constructed and arranged as and for the purposes set forth.

55,339.—Peat Machine.—Arthur Moffatt, Washington, D. C.:

I claim, 1st, The cylinders, B and B′, in combination with the standard, C, arranged for the purpose of feeding, crushing, and grinding, substantially as and for the purpose herein set forth.

2d, The application of heat to the different parts of the machine, substantially as and for the purpose herein described.

3d, The cylinders, S and S′, having chambers, m, in combination with the plunger, o, operating substantially as and for the purpose herein described.

4th, The piston, O, having an endward movement forward and backward, in combination with the feeding openings, i and i′, operating substantially as and for the purpose specified.

5th, The ejecting-rod, O′, provided with a disk in each chamber, and operating as herein described, for the purpose set forth.

6th, The vibrating-rod, p, in combination with the clogged-wheel, r, and operating substantially as described.

55,340.—Heat-generating Apparatus for Cooking Purposes.—Oscar J. Morrill, Chelsea, Mass.:

I claim, 1st, The employment of the inclined spur-wheel for effecting the adjustment of the wick by imparting a rotative spiral movement, substantially as set forth.

Also, the incasement of this wheel in the chamber or box, n, substantially as and for the purpose set forth.

Also, bending the teeth of the inclined spur-wheel, so that they act at right angles to the surface of the wick, substantially as described.

Also, in combination with the spur-wheel and spindle, the tube, o, extending up through the reservoir, substantially as described.

Also, giving to the feed-wheel such construction with reference to the wick which it rotates that its teeth shall not drag the threads from the wick-tube or become entangled therein, each tooth freeing itself from the wick before it reaches the surface of the tube through which the wheel projects, as described.

Also, the employment, in combination with a tubular wick and two foraminous cylinders, of a non-conductive or slow-conductive packing, p, over the top of the fluid-containing chamber, or between the flame and said chamber, substantially as described.

Also, in combination with a tubular wick and two foraminous cylinders, the packing, q, between the air-tube, l, and the wick-tube.

Also, supporting the inner flame-tube, g, upon this packing or a tube, r, extending therefrom.

Also, the passage, t, communicating from the upper part of the reservoir chamber with the wick chamber, substantially as described.

Also, so applying the outer wick-tube that there shall be a space, s, between the outer wick-tube and the outer flame-tube, which space is filled with the packing, p, substantially as described.

Also, making the supporting tube, r, and the upper part of the outer wick-tube of perforated metal, for the purpose described.

55,341.—Vial for holding Solutions.—Cyrus H. Morse, North Kingston, R. I.:

I claim a vial, bottle, or similar vessel, A, made with a funnel-shaped diaphragm, B, as described, in combination with the chamber, c, for the purpose specified.

55,342. — Liniment.—Richard M. Moyle, South Manchester, Conn.:

I claim Australian rheumatic white liniment, composed of ingredients in about the proportions substantially as described.

55,343.—Cable-stopper.—Peter Murry, Milwaukee, Mich.:

I claim the combination of the movable jaws or jaw, C, C′, with the stationary pin or jaw, D, eccentrically slotted wheel, G, and lever, H, all constructed and arranged to operate substantially as and for the purpose herein described.

55,344.—Curtain Fixture.—G. W. Nell, Philadelphia, Pa.:

I claim a shade-cord-holder composed of a sliding rod, B, with screw-shank, D, spring, b, and tubular button, E, constructed and operating substantially as and for the purpose set forth.

55,345.—Broom Clasp.—Peter H. Niles, Boston, Mass.:

I claim the spring-pin in combination with the protector, for the purpose and in the manner substantially described.

55,346.—Harbor Dredging Boat.—William H. Nobles, St. Paul, Minn.:

I claim, 1st, The construction of the hull of the dredging steamer containing the water-tanks, P, and having upon its bottom surface the plow, L, when the bow or forward part of said dredge is constructed so as to draw less water than the stern and admitting across the center thereof an open space, B, for the introduction of plows or scrapers, as herein described and set forth.

I also claim the plows or scrapers, C, placed spirally on its shaft, E, operating on an upright movable frame, D, with the endless chains, W, sand-buckets, T, and pulleys, X, arranged and combined as herein described and for the purposes set forth.

I also claim the mode of filling the buckets, T, by means of the plows or scrapers, C, as herein described.

55,347.—Steam Dredging Boat.—William H. Nobles, St. Paul, Minn.

I claim, 1st, The wheels, E, operating in square apertures, and located either obliquely or straight across the boat, having their plows, L, set spirally and obliquely, so as to make a clear channel, and throw the dirt to each side of the boat, when said devices are combined with the upper works or frame of a vessel greater in extent than the hull thereof, as herein described.

I also claim the combination of the spirally set plows, L, platform, C, and center-plow, T, when arranged upon a boat, as herein described and for the purposes set forth.

55,348.—Harness Saddle-seat.—O. B. North, New Haven, Conn.:

I claim a saddle-seat, of the form described, cast in one piece, substantially in the manner as herein fully set forth.

55,349.—Comb.—Joseph P. Noyes, Newark, N. Y.:

I claim, as an improved article of manufacture, the folding comb, herein described, consisting of the two blades, A, B, metallic backs, C, D, and hinge-joint, E, made solid with the said metallic backs, all as specified.

55,350.—Car Truck.—John Nusbaum, Alliance, Ohio:

I claim the shoe, D, with the flanges, c, and braces, E, F, in combination with the truck, in the manner and for the purpose set forth.

55,351.—Harrow.—William S. O'Brien, Brimfield, Ill.:

I claim the arrangement and attachment of the eye-rods, a, a, a, to the screw-nuts, b, in the center harrow, for the securing and adjustment of the outer harrows, A′, A′, substantially in the manner and for the purpose as herein described.

55,352.—Fence.—A. W. Olds, Green Oak, Mich.:

I claim the arrangement of the strips, A, B, C, and slats, b, d, in combination with the brace, f, and mode of connecting the pannels together, substantially as and for the purpose set forth.

55,353.—Cotton-bale Tie.—William Onions, St. Louis, Mo.:

I claim, 1st, The head, C, having the hook upon one side, substantially as and for the purpose described.

I also claim forming the head, C, plate, E, and rivet, a, of one and the same piece, as and for the purpose specified.

55,354.—Hose Coupling.—Jason C. Osgood, Troy, N. Y.:

I claim the screw and nut cut with double threads and leaving two or more of said double threads at the base of the screw and nut whole or uncut, in combination with the division into sections of the upper threads of the screw and nut, substantially as and for the purposes as herein set forth.

55,355.—Vaginal Spring.—Seth E. Parsons, Albany, N. Y.:

I claim the peculiar shape of the perforated bulb, A, and the long stem on the tube, B, in connection and combination with the rubber bulb, C, in the manner and for the purpose as herein set forth.

55,356.—Cattle Pump.—John S. Patric, Rochester, N. Y.:

I claim the combination and relative arrangement of the base, A, or its equivalent, and the jointed tilting-frame, B, D, its fulcrum, E, and counter-balancing weight, H, with the hollow piston or pipe, p, of the pump, as and for the purposes set forth.

55,357.—Hydrant.—Joseph Paudler and Friedrik Bauschtliker, Washington, D. C.:

We claim the arrangement and combination of the grooved circular air and water chambers, R, S, valve, T, air-tubes, D, D, with the upright lever or wrench, L, for letting on or cutting off the supply of water, and the upright levers or wrenches, G G, to tighten the packing, K, as herein described.

55,358.—Caster for Furniture.—J. C. Plumer, Boston, Mass.:

I claim, 1st, The use of a disk of rubber, leather, or other similar flexible material for the purpose of retaining the caster spindle in its place, in the manner set forth.

2d, The combination of the circular support, E, and the shoulders, F, as and for the objects specified.

55,359.—Generating and Supplying Illuminating Gas.—E. A. Pond and M. S. Richardson, Rutland, Vt.:

We claim the method herein described of supplying gas generators or vaporizers of whatsoever construction from an independent air-pump or air-forcing apparatus located at any place convenient, but so that the air shall enter the said vaporizer, and become charged with the hydro-carbon vapor at or near the point where gas is to be consumed.

55,360.—Churn.—S. T. W. Potter, Scott, N. Y.:

I claim, 1st, The floats, F, secured to the dasher-rods, g, constructed and arranged substantially as described.

2d, The scrapers, G, in combination with the floats, F, substantially as shown and described.

55,361.—Chamber Vessel.—Andrew Rankin, New York City:

I claim the combination of the arms, G, and spindle, H, operating relatively with slotted-plate, F, of the vessel, B, having a nozzle, D, for the reception of the deodorizing agent, all arranged and applied in the manner herein described for the purpose specified.

55,362.—Corn-sheller.—Daniel K. Reeder, Elliottsburg, Pa.:

I claim, 1st, The combination of the double-toothed wheels, E, the concave holders, i, mounted on slats, e, provided with yielding springs, f, and the grooved hopper, D, all constructed and arranged substantially as and for the purposes described.

2d, The helical gains, h, in the concave holders, i, and for the purposes described.

3d, The teeth upon the wheels, E, set at an angle as described to the radii of said wheels, in combination with the concave holders, i, as and for the purpose described.

4th, The grooved floor of the hopper, D, in combination with the apertures, D′, substantially as and for the purpose described.

5th, The shaking inclined floor, G, and slotted screen, G′, in combination with the shelling machinery and revolving fan, substantially as and for the purposes described.

55,363.—Machine for compressing the Cylinders of Casks upon their Heads to form a Tight Barrel.—William Reid, West Arlington, Vt.:

I claim the conical ring composed of sliding segments, operated substantially as described for compressing the shell in combination with the movable disk, or the equivalent thereof, for holding and controlling the shell to be compressed, substantially as described.

55,364.—Brace for Bits.—Cromwell O. Richey, Aurora, Ind. Ante-dated May 16, 1866:

I claim the retaining bar, D, spring, E, ferrule, k, and slot, C, in combination with bit, B, and pin, b, arranged as above described, and for the purpose set forth.

55,365.—Hoe.—Edwin Ritson and William W. Brigg, Mattaville, N. Y.:

We claim, 1st, A hoe composed of a back, A, shank, B, and ferrule, C, all cast in one piece and with teeth, D, secured to the back, A, in the manner substantially as set forth.

2d, Having the teeth, D, made in the form of a scaline triangle, with oblique side and attached to the back, A, in reverse position from the center outward, so that the oblique sides will face the center of the hoe, as shown and described.

55,366.—Rivet or Bolt Cutter.—D. D. Robinson, Niles, Mich.:

I claim, 1st, An improved machine for cutting off bolts or rivets formed by combining and arranging the eccentric levers, A, B, the jaws, C, D, and plates, E, F, G, J, with each other, substially as described and for the purpose set forth.

2d, The combination of the toothed and stop-plates, H, I, with the eccentric levers, A and B, substantially as described and for the purpose set forth.

55,367.—Manufacture of Artificial Fuel.—Charles Saffray, New York City:

I claim, 1st, The within-described process of aggregating coal-dust or waste coal by first producing a powder of pitch or resin and coal-dust, which is mixed cold with the coal to be aggregated, and, after having been subjected to a suitable pressure, is dried, substantially as and for the purposes set forth.

Also, the product obtained by treating coal-dust or waste coal in the manner above specified.

55,368.—Dentist's Chair.—J. A. Salmon, Boston, Mass.:

I claim, 1st, The arrangement of the gimbal-ring, d, the journals, b, b, c, c, bearings, c, c, f, f, curved bars, g, l, and their bolts, j, m, with the chair-body, B, and the base or foot-frame, A.

I also claim the arrangement and combination of the movable foot-board supporting-racks, r, r, and their operative slide-rod, n, with the chair-body, B, the foot-board supporting-arms, p, p, with their cross-bar, t, and the crank-shaft, s, and band, w, for raising and lowering the foot-board, as specified.

I also claim the mechanism for adjusting the elevation of the chair-seat, the same consisting of the wheel, a′, with its scroll-flange, b′, rack, z, and the carrier, y, arranged and combined with the seat and the chair-body, substantially as set forth.

I also claim the improved head-rest hinged-joint, as made of the recessed cylinder, f, the pin, k′, the clamp-screw, m′, and the bearing, h′, constructed and arranged together as specified.

I also claim the combination of the cross-slot, n′, in the adjuster with the clamp-screw, m′, and the head-rest, E, applied together, substantially as described.

55,369.—Truss.—Howard Sargent, Boston, Mass.:

I claim the pad, A, as described, made of sponge, for the purpose set forth.

55,370.—Sheep-rack.—D. F. Sexton, Whiting, Vt.:

I claim, 1st, Arranging the troughs in a sheep-rack so that the same can be slid up and down in suitable guides, substantially as and for the purpose specified.

I also claim so arranging the division-strips, C, that a greater space shall be provided at the top than at the bottom, substantially as and for the purpose specified.

55,371.—Method of preserving Vegetable Fiber.—T. P. Shaffner, Louisville, Ky. Ante-dated April 10, 1866:

I claim, 1st, The process of imparting a pure metallic coating to fibrous substances by precipitation, by electrical action of a metal upon a metallic surface, previously given by saturation with a metallic solution and subsequent removal or evaporation of the water of suspension or evaporation.

2d, Saturating the fiber, fabric, or wood, as described, with a liquid containing plumbago in suspension for the purpose of imparting a metallic coating to said fibrous substances, upon which a film of metal may be afterward precipitated by electrical action.

55,372.—Cotton-seed Planter.—N. B. Sherwood, Millville, N. Y.:

I claim, 1st, The vertically revolving feeder-belt, B, constructed and operating substantially in the manner and for the purposes herein shown and described.

2d, The fixed separating brush, E, arranged and operating substantially as and for the purposes set forth, in combination with the vertically revolving belt, B.

3d, The revolving discharge-brush, F, arranged and operating in connection with the belt, B, substantially as and for the purposes herein shown and described.

4th, The employment or use of the automatically adjustable back, G, of the grain or seed-hopper, in combination with the delivering devices.

5th, Constructing and arranging the parts so that the belt, B, whether verticle or inclined, shall constitute one side or end of the hopper or box, as set forth.

6th, So arranging and operating the toothed belt, B, or delivering devices in this class of seed-planters, as to convey the seed upward out of the hopper or box, for the purpose set forth.

55,373.—Cotton-seed Planter.—N. B. Sherwood, Millville, N. Y.:

I claim the employment of the revolving separator-bush, B, arranged and operating in combination with the toothed delivery-belt, D, substantially as and for the purposes herein shown and described.

55,374.—Horse-shoe.—Francis Shinn, Rockport, Ill.:

I claim attaching the toe or calks of a horse-shoe to the plate, substantially as described, so that they shall be held to the plate by a single nail, which at the same time serves to hold the shoe to the hoof, and so that the removal of the single nail which holds a toe or calk shall permit it to be removed or replaced at pleasure without removing the plate.

55,375.—Saw.—Charles T. Shoemaker, Philadelphia, Pa.:

I claim, 1st, The tooth, B, its split projection, b, and grooved edges adapted to a recess in the saw, and screwed thereto by taper pins, m, m, or their equivalents, all substantially as set forth.

2d, A piece, D, formed, fitted to an opening in the saw, and adapted and secured to the tooth for the retention of same, all substantially as set forth.

55,376.—Brick-drying Press.—John P. Shryock, Zanesville, Ohio:

I claim, 1st, The brick-drying apparatus herein described, consisting of the kiln, A, track or rail, B, B, car, C, tray, G, fire-place, D, heating-flue, E, and stack, F, constructed and employed substantially as and for the objects specified.

I also claim the brick-bearing cars, consisting of the open frame, C, wheels, C, and axles, C2, constructed and arranged in the manner and for the purposes set forth.

55,377.—Means for working Ships' Pumps.—Lebbeus Simkins, Brooklyn, N. Y.:

I claim the connection of a suitable connection, such as the shafts, F, F, I, L, and bevel-wheels, H, J, K, or any other equivalent means in combination with the pump, A, and capstan, O, constructed and operating substantially as and for the purpose described.

55,378.—Burglar Alarm.—George Simpson. Waterbury, Vt.:

I claim the sliding-head, E, hinged taper-holder, m, on the guide-rod, l, spiral spring, r, friction-plates, q and n, lever, I, and catch, S, in combination with clock-work to produce the alarm and strike a light, substantially as described for the purposes specified.

55,379.—Sugar-cane Mill.—E. W. Skinner, Madison, Wis. Ante-dated December 5, 1865:

I claim, 1st, Arranging a guide or shed, N, provided with shoulders, O, O, between the lower rollers, to prevent the cane from running off the ends of the rear roller, as and for the purposes set forth.

2d, Arranging beneath the journal bearings of the rollers the cups, a, provided with outlets, a′, substantially as and for the purdescribed.

55,380.—Rake-attachment to Harvesters.—Ephraim Smith, Clinton, Pa.:

I claim, 1st, The lifting-rods, d, d, d, when provided with the guard-fingers, f, f, f, projecting upward from their outer ends near the shaft on which they turn, substantially as and for the purpose herein specified.

2d, In combination with the above, I claim the arrangement of the disk, or wheel, G, with its cam pin and gear-teeth, and the disk or wheel, H, with its cam projection and gear-teeth, for giving the required movements to the lifting rods, substantially as herein set forth.

55,381.—Cultivator.—H. B. Smith, Eureka, Ill.:

I claim, 1st, The constructing of the frame, A, in the manner substantially as herein shown and described to admit of said frame being expanded and contracted laterally to adjust the plows nearer together or further apart, as may be required, and admit of a direct application of the draught of each animal to the device, as set forth.

2d, In combination with the frame, A, thus constructed, I claim the pivoted beams, C, C, arranged or applied substantially as and for the purpose set forth.

3d, The connecting of the plow-beams, G, G, to the beams, C, C, by means of the universal joints, H*, constructed substantially as shown and described, to admit of the vertical, lateral, and rolling motion of the plows, as set forth.

4th, The combination of the adjustable frame, A, pivoted beams, C, C, plow-beams, G, G, all arranged to operate in the manner substantially as and for the purpose set forth.

55,382.—Hollow Auger.—James M. Smith, Seymour, Conn.:

I claim the combination of the hollow shank, A, cylinder, I, adjusting screws, H, and slides, all constructed and arranged substantially as described, so as to adjust the cutters and guides as and for the purpose specified.

55,383.—Vapor Burner.—Willard H. Smith, New-York City:

I claim the sleeve, E, the wick-tube, F, and the shield, G, combined and arranged in the manner and for the purpose herein set forth.

55,384.—Potato-digger.—Simon Soules, Dowagiac, Mich.:

I claim, 1st, The construction of the sides, A, A, of the form substantially as shown with fenders, g, g, in combination with the forward inclined shovel, D, and the inclined grating, G, substantially as described.

2d, In combination with the upright sides, A, and inclined shovel, D, and the inclined grating, G, I claim the rollers, c, c, and their tappets, d, substantially as described.

3d, The double-inclined grating, G, hinged and operated substantially as described.

55,385.—Piano-forte.—William Steinway, New York City:

I claim, 1st, The use in piano-fortes of a metal case cast in one solid piece, consisting of the plate, a, braces, b, rafters or brace-frame, c, and connecting-piece or flange running round on three sides of the case and supporting the regulating apparatus, leaving one side open for the insertion of the sounding-board, with its bars and bridges, substantially as described.

2d, The method herein described of supporting the sounding-board by means of screws, springs, wedges, wire-draws, or any other equivalent means, bearing on and bracing against the edges thereof, substantially as and for the purpose set forth.

3d, Supporting a number of the lowest steel strings and highest covered bass strings a second time between the regular sounding-board bridge and the hitch-pins, either upon a prolongation of the regular sounding-board bridge, or upon an independent bridge, for the purpose of equalizing the transition from the steel springs to the covered bass strings, thus preventing any break in the tone.

55,386.—Lubricating Journals.—John J. Stevenson, Auburn, N. Y. Ante-dated May 22, 1866:

I claim the application of the self-oiling cup or box to the bearings of mowing and reaping machines, when used as and for the purpose above specified.

55,387.—Piston-head for Steam Engines.—Edward Sullivan, Pittsburg, Pa.:

I claim, 1st, The use in piston-heads of steam engines, furnished with expanding packing rings, of one or more self-acting valves, for the admission of steam therein, each valve consisting of a single valve-piston or plunger, so arranged that the live steam shall press on both ends of the plunger at the same time, and from the inside of the piston-head and the other from the outside, the area of the two ends of the valve-plunger differing in proportion to the relative desired pressure of the steam on the exterior of the piston-head, and on the packing-rings within the piston-head, substantially as and for the purpose herein-before described.

2d, The combination of the valve-cylinder, g, piston, p, and stem, q, forming a self-acting valve for the admission of steam into the interior of the piston-heads, for regulating the pressure of steam on the packing-rings, constructed and operating substantially as herein-before described.

3d, Combining with the piston-head of a steam engine having expanding packing-rings, a device, constructed and operating substantially as herein-before described, so as to retain the live steam which enters the piston-head, and obviate the frequent change of steam, thus preserving a constant and uniform pressure on the packing-rings, and preventing the shuffling motion of the rings consequent on the continued passage of steam in and out of the piston-head.

55,388.—Apparatus for collecting Floating Oil from Streams.—E. C. Summers, Huntingdon, Pa.:

I claim, 1st, The combination of the boards or planks, B, with the bent sheets of iron, C, when arranged to form a floating boom for collecting surface oil, substantially in the manner herein-before described.

2d, The combination of the trough, D, with the trough or boom, A, for confining the oil and water as it passes through the former, to effect the more perfect action of the chute, E, substantially as described.

3d, The combination of the chute, E, with the trough, D, and tank, I, when arranged to operate substantially as described and for the purposes specified.

55,389.—Planing Machine.—John B. Tarr, Chicago, Ill.:

I claim, 1st, The construction of the mouth-piece, B, B, c, f substantially in the manner herein described and shown.

2d, The arrangement of the mouth-piece, B, B, slide, b, spring, c, in relation to the cutter, A, substantially in the manner herein described and shown.

55,390.—Bed-bottom.—Peter Taylor, Pawtucket, R. I., and William A. Gove, Charlestown, Mass.:

We claim, 1st, The combination and arrangement of the arms, c (projecting from the frame, A), with the elastic or india-rubber straps, and their supporting rollers, applied to the frame, B, the whole being substantially as specified.

2d, The combination of the buckle, or equivalent take-up mechanism, with the arms, c, and the elastic strips applied to the frames, A and B, substantially in manner as specified.

3d, The combination of the straining plates, F, the elastic straps or springs, their supporting rollers, and the arms, c, the whole being arranged together and with the frames, A and B, substantially in manner and so as to operate as specified.

55,391.—Tool for cutting-off Boiler Tubes.—Nicholas Thomas, Chicago, Ill.:

I claim an improved tool for cutting off boiler tubes, constructed and arranged substantially as herein described and for the purpose set forth.

55,392.—Call Bell.—Horace A. Thompson, Hartford, Conn.:

I claim the hinge pad, d, in combination with the bell, a, striking knob, c, arranged and operating substantially as and for the purpose described.

55,393.—Magnesium Lamp.—Robert H. Thurston, Providence, R. I. Ante-dated Jan. 4, 1866:

I claim, 1st, Feeding magnesium upwards to the point where combustion is to take place, from below the flame, by a regular motion, to be determined by the rate at which combustion proceeds, in the manner substantially as described.

2d, The combination of curved guides, b, b′, or guides arranged in a curve with the mechanism for feeding a ribbon or ribbons of magnesium, so that the section of such ribbon or ribbons, where combustion takes place, shall be circular.

3d, Combining with such guides a clearer, c, constructed and operated substantially as described.

4th, The combination of a bucket-wheel, A, having a continuous rotary motion, as described, with a set or sets of feeding rollers, a, a′, arranged and operated substantially as specified.

55,394.—Broom Clasp.—Howard Tilden, Boston, Mass.:

I claim the improved broom strap or clasp described, to wit, a broom strap or clasp made of two loops, connected by two springs, substantially as described.

55,395.—Gas Apparatus.—Oakes Tirrill, Burlington, Mass.:

I claim, 1st, In generating illuminating gas from hydro-carbon fluids, the method described of heating the fluid in a coil or other suitable apparatus which shall be outside of and separate from the generator and yet at the same time so connected and combined therewith as to cause the fluid to circulate freely and continuously through the said coil or other apparatus and generator, as and for the purposes herein shown and set forth.

2d, In combination with apparatus for generating gas as described, I claim the employment of a spiral coil of pipe or tubing outside of the gas generator, and connected therewith by means of pipes or other suitable device, together with a burner for heating the said coil, substantially as herein described and for the purposes set forth.

3d, In combination with the spiral coil of pipe or tubing, as set forth, I claim the double jacket and cap fitting over said coil, and arranged substantially as and for the purposes herein shown and described.

55,396.—Transit Instrument.—William S. Trowbridge, Milwaukee, Wis.:

I claim, 1st, The attaching of the extra telescope by extending the shaft of the transit instrument, for the purpose of describing angles from one to ninety degrees.

2d, The attachment of the graduated quadrants or quadrant on the transit instrument, in combination with the telescope or telescopes and the table or tables for ascertaining the horizontal and perpendicular, by taking the angle or surface measurement of slopes in incline of ground passed over.

55,397.—Till Lock.—Cyrus Tucker, La Crosse, Wis.:

I claim, 1st, The independent guards, D, constructed as shown and described, and mounted vertically in the frame, C, as set forth.

2d, In combination with the guards, D, I claim the bolt, F, arranged to move vertically and engage in the notches of the guards, as set forth.

3d, In combination with the bolt, F, provided with the arm, r, I claim the pivoted dog, E, arranged to operate as set forth.

4th, The pawl, n, arranged to operate in combination with the dog, E, and arm, r, as herein described.

5th, The bell, H, having its hammer, g, provided with the lever, f, arranged to operate in combination with the arm, r, as set forth.

55,398.—Apparatus for Inhaling Gases.—P. H. Van der Weyde, New York City:

I claim, 1st, The construction of the apparatus described for the generation, preservation, but particularly for the administration of anæsthetic gaseous substances, so that the injurious products of the respiration are absorbed by the passage of the expired gas, by a separate channel, through an appropriate alkaline solution, and all waste of the expired gas is thus avoided.

2d, The attachment of a strong cylinder able to stand the pressure of at least fifty atmospheres, containing the laughing gas condensed to its liquid form, of which a portion by the simple partial opening of a stop-cock expands, cools, and supplies the common breathing bags, or what is better the above described inhaling apparatus with any desired quantity of fresh coal, and perfectly pure nitrous oxyd gas.

55,399.—Corn Planter.—Charles A. Wakefield, Pittsfield, Mass.:

I claim, 1st, The inside scraper, A, applied to the rear surface of the plunger, in combination with the scraper, b, applied to the front surface thereof, substantially as herein set forth for the purpose specified.

2d, The side scrapers, C and d, applied to the plunger substantially as herein set forth for the purpose specified.

3d, The oblique tongue or feather, e, working in the notch, f, of the slide, g, to operate the said slide, substantially as herein set forth for the purpose specified.

4th, The zig-zag deflectors, n, in the feather, e, operating the slide, g, substantially as herein set forth for the purpose specified.

55,400.—Brick Machine.—Philip N. Walliston, Springfield, Ohio:

I claim, 1st, The mixer or kneader shaft, C, having a scraper, K, at its lower end, in combination with the scraper, N, when arranged together and so as to operate substantially in the manner described for the purpose specified.

2d, So arranging the scraper, N, that its movement can be adjusted at pleasure, substantially as and for the purpose described.

3d, The arrangement of the molds, V3, in combination with the followers or plungers, F2, when so operated as to move up and down, substantially in the manner described for the purpose specified.

4th, Forming apertures in the molds, as and for the purpose specified.

5th, The rock-shaft, N2, connected with the sliding-arm, Q2, in combination with the lug, V2, or its equivalent, upon the rotating disk, D2, when arranged together and with the endless traveling apron, U so as to operate substantially in the manner and for the purpose described.

6th, The disk, D2, having cam-shaped flanges in combination with the molds, V3, and followers, F2, connected with the said flanges, and all arranged together so as to raise and lower the said molds and followers, substantially as and for the purpose specified.

7th, Forcing the clay from the kneading-mill through openings corresponding in shape to that which it is desired to impart thereto, according as bricks, tiles, etc., are to be made from it substantially as described, the clay as it is forced through said openings passing to the molds to be operated upon by them, for the purpose specified.

55,401.—Cradle, Stool, and Chair.—Joseph B. Warren, Danversport, Mass.:

I claim the cradle pivoted, j, with box, h, in the rocker-frame and the adjustable portions, j, d, A and B, B, as above described for the purposes herein set forth.

55,402.—Table Mat.—Charles Weber, West Meriden, Conn.:

I claim a table mat, made as herein described, and provided with a metal frame, substantially as and for the purpose specified.

55,403.—Car Truck.—Levi H. West, Cambridge, Mass:

I claim the combination and arrangement of the elastic fulcra or the springs, e, e, with the said frames, A, B, and the levers, D, D, or the same and the springs, F, F, the whole being substantially as and so as to operate as specified.

55,404.—Knife-polisher and Knife and Scissors Sharpener.—Jonathan Wheeler, Athol, Mass.:

I claim an improved combined knife-polisher and knife and scissors sharpener formed by combining the emery-wheels, F and G, and tempered steel-cutters, H, I and J, with each other, and with the shaft, D, and spring, N, the whole being constructed and arranged substantially as described and for the purpose set forth.

55,405.—Steam Generator.—Norman W. Wheeler, Brooklyn, N. Y.:

I claim, 1st, The frames, c, c, c, when arranged around and secured to the shell of a vertical tubular boiler, substantially as and for purposes described.

2d, The circulating-pipe, g, in combination with the water bottom, h, and the crown-sheet of the furnace, D, D, when such crown-sheet is also a flue-sheet for the tubes, B, B.

55,406.—Packing Slide-valves for Steam Engines.—Norman W. Wheeler, Brooklyn, N. Y.:

I claim the ports, i, i, in combination with packing-rings or segments thereof expanded by their own elasticity or by special springs, substantially as and for the purposes described.

55,407.—Churn.—H. Whisler, New Market, Ohio:

I claim the combination of the wheels, B and m, the ears, S, and the dashers, E, the whole constructed and operating in the manner and for the purpose herein set forth.

55,408.—Horse Hay-fork.—Peter A. Wise, Stockbridge, N. Y. Ante-dated Dec. 5, 1865:

I claim, 1st, The metallic shank, a, attached to the head of the fork and passing into the slotted end of the handle, c, to which it is attached by the cross-bolt, b, in combination with the latch, d, as and for the purposes specified.

2d, The combination of the fork hinged to the handle, a suspending bail, and a brace extending from the handle to the bail, substantially as specified.

55,409.—Broom.—Joel Wisner, Aurora, N. Y.:

I claim, 1st, The employment of the adjusting-bar, E, in combination with the head-block, B, substantially in the manner and for the purpose described.

I also claim suspending the holding-plate, E, by the screws, D, in combination with the fixed head-block, as shown and described.

55,410.—Sash and Door Bolt.—H. T. Woodman, Dubuque, Iowa:

I claim the combination of the bolt, A, slotted sleeve or casing, B, connecting link or rod, D, and crank-arm, E', of shaft or spindle, F, suitably formed for receiving a handle-knob, key, or other equivalent device, when arranged together so as to operate substantially in the manner described and for the purpose specified.

55,411.—Machinery for making Wire Sieves.—E. B. Bigelow, Boston, Mass., and Charles H. Waters, Groton, Mass., assignors to Clinton Wire-cloth Company.

We claim, 1st, The cutting apparatus, constructed and operated substantially as described.

2d, The forming apparatus, constructed and operated substantially as described.

3d, The expanding fastener, constructed and operated substantially as described.

4th, The method of manufacturing wire-cloth sieves by the successive use of the cutting apparatus, cutting the sieve-bottoms diagonally across the web of the cloth, forming apparatus for turning up the edges of the sieve-bottom, and the expanding fastener for distending the sieve-bottoms, substantially as described.

55,412.—Lathe.—L. L. Crane, assignor to Leavitt, Crane & Company, Cleveland, Ohio:

I claim the ways, m, m, when arranged in the same plane, but in an angular or inclined position in relation to the ways, n, n, and centers, g, c, the ways, n, n, being in line or parallel to each other, and the centers, g, c, all combined and operating conjointly in the manner and for the purpose set forth.

55,413.—Mop-wringer.—John M. Enos, assignor to himself and Franklin Smead, St. Joseph, Mich.:

I claim the combination and arrangement of the wringer, C, when constructed substantially as shown with the mop, M, mop-head, A, and handle, B, provided with a pin, a, operating substantially as specified, and for the purposes set forth.

55,414.—Meat-chopper.—Calvin A. Foster, assignor to A. F. Spaulding and S. M. Scott, Winchendon, Mass.:

I claim, 1st, The combination of the raising arm, I, with either or both the knives and the operative mechanism and supporting frame thereof.

I also claim the combination as well as the arrangement of the post, g, and its turn-button, h, or the equivalent thereof, with the frame, A, and the raising arm, I, and one or more knives, G, G, and mechanism to operate such knife or knives, substantially as described.

I also claim the operative mechanism of each knife, G, the same consisting of the knife-carrier, H, the vibratory arm, e, and the rotary crank, d, arranged substantially as specified.

I also claim the application of the tub-cover to the raising arm, I, so as to be lifted off the tub thereby when such arm is in the act of being elevated, substantially as set forth.

I also claim the application of the plow, K, to the raising arm, I, so as to be lifted out o the tub thereby, when such arm is in the act of being raised as explained.

I also claim the mechanism for imparting to the tub an intermittent rotative motion and enabling the tub to be separated from the cross of such mechanism, the same consisting of the stud, x, the cross or their equivalents, the internal ratchet, r, the pawl, s, the bent lever, u, the connector, v2, and the arm, w, projecting from the carrier, as set forth.

55,415.—Planing Machine for cutting Slats for Blinds.—Martin Free, assignor to Alfred Louderback, Philadelphia, Pa.:

I claim the reciprocating carriage, C, D, carrying the cutters, c', d', and operating automatically the devices which feed the block, E, to the same as described, the said feeding devices consisting of the lever, G, pawl, H, springs, I, I, stud wheel, J, screw-shaft, f1, f2, f3, and gear-wheels, F, F, F, constructed and arranged substantially as described.

55,416.—Mail Bag.—John Fye, assignor to himself and John F Sutherland, Hamilton, Ohio:

I claim the construction of the mouth of the bag as shown at F, in combination with the cover as shown in Fig. 2, and the weight at the bottom of the lining, D, for the purposes set forth.

55,417.—Spool-thread Regulator for Sewing Machines.—William H. Hawkins, assignor to himself and James D. Orne, Rochester, N. Y. Ante-dated May 30, 1866:

I claim the adjustable thread-regulator herein described, the same consisting of the slotted arm, C, D, b, sleeve, a, sliding arm, E, and plate, F, arranged to operate in the manner and for the purpose specified.

55,418.—Treating Wood, Straw, etc., for Manufacture of Paper-pulp.—H. L. Jones and D. S. Farquharson, assignors to themselves and Albert M. Hastings and Alexander McVean, Rochester, N. Y.:

We claim, 1st, The subduing of straw, wood, or any fibrous material to be converted into paper pulp, by subjecting the same to the action of alkali liquor of any desirable temperature applied under the hydrostatic pressure of the liquid itself applied by a force-pump or otherwise, instead of using steam pressure, preparatory to the bleaching of such material in the ordinary methods, substantially as shown.

2d, The combination with the cylinder, A, of the pump, D, and pipe, B, substantially as and for the purposes above set forth.

3d, We claim the safety-valve, K, in combination with the pump, D, below the piston or plunger and in direct communication with the pump-barrel, substantially as above described.

55,419.—Stove-pipe Drum.—Werner Kroeger, assignor to himself and Constantine Ries, Milwaukee, Wis.:

I claim a heat-radiator composed of three concentric cylinders, a, b, b', c, in combination with two horizontal partitions, g, g', and dampers, h, h', all constructed and operating substantially in the manner and for the purpose herein set forth.

55,420.—Knitting Machine.—M. T. Lamb, assignor to himself and Isaac W. Lamb, Valparaiso, Ind.:

I claim, 1st, Attaching the counter to the sliding frame in such a manner that the movement of the sliding frame will carry the teeth of the dial against a stationary pawl or ratchet, substantially as and for the purpose herein described.

2d, The changer, G, consisting of a bent wire, or its equivalent, attached at its ends to the cam-shifters, p, and so placed that the operator can operate it with one hand while he turns the machine with the other hand, substantially as described.

3d, Constructing and applying the changer, G, to the cam-shifters, p, of a knitting machine, in such a way that it can be removed at pleasure without alteration in the machine, substantially as shown.

55,421.—Making Eyelets.—William R. Landfear, assignor to himself and David Whittemore, Hartford, Conn.:

I claim the combination and arrangement of the lever, or its equivalent, the socket and knife, or the same and the supporting plate, the same being to operate substantially in manner and for the purpose as set forth

55,422.—Take-up Mechanism for Circular Knitting Machines.—John Lessels, assignor to Clark Tompkins, Troy, N. Y.:

I claim the combination in the take-up mechanism of a knitting machine of the following instrumentalities, viz., the take-up roller, screw-shaft (having an endwise movement), vibrating pawl, and movable stop operated by the screw-shaft, all operating substantially as set forth.

55,423.—Saw.—John Lippencott, assignor to himself and Thomas Bakewell, Pittsburg, Pa.:

I claim, 1st, The use of tapering saw teeth or teeth points inserted into correspondingly shaped slots in the saw plates, having their sides flush with the side of the saw plate and secured from lateral displacement therein, without riveting or upsetting, by the groove in the edges of the slot in the saw plate and correspondingly shaped edges of the tooth (or groove in the edges of the tooth and beveled edges of the slot), substantially as herein-before described.

2d, The use of saw teeth or teeth points bifurcated at the rear end, and with or without a head or projection at the extremity of the prongs, for insertion into the plates of circular or long saws, substantially as and for the purposes herein-before set forth.

3d, The tapering slot in the saw plate for the insertion of the removable teeth, with an enlargement, or operating at the rear end, for the purposes herein-before set forth.

55,424.—Floor Clamp.—Aaron Lloyd, assignor to Francis Hamblin, Mattoon, Ill.:

I claim hinging the prop, G, to the handle, A, when used for the purpose of a floor clamp, constructed and operating in the manner as herein described and represented.

55,425.—Operating Dies for forming Articles of Metal.—Eli J. Manville, Waterbury, Conn., assignor to himself and Sidney L. Clark, Torrington, Conn.:

I claim, 1st, Two or more dies fitted to move radially in a stock, in combination with an adjustable tappet or tappets revolving around the said stock, and acting directly upon the outer ends or edges of said dies, substantially as set forth.

2d, Pairs of radial dies, formed with their contiguous edges beveled or at an inclination, as specified.

55,426.—Process for preparing Stuffing for Currying.—C. L. Morehouse, assignor to himself and J. B. Merriam, Cleveland, Ohio:

I claim, 1st, The above-described mode or process of clarifying paraffine oil by the use of a blast of air in jets for agitating the oil, while treating the same with a large proportion of sulphuric acid, thus checking the excess of chemical heat, substantially as set forth.

2d, The use of hot water in washing the oil, substantially in the manner and for the purposes set forth.

3d, The use of a blast of air from the ice chamber for crystallizing the paraffine, substantially as set forth.

55,427.—Harvester.—David R. Paiste, assignor to Reese, Lake, Melick & Co., Willistown, Pa.:

I claim, 1st, The finger-bar, F, with its bar, J, in combination with the K', and the grooved pulley, a, secured to the frame of the machine, the whole being arranged and operating substantially as and for the purpose described.

2d, The combination with the above of the adjustable lever, E, substantially as and for the purpose herein set forth.

55,428.—Hot-air Engine.—S. H. Roper, assignor to Elmer Townsend, Roxbury, Mass.:

I claim providing the auxiliary air-passage, j, with the safety-valve, k, when arranged to operate substantially as described and in combination with the inlet-pipe, c, and its throttle-valve, g.

55,429.—Mop.—James Sangster and Milton Boyd, assignors to Joseph B. Lichtenstein, Buffalo, N. Y.:

We claim, 1st, The combination with said rollers, F and G, of the guide-plates, or their equivalents, when constructed as and for the purposes herein substantially described.

2d, In combination therewith, we claim the thumb-piece, D, spring, E, and bar, H, as described.

55,430.—Lifting-jack.—Thomas Sheldon, Enfield, Conn., assignor to himself and Henry Inman, Portland, Maine, and E. P. Furlong, West Brook, Maine:

I claim a lifting-jack as herein described, and combining the various parts, in the manner and for the purposes set forth.

55,431.—Combined Hook and Button.—William H. Shurtleff, assignor to himself and Henry A. Church, Providence, R. I.:

I claim the combination of a button with a shank, secured at the periphery and bent under and down at a point diametrically opposite of the button to constitute the lacing-stay, substantially as herein shown and set forth.

55,432.—Brick Machine.—John Watson, assignor to Oran W. Seeley, Buffalo, N. Y.:

I claim the combination of the slotted-rod, D, with the cam, I, when used to give an irregular reciprocating motion to the molds of a brick machine, for the purpose and substantially as herein described.

55,433.—Measuring Pump.—S. H. Wheeler, assignor to himself, Richard Hedden, James Thompson, and Robert B. Thompson, Dowagiac, Mich.:

I claim, 1st, The enlarged chamber, C, upon the upper end of the pump-barrel, having a check-valve, a, in it, as arranged in relation to the valve, c, on the rod, D, and caged piston, c', substantially as described.

2d, Providing the upper end of the piston-rod, D, with a cone or circular wedge, F, for actuating the registering devices at every descent of the piston, substantially as described.

3d, The vibrating lever, i, spring, j, pawl, h, and arm, k, in combination with the ratchet-wheel, g', disk, g2, and a circular wedge, F substantially as described.

4th, In a pump having a registering device applied to it, I claim providing for regulating the length of the piston-rod, by means substantially such as described.

5th, In a pump having the registering device applied to it, I claim the use of a valve, c, c', applied to the piston-rod, substantially as described.

55,434.—Knitting Machine.—James G. Wilson assignor by mesne-assignments to Union Seamless Knitting Machine Company, New York City:

I claim, 1st, The employment for the purpose of controlling the direction and changes of direction of the rotary motion of the needle-ring or needle-bar of a knitting machine, of a studded wheel or drum, so constructed, applied, and operating that it performs its duty without any movement in a direction parallel with its axis, as herein described.

2d, So constructing and operating the aforesaid wheel or drum, having no movement in a direction parallel with its axis, that it will make but one revolution during the operation of making a complete stocking or other knitted article, as herein specified.

3d, Combining the aforesaid studded wheel or drum having no movement parallel with its axis, with a slide, H, and pawls, h, h', or their equivalents, which produce the rotary movement of the needle-ring of a circular knitting machine, by means of a three-armed lever, K, L, L', constructed, applied, and operating substantially as herein specified.

4th, Giving the studded wheel or drum a compound rotary motion, viz.: a slow motion to bring its studs to an operative position, and a quicker motion to produce the action of its studs upon the needle-ring or needle-bar, substantially as herein described.

5th, The employment in a circular or straight knitting ma-

chine of the specified kind herein described of a system of needles having longitudinal and lateral movements alternately, and operating substantially as herein specified.

6th, The combination with a system of needles having a longitudinal reciprocating motion when used in a machine constructed specifically as herein described, of a system of yarn conductors so applied as to deliver yarn to immediately adjacent or consecutive needles, substantially as herein specified.

7th, The plate, F, either fitting between two projections, c, c', on the needles, as represented in the drawing, or, what is equivalent grooved to receive single projections on the needles, and operating substantially as and for the purpose herein specified.

8th, The vibrating presser applied and operating in combination with a laterally and longitudinally moving series of needles, substantially as herein specified.

9th, Combining the yarn guides and presser substantially as herein specified, to be operated by the same mechanism.

10th, The combination of a system of needles and a system of yarn guides operating automatically in conjunction with a yielding compressor and bridge for carrying and removing the needles without the use of stitch-hooks for taking off the stitches, in such manner as to knit simultaneously on two or more immediately adjacent or consecutive needles, substantially as herein described.

11th, The combination of the studded wheel or drum, M, having no movement parallel with its axis, and a series of needles and yarn conductors so applied as to effect the knitting simultaneously with separate yarns on immediately adjacent needles.

55,435.—PITMAN-HEAD FOR HARVESTERS, ETC.—Silas H. Wilson, assignor to Wm. H. Brown, Auburn, N. Y.:

I claim so combining and uniting the crank wrist and pitman of a harvesting or other machine, through a box and oil cup, as to admit of a triplicate motion between the wrist and pitman, to prevent all binding or cramping, as also clatter between the parts, substantially as described.

55,436.—LAMP CHIMNEY.—George L. Witsil, Philadelphia, Pa., assignor to himself and John F. Cabot, Elizabeth, N. J.:

I claim a lamp chimney which has the winding or spiral groove formed in it, substantially as described.

55,437.—ATTACHING AXES TO THEIR HANDLES.—Henry C. Wooding, Wallingford, Conn., assignor to himself and L. W. Turner, Galesville, Conn.:

I claim the herein-described wedge provided with a head and constructed so as to be secured, substantially in the manner specified.

55,438.—BOTTLE-STOPPER.—Howard Busby Fox, Oxton, England:

I claim, 1st, The within-described soft-lined cap, b, c, d, adapted to close the mouths of bottles or vessels having a screw-thread formed on the outer surfaces of said mouths by screwing thereon and to fit tightly not only upon the edge, but also along the surfaces of the screw-threads, substantially as and for the purpose herein specified.

2d, In connection with the above, I claim the divided or serrated edge, c, of the rigid portion of the cap, b, to facilitate the bending inward thereof to confine the soft lining, substantially as herein specified.

55,439.—PADDLE WHEEL.—James Goodier, Chester, and J. F. Kilshaw, New Brighton, England:

We claim the cam or piece, b, with grooves, n, elbow-pieces, l, links, K, and gabs, j, arranged and operated substantially as herein specified.

55,440.—REAPING MACHINE.—Richard Hornsby, Spittlegate, England:

I claim the combination of diagonal chains or bands for removing the cut grain, with a movable platform provided with slots or openings, as described.

55,441.—GALVANIC BATTERY.—George Lionel Leclanche, Paris, France:

I claim the use in electrical piles of insoluble or slightly soluble salts of copper or other equivalent material moistened with a liquid containing a salt in solution capable by its decomposition of rendering the said salts of copper or other equivalent material, soluble as described.

55,442.—CASTING STEEL.—Anton Lohage, Unna Westphalia, Prussia:

I claim, 1st, The process herein-before described, and called intermediate process, whereby I continue the melting process till the mass is "overmelted" or "superheated," made uniform and ready for casting.

2d, The modes herein-before described of altering the temper of the molten steel in the intermediate process.

55,443.—PHOTOGRAPHIC REST.—Oliver Sarony, Scarborough, England:

I claim the combined arrangement of an upright sliding bar or bars, b (in a suitable stand), the plate, g, the part, h, with means of receiving a curved slide, i, the slide, n, and the stems or bars, k and o, substantially as herein described, and combined therewith the supports for the body and head, as described.

55,444.—KNITTING MACHINE.—John Thornton and William Thornton, Pease Hill Rise, near Nottingham, England:

We claim the combination of the looping instruments with the mechanism for operating them and with the thread-guides, in such manner that said instruments are caused to make a partial rotation upon their axes and have thread laid and loops formed on them in the two positions occupied by them and at opposite sides of the fabric, substantially as set forth.

54,445.—HITCHING-POST.—Valentine Ward, San Francisco, Cal.:

I claim, 1st, The post or shell, A, sunk underneath a sidewalk or pavement, having an extension shaft or bar, P, to be drawn from or inserted in said post or shell at will, substantially as described and for the purpose set forth.

2d, The spring, E, or its equivalent, when arranged as above described, or by weights and pulleys, when a larger post is desired, substantially as described and for the purpose set forth.

RE-ISSUES.

2,262.—PROCESS FOR ROLLING INDIA-RUBBER CLOTH.—[Div. A.]—Francis D. Hayward, Malden, Mass., and Ira E. Sanborn, Boston, Mass., assignees of John C. Bickford. Patented March 19, 1850, and extended. Re-issued March 20, 1866:

We claim the new or improved process of applying rubber or caoutchouc when reduced to plastic consistency onto cloth, substantially as herein described—that is to say, by means of two contiguous rolls revolving in opposite directions, one carrying the cloth to be coated, the other the coat of rubber to be applied; the latter revolving at a higher rate of speed than the former.

2,263.—PROCESS FOR ROLLING INDIA-RUBBER.—[Div. B.]—Francis D. Hayward, Malden, Mass., and Ira E. Sanborn, Boston, Mass., assignees of John C. Bickford. Patented March 19, 1850, and extended. Re-issued March 20, 1866:

We claim the cloth coated with rubber, in the manner and by the means herein-before described, as a new fabric or article of manufacture.

2,264.—DIE FOR MAKING LAMP-TOPS, RIVETS, ETC.—Charles D. Leet, Dexter Smith, Joseph M. Hall, and Charles K. Farmer, Springfield, Mass., assignees by mesne-assignments of Luther C. White, Meriden, Conn. Patented Sept. 7, 1852:

I claim the combination of the annular die, supporting punch or mandrel, and presser, substantially as set forth.

2,265.—DOUGH-KNEADER.—John C. Loveland, Springfield, Vt. Patented January 16, 1866:

I claim, 1st, The combination of the grooved, fluted, or irregular surfaced rollers, B and D, constructed substantially as described with each other and with the frame, A, in which they work, as and for the purpose herein set forth.

2d, The combination with the rollers, B and D, and with the frame or supports, A, of the machine of a pair of inclined aprons or tables, K, substantially as described and for the purpose set forth.

3d, The combination of the disk, M, with the roller, B, aprons, K, and supports or frame, A, of the machine, substantially as described and for the purpose set forth.

2,266.—HARVESTER.—[Div. A.]—William K. Miller, Canton, Ohio. Patented February 8, 1859:

I claim, 1st, A frame composed essentially of a coupling or drag-bar and a brace, which are hinged to the main frame at two points and connected in the line of the hinges, and furnished with lugs by which they may be united to the shoe at two points, substantially as described.

I also claim, in combination with a yielding coupling arm and brace, an intermediate lug bolted to said frame, and projecting therefrom at such point as to make it capable of being united to a lug placed at the heel of the shoe, substantially as described.

2,267.—HARVESTER.—[Div. B.]—William K. Miller, Canton, Ohio. Patented February 8, 1865:

I claim, 1st, The short finger-beam hinged to the coupling arm or brace, so that said finger-beam may be raised up and folded to the rear in line with the driving wheels, substantially as and for the purpose described.

I also claim so constructing and arranging the hinged or pivoted point on which the finger-beam is thus folded backward, as that the outer or free end of said finger-beam in its folded position may conform to the inequalities of the ground over which it is drawn, and independent of the vertical movement of the machine, substantially as described.

2,268.—HARVESTER.—[Div C.]—William K. Miller, Canton, Ohio. Patented February 8, 1859:

I claim, 1st, A draw or coupling-bar hinged to the main frame, in combination with an adjustable hinge-piece and one or more setting or tightening bolts, substantially as described.

I also claim a yielding coupling-arm, made of two or more pieces or parts, in combination with a pivot and tightening bolts, for adapting one part to the other part thereof.

I also claim making the hinge-piece adjustable for the purpose of raising or lowering the points of the fingers or guards, substantially as described.

2,269.—HARVESTER.—[Div. D.]—William K. Miller, Canton, Ohio. Patented Feb. 8, 1859:

I claim the combination of a supporting-shoe hinged by its lugs to corresponding lugs on an adjustable hinge-piece, which latter is in turn hinged or pivoted to the yielding connection, by which the progressive movement of the finger-beam is controlled, substantially as described.

2,270.—HARVESTER.—[Div. E.]—William K. Miller, Canton, Ohio. Patented Feb. 8, 1859:

I claim so constructing and arranging the cutting apparatus of a harvesting machine and its connections with the main frame as that it may be converted from a front to a rear cutting machine by transposing said parts, without taking from or adding to the machine any other parts or pieces than those which constitute the cutting apparatus in either of its positions, substantially as described.

2,271.—ATTACHING SPRINGS TO WAGONS.—[Div. A.]—Charles S. Martin, Milwaukee, Wis. Patented Feb. 9, 1864:

I claim a device for suspending and securing india-rubber springs by or under the hind axles of wagons, substantially as and for the purpose set forth.

2,272.—WAGON SPRING.—[Div. B.]—Charles S. Martin, Milwaukee, Wis. Patented Feb. 9, 1864:

I claim the spring-bar, A, and rods, B, B, when used for the purpose of sustaining the load on the hind axle of a wagon, in combination with the india-rubber springs, F, substantially in the manner set forth.

2,273.—HORSE HAY-FORK.—Squire Raymond, Venice, N. Y. Patented Nov. 11, 1862:

I claim, 1st, The combination of the fork-arms, D, D', turning or opening at their extreme upper end, and the levers, E, E', constructed and operating substantially as described.

2d, The pulleys, A, G and H, arranged and operating in combination with the rope F, substantially as described, for the uses and purposes mentioned.

3d, The fork arms, D, D', the levers, E, E', with the extension, g, all used in combination with the rope, F, and cord, J, arranged as and for the purpose set forth.

2,274.—CARPENTER'S BENCH PLANE.—Wing H. Taber and Thos. R. Abbott, assignees of W. H. Taber, Lowell, Mass. Patented Feb. 28, 1865:

We claim, 1st, The mechanism whereby the cutting edge of the bit is adjusted with respect to the face of the plane by springing the iron upon its bed in the plane-stock, in the manner and by the means substantially as described.

Also, adjusting the inclination of the cutting bit with respect to the face of the plane by means of the adjustable bed, G, when used in combination with the clamping mechanism, substantially as described.

2,275.—STEAM DRILLING MACHINE.—Joseph W. Fowle, Boston, Mass. Patented March 11, 1851, and extended:

I claim a drilling engine in which the drill has an intermittent rotary movement, or a progressive feed movement, or both a rotary and feed movement, the attachment of the drill directly to the cross-head of the engine or to the piston, or an elongation therefrom, in such manner that the drill is driven by the direct pressure of the motor upon the piston.

2,276.—VACUUM APPARATUS FOR TREATING DISEASES.—Alfred F. Jones, Lexington, Ky. Patented Sept. 13, 1864:

I claim the use of the means above set forth, consisting of a receptacle, A, in combination with a cape, c, or its equivalent, for rendering such receptacle air-tight when to be used for inclosing any portion of the human body, substantially in the manner and for the purpose above described.

2,277.—MANUFACTURE OF SKIRT WIRE.—The Silver Skirt and Wire Manufacturing Company, assignees of T. S. Sperry, New York City. Patented March 7, 1865:

We claim skirt wire protected wholly or partially by metal wire, substantially as and for the purpose described.

2,278.—MACHINE FOR CHANNELING STONE.—Thomas Ross, Middlebury, John B. Reynolds, R. Barrett, and A. T. Merriman, assignees by mesne-assignments of John Taggart, Rutland, Vt. Patented Dec. 4, 1855:

We claim, 1st, A machine consisting of drills arranged in one or more gangs and also of mechanism for guiding such gang or gangs of drills, and imparting thereto or causing to be imparted thereto reciprocating movements or the same and longitudinal movements, whereby such gang or gangs when applied to stone may be caused to cut or drill one or more grooves therein, substantially as described.

We also claim the combination of one or more standards, U, U, or the equivalent thereof, with the drills or the gang or gangs thereof and machinery for guiding and operating the same, such standard or standards being to rest in the groove or grooves in which the drills may be in action, and being for the object or purpose as herein-before explained.

2,279.—CLOVER AND GRASS-SEED HARVESTER.—Benjamin F. Wright, assignee by mesne-assignments of Thomas S. Steadman, Springfield Township, Ohio. Patented May 23, 1854:

I claim, 1st, In combination with the main frame of a harvester, an axle upon which the cutters driving-wheel revolves, that derives all its connection with the frame through one end, and which end does not cross a vertical plane parallel with and touching the side of this frame nearest to it, a plate from which this axle projects, and a holding mechanism that holds this plate and frame together, and prevents any essential variation in the distance between this axle and the cutters driving pinion-shaft, or in their parallelism while the frame is being raised or lowered in respect to this axle, substantially as and for the purpose set forth.

2d, In combination with the main frame of a harvester, I claim an axle upon which the cutters driving-wheel revolves, that derives all its connection with the main frame through one end, and which end does not cross a vertical plane, parallel with and touching that side of this frame nearest to it; and a plate from which this axle projects, a holding mechanism that prevents any essential variation in the distance between this axle, and the cutters driving-pinion shaft or of their parallelism, while the main frame is being raised or lowered in respect to this axle; and another holding mechanism by which the attendant is enabled to have this main frame held at different hights in respect to this axle, substantially as and for the purpose set forth.

3d, In combination with the main frame of a harvester, I claim an axle-plate which is connected with one end of the axle of the cutters driving-wheel; said plate being wholly between the plane of said wheel, and a plane parallel with and touching that part of said frame nearest to said wheel; a holding mechanism which prevents any movement of this plate other than its movement in the arc of a circle concentric to the axis of the shaft of the cutters driving-pinion; and a holding mechanism having one portion further forward than the axle of the cutters driving-wheel, and another portion further back than said axle, between each of which and the frame is a portion of said plate, and by which said plate is held to the frame while it is being raised or lowered in respect to said axle, substantially as and for the purpose set forth.

EXTENSIONS.

8,904.—SMUT-MACHINE.—John M. Earls, Troy, N.Y. Letters-Patent, dated April 27th, 1852:

I claim, 1st, The projecting screen chambers, in combination with the arrangements for separating the rubbing-chamber from the fan-chamber, whereby the grain is prevented from being affected by the blast from the fan-chamber while it is passing through the rubbing-chamber, and is only brought in contact with the current of air where it ascends to take away the chaff and other impurities, substantially as herein set forth.

2d, In combination with the scouring surfaces, I claim the beating forks, for the purpose of beating the grain and breaking the hulls while falling from the rubber to the scourers, whereby the berries are more effectually cleaned from adhering impurities, as herein set forth.

8,929.—MACHINERY FOR GRINDING AND POLISHING SAW-BLADES, ETC.—Wm. Southwell, West Cambridge, Mass. Letters-Patent dated May 4th, 1852:

I claim, 1st, The combination of two grindstones, or their equivalents, revolving in the direction herein made known, for the purpose of grinding or polishing two sides of a saw, or other article, simultaneously, with a reciprocating frame, or its equivalent, for the purpose of holding the article being ground or polished, whereby the tendency of either stone to move the article is counteracted by the action of the other stone, and the same force is thereby required to reciprocate the article in either direction, as described.

2d, The combination of the right and left-hand screws, carriers and nuts for said screws, movable pedestals or boxes, together with the cross-shaft, worms, worm-wheels, and handles, substantially as set forth, for the purpose of moving two grindstones, or their equivalents, simultaneously against opposite sides of an article being ground or polished, as described.

3d, I do not claim giving an automatic transverse motion to grindstones; but what I do claim is, the arrangement of the screws, mitre wheels, handles, eccentric boxes, and movable frames, substantially as herein described, whereby I am enabled at any time to move the grindstones, or their equivalents, entirely across the machine for the purposes set forth, without interfering with the automatic traversing motion which is given to the said stones irrespective of their precise position with reference to the either saw frame, or either saw, or other articles fixed in said frames.

4th, The arrangement in the same machine of two sets of reciprocating frames, either of which can be stopped without affecting the other, and a carriage, whereby the grindstones can be caused to move from one frame to the other, by which arrangement one saw can be ground or polished while another is being adjusted into place.

8,920.—ELECTRO-MAGNETIC ALARM BELL.—Moses G. Farmer, Salem, Mass. Letters-Patent dated May 4th, 1852:

I claim as my invention the combination substantially as herein set forth of the electro-magnet and armature (or its electro-magnetic equivalent) with the falling ball or spring, and the detents, and the lifting cam, or its equivalents, so arranged that when the ball is supported by the armature a slight force only of the electro-magnet is required to trip the ball, which ball, in falling, acquires sufficient momentum to produce much greater mechanical effects than the magnet alone, the velocity of the ball in falling being still further accelerated by the force of a spring, if desired. The power thus obtained I use in the manner and for the purpose herein described.

8,952.—IRON SAFE.—William Alford and Jno. D. Spear, Southwark, Pa. Letters-Patent, dated May 18th, 1852:

We claim the application of chalk, or whiting, which has been subjected to the action of acids, and has been partially deprived of its carbonic acid; the material which we use being, in fact, the waste or residual matter left from the manufacture of what is called "mineral water," after chalk or whiting has been subjected to the action of acids for the purpose of expelling a portion of its carbonic acid; this residual matter consisting substantially of the substances named in the analysis before referred to, in the construction of double iron chests or safes, in the manner above described, or in any other manner substantially the same.

8,932.—SPEAKING TUBE.—Thomas J. Woolcocks and William Ostrander. Letters-Patent dated May 4th, 1852:

We claim the combination of an alarm-valve, with a speaking tube or pipe, in the manner and for the purpose substantially as set forth.

DESIGN.

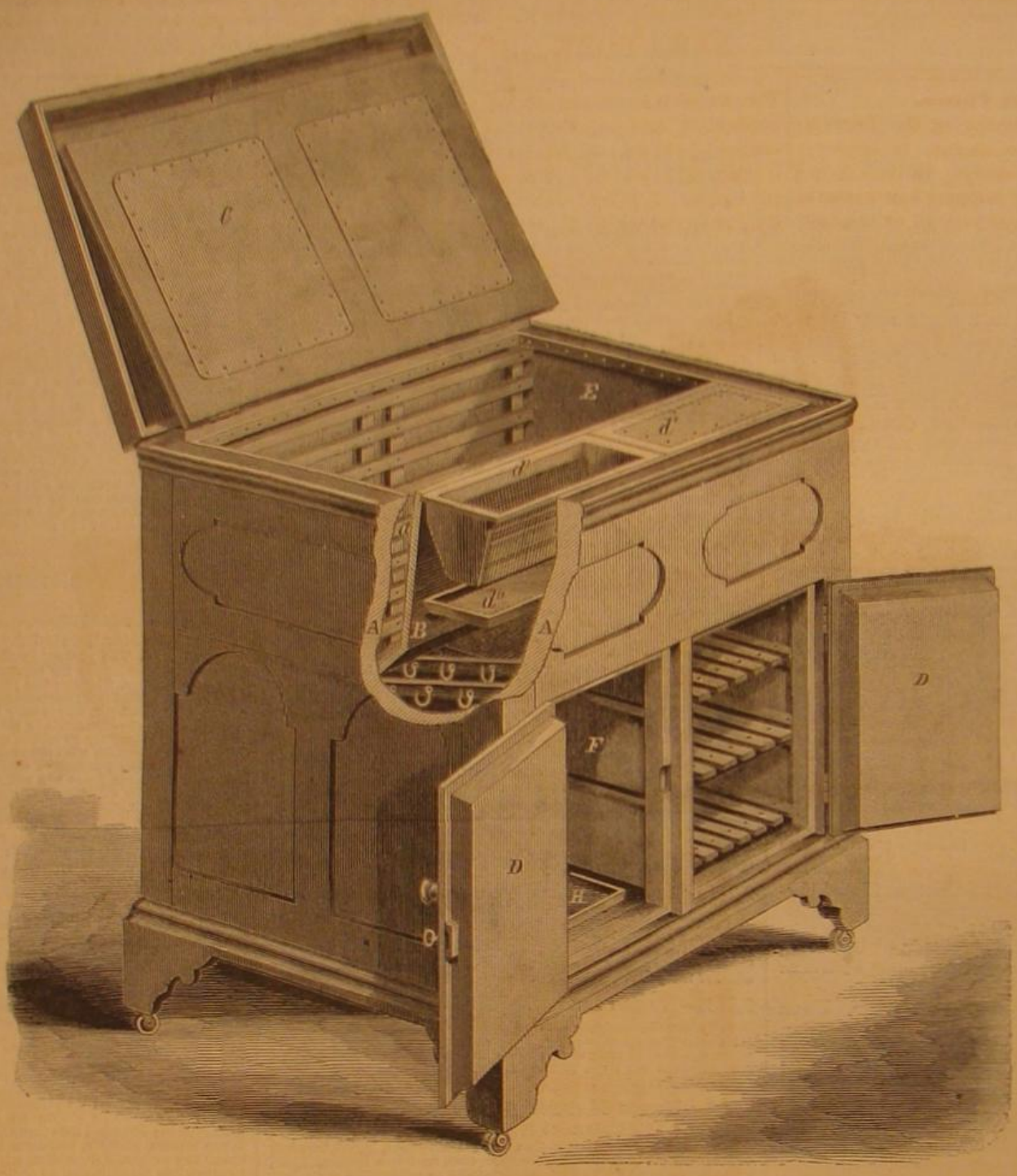
2,331.—HANDLE OF A SPOON.—Julius L. D. Somerville, Mass.

The Esquimaux Refrigerator.

It is singular that, with the experience of our armies in the field, so long a time should have elapsed before the use of an outside resisting medium to caloric should have been adapted to the common refrigerator. We well remember the difference between the temperature of water carried in the common tin canteen, unprotected, and that in a similar canteen covered with woolen cloth, or felt. While the one absorbed the rays of the sun and collected heat from the atmosphere, the water in the other was deliciously cool at all times. The improvement which is the subject of the illustration is, in part, an adaptation of this device to an ice chest. This chest seems to be equally well adapted to the preservation of substances from the action of frost or from heat. The chest is composed of wood for the outer shell, covered—sides, top, and bottom—with woolen cloth or felt. The inner shell is of wood or metal (zinc, for instance), with an air space between. In the illustration, A is the shell or outer wall; B the inner wall, and *a* the air space between the two. The top is closed with a hinged lid, C, and a cover, C'. The lid, C, may be made with a double wall inclosing an air space. This lid is so constructed and edged with cloth or felt as effectually to exclude warm air from the ice box, E. The doors in front, D D, are made in the same manner for the same purpose. The ice receptacle, E, occupies nearly the entire horizontal area of the upper portion of the chest, and has a bottom inclining to the rear, that any moisture may be carried off by a pipe in the rear portion (not shown). The cooling apartments are thus kept perfectly dry. These are separated by a vertical partition, and furnished with shelves and hooks. This partition is composed of two walls inclosing an air space. A part of the front upper portion of the chest contains two narrow boxes, *d' d'*, for receiving charcoal for purifying the air. Beneath them are shallow pans, *d''*, to receive any dust that may fall from the boxes. The pan, H, at the bottom of the refrigerator may also be filled with charcoal. The lid, C, when closed, cuts off all communication between the ice box and the refrigerating chambers, and between them and the outer air. By separating the different compartments of the refrigerator with double walls, inclosing air spaces, much more perfect insulation is produced than with single walls, and by the covering of the chest with flock, felt, or woolen cloth, the heat of the external air is effectually excluded.

It is known that some of the odorous gases of meats, etc., are lighter than common air, and must rise. In this refrigerator they must pass through the open-work purifiers, *d' d'*, and there be deprived of their odors. The inclined bottom of the ice box serves two purposes—one the facilitation of drainage and the other exposing a larger surface of ice to the action of the air. The gases which rise are purified by the charcoal in the upper boxes, and those which fall are purified by the charcoal box, H, at the bottom, thus keeping the air in the refrigerating chambers at all times pure and sweet. The arrangement for drawing off the moisture insures dryness, and the construction of the ice box, coolness. The opening of one chamber does not disturb the temperature of the other, their isolation being perfect by means of the double partition.

This appears to be as near perfect as a refrigerator, and also as a winter receptacle for articles liable to be injured by frost, as any we have yet seen. It possesses many advantages not found in others, among which may be mentioned its felt covering and its system of double partitions. Being built on scientific principles and in accordance with natural laws, it promises to fulfill its objects in a very satisfactory manner.



BUNN'S ESQUIMAUX REFRIGERATOR.

Patented May 9, 1865. For further information address L. D. Bunn, patentee, Morristown, N. J. The entire patent is for sale, except the States of New Jersey, Massachusetts, and Kentucky, which have been sold.

Asbestus.

A correspondent at L'Original, C. W., sends us a specimen of asbestus, stating that there is a "mountain of it" in his section. He desires to know if it possesses any commercial value, and thinks it might be used in the manufacture of paper. We do not believe pulp can be made from this mineral. It is used somewhat as a filter for chemical purposes, but beyond this its value is slight. It has the quality of resisting the action of fire, being one of the most incombustible of substances, and has been used to manufacture a coarse cloth which has been wrought into protecting garments for firemen. It was formerly employed as a lining for fire-proof safes, but its use for this purpose has been abandoned, other substances being found superior. Although indestructible by fire, it is a conductor of heat, which rendered it useless as a resisting medium for safes. It is found in large quantities on Staten Island, New York Bay, of much finer quality than the specimen sent to us from Canada.

Ballooning in England.

A newly invented guiding and propelling balloon, called the *Zodiac*, made by Mr. Jackson, of Derby, ascended from Cremorne Gardens a short time ago. Mr. Jackson claims to have attained the power so many have sought for in vain, of guiding the balloon, and even propelling it when the wind fails. The aeronaut sits on a long slender framework over the ordinary car, and the turning of a small crank sets in motion a long oar projecting from either side, spiked with large goose feathers, and simultaneously a cross of feathers at the front end of the frame, which, when in motion, resembles the toy windmill children run with in the street. Behind the voyager's seat, and easily guided, is a large rudder of goose feathers. The oars at the side may be worked singly or together. The balloon started briskly, and rapidly rose high, the descent being made near Epsom, the aeronaut returning by nine o'clock. We cannot say whether the expectations of the inventor were realized in guiding and propelling the machine, as we had no opportunity of observing its course.—*London Mechanics' Magazine.*

STEEL MADE FROM IRON SCRAPS—Take iron scraps in small pieces, put 40 lbs. in a crucible, with 8 ounces of charcoal, and four ounces of black oxide of manganese; expose the whole one hour and a half to a high heat, and run into molds.

INVENTORS, MANUFACTURERS,

The SCIENTIFIC AMERICAN is the largest and most widely circulated journal of its class in this country. Each number contains sixteen pages, with numerous illustrations. The numbers for a year make two volumes of 416 pages each. It also contains a full account of all the principal inventions and discoveries of the day Also, valuable illustrated articles upon Tools and machinery used in Workshops, Manufactories, Steam and Mechanical Engineering Woolen, Cotton, Chemical, Petroleum, and all other manufacturing and producing interests. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Electric, Chemical, and Mathematical Apparatus, Wood and Lumber Machinery, Hydraulics, Oil and Water Pumps, Water Wheels, Etc.; Household, Horticultural, 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 every body can understand and which every body likes to read.

Also, Reports of Scientific Societies, at home and abroad, Patent-law Decisions and Discussions, Practical Recipes Etc. It also contains an Official List of all the Patent Claims, a special feature of great value to Inventors and owners of Patents.

Published Weekly, two volumes each year, commencing January and July.

TERMS

Per annum.....$3 00
Six months.....1 50
Ten Copies for One Year.....25 00

Canada subscriptions, 25 cents extra. Specimen copies sent free Address

MUNN & CO., Publishers,
No. 37 Park Row, New York City

FROM THE STEAM PRESS OF JOHN A. GRAY AND GREEN

Scientific American.

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

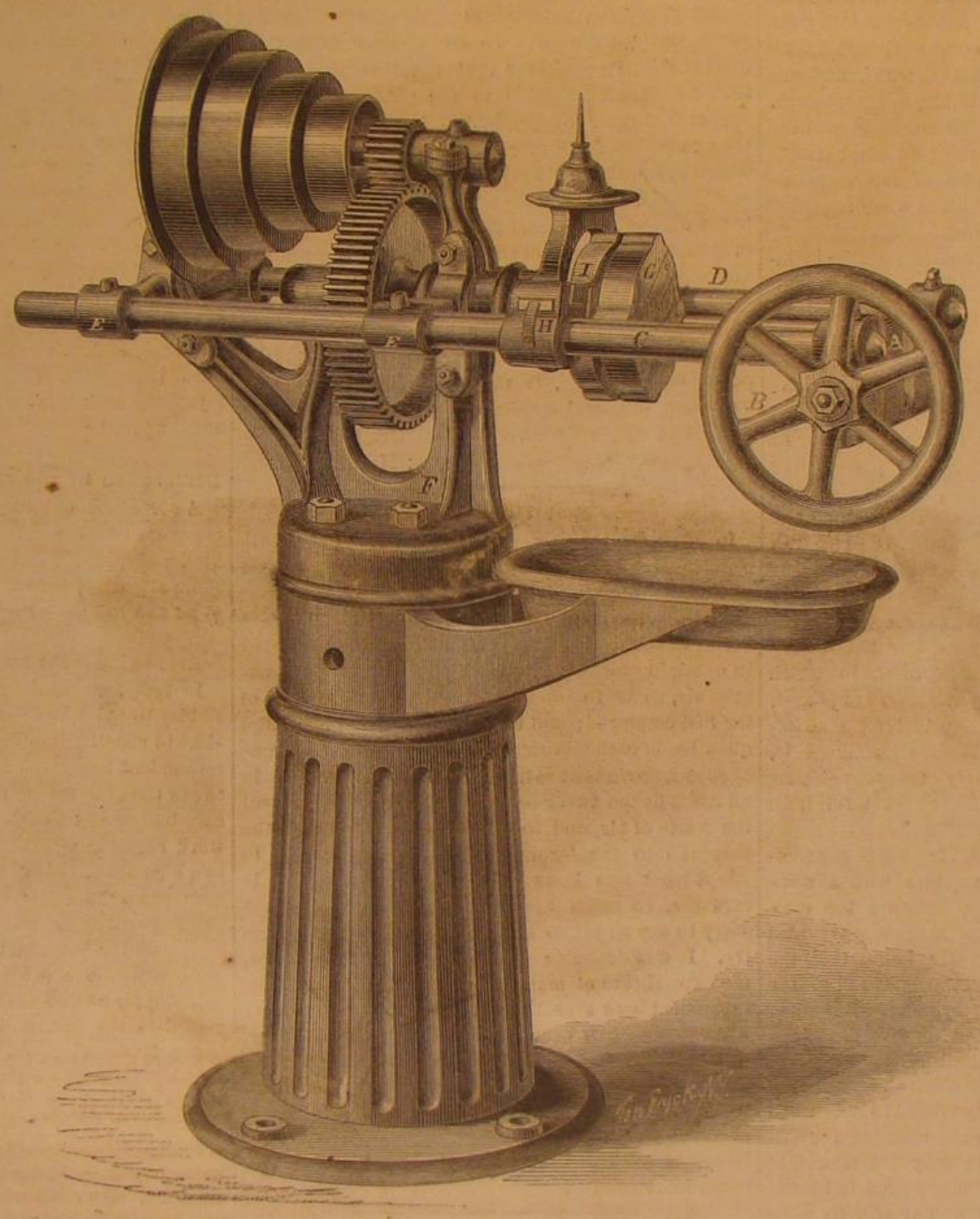
Vol. XIV.—No. 26. (NEW SERIES.)

NEW YORK, JUNE 23, 1866.

$3 PER ANNUM IN ADVANCE.

Improved Bolt Cutter.

If "time is money," all saving of the time employed in any process of manufacture is economy in cash; all improvements, therefore, in time-saving machinery are valuable. The ordinary bolt cutter is worked by reverse motions, entailing a loss of power and of time. The improvement here illustrated is intended to thread bolts by a continuous motion and at one operation.



SWEET'S BOLT CUTTER.

At A is a vise, the jaws of which are opened and closed by a right and left screw, worked by the hand wheel, B, which may be placed on either side of the vise to suit the convenience of the workman. The vise is secured to the sliding bars, C and D, which traverse horizontally through the bearings, E, which form part of the frame, F. The cutting dies are formed in two pieces, or parallel sections, secured together in such a manner that one starts the thread and penetrates the scale, and the other finishes the cut. They work in a dovetailed slot across the face of the head, G, which is secured to a hollow spindle to which motion is given by the pulley and gears.

At H is a stop or pawl, held in place by a spring, and intended to catch in one of the ratchet teeth on the disk, I, which turns freely upon the hollow mandrel. In the face of this disk, next the die head, is cut an ellipsoidal channel, or cam groove, which receives strong studs connected with and moving the dies. It will be seen that by turning the disk, I, the dies can be opened and closed. By means of an adjustable feather on the bar, C, not shown, which at the ends rises into inclined planes, the pawl is operated.

The operation is simple. When the blank is secured in the vise jaws, the bars being drawn forward, the pawl will be released and forced by the spring upon the ratchet, stopping the disk, I, for one-fourth of a revolution, when a cam upon the head, G, drives back the pawl. The stoppage of the disk has opened the dies and the blank can be introduced to whatever distance it is to be threaded. The sliding back of the rod, C, with the feather, again releases the pawl, and the stoppage of the disk another quarter of a revolution closes the dies; the pawl is thrown back and the cutting goes on automatically and rapidly.

It will be seen that after adjusting the feather on the bar, C, for the length of the bolt to be cut, the only work of the attendant is removing and replacing the blanks, so that the work goes on almost continuously, the dies opening automatically to receive the bolt, closing in the same way, and being held firmly to their work until the blank is threaded. The machine is simple, strong and compact. The application and adjustment of the shifting feather cannot be shown, but will be readily understood by a practical mechanic. It is seated in a slot cut in the bar, C. It is manufactured by Sweet, Barnes & Co., of Syracuse, N. Y., to whom all orders should be addressed, or to Wm. A. Sweet, President of the Onondaga Steel and Cutter Works, Syracuse.

Nitrate of silver, which is so extensively used in photography, is by no means sold in the shops in a pure state, and photographers who wish to procure superior copies should, therefore, purify it. The following is Mr. Maxwell Lyte's process for the purpose:—The trade article is first partially purified by crystallization; it is then redissolved to saturation in boiling water, and 1 per cent of nitric acid is added. The liquid is constantly stirred while cooling. A crystalline powder is gradually deposited, which is collected on a filter and washed with water acidulated with 10 per cent of nitric acid. The salt thus obtained is chemically pure.

Petroleum has been struck at Gadsden, Ga., at a depth of 237 feet.

WOOD TURNING AT HIGH SPEED.

We have received a communication on this subject from E. J. W., Lenox, Mass, which we have not space to publish in full, but make an abstract of the main points. He says his foot lathe runs at a speed of 700 turns per minute, but he finds that for wood of two inches in diameter and under, and for brass, a speed of 3,600 is far preferable, as the gouge or chisel is less liable to catch, and the work produced, much more satisfactory. He sends us a pulley chuck for wood, which is simply a disk of brass with a groove for a round belt, having a hole through the center, and three steel points or spurs secured equidistant from the center and each other, designed to hold the wood to be turned. With it is a punch of brass or other metal, having at one end, a flange or disk, from the center of which projects a steel pin long enough to pass through the center hole of the chuck and pierce the wood to form a center. The chuck is placed on the end of the stick to be turned, the spur of the punch inserted, and a smart blow with a mallet brings the disk of the punch in contact with the face or reverse of the chuck, and forces it home. The chuck may then be driven by a large pulley overhead, or it may be secured to the lathe spindle if the speed is high enough. He speaks highly also of the facility with which wet or green wood can be turned. His suggestions may be valuable to amateur turners.

The North London Railway.—With but 12 miles of line, and with trains working over 8 miles of connecting lines, or 20 miles in all, the North London Railway Company now have 54 locomotives, mostly of the heaviest class. The newer passenger engines, of which we have given a description in a recent number of *Engineering*, weigh 42 tuns, of which 30 tuns are on four coupled wheels. These engines have 17 inch cylinders, 24 inch stroke, 5 feet 9 inch wheels, and carry regularly a pressure of 160 lbs. per square inch.. Mr. William Adams, the company's engineer, builds his own engines at the company's works at Bow, and twelve additional engines are now on order there.—*Engineering*.

The newer the coal, in a geological sense, the less its calorific power; as the coal becomes older and approximates to anthracite in composition, the amount of carbon increases, while the oxygen decreases. Hence the cause.

[From the British Journal of Photography.]

A Powerful Source of Artificial Light.

One of the most brilliant discoveries made within the last few years, has just been made public by its inventor, who has not only discovered a new principle in electrical science, but has applied it to the construction of a machine which, by means of the carbon points, will give light of much greater brilliancy than has hitherto been produced by man. The present apparatus is made on a grand scale, but it remains to be seen whether a small machine cannot be made to work by hand, whereby the electric light can be produced at the mere cost of the labor and the carbon electrodes. So powerful is the current of electricity evolved by the present apparatus, that ordinary photographic paper, at two feet distance from the light, blackens in twenty seconds to the same degree that it will darken by exposure for one minute to the direct rays of the noon-day sun on a clear morning in the month of March.

This invention was first made known to the public by Professor Faraday, a week or two ago, at a meeting of the Royal Society. The paper containing the information was a very long one, sufficient to fill more than a whole number of this *Journal*, and was written by the inventor, Mr. H. Wilde, of Manchester. Some notes of the substance of its contents, and the marvellous effects produced by the powerful currents evolved by the apparatus, will be of interest, considering the promise of the invention when regarded from a photographic point of view.

Mr. Wilde first made a large hollow metallic cylinder with sides of iron, separated by a thick diaphragm of brass. This composite cylinder had its metallic parts bolted together by screws of brass. Permanent magnets could be placed over the cylinder, so that their poles would bite and make good contact with the opposite iron sides. The internal diameter of the cylinder was $1\frac{5}{8}$ inches. The four or five horseshoe magnets which could be placed over it, each weighed about one pound, and would each sustain a weight of ten pounds. Thus, when the magnets are mounted over the cylinder, the two iron sides of the latter become virtually the poles of one very powerful magnet. The armature is a long solid bar of soft iron, made to revolve inside the hollow portion of the cylinder. This solid bar has a deep longitudinal groove on each side of it, in which groove the insulated wires of the armature are placed, so that the latter has still a cylindrical form externally. It will be noticed that this arrangement is, in principle, that of the ordinary magneto-electric machine, though somewhat differing in form from those of the usual construction.

With apparatus thus arranged, Mr. Wilde connected the terminal wires of the armature with a common tangent galvanometer, to measure the electricity evolved as each permanent magnet was added to the outside of the cylinder. He found that the electricity produced was in direct proportion to the number of magnets on the cylinder. But now comes the wonderful part of the discovery. When the induced current of electricity from the armature was passed round an ordinary electro-magnet—the soft iron bar—the latter actually lifted 178 lbs., while the four permanent magnets on the cylinder, the original source of the power, would only lift a weight of 40 lbs. The effect here produced seems to be out of all proportion to the cause, and it will be seen what an important bearing the discovery has upon the law of the conservation of energy. Having made this first step, Mr. Wilde constructed a second cylinder larger than the first, and placed outside it electro-magnets instead of permanent magnets, the two machines being then worked together, and the current generated by the first being employed to excite the electro-magnets of the second. By this arrangement twenty four inches of No. 20 iron wire, 0·04 inch in diameter, were made red hot. Lastly, a machine with an iron armature ten inches in diameter was made, the total weight of the whole apparatus being four and a-half tuns. The three machines were then made to work together, the armature being driven as before by steam power, the results proving most astonishing. Pieces of cylindrical iron rods, each a quarter of an inch in diameter, and fifteen inches in length, were melted by the current, which also melted fifteen feet of No. 16 iron wire, 0·065 of an inch in diameter, and made twenty-one feet of the same wire red hot. Mr. Wilde says:—"The illuminating power of the electricity from the intensity armature is, as might be expected, of the most splendid description. When an electric lamp, furnished with rods of gas carbon half an inch square, was placed at the top of a lofty building, the light evolved from it was sufficient to cast the shadows from the flames of the street lamps a quarter of a mile distant upon the neighboring walls. When viewed from that distance the rays proceeding from the reflector have all the rich effulgence of sunshine. Lastly, as already stated, photographic paper is blackened in twenty seconds by this artificial light, to the same extent that it can be darkened by sunlight in a minute.

Such is the substance of the wonderful discovery made by Mr. Wilde. It is evident that its value to the photographer is a question of expense, there being no doubt as to its utility. As the most economical proportions of the parts of such machines become better known by experience, it is to be hoped that the maximum of light and minimum of mechanical power will be so altered from their present relative positions that the invention will be to some extent available to the photographer, and render him more independent of the weather. With the exception of the mechanical power, the expenses connected with the working of the apparatus are nominal. Ordinary wear and tear, the consumption of the carbon points, and the gradual burning away of the contact places of the necessary commutators, are inexpensive items, offering no impediment to the general use of the machine. Whether the expense of the mechanical power can be reduced so as to make the invention commercially available in the photographic world, is the only question hanging over one practical application of this, one of the noblest scientific discoveries of modern times.

WILLIAM H. HARRISON

Smelting Iron.

In a paper recently read to the Association of Foreman Engineers, of London, Mr. Oubridge traced the history of iron smelting from the very earliest periods, in the course of which he said that the great secret of economical and effective smelting consisted in obtaining for the purpose a rapid current of common air, so as to produce complete combustion of the fuel employed; and the speedy creation of a large quantity of carbonic oxide gas was the consequence of such an arrangement. The blast pipes should in all cases fit the tweer holes closely, so as to prevent the waste of air, and to direct the full force of the current into the furnace. It was all desirable to adopt what was known as the "drop bottom" in furnaces, so much used in America, and he was sorry to say as yet so seldom adopted in this country. It was desirable to lessen, as far as possible, the expenditure of manual labor, and this last arrangement was essentially a step in that direction. After a man had been engaged in working a furnace for several hours, it was rather hard to give him the task of raking it out and quenching it. By means of the drop bottom this might be accomplished in a few minutes, whereas it was a laborious and tedious process in the other case, and much more costly.

Preparation of Chrome Yellow.

The preparation of a good chrome yellow is rather difficult, and frequently the product obtained, instead of preserving its light canary color, becomes gradually orange colored. This change of tint greatly damages the beauty of the color, and consequently its value; it may, however, be altogether avoided, by leaving the precipitate of chromate of lead for some time in darkness. The reason why this orange tint is so easily produced is, that while the neutral chromate of lead, which constitutes chrome yellow, is of a light canary color, the basic salt, commonly called chrome red, is orange colored; but the former, like nearly every salt of lead, has a certain tendency to pass to the state of basic salt, whence arises a change of color, more or less marked, which is especially produced when acetate of lead has been used to prepare the chrome yellow. This alteration is less to be feared when nitrate of lead is employed, and when the solution of this salt, poured into that of chromate of potash, is rather less in quantity. Nitrate of lead is perhaps too expensive for every case, but it gives a purer, and, above all, a less orange product than the acetate.

Cork Springs for Cars.

In the published proceedings of the Franklin Institute, we find some remarks about the use of cork in the place of india-rubber for freight cars and other heavy vehicles:—

"The cork used for these springs is of the commonest description, harsh, hard, and full of fissures. It is cut into disks of about eight inches diameter, each pierced with a central hole. Previous, however, to cutting, it is soaked in a mixture of molasses and water, which gives it some softness and renders it permanently moist. A number of these cork disks are placed in a cylindrical cast-iron box, a flat iron lid or disk is placed over them, and by hydraulic pressure is forced down so as to reduce the thickness to one-half. A bolt is then run through box, corks, and cover at the center, and a nut being screwed on this, holds all in place, when the press is relieved, and the box of compressed cork, disks, or cork spring, is ready for use.

"One of these springs, placed in a testing machine, under a weight of 20,000 lbs., shows an elasticity suggestive of compressed air in a condensing pump. One would expect, from the appearance of the material, that, under heavy pressure, it would be pulverized or split into shreds, especially if this pressure was assisted by violent shocks, but in fact no such action takes place.

"A pressure which destroys india-rubber, causing it to split up and lose its elasticity, leaves the cork unimpaired, and, with the machinery in use, it has even been impossible, with any pressure attainable, to injure the cork, even when areas of but one inch were acted upon."

Difference in the Operation of Locomotives

A correspondent states that on a certain railroad there are two locomotives running, using the same kind and quantity of oil and tallow, and having the same attention, the cylinders of one of which "gum" so as seriously to interfere with its economical working, while the other remains perfectly free. He desires to know the reason for the difference.

In reply, we would premise that it is an impossibility to build two machines which shall be exactly alike in construction and working. Whether our correspondent has given all the conditions common between the two machines we much doubt, but if the care bestowed on each is the same, the conditions of work required equal, and the construction of the two locomotives alike, we cannot see why one should gum while the other remains free. In such cases theory is of little worth. A practical test by exchanging the work and workmen of the two locomotives will give more satisfactory results than any opinion formed on such insufficient data as is furnished in the communication, such opinion being at best only a conjecture.

Artificial Production of Goiter.

The cause of goiter is said by M. Maumene, a French chemist, to be the presence of fluorides in the water of certain regions. He has proved this experimentally. He gave a dog fluoride of potasium for five months, and at the end of this time he noticed a peculiar swelling in the neighborhood of the neck. His experiments were not then continued further, owing to the escape of the dog: but when the animal was recaptured, some three years afterward, the swelling was still as apparent as at first, though M. Gaillet, a Rheims physician, did not think it sufficiently prominently marked to justify him in calling it goiter. M. Maumene states that in all countries where goiter is prevalent fluorides prevail in the water.

M. GAILLARD suggests the making of a safety lucifer match by dipping the stick into melted sulphur after the application of the phosphorus. The sulphur being insoluble in water, and not melting below 110° centigrade, would hinder the phosphorus from doing any harm if the matches were dropped into food; and the greater friction necessary to ignite such a match would be a safeguard against accidental ignition.

PHENIC ACID.

What is it? We answer that it is carbolic acid, hydrate of phenyl, phenol, phenic alcohol, spyrol, salicone or mineral creosote, (C_{12} H_6 O, HO) (?). It has as many aliases as some of our notorious thieves, and under one or another of them is constantly getting into the newspapers. It was first christened carbolic acid by Runge, a German chemist, who discovered it in 1834. But it is not properly an acid; it is not sour, does not redden litmus paper, nor does it combine with alkalies any sooner than with acids; hence the names phenol, etc. In commerce—for it is sent to every part of the globe—the original name is still retained; but phenic acid sounds and looks more scientific, and is, therefore, commonly used in books.

Phenic acid, when pure, occurs in beautiful transparent needle-form crystals. If the crystals be exposed to the air, in a few minutes they absorb a very small quantity of moisture, and are transformed into an oily liquid, which is slightly heavier than water. Although the solid acid is so eager for water, it is satisfied with a very little, and is but slightly soluble in water. It has a burning taste and a powerful and persistent odor, which people call smoky. It dissolves freely in alcohol, ether, and oils, and is itself a powerful solvent of gum, resins, sulphur, and phosphorus. We cannot more briefly indicate its more useful properties than to say it is often called creosote, and that it is as like the genuine creosote as two peas. It is a poison to all animals and plants, and is especially destructive to insects and their eggs. All vermin hate the smell of it and get away from it as fast as they can. But although it is certain death to the animal, it is kind to the dead body, for it may preserve that forever; any kind of flesh which has been impregnated with phenic acid refuses to decay and return to dust. When decay has commenced, by putrefaction or fermentation, phenic acid will stop it instanter, and prevent its recurrence.

The chief source of phenic acid is gas tar, while the genuine creosote is found in wood tar. Both are separated in substantially the same way. Phenic acid is probably as powerful an antiseptic as creasote, and for many purposes is a cheap substitute. Those who understand smoking hams can have an idea of what the power of creosote is. How much creosote is there in a ham weighing fifteen pounds? Creosote is a very expressive word; it is derived from Greek words which mean "flesh preserver."

When nitric acid and phenic acid are brought together, picric acid, a splendid dye for yellow and green on silk and wool, is the result. Phenic acid, in the very crude form of gas tar and dead oil, has been used for preserving timber, and by the farmers for killing vermin. In the pure state it is generally known to physicians and is used by many of them.

Phenic acid is now much talked about as a disinfectant and especially in connection with the rinderpest. But its virtues as a disinfectant are doubtful. It promptly prevents the decomposition of matter which generates foul odors, but it acts slowly and poorly on the odors already existing. If it destroys an odor, it leaves itself in the place of it, and to most people will smell quite as "loud." The first odor of phenic acid is tolerable, but when continued it becomes exceedingly unbearable; it is quite the reverse of vice.—

"A monster..... ...." etc

THE MANUFACTURE OF BEET SUGAR.

Sugar is a modern product, so far at least as it has become a common condiment. In ancient times the product of the bee served inefficiently the purposes to which sugar is now universally adapted. The natives of the peninsula of India appear however to have known of its use, as also did the Chinese, from time immemorial. Indeed the word "sugar" is from the Sanscrit. That, however, used by the Chinese was probably the product of the sorghum. The sugar cane is a native of hot climates, and only within or near the tropics does it flourish, although it has been raised as far north as the Carolinas and Kentucky. But even in the localities most favorable in the United States for its growth and maturity, the necessity of replanting every three years, and the exposure to frosts and unfavorable seasons, have always made it an uncertain crop.

A substitute for the sugar of the tropics has always therefore been a desideratum. In the Northern States the maple is extensively cultivated for its saccharine sap, which, however, does not produce an article equal to the imported. The sorghum is found also to thrive well in this section, and the sugar and sirup from the Chinese cane has become an important production. Latterly the attention of the people has been drawn to the beet as a product, which yields sugar in good paying quantities. In France, Belgium, the Zolverein, Russia, and Austria, the product of sugar from the beet for the year 1859, was estimated at 357,500 tuns, at a cost, adding the manufacturer's profit, of from 9 to 11 cents per pound. On light dry soil the yield of the white or sugar beet is very large, and the manufacture of the sugar from it is not complicated nor difficult, requiring only care in the process of granulation. The establishment of its manufacture in France is due to the first Napoleon, who endeavored in this, as in other articles, to render his people independent of foreign importations. Through a long series of years it was encouraged and protected by premiums and duties discriminating in its favor, until at the present time it competes successfully with the imported sugars, although not specially protected.

From what data we can obtain, there appears to be no reason why its production and manufacture cannot be successfully prosecuted in this country. The juice from the beet cannot be so effectually separated by compression as from the cane, and to remedy this, one of two processes are employed, either by cutting or grinding the root and then subjecting it to pressure, or by maceration in water. This latter process, however, necessitates additional labor in the subsequent processes of filtration, concentration and granulation. These are similar to those pursued in the manufacture of cane sugar, consisting of boiling, evaporating, draining, crystallizing and claying. The refuse is of use in the manufacture of potash, the sirups are used as food, and the coarser sirups as a basis for the distillation of alcohol.

MISCELLANEOUS SUMMARY.

To Preserve Ice.—Put it in a deep jug, cover it with a plate, place the vessel on a pillow stuffed with feathers, and cover the top with another pillow carefully, thus excluding the external air. Feathers are well known bad conductors of heat, and consequently the ice is preserved from melting. Dr. Scwarz says, that, in this manner, he has preserved six lbs. of ice for eight days.

The following is an easy method of detecting whether the red color of wine is artificial or otherwise:—A small piece of bread or of sponge which has been well washed is dipped into the wine and then placed in water. If the color is artificial the water will be at once colored; otherwise the color will not be apparent for half an hour.

It is estimated that upward of 800,000 sewing machines have been manufactured in the United States since Mr. Howe introduced his invention, and that several millions of dollars are invested in the business. The Wheeler & Wilson Manufacturing Company employs a capital of $1,000,000.

The Sheffield file cutters, to the number of about 4,000 have been on a strike for several weeks. In the mean time a great impetus has been given to file cutting by machinery.

The vacuum pan was patented in England in 1812 by E. C. Howard, and the royalties paid under this patent for several years amounted to £200,000 per annum.

It has been ascertained that ozone is developed by the mechanical action of blowing machines producing strong currents. This fact may, in part, account for the healthy action of wind.

Steel Cannon.—Krupp, as we understand, is making a cast-steel cannon of 50 tuns weight, to be exhibited at the Paris Exhibition. This is about the weight of the American 20-inch army guns, the naval guns, of the same caliber, weighing about 45½ tuns.

The biggest piece of work ever done by the Water Department of Philadelphia is now in progress. Workmen are now engaged in connecting the forty-eight inch water main laid from Fairmount water works to Corinthian avenue with the turbine wheels.

The Athens (Ga.) *Cultivator* says the "probability is that the wheat crop throughout the Union will be considerably less than a full one. It will be considerably diminished at the South by rust, beside the injury sustained by the severe winter; at the North it suffered greatly in many sections from the latter cause Corn, though backward, looks well. Winter oats were badly killed out last winter, and are a very short crop in this section. Cotton, we hear bad accounts of from every quarter. Bad seed, planted in wet weather, hurried and indifferent preparations, hail storms, and beating rains, make the prospects of the growing crop very gloomy."

Another account says:—"Wheat in upper Georgia is believed to be out of danger and is promising well. Cotton is not promising. There will not be a fourth of a crop. Planters are still plowing up and planting corn."

An eccentric German physician recently died, leaving in his will what he considered a secret for increasing the years of our life. His own age was 109, and he attributed it to the fact that he always slept with his head to the north, and the rest of his body, as nearly as possible, in a meridional position. By this means, he thought the iron in his body became magnetized, and thus increased the energy of the vital principle. This idea is quite old; mention was made of it in the Scientific American many years ago.

To Wash Calico without Fading.—Infuse three gills of salt in four quarts of water; put the calico in while hot, and leave it till cold, and in this way the colors are rendered permanent, and will not fade by subsequent washing. So says a lady who has frequently made the experiment.

Varnish for Paintings.—Take mastic, 6 ounces, pure turpentine, ½ ounce, camphor, 2 drachms, spirits of turpentine, 19 ounces; add first the camphor to the turpentine; the mixture is made in a water water bath; when the solution is effected, add the mastic and the spirits of turpentine near the end of the operation; filter through a cotton cloth.

The lands along Oil Creek are estimated at a *bona fide* cash value of two hundred and fifty millions of dollars. Many portions of these lands have been sold at prices that would bring the whole at the same rate to this sum in the aggregate. The distance is but little over fifteen miles, and the valley narrow throughout its entire extent, so that an idea can be readily formed of the immense wealth contained in its bosom.

A useful cement is made by taking two parts of finely sifted unoxidized iron filings, mixing them with one part of perfectly dry and finely powdered loam, and kneading the mixture with strong vinegar until a perfectly homogenious plastic mass is formed. when the cement is ready for use. It must be made as wanted, for it quickly hardens, and once set is never fit for use again. The cement is said to resist fire and water.

The Southwestern (England) Railway Company possesses a monster engine, named the *Colossus*. It has been built to draw a train of eighty loaded wagons eighty miles in three hours, each loaded wagon weighing about ten tuns. It can drag nearly one thousand tuns from London to Southampton with almost the speed of a bird flying.

Round Steel Shot.—Large contracts for round steel shot are now being carried out at Sheffield, for the Admiralty, by Messrs. Cammel & Co. [limited], John Brown & Co, [limited], and Messrs Firth & Sons. Pot-steel is the sole material used, and the steel spheres, about 9 inches in diameter, are swaged out in blocks under the steam hammer.

A variable star has been discovered in the constellation of the Northern Crown, and has been carefully observed at the United States Naval Observatory in Washington. The daily rate of decrease is about four-tenths of a magnitude, and it has changed from the second to about the eight magnitude.

A fluteless flutist is spoken of in Havre, France, as performing wonderful things. He makes a flute out of his left hand, which he holds to his mouth, using the right in lieu of stops. The notes he produces are not to be distinguished from those of the real instrument.

The *Mechanics' Magazine* says that coal oil is a better article for preserving sodium and potassium than naphtha. In coal oil, soda keeps its luster for months and years, while in the purest naphtha it is dimmed in a few days.

SHOULD THERE BE A PATENT LAW?

It is said that the present Attorney General of England has vaguely intimated that the law of patents should be abolished. Sir William Armstrong has also expressed the same opinion, and some writers have ventured to urge such views, but the mature judgment of mankind is averse to so radical a proposition.

In a recent number of *Newton's London Journal of Arts*, we find this subject ably discussed in the report of a sub-committee appointed to consider the defects of the British patent system, from which we make some extracts:—

Many of the objections urged against patents on the ground of monopoly may be urged against other property of perpetual instead of limited duration.

The claims or rights of the inventor to own such property may be likened to those of the first finder or first occupant, and rest on the same principle as other property. The author of a book or of an invention has an undoubted right to keep it to himself; but if he thinks fit to publish the book or invention for the use of others, without which publication the book or invention would be valueless, exclusive property in such book or invention is gone, except so far as it may be retained or restored by municipal law. Much learning has been bestowed in support of the so-called natural right of an author, whether in a book or in an invention; but the sub-committee consider the question of such a legal natural right to have been long ago settled in the negative, and that the right of an author or inventor is the creature of municipal law.

The sub-committee cannot recognize any distinction in principle between the product of the brain as embodied in a book, picture, or statue, and an invention in the arts and manufactures; substantial differences, however, exist in dealing with such property. No property exists in an idea unless clothed or embodied in some material form; the protection to such property consists in the right to exclude others from multiplying copies. What is a copy may, under certain circumstances, give rise to serious difficulty. Not only must an idea be embodied in a material form as the basis of property, but the boundary or limits of that property must be defined. It has been urged as an objection to any patent law that it deals or attempts to deal with subjects incapable of being defined. What cannot be accurately defined is not the subject of property.

The eye or the ear can judge of the identity or similarity of two books, maps, pictures, or pieces of music; but an invention, embodied in a machine or a chemical process, admits of variations according to equivalents known or unknown. The imperfection of language, and the disposition to adopt forms of expression which may include or exclude as much as possible, as occasion may require, add to the difficulty; hence the necessity of some control in the creation of property to be protected by legal proceedings at the option of a party interested in checking or defeating rivals. The public have a direct interest in preventing the creation of rights which may be improperly used; hence the expediency of some check on the indiscriminate issue of patents.

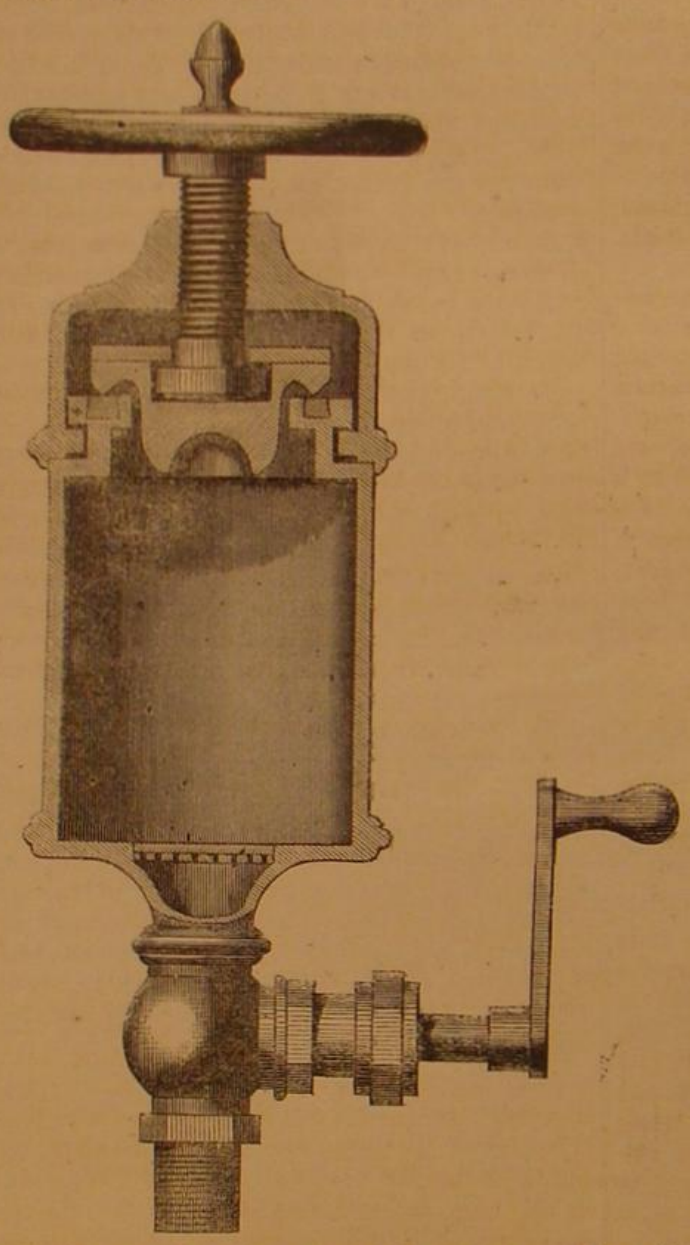
The interest of the public in the maintenance of a patent law, not the interest of the inventor, is the real question. The object of the patent law is to create, to call into existence, the trade, which, when so created or called into existence, shall be free; the duration of the monopoly given by the patent law being the time necessary for that purpose, which may and must differ in various cases. Property in each special invention is the only means hitherto devised for stimulating invention and rewarding the inventor. Invention, like poetry, may exist as a natural gift. Special instances may be referred to, in which a book or an invention might have been called into existence, or created, without the stimulus of copyright or patent right, or expectation of reward; but book making and invention may be followed as a legitimate business and means of livelihood, and of creating property to be transmitted to posterity. The poetry of Milton might have been recited to admiring audiences, but the capital to produce the first edition would not have been forthcoming if no property had existed in the product; that is, if there had been no exclusive right to the multiplication of copies. Watt might have exhibited his applications of the laws of heat and economy of fuel in the steam engine; but a Boulton would not have applied capital to call into existence the elaborate machinery by which our mines are drained, and looms driven, and railways worked, had there been no property in the product of the capital necessary for its existence. It has been often said, in reference to invention, that a Boulton is necessary for the development of a Watt; and no one acquainted with the history and progress of invention in this country, with the results of the labors of a Crompton, a Paul, and an Arkwright, can fail to recognize the fact that an unlimited amount of labor and capital is employed on the faith of the property to be created by its successful application. The dreams of the alchemists and searchers after perpetual motion laid the foundation of modern chemistry, and produced many mechanical equivalents. The authors of many most useful inventions have died in poverty, amid the wealth which their labors have created; but the public have reaped the benefit of those labors, which the patent system stimulated, however delusively.

Manufacture of Gold and Silver.

A correspondent from Indiana desires to know what would be the best use to which the discoverer of a method of making gold and silver could put his knowledge. We hardly know how to reply. If his object was selfish, he should keep the process a secret; and if he desired to benefit mankind in general, it is doubtful if giving it publicity would be a boon to the world. If the precious metals could be procured as easily and become as plenty as iron, their value would fall below that of this common metal, because they are not intrinsically as valuable as iron for the use and comfort of mankind. Gold and silver have certain qualities superior to similar qualities in iron, but in the really useful qualities, iron is the most valuable.

STORER'S OPEN-TOP SUET LUBRICATOR.

This instrument is used for supplying lubricating matter to the cylinders of locomotive steam engines, steam pumps, etc. Its distinctive feature is the movable top, which renders it capable of receiving suet or other fatty matter in bulk, which is gradually melted and fed in as required. Oil or melted tallow may be used in it, but they are carried off very rapidly, and, besides, are generally adulterated—sometimes to such



an extent that we have seen the valves, piston, etc., of a steam engine so badly eaten in a few months as to make it necessary to replace them.

It is asserted that suet only costs about forty per cent as much as good oil, so that it is an item of importance to use it as a lubricator.

Some twelve hundred of these cups are in use, all giving perfect satisfaction. The instrument will be readily understood by the accompanying engraving. The common globe valve at the bottom controls the steam opening and regulates the supply. The cover at the top is attached to the bowl with the clutch, as shown, forming an abutment for the screw, which, pressing on the loose valve, makes a joint on a ring of soft metal confined in a dovetailed groove. A very slight pressure is needed to make a tight joint. This is a very simple and efficient device, and it might be used for many other purposes.

It was patented Nov. 24, 1863, and March 13, 1866. Messrs. Cameron & Geoghegan, of 199 and 201 Center street, New York, are the manufacturers.

Manufacture of Crucibles.

Larkin, in his "Brass and Iron Founder's Guide," gives the following information on the above subject:—

The manufacture of crucibles is a branch of the potter's art, requiring great care to insure success; and, until lately, was at the best a very uncertain process. The chief requisites in a good crucible are, refractoriness in the strongest heats, capability of withstanding the corrosive effects of any substances that may be ignited in them, and the effects of sudden alterations of temperature. They must also be composed of a material sufficiently solid in its texture to prevent the passage of the solid metal through its pores.

The composition producing pots of the best quality is formed by pure fire clay mixed with finely ground cement of old crucibles, to which is added a portion of black lead or plumbago. The clay is prepared in the same manner as observed in pottery generally. The vessels, after being worked to the proper conical shape, are slowly dried, and then baked in a kiln.

The composition used in the Royal Foundery of Berlin is formed of eight parts in bulk of Stourbridge clay and cement, five of coke, and four of graphite or plumbago. Crucibles manufactured from this mixture are capable of withstanding the greatest possible heat in which wrought iron melts, being equal to from 150° to 155° Wedgewood. They also bear sudden cooling without cracking. In the Berlin foundery they have been employed for twenty-three consecutive meltings of seventy-six pounds of iron each, which perhaps is the most complete and trying test that could be adopted.

Another composition is as follows:—8 lbs. Stourbridge clay, 4 lbs. burned clay cement, 2 lbs. coke powder, and 2 lbs. pipe clay; the whole being compressed in molds while in a pasty state.

The Hessian crucibles from Great Almerode and Epterode, resist the action of fluxes, and are tolerably lasting. They are made from a fire clay containing a small amount of iron, but no lime. This is incorporated with silicious sand. These crucibles are rather porous, but they resist the effect of saline and leaden fluxes, and are not liable to crack, but they melt below the fusing point of bar iron.

The black lead crucibles bear a much higher heat. Their composition is two parts of graphite and one of fire clay; this is mixed into a pasty mass by means of water. The crucibles are baked slightly in the kiln, but are not completely hardened until put into the furnace for use. They are of a smooth surface, and are consequently suitable for gold and the precious metals generally. These crucibles are perhaps the very best yet manufactured, and many of the brass founders throughout Europe, and for aught I have yet seen to the contrary, all the brass founders of America, are adopting them in preference to the ordinary clay ones. Mr. Anstey's patent process for the manufacture of crucibles is as follows:—2 parts of finely ground raw Stourbridge clay, and 1 part of the hardest gas coke, previously pulverized, and sifted through a sieve of one eighth of an inch mesh, are mixed well together with water. This mixture is molded on a revolving wooden block somewhat similar to the process pursued in pot throwing, a gage being used to regulate the thickness of the pot, and a cap of linen placed upon the core previous to the application of the clay in order to prevent its adhering when removed. The pot is then dried in a gentle heat, and is not thoroughly completed until required for use. It is then warmed before a fire, and laid in the furnace, with the mouth downward—the heat of the fire having been previously lowered by the application of fresh coke. It is gradually brought up to a red heat, reversed, and fixed in its proper position in the furnace, and is then ready to receive the charge of metal.

CURB FOR DAMP WALLS.—The following is stated to be a good remedy for damp walls:—Three-quarters of a pound of mottled soap to one gallon of water. This composition to be laid over the brickwork steadily and carefully with a large flat brush, so as not to form a froth or lather on the surface. The wash to remain twenty-four hours, to become dry. Mix half a pound of alum with four gallons of water, leave it to stand for twenty-four hours, and then apply it in the same manner over the coating of soap. Let this be done in dry weather.

THE WAY FELT HATS ARE MADE.

At 101 Cliff street, in this city, is situated the hat-body manufactory of H. A. Burr. It is a large fire-proof building, filled with machinery, which is driven by a double cylinder beam engine of 400 horse-power. There are some half-a-dozen other similar establishments in the country, and they have all grown up from a simple invention, which has revolutionized the important art of making hats.

All felt hats, and the bodies of all silk hats, except a few cheap, heavy, woolen ones, are made of fur—mostly of the fur of hares and rabbits. When the several fibers of fur are crossed and entangled together in a sheet, and the sheet is then subjected to a peculiar rolling motion, the fibers are drawn more and more closely together, giving to the sheet a homogeneous character and considerable strength. Such a sheet is called felt, and the process of forming it is called felting. It has been stated that the fibers of fur are barbed or serrated, and that their hold on each other in felt is due to the interlocking of the teeth or barbs. On examining some rabbit's fur under a compound microscope, we were unable to discover any thing more than an irregular roughness, though the fibers seemed to be formed in short joints, somewhat like sugar cane.

Formerly the forming of a hat body was a laborious and tedious process, requiring some two hours' labor by a highly-trained and skilled workman. The proper quantity of fur was weighed, and divided by the scales into two equal portions. One of these was placed upon a table about six feet in length, which was situated in front of a window and protected by a vertical board at each end from lateral currents of air. The fur was then beaten up and arranged in order by means of a bow, formed of wood and catgut, and somewhat resembling a large fiddler's bow. The workman held his bow in his left hand, and drawing the string with his right, let it snap down upon the pile of fur, at the same time giving a peculiar twist to the bow to throw the fur into a pile or sheet of triangular form. This was pressed down flat and laid one side, and the other half of the fur was treated in the same manner. A sheet of paper, similar in form to the sheets of fur, but somewhat smaller in size and with one angle rounded, was then laid upon one sheet of fur, and the edges of the fur were bent over the edges of the paper on two sides and the rounded angle, the second sheet of fur was laid upon these, the whole was turned over, and the edges of the second sheet were rolled like the first. The edges of the two sheets, thus lapping, were subjected to a gentle rolling motion to partially felt them together. After a little further rolling of the whole mass, the paper was removed, and, by repeated dipping in hot water and rolling, the body was brought to the form of a hat, a wooden block of the latest fashion being introduced in the proper stage of the process.

About twenty years ago, Mr. Henry Augustus Wells, of this city, conceived the bold and original idea of a process for forming hat bodies, vastly easier and more rapid than the one above described, which was then in use all over the world. After years of expensive experiment, and many ingenious improvements by Mr. Burr and his partner, the plan of Mr. Wells was made practically successful, and by it all hat bodies in this country are now made.

Thin sheets of brass are punched full of small holes, about 64 to the square inch, and these sheets are brazed together in the form desired for hat bodies—that is, the form of a cone with a hemispherical summit. This is placed upon an air-tight box within which revolves, at high velocity, a spiral fan, drawing the air through all the holes into the cone, and blowing it out through a hole in the floor below; the cone at the same time slowly rotates around its vertical axis. A machine, placed in proper proximity, and furnished with a rapidly-rotating brush, beats the fur into a cloud, and blows it through a narrow vertical slit at the end of a wedge-shaped funnel, in a thin, attenuated stream, directly upon the rotating brass cone. The inward current of air draws the fur upon the outside of the cone in a sheet, with the fibers as completely crossed and interlocked as they can be by the most skillful bowing. A square foot of wet canvas is now dropped over the rounded top of the cone, and another piece of the same material is wrapped around it—the slow rotation of the cone making this wrapping a quick and easy operation. The whole is then covered with a second brass cone, (a little larger than the interior one, and perforated with larger holes), and is removed to a platform, and lowered into a kettle of hot water. The fur is instantly soaked by the water, which causes the fibers to adhere together with sufficient strength to form a bag that may be handled. The platform is then raised, the outer cone and the cloths removed, the inner cone inverted, and the fur loosened around the edge, when it falls upon the table in the form of a frail conical bag. Ten of these bags, or "bats," are laid in a pile, rolled in a cloth, and subjected to sufficient rolling motion to felt them strong enough to be sent to the hatters.

Fur for hat bodies is imported mostly from Germany, though some comes from Scotland. It is now worth four dollars a pound in this market; there is about an ounce in a fleece, and it takes from one to four ounces to make a hat body. Mr. Burr has made, at his establishment in this city alone, 10,000 bodies a day—1,000 an hour—for three months in succession. The fur is cut from the pelt by hand, and is imported in paper bundles. Formerly, the hair was all pulled from the skin before the fur was cut, by pressing it between a knife blade and the thumb of the workman, but now it is all cut off together, and the hair is rapidly separated by a machine, which also was invented in this country.

To form a hat body of sufficient thickness, and yet to have it as light as possible, it must be thicker in some parts than others—the rim and the junction of the rim and top with the sides being thick, and the other portions thin. By varying the width of the slit through which the fur is blown upon the rotating cone, the thickness of the several parts is adjusted to any desired scale with the utmost nicety, while by the steady rotation of the cone upon its axis the thickness of each part around the hat is made perfectly uniform.

Mr. Wells sold his patent for $30,000 to four men, and it ultimately came wholly into the possession of Mr. Burr, who has three or four other establishments besides the one in this city, and who receives a royalty of two cents on each bat manufactured by other parties. Some time since one of his licensees having made money enough, and having become old, Mr. Burr bought him out for $90,000. Mr. Burr is now selling out his machinery with the intention of retiring from business, having, he says, money enough to carry him through if he dies in any reasonable time.

The patent was granted on the 25th of April, 1846, and has been extended for seven years, so it expires next year. During the first fourteen years more than 46,000,000 of hat bodies were made on the machines, and for the last ten years no apprentice in this country has been taught the art of bowing fur—the machines having entirely superseded the old process. A man would form five bodies a day with the bow; by the machine three men and a boy will make 400 a day. Considering the extent of the business of manufacturing hats, and the completeness of the revolution wrought by this machine, it may, perhaps, be classed among the great American inventions.

To Clean Silver.—In one of his lectures before the London Society of Arts, Dr. F. Grace Calvert gives the following "simple method of cleaning silver or silver plate, without the trouble of employing rouge or other cleaning powder, which, besides rapidly wearing off the metal, takes up much time. It consists in plunging for half an hour the silver article into a solution made of 1 gallon of water, 1 lb. hyposulphite of soda, 8 oz. muriate of ammonia, 4 oz. liquid ammonia, and 4 oz. cyanide of potassium; but, as the latter substance is poisonous, it can be dispensed with if necessary. The plate being taken out of the solution, is washed, and rubbed with a wash leather."

A black ink, not corroding steel pens, and neutral, may be prepared by digesting in an open vessel, 42 ounces of coarsely powdered nutgalls, 15 ounces of gum senegal, 18 ounces of sulphate of iron (free from copper), 3 drachms of aqua ammonia, 24 ounces of alcohol, and 18 quarts of distilled or rain water. Continue the digestion until the fluid has assumed a deep black color.

Correspondence

Coffee, Still Nearer Perfection.

Messrs. Editors:—I feel rather diffident in writing on the subject of coffee-making, after the subject has been so ably handled by Professor Seely; yet I may possibly obtain a hearing in the matter, without being deemed intrusive, when I state that years ago, after many experiments, I succeeded in obtaining the most perfectly delicious coffee ever before tasted by myself or friends, it retaining its aroma in an eminent degree, and, at the same time, possessing all the strength of extractive matter desirable. This method of making coffee I subsequently published in the *Household Journal*, in its column of recipes.

I claim, and believe, that I was the first to discover and make coffee in the manner I am about to describe, which, although somewhat similar to the method pursued by Professor Seely, is, I think, more easily practiced by all persons desiring to do so.

Take, say a teacupful of freshly-ground coffee, one-half of which is to be put in a coffee pot, placed on a stove, and a sufficient quantity of warm (not boiling) water poured thereon, when it should be allowed to boil about five minutes, and then placed on the back of the stove for a few seconds.

The other half of the coffee may be put into a pitcher with a metallic cover, or a coffee pot used on the table only, and the liquid portion of the coffee which has been boiled poured therein, when, as the old ladies say, it draws in a similar manner to tea.

I thus, without any alteration of the form of the coffee pot, or the addition of strainers, really obtain all that is obtainable, of both the aroma and healthful extractive matter of the coffee used; at least by the use of ordinary culinary utensils.

The coffee which was in the pitcher, or table coffee pot, is either left therein, or at once placed in the cooking pot, where it is boiled the next morning, and half a teacupful again put into the table coffee pot, which is treated in like manner, thus proceeding in regular routine. In very warm weather, however, the coffee thus saved to be boiled should be kept in a cool place, as a few hours in a warm atmosphere is sufficient to cause the inception of fermentation, which gives an unpleasant flavor to the next morning's brewing.

I may remark, in conclusion, that no coffee should be used that has been roasted more than forty-eight hours before; and, in fact, coffee just roasted, but allowed to get cold before grinding, is always the best—which is the method pursued in Cuba, where they make a very delicious coffee from inferior berries,

James M. Jarrett.

Brooklyn, N. Y.

Is the World Growing Larger?

Messrs. Editors:—Is there not reason to think that the earth is daily increasing in size? Is there not an action taking place on its surface analagous to that which occurs in a plastic cell when placed in circumstances favorable for its development? To illustrate this thought. We plant a little acorn weighing a few grains in the ground. In the course of time, it becomes the large oak, weighing thousands of pounds, and spreading its branches far and wide in every direction. This oak gets its weight and bulk principally from the air we breathe, and remains upon the earth thousands of years, perhaps, and undergoes a great many changes before it is finally restored to the atmosphere, even if this event ever does take place. So animals derive their weight and bulk partly from the air they breathe into their lungs and partly from the vegetable productions which they devour. When animals die, their bodies, it is true, are partly decomposed into gas, and restored to the atmosphere, but they are principally seized upon and appropriated by growing vegetables, which in their turn are devoured by other animals. It thus seems to me that the earth, through the agency of its animals and vegetable productions, must be daily increasing at the expense of the atmosphere by which it is surrounded. In other words, the plants and animals of the earth are all the time appropriating to themselves the elements of the atmosphere and forming out of them new compounds which remain upon

the earth an almost indefinite length of time before they are decomposed and restored to the atmosphere. This idea is illustrated in our coal mines. All coal was originally wood, and like all wood, was formed principally at the expense of the elements of the atmosphere. This coal has remained upon the earth millions of years, perhaps, and now at length men urged on by their necessities, are digging it up, and by burning it, restoring it in the shape of carbonic acid, to the atmosphere, from which it originally came. No one, it seems to me, can doubt that the earth is larger now than it was when this coal exis'ed in the form of wood. Although the world may be increasing now, it does not follow that it will continue to increase for all time; sooner or later an equilibrium will be established between the amounts of elementary principles which the earth takes from and restores to the atmosphere. But at present, in my opinion, it is like a growing animal; its absorption exceeds its waste. In a word, our planet is not yet a full-grown earth; it is merely an "earthling"

W. H. B.

Baltimore, Md.

[This theory of the increase of the size of the world by accretion is not new. We do not know that any practical good can result from a discussion of this subject.—Eds.

Bill to Tax Inventors.

Messrs. Editors:—As you have opened your columns to the opponents of the bill imposing a fee upon an appeal to the Examiners-in-Chief in the Patent Office, you will doubtless admit a few words in its favor. The reasons for the bill are evidently not understood.

Until within a year the functionaries alluded to have been able to dispose of the appeals nearly as fast as they came in. On more than one occasion their register has been cleared. But for the last ten months the cases have increased at a much more rapid rate, and they are now between three and four months in arrear. This is not owing mainly to the interruption occasioned by the retirement of two of the Board, as has been suggested. The business brought before them has greatly exceeded what it was before; it is more than can be properly transacted, and is continually enlarging. Unless some remedy can be found for the evil it must soon become intolerable. It is so serious that a suitor remarked, a short time since, that he had better give five hundred dollars than to suffer the delay to which he had been subjected. If it can be checked in any better way, it would be gratifying to learn it. But no other has been devised than that of imposing a small fee upon the appeal. This will probably afford the needed relief. You cannot find another tribunal, or court of revision, which is not protected by the imposition of fees, and by the liability to costs, from being compelled to spend their labor on causeless appeals and frivolous proceedings. But it has become the practice to take an appeal to the Examiners-in-Chief in nearly every rejected case, without regard to its merits. The attempt is made continually where not the slightest reason exists for anticipating that the action of the primary Examiner will be reversed. But it costs less to carry up the question than to investigate it. There is a chance, and it involves no expense. Not a day passes when some utterly trivial case is not presented. It must be examined with care, nevertheless, and all the papers be read up, before its worthlessness is ascertained. A small fee will save a large part of this useless labor, and enable the Examiners-in-Chief to devote their attention to more important business, and to dispatch it with suitable expedition.

It has become quite common, moreover, to find appeals urged upon grounds, and accompanied with explanations, of which the primary Examiner never heard. To bring the application before the Appeal Board is gratuitous, and a more favorable hearing is anticipated. This has contributed to the burthen of the Board, to say nothing of its injustice to the primary Examiner.

Complaint has been made of the hardship of having to pay ten dollars to get an application thoroughly examined. To secure this end in every instance, the primary Examiners must be depended upon. It can never be accomplished by any one Board, however capable. In order that they may be able to consider with proper care the questions submitted to them, there must be some limit to the number of these questions. If they are required to take cognizance of all that arise, they must necessarily determine them without due investigation, or they must remain undecided. The cry will then be for a gratuitous appeal to the Commissioner, and then to the Judge of the Supreme Court, in order to obtain a "thorough examination."

The true theory of the Patent Office is, that the applications should be investigated to the utmost by the primary Examiner. In order to secure uniformity in their decisions these should be revised by the Examiners-in-Chief. It is manifest that neither should have any more duty imposed upon them than they can well discharge. The primary Examiners may be increased from time to time, as the emergencies of the Office demand. But there can be but one Board of Revision. Their business must be kept within reasonable bounds. And this can only be effected by requiring a fee upon appeals to it.

Scrutator.

Washington, June 7, 1866.

[We publish our correspondent's letter with pleasure, and fully recognize the fairness of his statements; but they do not alter our opinion as to the injustice of increasing the tax on applicants. The point of our objection is this: that inventors now pay enough for all the privileges extended to them at the Patent Office; and we suggest, that if the present Appeal Board cannot examine all the cases brought before it, let the law be amended to increase the force. The present large surplus fund will justify at least two additional $3,000 appointments; or, what would suit us just as well, if you please put on this $10 extra tax for appeal, but reduce the fee on applications to $10 each, making a total fee of $30 for the patent when issued. There are some people who have great skill in imposing burdens upon others, but it never occurs to them to propose relief.—Eds

Atmospheric Resistance to Railroad Trains.

Messrs. Editors:—At a meeting of the Massachusetts Institute of Technology, the atmospheric resistance to railroad trains was shown. A set of cars, made of pasteboard, with the engine of the usual form and shape, was placed upon a horizontally revolving cam, attached to a vertical shaft, driven round by the force of a given weight; the time of the revolutions was measured by an instrument beating seconds. Then the proposed improved form of car and engine (which improvement consisted in the conical shape given to the front part of the engine, same shape also to the rear end of the last car, spaces between the cars covered with canvas, with some other lesser changes from the common form), was placed upon the same rotating arm. The result showed, with the same power applied and same weight of cars and engine, a saving of twenty-five per cent in speed, which is, of course, equal to a gain of twenty-five per cent of running expense—certainly a most important item for railroad directors and railroad stockholders to inquire into. The same has also been tried by the same parties with hand cars, upon some of the roads in Massachusetts, with equally favorable results.

Square Soap Bubble.—Professor Rogers, President of the Institute of Technology, in experimenting upon the properties of the film formed by soap and water, found that various curious shapes were produced. He dipped a form of wire in shape of a hollow cube into soap and water, with a little glycerin added. On taking this out the shape of the film was that of two inverted pyramids, with the apex of each in the center; then blowing a small bubble, and placing it in the center, a beautiful square or cubical bubble appeared. Any one can easily try this with soap and water alone, but the film is stronger with a little glycerin added. Many other shapes of wire produce other beautiful forms at will. C. C.

Boston, June, 1866.

Abuse of the Franking Privilege.

Messrs. Editors:—I would like to inquire under what law a Member of Congress is at liberty to frank the business circulars of any firm through the United States mails?

Every inventor in this country that receives a patent for an invention, also receives a circular from a certain patent-soliciting firm in Washington, mailed free, under the frank of an M. C. *printed* on the envelope. And not only every inventor receives *one circular*, but if a man is *unfortunate* enough to receive more than one patent, he receives a circular for each patent, as I can testify, having received three within the last three weeks. Any person accustomed to looking over the weekly list of patents granted can judge how much matter is thus carried free in a year, and the above probably is not more than one-half of the number of those same circulars that are sent in that way.

It seems bad enough that a Member of Congress should have the right to lumber up the mails with a mass of political documents that very few care a fig for, but when it comes to taking contracts to send business circulars by the thousand, it seems to have a "bad look," to say the least. If it is all right, please inform your readers, as probably many have been struck by the same idea that has hit

An Inventor.

Springfield, Mass., June 2, 1866.

[The abuse of the franking privilege, of which our correspondent complains, is carried on to a considerable extent. Some patent agents in Washington, we understand, are not unwilling to practice this system of cheating the postal revenue. It is all wrong, and no honorable firm will resort to it. During the months of April and May we purchased at the New York post office over $600 worth of postage stamps. The frank of some accommodating M. C. would be a valuable saving in our office.—Eds.

Hand Lathe Tools.

Messrs. Editors:—In your admirable journal (to which I was introduced, to my infinite gratification, at Birmingham during the meeting there of the British Association) I see (Dec. 23d, page 402, Fig. 6) a handle to hold the various pieces for turning brass and iron in lathes.

I have a very small lathe, and turn only little trifles, and I am anxious to know whether these are made for such small amateur work. About twenty pieces, or tools, right and left, for common plain inside and outside work, would suffice, adapted to one handle.

If you could kindly, and without the slightest inconvenience, obtain for me the information as to such things being manufactured for small work, and what the cost of the handle with twenty pieces would be, I shall be extremely obliged. I do not require any extra finish, but the better the material the better they will answer my purpose. I can pay your agent here any expenses the inquiry may entail.

I trust we shall see at Paris many specimens of America's wondrous ingenuity. Your Patent Office must truly present a glorious spectacle to those who can appreciate such things.

Thomas Ingle.

The Viletta, Hants, Emsworth, England, April 19, 1866.

[The tools alluded to by our correspondent can be purchased in Sheffield, Birmingham, Manchester, or, in fact, any town of note in England where mechanics' tools are sold.—Eds.

Petroleum as a "Damaging" Lubricator.

Messrs. Editors:—In your issue of the 9th inst. is copied an item, going the rounds, that petroleum stains on printers' cloths are ineradicable, and that 6,000 cases have been rejected from this cause. As an article like this in your paper causes injurious effects among persons not wholly conversant with the points at issue, please allow me to give a few facts relative to the subject.

Our manufacturers, employing fine machinery particularly, have found, by a thorough system of tests, that coal oils are superior to sperm oils in the ratio of 100 to 84, a discovery extremely satisfactory from the great difficulty heretofore of obtaining regularly a grade of sperm or whale oil of uniform density, free of gum and foreign mixture. I can safely assert that nearly every large mill in New England is now using coal oils as a lubricator, without having yet discovered that it produces a stain on the cloth, more difficult to eradicate than is made by any other oil.

It is due, therefore, to the community at large that such statements should not be permitted to circulate without prompt refutation. C. M. S.

New York, June 11, 1866.

Measuring Logs.

MESSRS. EDITORS:—In your issue of May 12th is a communication from Mr. Heber Wells in regard to scaling logs to ascertain the number of feet in boards they contain. He gives his rule, which a moment's reflection will show to be incorrect, for a sixteen-feet log, twelve inches through, sawed into one square stick, would make only about 90 feet, which he makes 144. By his rule a twelve-feet log 24 inches in diameter will make but 216 feet, while all printed scales give 300, and it will always make that amount.

After near thirty years' experience in measuring logs and making and measuring lumber, I find no more perfect rule than the following: Multiply the length of the log in feet by half the number of inches in diameter, minus 4, and that product by the same number, divide that product by 4. Example—Log 12 feet by 24 inches—

$12 \times 10 = 120 \times 10 = 1200 \div 4 = 300$, amount of lumber.

The above rule is correct for an average lot of logs. If the logs are all small, less than 4 inches should be taken for slab; if very large, more than 4 inches should be allowed. Can you or any of your readers give me the reason why that mode of reckoning will produce that result? I have never found any one that could give me the information. Some of the printed tables are reckoned by this rule.

P. RHOADES.

Hannibal, N. Y., June 10, 1866.

HEALING SOAP.—A. A. Constantine, No. 59 Liberty street, has prepared a very excellent soap which is highly spoken of as a successful remedy for diseases of the skin. The basis is tar, which possesses healing properties. We have tried the soap, and like it very much.

Mr. Constantine also manufactures a laundry soap, which is also a very fine article.

CARE OF HARNESS.—Many persons owning harness do not wash or oil them once a year; consequently the leather becomes hard, dry, and rotten. A harness for service needs about two applications of neat's foot oil a year, but it should be washed as often as once in three or four weeks in strong Castile soapsuds, and kept in a dry place away from the dust.

ROSES, as soon as the flowers have opened and bloomed one day, should have the decaying flower cut away; cutting back to a good strong bud, from which will come a new stem and flowers. Attention to this practice of cutting will keep plants blooming almost continuously.

AN alloy consisting of ten parts of cast iron, ten of copper, and eighty of zinc does not adhere to the mold in casting, and it is of a beautiful luster when filed and polished. The most tractious metals are melted first, and the zinc last, in making it.

The bill to pay Assistant Examiners, for services rendered by them as Principals, has passed Congress and now awaits the signature of the President. We are glad to chronicle this tardy act of justice.

NEW INVENTIONS.

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

GUN.—W. G. OLIVER, Buffalo, N. Y.—This invention has for its object the guarding against the accidental discharge of the gun when carried with the hammer down; and it consists in combining a self-acting spring guard with the hammer.

WEIGHING SCALES.—JESSE S. LAKE, Smith's Landing, N. J., and EZRA B. LAKE, Bridgeport, N. J.—The object of this device is to furnish a weighing scale which shall indicate both the weight of the article and its value. It consists in combining with the beam or lever of a weighing scale a calculated table so graduated and arranged as to show the value of the amount weighed at a given price per pound.

FLAX DRESSING MACHINE.—DAVID S. ABBOTT, Cuba, N. Y.—This is a machine for dressing flax and hemp, and it consists in several novel features, the principal one of which is the form of the blades of the breakers, such blades being made with curves near their ends so as to throw the flax toward the middle of the bench and prevent it from getting outside of the arms and winding up on the shafts.

IMPROVEMENTS IN FLUTING MACHINES.—MRS. HENRIETTA H. COLE, New York City.—This invention relates to machines for making "fluting trimming," so-called, and it consists principally in so arranging one or two fluted rollers between which the material is passed, that the pressure of such roller thereon can be adjusted or released at pleasure, according as may be found necessary or desirable.

WATER METER.—ELIHU SPENCER and ERNEST L. MEYER, Elizabeth, N. J.—In this water meter two cylinders and sliding valves are employed, the valves working in a valve chamber common to both of them, and all being arranged together in a box in whose rear side is placed the water supply pipe.

LAMP CHIMNEY.—H. C. APPLEBY, Conneaut, Ohio.—This invention consists in constructing a glass chimney for lamps with corrugations flutings or the like, running spirally around the chimney, whereby the chimney will have a better capacity for expansion, and therefore be less liable to break than ordinary glass chimneys.

VACCINATOR.—HENRY MINTON, M.D., Brooklyn, N. Y.—This device consists in the arrangement of a puncturing tube in a barrel which contains a spring, in combination with a plunger passing through the puncturing tube, and provided with a momentum spring, so that when the puncturing tube is filled with the vaccinating matter and drawn back in the barrel against the action of the spring contained therein, and then released, after the barrel has been placed on the spot where the vaccinating matter is to be introduced, the tube punctures the skin and the plunger flies out, overcoming the power of the momentum spring, and causes the matter contained in the puncturing tube to discharge into the wound opened by said tube.

BALANCED CUT-OFF VALVE.—B. T. MCKINLEY, Falmouth, Ky.—This invention relates to a rotary valve which revolves on a seat at the bottom of a cylindrical chamber, in combination with a cut-off valve fitted into the cylindrical chamber over the main valve, and provided with a balance piston in such a manner that by means of said piston both the cut-off and the main valve are relieved from the pressure of the steam, or balanced, and by turning the cut-off valve in the direction against that in which the main valve revolves, the steam can be cut off at any desired point of the stroke, or shut off entirely, without any effect on the exhaust, which goes on without interruption.

DEVICE FOR KEEPING MEATS, ETC., UNDER BRINE.—JOHN BURGUM Concord, N. H.—This invention relates to an apparatus for keeping pork, beef, and other salted or pickled meats as well as fish, under brine while in barrels, firkins or the like. The invention consists in providing a circular or any other proper-shaped platform with a series of dogs so arranged and operating that the platform may be thrust down so as to place the meat below the brine, and there held by the dogs catching against the side of the barrel - a proper means for liberating them being provided.

DEVICE FOR TRIMMING MITERS.—ALBERT JOHNSON, Putman, Conn.—This invention relates to a device for trimming miters and planing them after being sawed, so as to render the surfaces smooth and true, and admit of a close joint being formed. It consists of a bed connected to a base by means of joints so arranged as to admit of the bed being adjusted in a more or less inclined position, according to the bevel required in one direction, this bed has an adjustable rest upon it to give a proper bevel to the work in another direction; also in a peculiar application of a plane to the device whereby it is retained in proper position so as to insure the work being done in a perfect manner.

PICTURE HOLDER.—WILLIAM WALKER, New Haven, Conn.—In this holder, frames of a uniform size and shape are provided for the several pictures, and are so arranged side by side in two series within a suitable box or casing, that by turning a pedestal or handle attached to the box, the several picture frames in regular order and succession will be made to pass from one row to another, bringing each in turn to the outside of each row or series, and in position for being viewed.

CORN SHELLERS.—WM GILMAN, Ottawa Ill.—This invention relates to a corn sheller, patented by F N. Smith, on June, 1843, whereby the efficiency of the sheller is greatly increased and many other important advantages secured.

TREATING WOOL.—P. S. HAINES, Newburgh, N Y.—The object of this invention is to facilitate the picking and carding of wool, and also to facilitate its treatment or disintegration by any other machines as well as by means of pickers and carding machines.

CULTIVATION OF STRAWBERRIES.—B. FULLER, Norwich, Conn.—The object of this invention is to improve the cultivation and raising of strawberries, and other plants and vines, and it consists in the use of a peculiarly formed and constructed vase made of earthen or pottery ware, or other suitable material.

MEDICAL COMPOUND.—P. ROSENBLATT, Greenville, Tenn.—This invention relates to a medical compound especially intended for the cure of dyspepsia, lung and liver complaints, and other species of indigestion.

MACHINE FOR GUMMING AND PRINTING ENVELOPES, ETC.—THOMAS V. WAYMOTH, New York City.—This invention relates to a machine for gumming and printing the blanks for envelopes, wrappers and other similar articles.

SWAGING THE ENDS OF THE BLANKS OF SCREW AUGERS.—RUSSELL JENNING, Deep River, Conn.—This invention is designed to facilitate the manufacture of screw augers as patented by this inventor Jan. 30, 1855, and reissued Oct. 3, 1865. The object is to swage the ends of the blanks in such a form that the heads of the augers may be subsequently made without welding any portions thereto, the metal being so disposed or distributed by the swaging, as to admit the spur, lips and cutting edges of the augers being all produced at one operation.

BUCKLE.—I. N. PLOTTS, New York City.—This invention consists in constructing the buckle frame of a continous rod or strip of metal and in attaching to the said frame a transverse bar, which is fitted to slide to and fro on opposite side strips of the frame, whereby a very cheap and efficient buckle is produced.

CATTLE POWDER.—JOHN S. ANDERS, Northwater, Pa.—This invention relates to a mixture which is intended as an antidote against various diseases of horses and cattle in general, and which has proved to be a preventive against the cattle plague.

FASTENINGS FOR BOXES.—H. T. BARKER, Napa, Cal.—This improvement consists in the mode or device for fastening a box for the transportation of fruit and for other purposes, by means of a slot and catch on one side or end of the box, and an upright bolt and nut turned with a key, on the other side or end, to secure it.

SASH FASTENER.—J. W. ELLIOTT, Leicester, Mass.—This device is a combination of a spring bolt for sash fastenings which is operated by a hinged lever which acts as a cam, by which the face of the bolt is withdrawn from the jaw of the window frame.

MACHINE FOR SANDPAPERING WOOD WORK.—J. H. WONDERLY, Williamsport, Pa.—This is an adjustable table which supports the wood, above which is a revolving disk faced with sandpaper and supported by a bracket in such a manner that it may be brought over any portion of the wood to be operated upon. The disk is put in motion by means of belts and pulleys attached to the bracket. A chest surrounds the disk, and from said chest the air may be exhausted by means of a fan which is connected with the chest by means of a series of tubes passing along the brackets, and so jointed as to move with it. The dust is by this means drawn into the chest and carried away from the wood

MEDICAL COMPOUND.—PETER EISENHUTH, Monroe, Mich.—This compound is a balsam which is an excellent remedy for colic, pains in the limbs, for all kinds of cold, coughs, fever, weak eyes, sea sickness, frost and fresh wounds; being applicable both externally and internally. It also cures the buzzing in the ears in a short time.

Notes and Queries

S. O, of Colorado.—Your suggestion to Aerostats to employ condensed gas is not new. This plan is well understood by all who are familiar with ballooning experiments.

F. W., of Wis.—If you have a taste and aptness for the business, become a mechanic. No profession is more honorable or useful.

W. P. B. C., of Wis., suggests that readers of the SCIENTIFIC AMERICAN keep a small book to note the pages containing useful recipes and other matters for reference. As he intimates, it would save them trouble and us the annoyance of repeated questions. The suggestion is a good one.

T. R., of Sing Sing, is informed we do not prepay postage on the paper. The rule to find the gears for screw cutting can be obtained from any manual on mechanics. We give a brief one. Divide the number of threads in the leading screw with that proposed to be cut. The quotient shows with the divisor the proportion between the gears. There is no perfect solvent for vulcanized rubber. The best is spirits of turpentine or petroleum naphtha.

R. C., of Conn.—Cimeg's process with Rochelle salt is commonly considered to be the best for silvering glass with pure silver. You may find this and all the other plans in the back volumes of this paper.

E. H., of Conn.—Micaceous ore is not used as a substitute for plumbago in making crucibles. It sometimes looks and feels like plumbago, but a crucible made of it with sand and clay would melt in a kitchen fire.

G. A. L., of N. Y.—Send your address and we will mail you a pamphlet which will inform you how to obtain a patent. The expease of engraving we cannot tell without seeing your model.

A. F., of Ohio.—We have found no difficulty in whitewashing over old paint. A pound of glue in about ten gallons of whitewash will aid in making it durable. One year ago we applied such a composition to an old house and it still looks and wears well.

G. B. C., of Ill.—We do not think *verbatim* reports of Prof. Doremus's lectures have ever been made. The most interesting and novel experiments were published in the SCIENTIFIC AMERICAN.

C. W., of Mass.—The ends of lead pipe are joined with plumbers' solder, which is made with two parts lead to one tin. The process is called "wiping a joint," and requires a certain degree of dexterity acquired by experience. The metal is used at a certain stage of temperature nearly approaching congelation, and is daubed and smeared over the surface much as wet clay would be.

Reader, of Mass.—The substance formed in your fusible plug is doubtless scale, which is deposited on brass as well as iron. The rough appearance on removal is doubtless owing to corrosion. Galvanic action would have a tendency to repel scale. We have seen shellac dissolved in ammonia. Booth to the contrary notwithstanding.

J. E. C., of Ohio.—An experiment tried by Mr. Charles Emery, of the U. S. Navy, showed that the injector was not economical as a means of supplying water.

S. M., of Ohio.—Vegetable parchment is made by immersing paper for a few seconds in a mixture of 2 parts sulphuric acid and one part water. The mixture is used at the temperature of 60°, and immediately on removal the parchment is thoroughly rinsed in clear cold water.

C. A. B., of Conn.—Clay is silicate of alumina. Add the clay to diluted sulphuric acid and boil; you thus produce sulphate of alumina. To this last add a solution of carbonate of potash and impure alumina is precipitated. Dissolve this alumina in hydrochloric acid and to the solution add ammonia; the precipitate which now appears is pure alumina. If your object is to procure only a small quantity of alumina, you will succeed easiest by extracting it from alum.

A. B., of Mass.—The Amiens about which you inquire is in France. A letter addressed to the society will reach its destination.

Inventors or manufacturers of first rate quartz crushers; also machines for raising gravel, etc., from river bottoms, are requested to communicate with Samuel M. Carter, Spring Place, Ga.

TRAPPER'S GUIDE.—S. N. Newhouse, Oneida, N. Y. Price 75 cents.

An interesting pamphlet of over 100 pages on the capture of fur-bearing-animals, has just been published by the Oneida Community, Oneida, N Y. The book contains illustrations of a great number of fur-bearing animals, with a description of their habits, where they may be found, how to catch the various species, and the best trap for the purpose.

Improved Tubular Evaporator.

This is an improvement designed to supersede the use of the steam evaporator and to simplify the reduction of saccharine juices to sirups. The inventor claims that it is equally adapted to the evaporation of cane juice, sorghum, and maple sap, and it appears as well applicable to beet juice. The manufacture of sugar is becoming more and more important every year. The desolation caused in our sugar-producing States, by the war, has left us too nearly dependent upon foreign production, and every means to utilize our own saccharine-producing plants, by cheapening the process of the manufacture of sugar, is worthy careful consideration. The demand for "sweetening," by sour humanity, in every period from infancy to old age, is additional reason for giving prominence to an improvement like that under consideration.



HAWLEY'S TUBULAR EVAPORATOR.

The outside of this evaporator is composed of wood, this being a non-conductor and economizing the fuel as well as retaining the heat. The first pan, or defecator, A, is capable of holding from fifteen to one hundred gallons, and is provided with nine copper flues, three in a series. The sap or juice is received into it in a continuous stream from the mill, through the pipe, B, and is brought to the boiling point at the end nearest the fire, thus carrying the scum back convenient for skimming. From the defecator it is brought into the front or main pan, *C*, by a gate, situated midway between the top and bottom of the defecator, to avoid the scum on the top and the sediment at the bottom. The sap is brought here in close contact with the copper fire box and made to boil more rapidly than in any other evaporator. When the sap has reached 25° Baume, it is passed by a similar gate to the finishing pan, E, parallel to the defecator. This pan is furnished with one series of flues, of wood, six in number, near the bottom. Here the product and process is entirely under the operator's control, by means of a damper under the fire box, which will shut off the hot air and admit a current of cold air at will, producing the same effect as removing the pan from the fire in other evaporators. The defecator is also furnished with a similar damper, handle shown at F, by which the heat in either of these receptacles is absolutely controlled.

After the sirup is finished it is passed into the cooler, G, by the gate, H. This extends under the defecator and finishing pan, and will hold and cool the sirup as fast as it is made. After becoming sufficiently cool, which process is facilitated by the longitudinal opening, I, which permits the steam and heat to escape, it is drawn off into barrels by the cock, J. The grate of the fire box (door shown at K), is hung on hinges so that its contents can be instantly dumped into the ash box, if the evaporator is used as a stationary, or on the ground, if portable. The smoke arch, L, collects the smoke after passing through the flues and discharges it through the stack, M.

It is claimed that this evaporator has every advantage possessed by the steam evaporator, and yet can be furnished at one-eighth or one-tenth the cost. It is portable and can easily be moved from place to place by a boy. The heating surface to which the sap is exposed is four or five times greater than in other evaporators, and it requires only one-half the fuel used in others to accomplish the same amount of work. It requires no masonry, and is complete in itself.

Patented May 1, 1866, by B. R. Hawley. Application pending through the Scientific American Patent Agency on other improvements. For further information address Marvin, Washburn & Co., assignees and manufacturers, Alton, Ill.

MERSHON'S WATCH KEY.

Some persons take about as much care of a watch as they would of a cast-iron grindstone. Half the injuries to this delicate machine, requiring the repairer's skill, are the result of carelessness. But the most careful will, at times, make a mistake, and none is more common than that of attempting to wind the wrong way. This invention is designed to obviate these mistakes by rendering them impossible, and at the same time to furnish a more convenient key than those in common use. The construction and operation of this key can be seen by the accompanying illustrations.

Fig. 1.



Fig. 2.



Fig. 3.

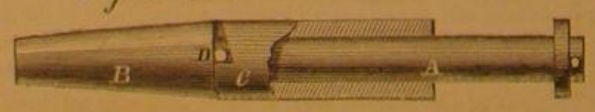


Fig. 1 represents the key perfect. In Fig. 3 will be seen a central shaft, A, attached to a pipe, B, and having a sleeve or tube, C, upon it. The lower portion of the sleeve forms a ratchet of two teeth, which catch upon the pin, D. By turning this sleeve to the right, the pipe is made to revolve by means of the ratchet and pins, while, by a reverse motion, the incline of the ratchet slides over the pin, and the sleeve only is turned. The spring, E, Fig. 2, holds the sleeve to the pins, but allows a lateral motion on reversing the revolution. The spring is held in place by the collet, F, and the whole is inclosed by the ornamental case, G.

The advantages of this key are obvious. It is more simple than some other ratchet keys, and is not liable to get out of order; the hand does not require to be removed from the key at each turn, which frequently injures the watch by "canting" the pipe. Only two teeth are made on the ratchet, as in winding a watch it is done by half revolutions.

This invention was patented Nov. 24, 1863, by R. S. Mershon, assignor to himself and John M. Harper, 308 Chestnut street, Philadelphia, to whom all communications should be addressed.

WORKINGMEN'S ASSOCIATIONS.

Among our workingmen are temporary combinations and more pretentious organizations for raising the price of work and shortening the hours of labor; and we have, also, trades' unions, designed for mutual protection against the aggressions of capital and the interference of outside pretenders. These combinations may be useful in their way. They may, if they do nothing more, bring the employer and employed in close contact, enable them to understand each other better, and throw new light upon their new relations. We cannot believe that there is, necessarily, any antagonism between capital and labor, but that what is for the best interests of the one is also for the best interests of the other, however much appearances or present circumstances may seem opposed to such an idea.

But what is more needed are associations among men of the same branch of business, including in their membership both workmen and employers, and having for their main object a comparison of experiences and discoveries. Hardly a single member of such an association would be found who could not, in some particular, add to the general fund of information. Unworthy jealousy and competitive prejudice should not be allowed to interfere with the free interchange of opinions and information. There are associations for this object located in our principal cities which are of great advantage to those who avail themselves of their investigations; but there is no reason why similar associations on a smaller scale, perhaps, should not exist in every small town or village. The comparison of results at mechanics' fairs is productive of great benefit, and we cannot see why a more frequent comparison of the processes by which these results are attained should not be equally beneficial. This is a matter entirely within the control of our mechanics, and we hope the suggestoin will be considered.

NOVEL MODE OF TREATING COFFEE.

Under the above caption we published, on page 359, a brief review of a reported trial upon a suit brought by Wm. Newell against Ezra Wheeler & Co., of this city, to enforce a contract based upon a patent granted to Mr. Newell in Nov., 1857, for an apparatus for polishing and cleaning coffee. Our article stated that one of the features of the process consisted in running the coffee through black lead, which gave to it a shiny metallic appearance.

The report published in the Scientific American was condensed from a more lengthy one that appeared in the *Herald* of May 15th.

Upon examination of Mr. Newell's patent, above referred to, we find that it was an error to state that the process consisted in part of running the coffee through black lead. Mr. Newell's invention consists in polishing coffee by subjecting it to the combined action of heat and friction, no mention being made in the patent of the use of black lead. We consider it due to Mr. Newell that the erroneous impression should be removed, and we take pleasure in making the correction.

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 on them will be promptly attended to.

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

☞ American and Mexican News Company, Mexico, are Agents for the SCIENTIFIC AMERICAN.

☞ Messrs. Trübner & Co., 60 Paternoster Row, London, are also Agents for the SCIENTIFIC AMERICAN.

VOL. XIV., No. 26..[NEW SERIES.]. *Twenty-first Year.*

NEW YORK, SATURDAY, JUNE 23, 1866.

Contents:

(Illustrations are indicated by an asterisk.)

*Sweet's Bolt Cutter	423	Atmospheric Resistance to Railroad Trains	424
Wood Turning at High Speed.	423	Abuse of the Franking Privilege	428
A Powerful Source of Artificial Light	424	Hand Lathe Tools	428
Smelting Iron	424	Petroleum as a "Damaging" Lubricator	428
Preparation of Chrome Yellow	424	Measuring Logs	429
Cork Springs for Cars	424	New Inventions	429
Difference in the Operation of Locomotives	424	Notes and Queries	429
Artificial Production of Goiter	424	*Hawley's Tubular Evaporator	430
Phenic Acid	425	*Mershon's Watch Key	430
The Manufacture of Beet Sugar	425	Working Men's Associations	430
Miscellaneous Summary	425	Novel Mode of Treating Coffee	430
Should there be a Patent Law?	426	The Scientific American—A New Volume	431
Manufacture of Gold and Silver	426	The Non-recoil Gun—A New Principle in Explosives	431
*Storer's Open-top Suet Lubricator	426	What the South Needs	431
Manufacture of Crucibles	426	Patent Claims, 432, 433, 434, 435,	438
The Way Felt Hats are Made.	427	Advertisements	436, 437, 436
Coffee, Still Nearer Perfection	427	Index	438, 439, 440, 441, 442
Is the World Growing Larger?	427		
Bill to Tax Inventors	428		

THE SCIENTIFIC AMERICAN—A NEW VOLUME.

The present number closes Vol. XIV. of the new series. The next number will appear in a new dress of type, and be greatly improved in clearness and beauty of mechanical execution.

The SCIENTIFIC AMERICAN has become an authority in the specialties of science and mechanics, and we shall endeavor to maintain that character for it and add to its influence. Its editors are selected for their practical knowledge of the subjects comprised in their respective departments, as well as for their ability to present those subjects in a clear and comprehensive light. A practical, analytical chemist devotes his time to the chemical and mineralogical department; the scientific department is in charge of a thorough and competent scientist, and the mechanical is managed by a gentleman whose long practice and experience makes his opinions valuable.

Apart from the editorial labor, we believe that the valuable suggestions and practical information frequently embodied in the contributions of correspondents, add immensely to the advantages of the paper to all classes of our producing and investigating readers. Our recipes are intended to be reliable, and in reply to inquiries for information we endeavor to present the facts, or, where discovery has not demonstrated them, to suggest a course which may lead to their elucidation. In short, we intend to make this journal a *vade mecum* to the mechanic, the scientific investigator, and the worker in all branches of productive industry.

With this number, as with many previous numbers, we send out a supplement. We find it necessary, often, to give our readers more than we promise in order to enable them to keep pace with the march of improvement. The supplement will be found to be not the least valuable portion of our paper, particularly to those who preserve the numbers for reference.

THE NON-RECOIL GUN—A NEW PRINCIPLE IN EXPLOSIVES.

Experiments have been made in England with tubes open at each end, used as a means of propelling a ball, or bolt, by the explosion of gunpowder, or gun-cotton, which seem to involve a principle in the resistance of gases not hitherto investigated.

We do not propose to assume the task of explanation, at least just now, but to state the facts, with our own suggestions, and leave our correspondents at liberty to give their theories, or the results of their experiments. It would seem that if the experiments in England have been fairly conducted (as we have no reason to doubt) the discovery may be made one of great value, especially in naval guns.

A Mr. Harding has been experimenting with open steel tubes, in which he inserts a charge of gunpowder backed by a felt wad, and, at a short distance in the rear, another felt wad, leaving an air space between. On the top of the charge of powder or cotton is a ball, in immediate contact with the charge. The charge is ignited in the usual manner, at the rear end, and the effect on the ball seems to be equal to that of a gun with a breech, while the wads are thrown out at the rear end of the tube, torn into lint, and the tube has no recoil.

These are, in brief, the facts in relation to this experiment, and it now remains to ascertain upon what principle the action of the explosive gases is expended mainly on the projectile and not on the breech wads. Between the charge and the ball there is no inclosed air space, but between the charge and the end wad there is. The resistance of the end wad must be equal, or nearly so, to the force exerted upon the projectile, yet one presents but a slight mechanical obstruction, while the other has the resistance of gravity and the column of air between it and the muzzle of the gun.

In commenting upon this experiment the law relating to the transmission of sound in waves forces itself upon our attention, but does not seem to explain satisfactorily the facts involved in these trials. The only solution which seems at all promising is that of the wedging or transverse jamming of the particles of compressed air between the two wads. It is known that a gun barrel can be burst by a slight obstruction placed in the muzzle, confining the air above the projectile and charge. But in this case the fracture is not always toward the muzzle, where the greatest compression would be likely to occur, but at the breech, the strongest part. We can account for this only on the supposition that the temporary obstruction at the muzzle compels the particles of the explosive gas to force themselves upon those immediately in front, thus producing a strain upon the walls of the tube.

In the case of an open breech, temporarily closed by wads inclosing an air space, the air thus confined is compressed, and finding no immediate exit or release, we may consider the globular particles of the air to be forced into wedge-shaped or cone-like forms, thus pressing laterally against the sides of the tube and forming, for an instant, a diaphragm of resistance as a substitute for the solid breech. It is well known that waves of sound can be propelled only at the rate of 1,100 feet per second, while the velocity of a ball propelled from a gun by an explosive is about 1,600 feet per second. There is therefore a loss of time between the movement of the ball and that of the resisting wads. In other words, the compressed atmosphere confined between the two wads behind the charge, does not have time to resist or recover from the sudden compression until the projectile is driven from the gun.

This matter is a fruitful source of speculation, but we have neither time nor space to investigate it further at present. It is worthy attention, as on it may depend valuable improvements in gunnery and new discoveries in science.

WHAT THE SOUTH NEEDS.

The Macon (Ga). *Citizen*, in a recent article, urges the necessity of capital and labor to rebuild the waste places of the South, and while it strongly advises the young men of the country to turn their attention toward developing the natural resources of that section, favors the invitation of capital and intelligent labor from Europe and the North. It, however, unnecessarily, we think, while stating that "we want the ingenuity and practical science of the Northern mechanic and artisan, and their indomitable industry and perseverance," exhorts them to "lay aside their intense radicalism and come down to this land of flowers and beauty," etc.

The *Citizen* is in error in supposing that the "Northern mechanic and artisan" are intense radicals. The radicalism that has cursed both sections of the country, North and South, and hindered the development of our natural resources and the progress of internal improvements, does not belong to the really producing and improving classes in either section. Fanaticism and its twin brother, intolerant bigotry, are to be found rather among political demagogues and not among the brain, brawn, intellect, and muscle-users of the country. Their mission and object is a nobler one than that of exciting or prolonging the influence of sectional and unworthy prejudices. The country is more dependent to-day upon the peaceful and beneficent influences of the mechanic and the capitalist, for future prosperity and future harmonious development, than upon President or Congress. It is gratifying to see that journals published in the South are willing to aid in the consummation of a union such as a community of interests and a harmony of objects will secure.

The South needs "reconstruction." Not so much a reconstruction of her political fabrics, but a material reconstruction. There are churches, dwellings, stores, shops, and bridges to be rebuilt; machinery to be introduced, cotton, wool, iron, and wood to be manufactured; mines to be delved, roads to be built, rails to be laid, ships to be constructed, and farms to be worked. Millions of wealth, now latent and unemployed, await only the magic hand of labor, guided by intelligence, to bless the people of the South, the country, and the world. The Mobile *Times* says:—"The South wants population—industrious population—working population. Where is this population to come from?" We answer, from the North and West. Will they be welcome? We answer, yes. It is only those interested to keep up a show of power who deny it. Northern and Western men, with good habits, with industry, with capital, are wanted. We have to fill up the room of one million blacks and one million whites slaughtered during the war. They were producers, and must be replaced.

"The Northern and Western man who comes among us as an equal, is not only welcome, but he is desired. He will populate our cities, he will cultivate our fields, he will develop our mineral resources. If he is a capitalist, he will build up our trade."

We believe it is the interest as well as the duty of our mechanics and capitalists to aid the South, by contributing of their wealth, their energy, enterprise, labor, and perseverance, to develop its natural and artificial advantages. Every useful immigrant from the North and the West will, we doubt not, be welcomed and find remunerative employment and investment, as well as a pleasant home. No work could be more patriotic, while none would be more profitable. The great need of the country now is a permanent settlement of the difficulties which engendered the bitter feelings that led to the war, and the removal of the jealousies, animosities, and prejudices which have grown out of the war. No agency could be more powerful to this end than the penetrating and peaceful influences of the constructive arts. By a union of means and of labor, and a common purpose of material improvement and internal development, the people of the two sections would become thoroughly acquainted and mutually attached.

After all, the mechanic and workingman are the true civilizers of the world. Their influence, although not so demonstrative and pretentious as that of government officials, is much more permanent and far-reaching. With an immigration of our intelligent mechanics into the South we expect to see the problem of "reconstruction" solved without the aid of politicians.

MINING BUREAU.—We have received the prospectus of the "Mining Bureau of Montana," an association of gentlemen organized at Virginia City for the purpose of giving information concerning the mining resources of that territory. It appears to be based upon the right principles, and if managed according to the plans laid down, it will be a valuable agency to those who may wish to invest in mining operations.

OBLIQUE BELTS.—It sometimes happens that it is necessary to lead a belt obliquely from a pulley or flywheel, and in such cases much trouble is frequently caused by the strap slipping off. This can, in very many instances, be prevented by fastening a strap of thick leather, of a less width than the belt, around the center of the rim of the flywheel or pulley. The leather strip may be secured by counter-sunk copper screws passing through it, and tapped into the rim of the wheel.—*Engineering.*

Patent Claims

ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING JUNE 12, 1866.

Reported Officially for the Scientific American.

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

55,446.—FLAX-DRESSING MACHINE.—David S. Abbott, Ischua, N. Y.:

I claim, 1st, Making the blades of the beaters of flax-dressing machines with a curve that rises towards their ends, substantially as described.

I also claim making one of the boxes for the journals of the apron-roller, S, movable, so that that roller can be taken out and cleaned at pleasure, substantially as described.

I also claim the clamp, H, constructed substantially as described, applied to the feed-table of a flax-dressing machine.

55,447.—PORTABLE GAS-STAND.—Boyd Allen and John Riddell, Boston, Mass.:

We claim, 1st, The sliding portable gas stand, constructed and operating substantially as described.

We also claim the combination of the stuffing-box with the inner end of the sliding-tube, as and for the purpose specified.

55,448.—SEAT AND COUCH FOR RAILROAD CARS.—Horatio Allen, New York City:

I claim, 1st, The combination with the floor and sides of a railroad passenger car of couches of a rhomboid form, placed diagonally to the length of the car, as herein described, and constructed of two seat-pieces, A, A′, two corner-pins, E, E′, and two central pieces, F, F′, and supported by frames and legs, said couches being convertible into a pair of seats, by putting out of the way the two corner-pieces, E, E′, and securing in a vertical position the two center-pieces, F, F′, by the cap-piece, G, said pair of seats having a relative position diagonal to the length of the car, all substantially in the manner and for the purpose herein described.

2d, The combination with the seats, herein described, and sides of a railroad passenger car, of upper couches of rhomboidal form placed diagonally to the length of the car, as herein described, and constructed of a frame supported as herein described, all substantially in the manner and for the purpose herein described.

55,449.—MEDICINE.—John S. Anders, North Wales, Pa.:

I claim a cattle powder made of the ingredients herein specified, and mixed substantially as set forth.

55,450.—LAMP CHIMNEY.—H. C. Appleby, Conneaut, Ohio:

I claim a spirally corrugated or fluted glass lamp chimney, constructed substantially as shown and described.

55,451.—PAPER BOSOM AND COLLAR.—James C. Ames, Northampton, Mass.:

I claim a new article of manufacture, consisting of a paper bosom and collar combined, when constructed as herein shown and described.

55,452.—COMPOSITION OF IRON AND OTHER METALS.—Wm. M. Arnold, New York City:

I claim the composition produced by the mixture of the ingredients above described, when made substantially of the proportion and in the manner herein contemplated and set forth.

I also claim the preparation of an alloy adapted and intended for use in the manufacture of my final composition, and which alloy is composed of copper, tin, zinc, and antimony, in the proportions above contemplated and set forth.

55,453.—BOLSTER FOR WAGONS.—D. L. Babcock, St. Charles, Minn.:

I claim the metal cap, B, constructed substantially as shown, and applied to the bolster of ordinary wagons and similar vehicles, as and for the purpose set forth.

55,454.—CURTAIN FIXTURE.—Jacob B. Bailey, New York City:

I claim, 1st, The cord-ring, e, formed with a groove around its periphery for an endless cord, an opening through it for the curtain roller to pass entirely through to its bearing and with teeth to penetrate said roller, as and for the purposes set forth.

2d, The combination of the semi-circular shoe or bracket, h, with the cord ring, E, and roller, b, for the purposes set forth.

3d, The friction spring for the curtain-roller formed by slitting the end of the said roller and introducing it within a ring or bracket, as set forth.

55,455.—FASTENING FOR FRUIT-BOXES.—Henry T. Barker, Napa, Cal.:

I claim the arrangement shown and described, consisting of the headed catch at the slotted end of the lid and the threaded bolt at the other end upon which the lid is screwed by the nut.

55,456.—RAILROAD SWITCH.—Joseph Bradt, Avon, N. Y., and James Hayes, Rochester, N. Y. Antedated March 6, 1866:

We claim the combination of the lifting tread-lever, I, with the ribbed chair or chairs, H, having seats, d, d, d, which correspond in number and position with the several diverging rails, B, C, D, when arranged in connection with the ordinary switch-lever, E, and connecting-rod, G, substantially as and for the purpose herein specified.

55,457.—MODE OF SUSPENDING CARS ON SPRINGS.—Alfred Bridges, Newton, Mass.:

I claim, 1st, The guide-pieces, c, c, combined and arranged relatively to the supporting-bar, E, box, C, axle, b, springs, D1, D2, and suspension-rods, G1, G2, or their respective equivalents, substantially as and for the purpose herein set forth.

2d, The jaw or frame, I, bar, H, suspension-rods, G1, G2, supporting-bar, E, springs, D1, D2, and axle-box, C, or their respective equivalents, combined substantially in the manner and for the purposes herein set forth.

3d, The method of locking the jaw or frame, I, upon the removable bar, H, by flanges, h′, or their equivalents, so as to resist horizontal strains without throwing such strains on the bolts, J, J, or their equivalents, substantially as and for the purposes herein set forth.

4th, The arrangement of the shelves, C1, C2, which support the springs, D1, D2, so as to swing near, but not in contact with, the upright inner faces, h, of the inclosing frame, substantially as and for the purpose herein set forth.

55,458.—DUST RANGE OR RECEPTACLE.—Alden Brigham, Coldbrook, Mass.:

I claim a dust range and receptacle as a new article of manufacture, the same consisting of a box with top flanges whereby it is held in the floor and sliding-bottom and register-cover, all the parts being constructed and arranged for use as set forth.

55,459.—ARTIFICIAL LEG.—Jesse Bringhurst, Philadelphia, Pa. Ante-dated June 1, 1866:

I claim, 1st, The bolts, C, as described and for the purpose set forth.

2d, The swivel-box, E, in combination with the bolt, C, and rubber packing, H, as specified and for the purpose set forth.

55,460.—LOCK.—B. V. M. Breuse, Kokomo, Ind.:

I claim, 1st, The combination of the pointed key, K, and the spring obstacle plate, N, substantially as described.

2d, The combination of the toothed key, K, with the spring tumblers, H, H′, spring bolt, C, with notches, I, I, arranged and operated substantially as described and represented.

3d, The combination of the notched spring-bolt, C, with notch, d, and the spring tumbler, F, f, arranged and operating substantially as described and represented.

55,461.—CENTRIFUGAL MACHINE.—John D. Browne, Cincinnati, Ohio:

What I claim in the construction of a centrifugal sugar separating machine is the separate or variable motion of the screen and distributor, as herein substantially described.

I also claim the oblique or spiral deflector as herein described and for the purpose set forth.

55,462.—BED-BOTTOM.—Daniel W. Burbank, New York City:

I claim, 1st, The combination of a double helical spring, C, C, with the double-headed mandrel, O, O, and the arm, E, E, when the coils of the spring are wound apart so that no part touches another part, substantially as specified.

2d, The enlarged loop, D, in combination with the slat, B, and mandrel, O, as specified.

3d, The double hook, N, N, in combination with the spring and rail, as specified.

4th, The corner lock, L, L, K, in combination with the frame slats and springs, substantially as set forth.

55,463.—DEVICE FOR KEEPING MEAT UNDER BRINE.—John Burgum, Concord, N. H.:

I claim, 1st, The platform or disk, A, provided with dogs, B, or their equivalent, constructed and arranged so as to operate substantially in the manner specified.

2d, The combination of the dogs, B, platform, A, collar, C, and connecting link, b and b′, or their equivalent, substantially as herein specified.

55,464.—MODE OF STARTING CARS.—W. H. Butler and R. G. Hatfield, New York City:

We claim, 1st, The combination and arrangement of the body of a vehicle, loose and portable upon the truck which supports said body, and movable thereupon by means of rollers, roller-sheaves, wheels, pulleys, or their equivalents, substantially as and for the purpose herein described.

2d, The combination of the frame, A, with the guide, D, springs, F, flanges, E, small wheels, C, and body, B, substantially as described and for the purpose set forth.

55,465.—DENTAL IMPRESSION CUP.—O. B. Buttles, Milwaukee, Wis.:

I claim combining with a dental impression cup an inner rim or flange, a, for preventing the wax or other impressed material from moving or slipping in the cup, as the latter is being removed from the mouth, substantially as described.

55,466.—COOKING STOVE.—Gardner Chilson. Boston, Mass.:

I claim the arrangement of the separate heat-saving plate within each of the oven-flues and case of the stove, so as not only to perform its function of saving heat, as described, but to gradually diminish the smoke-passage through the flue, in manner as specified.

I also claim the combination and arrangement of the arched chamber, G, with the oven, the vertical flues at the back of the oven, and with the three flues arranged beneath and against the oven, in manner as explained.

I also claim the combination and arrangement of the bay, A, and its side opening and its closing slide with the stove-body and with the grate-journal, as described.

55,467.—REAPING AND MOWING MACHINE.—Morell Clark, Castalia, Iowa:

I claim the arrangement of forked bar, C, bar, D, forked finger-bar, E, and journals, c, c, in combination with the axle, A, bevel-wheels, F, G, shaft, H, wheels, I, J, shaft, K, crank-pulley, L, pitman, M, and sickle, N, constructed and operating in the manner and for the purpose herein specified.

55,468.—MACHINE FOR CURVING THE BACKS OF BOOKS.—John E. Coffin, Portland, Maine:

I claim, 1st, The combination and arrangement of the cams, F, G, H, I, J, and K, in the main shaft, C, in the manner and for the purposes before described.

2d, The combination of the shaft, M′, the truck, o, the cog-wheels, w and x, the screws, Z, the sliding boxes, y, the posts, L, the segment-levers, k, and the adjustable pressure-bar, O, as and for the purpose described.

3d, The combination of the cam, F, lever, N, link, Q, lever, R, regulator, M, h, and sliding mold, f, as and for the purposes described.

4th, The combination of the cam, G, lever, g, shaft, P, levers, l, links, J, segment-levers, I, and segment-levers, k, and the pressure-bar, O, as and for the purpose described.

5th, The combination of the cam, I, lever, r, frame, p, p, supports, c, c, and sliding frame, s, s, for the purpose of raising the jaws under the pressure-bar and pushing the book through the jaws so it can be easily removed.

6th, The combination of the cam, J, shaft, S, levers, t, t, links, u, u, toggles, Z′, Z′, links, e′, e′, posts, L, L, as and for the purpose described.

7th, The combination of the cam, K, lever, o′, shaft, T, lever, p′, link, e, frame, p, p, sliding frame, S, S, screws, b, b, and bar, m′, for the purpose of adjusting the position of the book and presenting it to the operations of the pressure-bar.

8th, The combined use and arrangement of a solid adjustable pressure-bar, O, with the jaws which rise under the bar when the bar is in operation.

9th, The use of the clasp-holder, d, the screws, c′, c′, and the hinges or joints, r′, r′, as and for the purpose specified.

55,469.—FLUTING MACHINE.—Henrietta H. Cole, New York City:

I claim the upper roller of a fluting machine in boxes or bearings, resting upon spiral or other suitable springs, and moving upon guides, in combination with adjustable weighted levers for holding such boxes or bearings down, when arranged together and so as to operate substantially in the manner described and for the purpose specified.

55,470.—SEEDING MACHINE.—Byron D. Cook, Clarendon, Mich.:

I claim, 1st, The arrangement of the converging wings, w, upon the shafts, S1, S2, in such manner as to scrape seed or fertilizing material from each side and towards the center of their respective discharge apertures, O1, O2, substantially as herein set forth.

2d, The employment of the converging wings, w, in combination with the revolving agitator, E, the vibrating clearing fingers, f, and the distributor, D, arranged and operated relatively with each other and with the rest of the machine, substantially in the manner and for the purposes herein described.

55,471.—WASHING-MACHINE.—Elisha H. Cook, Clarendon, Mich.:

I claim, 1st, The employment of the suspended beaters, B, constructed with boxes, V, to contain weights, in combination with the perforated partition-board, P, substantially as and for the purposes herein described.

2d, The mode of actuating the suspended beaters aforesaid, by means of the crank-shaft, S, and cam, C, in combination with an adjustable roller, D, the same being operated in connection with the hangers and standards herein described, substantially as and for the uses specified.

55,472.—PLOW-COLTER.—Jacob Custer and Charles Rowland, Clinton, Ill.:

We claim the construction of a self-supporting colter in the form of an arch resting on its abutments, the share and post, and which, from its peculiar construction and application, is reversible and equivalent to two single colters, which form one arch, or arc of a circle.

We also claim the construction of the rod in combination with the colter, which rod passes to the beam and descends to and down at each side of the colter in the form of a fork, substantially as shown and described.

55,473.—MOSQUITO-NET.—J. G. De Coursey, Philadelphia, Pa.:

I claim, 1st, a net, A, in combination with elastic cords or bands, one of which is applied to each edge of the net, as and for the purpose described.

2d, In combination with the above, I claim the perforated corner strips or plates, B, of metal or other equivalent material, for the purpose specified.

55,474.—MEDICAL COMPOUND.—Peter Eisenhut, Monroe, Mich.:

I claim a medical compound made of the ingredients herein specified, and mixed together substantially as and for the purposes set forth.

55,475.—SASH-FASTENER.—J. W. Elliot, Leicester, Mass.:

I claim, 1st, The combination of the bolt, A, plate, C, spring, F, and lever, H, the whole being constructed and arranged to operate as herein described, so as to constitute a sash-lock and sustainer.

2d, The combination with the bolt, C, and lever, H, of the fulcrum, h, and lever, c, permitting the ready attachment and detachment of the lever, as and for the objects specified.

55,476.—FARM GATE.—William Elliott, Stockport, N. Y.:

I claim, 1st, Employing the inclined railway, D, in combination with the cords, pulleys, and posts, arranged substantially as and for the purpose herein described.

2d, The combination of the knee-levers, d, d′, with the drop-catch, h, arranged substantially in the manner and for the purpose set forth.

3d, The combination and arrangement of posts, pulleys, and cords, as or substantially as herein described, when employed for opening and closing gates of any other construction.

55,477.—PORTABLE DOOR FASTENING.—Levi S. Enos, Almond, N. Y.:

I claim the portable door fastening, constructed as herein described, as a new article of manufacture.

55,478.—ANIMAL TRAP.—Josiah B. Fairchild, Covington, Ky.:

I claim the folding-doors, a, armed with prongs, d, the springs, e, and trip-floor, f, in combination with the body, A, of the trap, all constructed and operating as above described and for the purpose set forth.

55,479.—DRAUGHT-PIPE FOR LOCOMOTIVES.—James M. Foss, Concord, N. H.:

I claim the draught pipe as made with two or any other suitable number of holes, b, b, arranged in its rear, and having a visor, c, to each, and with the front of the pipe closed and its lower end open, substantially as described.

55,480.—DEVICE FOR EXPELLING WATER FROM THE HOLDS OF VESSELS.—Thomas W. Fox New London, Conn.:

I claim the combination of the semi-cylindrical vacuum producer, Fig. 4, with the tube, A, when they are constructed, fitted together, attached to the vessel and used substantially as herein described and set forth.

55,481.—GATE.—Patrick Freeman, Benton county, Iowa:

I claim the reel or revolving part of the gate upon the shaft, A, together with the locking bolts, r and p, substantially as and for the purpose herein specified.

55,482.—VASE FOR CULTIVATING STRAWBERRIES.—Reuben B. Fuller, Norwich, Conn.:

I claim, 1st, The vase, A, made substantially as herein described, and for the purposes specified.

2d, In combination with the above, I claim the use of the vessel or pot, E, or its equivalent, as and for the purpose described.

55,483.—PRUNING-HOOK.—Michael Gates, Paw Paw, Mich.:

I claim communicating a "drawing cut" movement to the chisel, C, by bending its bar as at a, and operating it between guides, in connection with the hook, A, and its attached stock, substantially in the manner and for the purpose herein described and set forth.

55,484.—CHURN-DASHER.—A. J. Gibson, Cincinnati, Ohio:

I claim, 1st, The churn-dash, A, constructed with two truncated cones, placed base to base (one or more of which may be united, forming a more extended dash as shown in the drawings), as above described and set forth.

2d, The churn-dash, A, in combination with the churn-handle, B, for the purpose above specified.

55,485.—CORN-SHELLER.—William Gilman, Ottawa, Ill.:

I claim, 1st, The rail, O, placed just in front of the open end of the cylinder concave, I, for throwing or deflecting the corn escaping from the said concave to the screen or riddle, J, arranged substantially as described.

2d, The front rail, D, in combination with the rail, O, substantially as and for the purpose specified.

3d, The combination of the deflector rail, O, screen, J, and fan or other suitable blower, when arranged together and so as to operate substantially as described, and for the purpose set forth.

55,486.—CLOTHES-WRINGER.—R. Gipson, Shelby, Ohio:

I claim the arrangement of the shaft, D, sleeve, a, lugs, C and C′, in combination with the bridge-tree, B, gearing, D, D′ and H, H′, operating as and for the purpose set forth

55,487.—HARVESTER RAKE.—William F. Goodwin, Washington, D. C.:

I claim, 1st, The standards, G1 and G2, and cap, G, arranged for the purpose and to operate in the manner substantially as described.

2d, The cam, M, flange, q, yoke, Y, bar, I, guide-box, D, link, L, crank, S3, journals, S1 and S2, rod, S, bar, F, with its projection, F, and stud, E, arranged to operate in the manner and for the purpose substantially as described.

3d, The pulleys, P and P′, chain, N, shaft, C, and crank, C′, arranged to operate in the manner and for the purpose substantially as described.

4th, The bars, B1, B2, B3, B4, B5, and B6, constructed and arranged to form the jointed arm, B, to operate in the manner and for the purpose substantially as described.

55,488.—ROCK DRILL.—John Greives, Brooklyn, N. Y.:

I claim the drill constructed of a central polygonal rod with cutting point and angular sectional cutters bolted to the sides of said rod, substantially as herein specified.

55,489.—Wooden Mat for Cars.—Warner Groat, Green Island, N. Y.:

I claim a wooden mat for railroad cars and for other similar or suitable purposes, composed of wooden slats, A, spaced or retained at a proper distance apart by washers, B, and bolts, C, substantially as herein shown and described.

55,490.—Apparatus for treating Wool for picking, carding, etc.—P. S. Haines, Newburg, N. Y.:

I claim the perforated steam-pipe, F, constructed and located as described, and continued beyond the line of its perforations and connected to a water-pipe to run off the water of condensation continuously, substantially as set forth.

55,491.—Churn.—Alexander W. Hall, New York City:

I claim providing for the operation of the swinging dasher, G, by means of a pendulum weight applied outside of the churn and in connection with the said dasher, substantially as herein set forth.

55,492.—Revolving Desk.—Charles Hope, Springfield, Mass.:

I claim the revolving desk herein described, constructed with the standard, B, supporting and forming a pivot for the part, A, and having these and the other parts arranged substantially as shown and described.

55,493.—Construction of Screw-taps.—Bennet Hotchkiss, New Haven, Conn.:

I claim forming reamers, taps, and dies, substantially in the manner and for the purpose herein set forth.

55,494.—Transfer Switch.—Horatio Willard, Plainfield, Ind., assignor to himself and George F. Adams, Indianapolis, Ind.:

I claim pivoting the movable or transfer section of track at one end and attaching the other end to a segmental tie or bar, formed as shown and resting on friction rollers so arranged as to raise the suction from its bed, for the purpose substantially as set forth.

55,495.—Hoop-skirt Wire.—Stillman Houghton, Worcester, Mass.:

I claim as an improved article of manufacture skirt hoop-wire, first covered with a fibrous material and then a braided plated wire covering or casing applied thereto, substantially as shown and described.

55,496.—Invalid Bedstead.—Eugene Hutchinson, Manchester, N. H. Ante-dated June 1, 1866:

I claim, 1st, The combination of the bed-supporting frame, D, the back elevator, G, the bedstead frame, A, and mechanism, substantially as described, for operating or moving the said frame, B, so as to elevate the frame, G.

I also claim the combination of the auxiliary frame, E, and its elevating mechanism, substantially as described, with the bedstead frame, A, and the back elevator, G.

I also claim the combination of the frame, E, and its elevating mechanism, the bedstead frame, A, the back elevator, G, the frame, D, and mechanism for operating the latter as described.

I also claim the combination of the leg-rest or frame, F, the frame, E, the back elevator, G, the elevating frame, D, and the two bedstead frames, A, B, the whole being constructed and applied together in manner and so as to operate substantially as explained.

55,497.—Saw-mill.—E. P. Irons, Baltimore, Md.:

I claim, 1st, The described mode of connecting the elastic saw bands, g, g′, to the walking-beam by rods, f, f′, attached at points, e, at the opposite ends of the beam from that upon which the said bands, g, g′, are lapped, substantially as described.

2d, The manner substantially as herein described of attaching the flexible wire cords or bands to the ends of the saw by means of the stirrups, q, in combination with the jaws, t, t, the adjustable gibs, u, u, and guides, U, the parts arranged and operating substantially in the manner and for the purpose set forth.

3d, The combination of the connecting-rods, i′, bell-crank, K, K′, graduating connecting-rod, k, lever, M, feed hand, m, rag-wheel, o, and shaft, L, with pinions and racks arranged and operating substantially as and for the purpose set forth.

4th, The manner of graduating the length of the cut or feed by means of the graduating connecting-rod, K, moving up and down on the arm, K′, of the bell crank-lever, so as to be moved a long or short distance, for the purpose and substantially in the manner set forth.

5th, The combination of the adjustable steel arming-plates, x, with a connecting-rod, k, arranged and operating as herein set forth, for the purpose of compensating for wear, and allowing lost motion to be readily taken up, as set forth.

55,498.—Die for swaging the Ends of Auger-blanks.—Russell Jennings, Deep River, Conn. Ante-dated Dec. 19, 1865:

I claim the swaging of the ends of auger-blanks so as to have thick masses or portions, c, c, at the sides thereof, with a central thick portion for the pintle, by means of dies constructed substantially as described, for the purpose of enabling the heads of augers to be formed or swaged at one operation, and so avoid all welding and joining of parts, as set forth

55,499.—Machine for trimming Miter-joints.—Albert Johnson, Putnam, Conn.:

I claim the adjustable bed, C, in combination with the adjustable bar or seat, E, and the plane, H, substantially as and for the purpose set forth.

55,500.—Knob Lock.—Frank G. Johnson, Brooklyn, N. Y.:

I claim the movable tumbler-case, C, in combination with a knob, A, having a stationary flanged guard, B, applied to it, substantially as described.

55,501.—Bolt-heading Machine.—Edward Kaylor, Pittsburg, Pa.:

I claim forming the head on square-head bolts by means of a machine constructed and operating substantially as herein-before described, by staving up the iron with a heading tool between two side dies which at the same time advance and compress the iron as and while it is being staved, and then compressing the other two sides of the head by another pair of dies which advance and compress the opposite sides of the head as the first pair recede, the operation being repeated until the head is properly formed.

55,502.—Method of preserving Eggs.—Augustus G. and E. E. Kyle, Newville, Pa.:

We claim the within-described compound as a packing for preserving eggs, substantially as set forth.

55,503.—Weighing Scale.—Jesse S. Lake, Smith Landing, N. J., and Ezra B. Lake, Bridgeport, N. J.:

We claim, 1st, The combination with the beam or lever, C, and beam or partition, H, of a weighing scales, of the scales, M, N, O, constructed and arranged substantially as described and for the purpose set forth.

2d, The combination of the cylinder, J, and cog-wheel, I, with the toothed end of the beam or lever, C, substantially as described and for the purpose set forth.

3d, The combination with the cylinder, J, and beam, K, of the weighing scales of the tables, P, R, S, constructed and arranged substantially as described and for the purpose set forth.

55,504.—Apparatus for molding Castings.—P. W. Lamb, Albany, N. Y.:

I claim the cams, J, and cam-shafts, I, in combination with the box, A, frame, B, and cope, D, arranged substantially as herein set forth for the purpose specified.

55,505.—Gate Hinge.—Henry Last, West Lebanon, Ind.:

I claim an improved double-jointed gate hinge, constructed and arranged substantially as herein described and for the purpose set forth.

55,506.—Rope-guard.—Obadiah B. Latham, Seneca Falls, N. Y.:

I claim the combination of a metallic knob with a rope of whatever material composed, such knob being concave in its inner surface, to allow for the expansion of the rope, fastened and operated in the manner described.

55,507.—Composition for Water-proofing.—John D. Lee, Trenton, N. J.:

I claim the mixing of the ingredients and the applying them to boots and shoes to render them impervious to water, as herein described.

55,508.—Churn.—E. O. Leonard, Binghamton, N. Y.:

I claim the combining and arranging of the body and dasher, substantially as herein recited, so that the body and the dasher may be operated as described.

55,509.—Apparatus for making Coffee.—Friederich Liesche, East New York, N. Y.:

I claim, 1st, The combination of the suspended vessel, C, weighted frame, D, curved tube, G, strainer, H, and stationary vessel, F, the whole arranged with regard to a lamp or other burner, substantially as herein set forth for the purpose specified.

2d, The lever, k, and spring or weight, m, n, operating in combination with the movable vessel, A, to extinguish the lamp or burner when the said vessel is raised, in the manner substantially as herein set forth.

55,510.—Paint.—H. A. and D. E. Longsdorf, Mechanicsburg, Pa.:

We claim the compound composed of the ingredients herein named, and mixed together in or about the proportions described, for the purpose specified.

55,511.—Speculum.—Charles Leutz, Philadelphia, Pa.:

I claim the described improvement in speculums, consisting in the use of the springs, I, I, and notched pins, G, G, or their equivalents, when arranged relative to each other and to the leaves, A, A and F, F, substantially as and for the purpose specified.

55,512.—Fruit Jar.—John Letchworth, Philadelphia, Pa.:

I claim the cap, B, made of thin metal, and having internal projections made by external indentations, the whole being applied to the neck of a jar, substantially as described.

55,513.—Squeezer.—John Letzkus, Pittsburg, Pa.:

I claim the combination of the top upset, p, lower upset, f, and drums, e and n, with the main shaft, S, geared directly or indirectly to the inner circumference of the lower upset, the whole being arranged and operating for the purpose of squeezing puddler's balls, substantially as herein-before described.

55,514.—Machine for tunneling Rock.—Thales Lindsley, Rock Island, Ill.:

I claim, 1st, The drill-gauge, substantially as and for the purposes specified.

Further, the ram-guide, in combination with said gauge, the ram, and the drill-wheel, substantially as herein specified.

Further, constructing the drills and the drill-shafts, and connecting the same, substantially as set forth.

Further, the combination of the compensating springs with the drill-shafts, substantially as set forth.

Further, the drill-shaft-guides and the notched collars between the compensating springs, substantially as specified.

Further, the water-pipes and jets in connection with the drill-wheel and ram, substantially as set forth.

Further, the combination of parts forming the drill-wheel, substantially as set forth.

Further, the grooved collar upon the long ram-sleeve and the clutch attached to the rear face of said drill-wheel and working into said collar, substantially as herein specified.

Further, the ram and the ram-hammers, substantially as herein specified.

Further, the wedge index, in connection with said hammers, or their equivalents, together withthe splitting apparatus, substantially as set forth.

Further, the cam-wheel and its adjustable cams for working the drills, substantially as set forth.

Further, the drain drill, and the collar upon the long ram-sleeve, which serves as its guide, constructed and arranged substantially as described.

Further, the non-revolving of the ram-sleeve aforesaid, and the non-revolving of the short ram-sleeve of the rear frame of the machine, as specified.

Further, the combination of the valves receiving the com-dressed air to the ram-cylinders, and the valves discharging it from them with a hand-lever, so as to control the action of the ram, etc., by a touch of the engineer, substantially as set forth.

Further, the construction of the platforms upon the legs of the machine, substantially as described.

Further, the supporting of the machine upon friction-wheels, beveled upon their face, substantially as set forth.

Further, moving the drilling apparatus back and forward by means of the ram-cylinders and their connections, substantially as set forth.

Further, moving the ram back and forth at any velocity desired by the engineer, by means of the ram-cylinders and their dependencies, substantially as specified.

Further, moving the machine by means of said ram-cylinders, and the toggle-levers, substantially as set forth.

Further, the toggle-levers and their necessary appendages, substantially as set forth.

Further, the bracket drill, constructed and operating substantially as specified.

Further, the hauling out of the debris by means of the drag-pulley and its appendages, substantially as specified.

Further, also the hauling out of the debris by means of the ram, and the tackle and clamps appended, substantially as specified.

Further, the combination whereby the ram and the drill-wheel are united and revolved, substantially as set forth.

Further, in combination with a machine, constructed substantially as herein set forth, the method of leveling the same transversely of the tunnel, and of adjusting it to the grade line of the excavation, as herein specified.

Further, the combinations by which the ram-cylinders operate without the oscillating cylinders or in conjunction with them, and *vice versa*; by which the bracket-drill works independently of the drill-wheel, or simultaneously with it; by which the drag-pulley hauls rock independently of, or cotemporaneously with, the snag-pulley, and *vice versa*; by which the drill-wheel revolves without the cam-wheel or in conjunction with it; by which the ram-cylinders through the toggle-levers may move the machine forward and backward, whilst the oscillating cylinders through the drag-pulley are hauling out rock from the heading; by which the drills are kept home to their work and at the point of maximum action, and by which the bottoms of the concentric channels are kept relatively in the same plane, whatever the disparities in the hardness of the rock cut; by which the ram is permitted, at the will of the engineer, to move independently back and forth and without shock to the machine from the oscillations; by which the drills for the heading are kept cool, the dust from them laid, and their minute chips swept out of the concentric channels into the common drain; by which a drain is cut in the bottom of the tunnel parallel with, and directly under, the axial line of the same; by which the machine progresses forward and backward with or without the convenience of a railroad, and by which the tunnel, adit, etc., are supplied with an abundance of fresh air and water; by which, finally, the drill-wheel, the cam-wheel, the ram, the bracket-drill, the drag-pulley, the snag-pulley, the ram-cylinders, the oscillating cylinders, and other parts may operate concurrently and otherwise; all of which substantially as presented.

55,515.—Boom-connection for Masts.—Bartholomew McGrath, Gloucester, Mass.:

I claim, 1st, The mast and boom-connection, as composed of the clasps, F, F, the curved-rod, C, its screws and nuts, and the arms, D, D, arranged substantially as specified.

2d, The combination of the wheel, E, with the clasps, F, F, the curved-rod, C, its screws and nuts and the arms, D, D, the whole being arranged as explained.

55,516.—Steam Engine.—William Louis Winans and Thomas Winans, London, England:

We claim the arrangement of the propelling-shafts, e, between the piston-rods, c, c, mounted in suitable bearings on the cylinders, a, or frames attached to the cylinders, the cylinders being placed directly below the propelling-shafts, whose cranks work down alongside of the cylinder or cylinders, for the purpose herein set forth.

55,517.—Hand Corn Planter.—David McKanna, Madison, Wis.:

I claim, 1st, Operating the seed-slide, D, by means of the inclined-rod, b, when placed at one end of the slide, as shown and described.

2d, The combination of the stationary bar, B, having the groove, H, therein, the bar, C, provided with the slot and the inclined rod, b, and slide, D, all arranged and operating as set forth.

55,518.—Balanced Cut-off Valve.—B. F. McKinley, Falmouth, Ky.:

I claim the adjustable cut-off valve, E, and balance-piston, F, in combination with the revolving valve, C, constructed and operating substantially as and for the purpose described.

55,519.—Broom-head.—Charles Messenger, Chicago, Ill.:

I claim making the head in two parts, as described, in combination with the ring, K, springs, N, teeth, H, as and for the purpose set forth.

55,520.—Breech-loading Fire-arm.—Isaac M. Milbank, Greenfield Hill, Conn.

I claim, 1st, A swinging breech in combination with a transverse turning bolt, beveled on one side to enter a recess and acting to retain the breech by a partial turn of said bolt, substantially as set forth.

2d, The lever, h, for turning the bolt, e, of the swinging-breech, in combination with the hammer, g, the parts being fitted substantially as specified, so that the discharge of the hammer shall insure the proper turning of said bolt, as set forth.

3d, The latch, i, in combination with the lever, h, and turning bolt, e, as set forth, whereby the said latch is disconnected from the lever by the closing of the breech, as set forth.

4th, The spring, K, in combination with the turning-bolt, e, and swinging breech to effect the locking or partial locking of the breech as soon as closed, as set forth.

5th, The claw or retractor, n, formed with or attached to the supporting block, g, in combination with the swinging breech-block, as and for the purposes specified.

55,521.—Vaccinator.—Henry Minton, M.D., Brooklyn, N. Y.:

I claim the puncturing-tube, b, and plunger, d, in combination with the springs, h, i, trigger, K, and barrel, A, constructed and operating substantially as and for the purpose described.

55,522.—Sleigh-brake.—J. J. Moore, Little York, N. Y.:

I claim the tongue, B, working in a slot in the bar, C, being provided with the rods, b, b and f, f, the same connected to join spurs, h, h, when arranged and used substantially as and for the purposes herein set forth

55,523.—Automatic Heliotrope.—Leopold F. Morawetz and Charles Volkmar, Baltimore, Md.:

We claim, 1st, The axis, A, adapted to revolve on one or more fulcra, so that it can be adjusted to a position parallel to the axis of the earth, in conjunction with a solar instrument, substantially as specified.

2d, The driving-wheel, O, applied at a suitable point on the axis, A, in combination with a weight or its equivalent, and with or without an escapement, substantially as described

3d, The construction of the main revolving axis of the heliotrope so that it supports a solar camera for photographic and other purposes, and revolves said camera, as well as permits it to be revolved, in such manner that the main supporting axis and the camera may be brought into any required angle of inclination with relation to each other, substantially as described.

4th, Automatically moving an optical or solar instrument in the plane of the daily course of the sun, and synchronic with the sun, so that the solar rays shall fall directly or continually with the same angle of incidence upon a certain point of said instrument, by means substantially as herein specified.

55,524.—Nicking Screw-heads.—George S. Morris, Taunton, Mass.:

I claim the improved two-nicked screw, having each of its nicks made so as to increase in width as it approaches the circumference of the head of the screw, the same being substantially as and for the purpose specified.

55,525.—Photographic Apparatus.—Emile Muller, New York City:

I claim the apparatus for holding vases or other uneven objects for the purpose of photographing thereon, substantially as herein-before described.

55,526.—Fanning-Mill.—John Mumma, Middletown, Ohio:

I claim, 1st, Constructing the fans, e′, with curved ends for gathering the air, and concentrating the blast in the manner described.

2d, The deflecting board, C′, upon adjustable shaft, a′, arranged so as to be set and retained in any desired position by means of the exterior handle, d′, in the manner and for the purpose described.

3d, The combination of the toothed feeding-roll, Q, with the hopper, arranged and operated as described.

4th, Shaft, R, and fingers, c, vibrated by the arm, e, and cam, S, in the manner and for the purpose described.

5th, The shoe, F, in combination with spring, g, and cams, S, on shaft, P, operating in the manner and for the purpose described.

6th, The combination of the double tapering tappet or cam, L, with adjusting blocks, 4, and spring, i, in the manner and for the purpose specified.

7th, The adjusting roll, T, arms, m, and staples, n, in combination with the shoe, suspending wires, h, for regulating the motion of the shoe in the manner described.

8th, The combination of the journal-blocks, V, W, the bolt and thumb-screw, r, with the friction rubber-block interposed as described, for the purpose specified.

9th, The combination of the wires or rods across the inner end of the shoe, with the clamping-rod and thumb-screw, X, for securing the sieves and screens in the manner substantially as described.

10th, The arrangement of the india-rubber blocks in the sides of the casing, B, adjustable by set screws, Z, to regulate the vibrations of the shoe and obviate wear and noise in running the mill, as specified.

11th, The combination of the shoe, F, rock-shaft, R, cams, S, and spring, g, with their connecting and regulating mechanism, operating substantially as set forth for the purpose specified.

55,527.—Gas-inhaler.—Cuthbert L. Munns, Philadelphia, Pa.:

I claim the hollow tube, C, in combination with the reversible plug, with its ball-valve, and the ball-valve, O, the whole being constructed and operated substantially in the manner and for the purpose set forth.

55,528.—Horse Hay-fork.—John K. O. Neil, Kingston, N. Y.:

I claim, 1st, Operating the tines or fingers of a grappling-fork by means of a rod connecting said tines or fingers with a pivoted cross-lever, said rod being pivoted to both tines and lever at a distance from their centers of motion, as set forth.

2d, The cross-lever, C, in combination with the arms, B, B, fingers or tines, A, A, and connecting-rod, D, as and for the purpose described.

55,529.—Baby-walker.—P. Pallissard, Aroma, Ill.:

I claim the arrangement of the hoop, A, supported by the caster-wheels, F, F, and connected with the ring, E, by the supports, B, B, having screw-threads cut upon their ends for the ready adjustment of the ring, E, to the hight of the baby, the whole being constructed and operated substantially in the manner and for the purpose set forth.

55,530.—Fruit Basket.—Jesse K. Park, Marlboro, N. Y.:

I claim the combination of the warp-bands, D, with the interwoven weft or filling splints, E, passing up and down, and bent over the upper edge of the basket to form the binding, substantially as herein set forth for the purpose specified.

55,531.—Valve.—Jefferson Peabody, Dixmont Center, Maine:

I claim the improved valve-box as made with the case, A, series of valve-guides, D, D, D, stops, E, E, E, arranged with respect to the valve, B, and the opening, C, of its seat, substantially in manner as described.

55,532.—Refrigerator for cooling Oil, etc.—Charles F. Pike, Providence, R. I.:

I claim, 1st, The construction of parallel open-mouth pipes or tubes fastened to the ice-box or receptacle, A, and water-tank, C, in combination with the ice-box or receptacle, A, and also in combination with the water-tank or receptacle, C, substantially as herein described and for the purposes herein-before set forth.

2d, The application of the pump or pumps, as herein described, for the purposes of keeping up an artificial circulation by raising the water from the water-tank, C, and throwing it into the ice-box or receptacle, A, and the using of the water so raised and thrown into the ice-box or receptacle, A, substantially in the manner and for the purpose herein-before stated.

55,533.—Buckle.—I. N. Plotts, New York City:

I claim a buckle having the bar, B, with its eyes, a, a, encircling the sides of the frame, A, arranged to slide to and fro, in the manner and for the purpose herein described.

55,534.—Medical Compound.—Peter Poucin, Minneapolis, Minn.:

I claim the medical compound composed of the ingredients united in the proportions and manner as above set forth.

55,535.—Lard Lamp.—Charles F. Rees, Millersville, Penn.:

I claim the combination of the lamp and stand, J, K, L, N, with its vessel, B, spout, I, and arrangement of the cylinders, A, C, and rings, E, G, in the manner and for the purpose set forth.

55,536.—Die for forming Metal Heads on Harness Nails.—F. Reynolds and F. L. Hilbright, Newark, N. J.:

We claim, 1st, The half-dies, B and C, constructed as described, in combination with each other and with the block, A, substantially as and for the purpose set forth.

2d, The combination of the lever, F, with the block, A, and with the half-die, B, substantially as described and for the purpose set forth.

3d, The combination of the spring, G, with the block, A, and with the lever, F, substantially as described and for the purpose set forth.

4th, The combination of the wedge-stop, E, with the block, A, and with the half-die, C, substantially as described and for the purpose set forth.

55,537.—Car Coupling.—Nathaniel Robbins, Jr., Rockport, Mass.:

I claim in combination with the link and the draw-bar, a mechanism, substantially such as described, or its equivalent, for enabling a person without going between the cars or taking a position where he will be liable to be crushed by and between them, to control and direct the link with respect to its entrance into the mouth of another draw-bar, as specified, such mechanism being the arm applied to the link and the rod or rods arranged on the draw-bar, the whole being as set forth.

55,538.—Hanging Window-sash.—Augustus Roehrig, Williamsburg, N. Y.:

I claim the arrangement of a sinuous wire, d, in the frame, A, in combination with three or more staples, a, b, c, fastened in a zig-zag line in the sash, B, substantially as and for the purpose described.

55,539.—Steam Generator.—Robert E. Rogers and James Black, Philadelphia, Pa.:

We claim one or more water-spaces or jackets surrounding or in combination with the boiler, a, constructed substantially as herein recited, said water-spaces or jackets having or not the tubes for circulation and exposure to heat, and being provided with fire-tubes or not, substantially as described and for the purposes set forth.

55,540.—Medical Composition.—P. G. Rosenblatt, Greenville, Tenn.:

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

55,541.—Telegraphic Repeater.—C. H. Rudd, Sandusky, Ohio:

I claim the posts, G, L, with the spring, M, post, K, and extension of the lever, E, beyond the line of the post, F, F, so arranged as to enable me to use extra force, for holding the relay closed, when said extra power is obtained from the main current, which is unemployed just at the time when needed, substantially in the manner and for the purpose set forth.

55,542.—Cotton-gin.—H. V. Scatlergood, Albany, N. Y.:

I claim the cylinder having a surface consisting of rounded needle-pointed teeth so curved and arranged as that the point of each tooth approaches nearer to its next preceding tooth than at any other point thereof, substantially in the manner and for the purpose above described.

55,543.—Bag Frame.—Albert J. Sessions, Bristol, Conn.:

I claim slitting or cutting the strip, substantially as described so as to form one-half of a bag-frame in one piece of metal.

55,544.—Alarm Funnel.—Joseph Sholl and John Collins, Burlington, N. J. Ante-dated May 28, 1866:

We claim the combination of the funnel, A, with its tube, b, the rod, C, with its float, D, and the bell, H, as and for the purpose described.

55,545.—Manufacture of Stone, Cement, and Plaster.—Frederick Rensome, Ipswich, England:

I claim, 1st, The manufacture of artificial stone, cement, or plaster, by mixing silicate of soda or potash with quick-lime and chalk, or sand or clay or other similar substance, substantially as described.

2d, The manufacture of artificial stone, cement, or plaster, by mixing together in a paste, chalk, or sand or other suitable mineral in a powdered state, soluble silicate and a soluble salt of an alkaline earth or of aluminum or iron, substantially as described.

55,546.—Lamp Burner.—Willard H. Smith, New York City:

I claim, 1st, The metal-plate or its equivalent, with points between the two pieces of cork entering both as represented, as and for the purpose set forth.

2d, The two parts, A and B, constructed and combined as and for the purpose set forth.

3d, The mode of fastening the wick-tube to the said metal-plate and of fitting the same snugly in the said cork or other non-conductor, so as to hold the same firmly in its place without touching the metal-plates inclosing the non-conductor either above or below, as set forth.

4th, The combination of the parts, A and B, filled with cork or other non-conductor, fastened together by means of the metal-plate as shown in Fig. 4, as set forth.

5th, The combination of the sleeve, G, and the tips, E and F, as and for the purpose described.

55,547.—Water Meter.—Elihu Spencer and E. L. Meyer, Elizabeth, N. J.:

We claim, 1st, A water-meter made and arranged substantially as above shown, that is to say, consisting of two cylinders having a common valve-chamber between them, within which valve-chamber are placed two slide-valves, operated substantially as described by means of a shaft rotated by proper connections from the pistons of the cylinders, such shaft carrying a worm, E, which rotates a gear-wheel, F, whose spindle carries a fixed index, all as above set forth.

2d, Combining the said apparatus mentioned in the preceding clause with an inclosing box, A, in the manner substantially as above shown.

55,548.—Apparatus for generating Washing Gases for Inhalation.—A. W. Sprague, Boston, Mass.:

I claim, 1st, The combination of the float, F, and vessel, E, with the lever, H, or its equivalent, as and for the purpose described.

2d, The perforated conical projections, C, formed in the tube, B, or its equivalent device, substantially as and for the purpose specified.

55,549.—Lock.—Martin Staehelin and Henry Young, Port Chester, N. Y.:

We claim the swinging-frame, E, applied in combination with the shot-bolt, B, latch, C, and key, D, substantially as and for the purpose set forth.

55,550.—Hose Protector.—Isaac H. Stone, St. Louis, Mo.:

I claim the combination of the rails, A and A', with the hollow beam, B, the dogs, c, and spurs, c', forming a secure protection for hose during the entire length of its passage over railway tracks, as set forth.

55,551.—Harvester Rake.—Ole O. Storle, North Cape, Wis.:

I claim, 1st, Bevel wheels, 5, and segmental wheels, 6, and pinion, 4, in combination, constructed and operated substantially as and for the purpose described.

2d, Guide-wheel, 18, in combination with guide-truck, 19, and rake, 14, substantially as and for the purpose described.

55,552.—Nippled Cartridge for Breech-loading Fire-arms.—Thomas L. Sturevant, Boston, Mass.:

I claim the combination and arrangement of the tongue, D, with the nipple, C, and the charging tube, A, arranged substantially as specified.

55,553.—Curry-comb.—Miles Sweet, Troy, N. Y.:

I claim, 1st, A series of comb-bars, A formed with perforations, b, and fastened together by collars, d, and rivet-bolts, e, extending through the said collars and comb-bars, substantially as herein described.

2d, A series of perforated comb-bars, A, fastened together by rivet-rods, c, and collars, d, and with the rivet-rods forming a shank, m, for a handle, substantially as herein described.

3d, A series of perforated comb-bars, A, fastened together by rivet-rods, c, and collar, d, and having one or more of the collars extending beyond the end of the comb-bars, substantially as herein described.

4th, A series of single perforated comb-bars, A, fastened together by rivet-rods, c, and collars, d, and having a back-plate, P, secured to the said comb-bars, substantially as herein described.

55,554.—Planking Clamp.—Joseph C. Thomas, Kennebunk, Maine:

I claim the combination of the screw, a, the nut, C, the rotary head, g, the two chains, D, D', and the hooks, E, E, the whole being constructed, arranged, and applied to the stock, A, provided with the screw, B, substantially as and so as to operate as and for the purpose herein-before specified.

55,555.—Air-tight Burial-car.—Charles Timmerman, Amsterdam, N. Y.:

I claim, 1st, The use and arrangement of the tongue pieces, E and F, and corner-plate, D', for connecting and fastening the bottom and upright parts of the case together, substantially as described.

2d, Constructing the cover or upper part of the burial case of iron and wood in combination, substantially as described.

55,556.—Dog Churn.—Franklin Traxler, Scottsburg, N. Y.:

I claim, 1st, Communicating a vibrating movement to the arm, b, by means of a cam-wheel, G, applied to the shaft of the tread-wheel, said wheel acting upon rollers, c, c', the bearings of which are allowed to have a movement independent of the arm to which the wheels are attached, substantially as described.

2d, The pivoted bearing-plate, d, having rollers, c, c', applied to it, in combination with a vibrating arm, b, or its equivalent, and a cam-wheel, G, substantially as described.

3d, The construction of the main supporting frame of triangular supports, A, A, horizontal beams, B, B', and a stall, E, substantially as described.

4th, The combination of an inclined tread-wheel, D, cam-wheel, G, rollers, c, c', vibrating arm, b, pitman, a, and vibrating lever, F, arranged and operating substantially as described.

55,557.—Coal Elevator.—John P. Tucker, South Reading, Mass.:

I claim the combination of the slotted arm, E, the curved lever, H, provided with the tripper, C, the director, J, the scoop, I, and the rope, K, with the gallows-frame and its discharging chute, the whole being arranged and made to operate substantially as above set forth.

55,558.—House Bell.—Andrew Turnbull, New Britain, Conn.:

I claim the cast-metal hub, c, having the eyes, g, and rod, h, firmly secured therein, in combination with the spiral spring, n, detents, m, plate, a, and bell, d, substantially as and for the purpose described.

55,559.—Steering Apparatus.—J. B. Van Deusen, New York City:

I claim, 1st, The interposition between the tiller and the rudder-head of a steering apparatus of a spring or springs, operating substantially as and for the purpose herein described.

2d, The combination of the inner and outer ring with their radial projections, and india-rubber or other springs, substantially as and for the purpose as herein fully described.

55,560.—Die for welding Links into Chains.—Frederick Van Patten and Oren A. Anthony, Ilion, N. Y.:

We claim forming the dies, E and F, with two or more cavities for the reception of two or more links, as and for the purpose specified.

55,561.—Picture-holder.—William Walker, New Haven, Conn.:

I claim, 1st, A holder for pictures, cards, and for other analogous purposes, consisting of a series of frames, or their equivalents, placed one in front of another, but in two rows or sections, when such frames are so connected through any suitable mechanism with the outer casing or box in which they are arranged, or with a pedestal or other portion of the same, that by either revolving such casing or box, or its pedestal or other portion thereof so connected, the said picture frames, in regular order and succession, can be brought to the end of each row or section in proper position for being viewed, substantially in the manner described.

2d, The combination of the reciprocating sliding carrier-plate, H, with the transverse sliding-plate, K, when both connected with and operated by a common revolving disk, E, of the box or casing, A, or its equivalent, and arranged with regard to the double row of frames, B, so as to act upon the same, substantially in the manner and for the purpose specified.

55,562.—Machine for gumming and printing Envelopes.—Thomas V. Waymoth, New York City:

I claim, 1st, The hinged table, B, which swings back and forth on arms, a, to operate in combination with the gummer, D, substantially as and for the purpose described.

2d, The movable separator, G, in combination with the gummer, D, substantially as and for the purpose set forth.

3d, The endless apron, H, in combination with a suitable mechanism, imparting to it an intermittent motion, and with the reciprocating carrier, F, and gummer, D, constructed and operating substantially as and for the purpose described.

4th, The finger, l', and rollers, k', in combination with the apron, H, and carrier, F, constructed and operating substantially as and for the purpose set forth.

55,563.—Snap-hook.—R. L. Webb, New Britain Conn.:

I claim the employment of the spring, d, passing around the heel or joint formation, when both ends are secured to the outside edge of the hook-shank and the latch without a pivoted joint, substantially in the manner as and for the purpose described.

55,564.—Hot-air Furnace.—Edward Webster, Hartford, Conn.:

I claim, 1st, The employment of the plate, j, in combination with the arrangement of the exit flange or pipe, t, substantially as and for the purpose described.

I also claim the case, u, constructed as described, in combination with the dish, v'', tube, w, and cover, v''', substantially as and for the purpose described.

55,565.—Apparatus for molding Peat.—Edward Weissenborn, Hudson City, N. J.:

I claim, 1st, The combination of a reciprocating ram, F, having a hammer-like action, the compression-box, E, and the open-bottomed mold or molds, c, substantially as and for the purpose herein specified.

2d, The cylinder, B, and its piston, in combination with the ram, F, compression-box, E, and mold or molds, c, substantially as and for the purpose herein set forth.

3d, The construction of the partitions, b, b, of the mold-frame with sharp cutting upper edges, substantially as and for the purpose herein described.

4th, The open-bottomed mold or molds, c, constructed with a downward taper, substantially as and for the purpose herein specified.

55,566.—Churn.—Amos Westcott, Syracuse, N. Y.:

I claim, 1st, The use of dasher-paddles having their faces beveled or cut away diagonally, substantially in the manner and for the purpose above described, when combined with the main shaft, as above described.

2d, The manner of connecting the main shaft with the gearing and body of the churn, in combination with said shaft and the dasher-paddles, constructed substantially as and for the purposes above described.

3d, The combination of the parts mentioned in the preceding claims, constructed as above described, with the fan-wheel or blower, substantially as above described.

55,567.—Caster for Sewing Machines.—John N. Wilkins, Chicago, Ill.:

I claim the combination of the leg with the forked plate, A, and the wheel by means of the screw and lug, substantially as specified.

55,568.—Wardrobe and Bedstead.—Levi Wing and David Myers, Chicago, Ill.:

We claim the combination of the wardrobe, A, provided with its regular and distinct compartment for wearing apparel, and the bedstead, E, arranged so as to fold into a recess in the rear part of said wardrobe, substantially as herein specified and shown.

55,569.—Sheep-shears.—Tobias and John W. White, Adrian, Mich.:

We claim, 1st, The employment in a pair of sheep-shears of a central blade, c, arranged in such relation to the two blades of an ordinary pair of sheep-shears as to effect the object herein specified.

2d, The combination of the guard, D, with the central blade, C, and stops, g, g, on the blades, A, A, substantially as specified.

3d, Attaching the shank of the central blade by a screw and nut, or an equivalent thereof, which will permit of the said shank, and the central blade also, being removed from the shears at pleasure.

55,570.—Machine for sand-papering Woodwork.—J. H. Wonderly, Williamsport, Pa.:

I claim, 1st, The combination of the cap, d, or equivalent jointed connecting pipes and exhaust fan, operating substantially as described.

2d, The adjustable table, B, provided with the sliding-frame, p, having the inclined planes, s, s, and the regulating screw, C, arranged and operated substantially as shown and for the purpose set forth.

55,571.—Screw-cutter.—Moses M. Young, Chelsea, Mass.:

I claim, 1st, The improved arrangement of the guide, C, or its application directly to the die, B, and so as to project therefrom, as specified in combination with the application of the die to the stock so as to enable the two to be separated without the necessity of first detaching the guide or centralizer from the die.

I also claim the combination and arrangement of chip-discharging passages, k, k, with the guide and the die applied together, as set forth.

55,572.—Paint-mill.—George Philip Zindgraf, Philadelphia, Pa.:

I claim, 1st, Rounding the shoulder, r, of the part, q', of the mill-spindle, N, and forming a rounded recess or cup in the top of the rynd, q, into which the rounded shoulder, r, is received, substantially as and for the purpose herein specified and described.

I also claim the extension of the mill-spindle up through the balance-rynd of the lower running stone, so as to attach the feeding-screw thereto, as specified.

55,573.—Valve-arrangement for Organs, etc.—Moritz Baumgarten, assignor to himself, Jacob Heller, G. C. Clarke, A. S. Keeler, and Morris Steinhert, New Haven, Conn.:

I claim the arrangement of the rod, L, provided with packing

collars, a, in combination with the valves, D, E, and F, more or less, substantially in the manner and for the purpose herein described.

55,574.—SPRING BED-BOTTOM.—Charles B. Bristol, assignor to himself and Philippe Koch, New Haven, Conn.:

I claim the combination of the 'spiral 'or helical springs, C, C, etc., when placed horizontally with the connecting-rods or hooks, b, b, etc., or their equivalents, and the frame, A, A and A', A', when the whole is constructed, arranged, and fitted for use substantially as herein described and set forth.

55,575.—OSCILLATING ENGINE.—Felix Brown, assignor to A. & T. Browne, New York City:

I claim, 1st, The rock-shaft, j, and arm, i, or other equivalent mechanism, in combination with the links, h, h', arms, g, g', valves b, b', and oscillating cylinder, A, constructed and operating substantially as and for the purpose described.

2d, The arms, o, links, p, and studs, q, in combination with the exhaust-valves, c, c', and with the oscillating cylinder, A, constructed and operating substantially as and for the purpose set forth.

55,576.—MITER-BOX.—Daniel Bull, assignor to himself, C. D. Vaughn, and F. A. Gibbs, Amboy, Ill.:

I claim, 1st, The parallel moving saw-guide frame arranged, constructed, and operating substantially as and for the purpose set forth.

2d, Arranging the slotted self-adjusting cylinders or rollers in sashes, e, e, or their equivalents, in combination with the parallel moving frame and the stationary frame, all constructed and operating substantially as described.

3d, The adjustable gauge-stops, I, in combination with the saw-guide frames and the lugs or pointers, p, all constructed and arranged substantially as described.

4th, The combination of the index-plate, m, cross-tie, H, n, parallel moving frame and notched segment, C2, and support, C3, substantially as described.

5th, The combination of the segment notched-plate, C2, support, C3, parallel moving saw-guide frame and combined thumb-catch and lever or link, F, all constructed and arranged substantially as described.

6th, The stationary saw-guide frame constructed with a self-adjusting roller, in combination with the parallel moving saw-guide frame, also constructed with a self-adjusting roller and with a front-board or piece, D, D, the said parts being applied together on a miter-box, which is constructed and furnished with the appurtenances described, substantially as set forth.

55,577.—BLIND-FASTENER.—H. M. Clark, assignor to Charles Blanchard, Meriden, Conn.:

I claim the combination of the slotted bar, E, pin, A, the wheels, C and D, and the knob, B, or its equivalent, constructed and arranged to operate together substantially as herein described.

55,578.—PIPE-WRENCH.—Durfee W. Coggeshall, assignor to George E. Church, Providence, R. I.:

I claim the pipe-wrench made substantially as described, viz.: of the lever and hinged jaws or clasp, provided with the tooth, a, and bearing, f, and combined and arranged in manner and so as to operate substantially as and for the purpose as herein-before described.

55,579.—CANVAS-STRETCHER.—Chauncy Dowd, New Haven, Conn., assignor to H. W. Gear, New York City:

I claim the swivel-buttons, c, and eccentric abutting plates, d, in combination with the strips, a, b, of the frame, A, constructed and operating substantially as and for the purpose described.

55,580.—CARRIER OF BRAIDING MACHINES.—Otis E. Drown, assignor to Darius Goff and Darius L. Goff, Pawtucket, R. I.:

I claim combining the weight constructed as described, to be lifted from the bottom by the surrounding bight of the yarn with the pawl, constructed as described to slide on a separate guide, and permitting the weight partially to pass it before being lifted to let off more yarn, substantially as described for the purpose set forth.

I also claim the combination of the hooks or guides, r and s, as described, with the tension-weight constructed as described, with the groove or hook, t, on one side of the bottom thereof for receiving the yarn, substantially in the manner described and for the purpose set forth.

55,581.—FRUIT JAR.—John Focer, assignor to W. and S. A. Whitney, Glassboro', N. J.:

I claim the thin metal-ring, D, having screw-threads adapted to similar threads on the cover, B, and neck, A, of a preserving jar, all substantially as and for the purpose herein set forth.

55,582.—KEY FOR LOCKS.—Porter A. Gladwin, Boston, Mass., assignor to himself and Horace M. Lee, Dorchester, Mass.:

I claim the within-described safety-guard for locking keys, consisting of the shank, B, in combination with the hook, C, substantially as described.

55,583.—BRICK MACHINE.—Isaac Gregg and Charles Green, assignors to Isaac Gregg, Philadelphia, Pa.:

We claim operating the alternating "sweeps or mold clearers," of the said brick machine by means of the device consisting of the lever arms, D, D' and H, H', and the bars, E, E' and F, and the fixed joint, G, in combination with the two rock-shafts, C, C', and lever-arm, I, the same being constructed, arranged, and applied to operate together, substantially as described.

55,584.—ICE-CREEPER.—Augustus S. Hadaway, assignor to himself and W. S. Hadaway, Plymouth, Mass.:

I claim the combination of the wire, F, the toggle-lever, L, and the plate, D, all for the purpose set forth, and substantially as specified.

55,585.—PRESERVE CAN.—Friederich H. Lauter, back, assignor to himself and Newman S. Wax-Boston, Mass.:

I claim the combination as well as the arrangement of the ring, D, and its stud, c, and curved arm, d, with the staple, C, and the hinged loop, E, applied to the body of the can, as specified, the cover of the can being provided with an annulus, b, of india-rubber or its equivalent, and the whole being substantially as herein-before explained.

55,586.—MODE OF DRIVING PILES.—John McClay, assignor to himself and J. W. Bliss, Hartford, Conn.:

I claim the yoke or clamp, d, constructed as described, and operating as set forth.

55,587.—ASH-SIFTING DEVICE IN COOKING-STOVES.—Edward Mingay, Boston, Mass., assignor to the Boston and Maine Foundery Company, South Reading, Mass.:

I claim my improved construction of the sifting-hod, as described, and the arrangement of it and its chamber so as to extend directly underneath the grate, in order to cause the coals or ashes, when discharged from the grate, to pass vertically into the hod without first falling on an inclined plane or such a spout leading into such hod as to require the said ashes to be raked from it into the hod.

55,588.—SAFETY-STOP FOR GUN-LOCKS.—W. G. Oliver, assignor to himself and C. K. Remington, Buffalo, N. Y.:

I claim the combination with the hammer of the gun-lock of the automatic spring-guard, so arranged as, in its normal position, to engage with the hammer and act as a detent thereto, and relieved from the same for the purpose of cocking by pressure towards the stock, substantially as described.

55,589.—BOTTLE-STOPPER.—Thomas Primer, New London, Conn., assignor to Henry W. Putnam, Bennington, Vt.:

I claim the combination of the collar, a, hook, b, rigid cross-piece, d, tapering mass of soft material, c, and tie, c, arranged substantially as and for the purpose herein specified.

55,590.—PHOTOGRAPHIC BATH.—Robert E. Sisson, Wickford, R. I., assignor to Cyrus H. Moore and Asa Sisson, North Kingston, R. I.:

I claim the use of the independent false bottom, B, B, in combination with a photographer's bath, substantially as and for the purposes described.

55,591.—TOY TOP.—F. O. and William W. Tucker, Meriden, Conn., assignors to themselves and H. C. Stiles, New Haven, Conn.:

We claim, 1st, The arrangement of the ballast ring, D, substantially in the manner and for the purpose specified.

2d, The combination of the two cords, L and P, with the hooked tube, F, and barrel, E, constructed and arranged to operate substantially in the manner and for the purpose specified.

55,592.—PHOTOGRAPHIC PROCESS FOR COPYING DRAWINGS, ETC.—William Willis, Birmingham, England, assignor to Vincent Brooks, London, England:

I claim the improvements in processes for copying or reproducing, by the agency of light, drawings, engravings, lithographs, and photographs, and written and printed documents, herein described—that is, preparing the sensitive surface to be acted upon by light by the use of a solution containing a chromate mixed with an acid which will combine with the oxyd of chromium formed by the action of light, and with the organic base used for development, and developing the picture by means of aniline, pyrrol, and other organic bases which, when applied either in the state of vapor or liquid, are oxydized by the chromic acid and form therewith a dark-colored compound.

55,593.—ANCHOR.—Peter Dinzey, St. Bartholomew, West Indies:

I claim, 1st, The shank, A, with its branches, a, a', in combination with the adjustable fluke, B, the whole being constructed and arranged substantially as and for the purpose specified.

2d, The combination with the above of the cross-pieces, c, c', for the purpose described.

55,594.—ELECTRO-MAGNETIC ATTACHMENT TO RULING MACHINES.—E. D. Averell, New York City:

I claim, 1st, The circuit break, consisting of a metallic lever and finger, with a piece, n, of non-conducting material, in the hub of the lever, and a spring, l, or its equivalent, the whole applied and operating substantially as herein specified, in combination with a galvanic battery, or other generator of an electric circuit, and a ruling machine.

2d, The lever, R', and finger, l', applied in connection with the lever, R, and finger, l, substantially as and for the purpose herein specified.

3d, The rollers, Q, Q', applied in connection with the levers, R, R', and fingers, l, l', and adjustable relatively to the cloth, B, and rollers, D, D, substantially as and for the purpose herein described.

4th, The combination of the posts, L, L', adjustable about their axes, the arms, M, M', and the rods, N, N', carrying the foot-pieces, P, P', rollers, Q, Q', circuit-break, R, and lever, R', substantially as and for the purpose herein specified.

5th, The foot-pieces, P, P', carrying the rollers, Q, Q', circuit-break, R, and lever, R', adjustable relatively to the rods, N, N', or other equivalent supports, by screws, g, g, substantially as and for the purpose herein set forth.

RE-ISSUES.

2,280.—POTATO-DIGGER.—L. Aug. Aspinwall, Albany, N. Y. Patented Nov. 14, 1865:

I claim, 1st, The screen or screens, F, F, having a lifting movement and vibrating one from front to rear, and, when two are used, vibrating alternately.

2d, The combination of such screen or screens with a plow, having an uninterrupted passage for the earth over its entire upper surface, substantially as set forth in the above specification.

2,281.—APPARATUS FOR STRAINING PAINTS AND OTHER MATERIALS.—Luman Bishop and Stephen Brewer, Cortlandville, N. Y., assignees of Luman Bishop. Patented Feb. 20, 1866:

We claim, 1st, The strainer, G, or its equivalent, as and for the purposes herein shown and described.

2d, The combination of the strainer, G, with the tube, F, and piston, B, substantially as and for the purpose described.

3d, The lateral apertures, H, H, H, or their equivalents, in combination with the tube and piston, substantially as and for the purpose herein described.

2,282.—CYLINDER-POLISHER.—George Cowing, Seneca Falls, N. Y. Patented April 14, 1863:

I claim the expanding arms, A, A, in combination with the vulcanized scourers, B, B, substantially as described.

2,283.—PIPE-TONGS.—Allen Beach, Boston, Mass., assignee of Henry H. Gilmore, Medford, Mass. Patented April 6, 1858:

I claim, 1st, Constructing either member of a pair of pipe tongs with a slot or its equivalent, so that by the relative adjustment of the jaw and pivot the "grip" of the tongs can be accommodated to various sizes of pipes, substantially as herein described.

2d, The combination of an inclined plane or planes, or the equivalent thereof, with the slotted jaw, for the purpose described.

2,284.—CAPPING WOOD SCREWS.—Charles T. Grilley, New Haven, Conn. Patented April 20, 1852; and extended for 7 years:

I claim the application to a nicked screw-head of a cap already nicked and folding the same upon and around said screw-head by compression, substantially as described.

2,285.—TANNING.—Judson Schultz, Ellenville, N. Y. Patented April 3, 1866:

I claim the treating of hides or skins substantially as herein described.

2,286.—BLANK FOR SHOE-PEGS.—Benjamin F. Sturtevant, Boston, Mass. Patented Aug. 16, 1859:

I claim as of my invention the new article of manufacture herein described, which is a peg-blank, having essential characteristics substantially such as herein set forth.

2,287.—CLOTHES-WRINGER.—Wm. B. Rhoads, assignee by mesne assignments of Nelson B. White, South Dedham, Mass. Patented March 4, 1862:

I claim, 1st, The combination with rolls of a wringing machine of bevel cog-wheels for transmitting motion from one roll to the other, substantially as described.

2d, In a machine for wringing clothes, I claim the bevel-gears, K and N, with l and m, and shaft, b, operated by the groove, r, arranged substantially as described, and driven by any power in combination with rollers of india-rubber or other suitable material, as set forth.

3d, In a wringing machine, I claim a "purchase" cog-wheel, that is to say, a cog-wheel of any form, mounted upon an independent axis, and employed to give motion to the gearing or other devices which rotate the rolls.

DESIGNS.

2,332.—TRADE-MARK.—Samuel E. Barney, assignor to the Elm City Company, New Haven, Conn.

2,333.—BRACKET.—John H. Bellamy, Charlestown, Mass.

2,334.—LADY'S TUCKED PAPER COLLAR.—J. M. Flagg, Providence, R. I.

2,335 and 2,336 (2 cases).—TRADE-MARK.—H. Fletcher, assignor to the Fletcher Manufacturing Co., Providence, R. I.

2,337.—COOK'S STOVE.—C. Harris and P. W. Zoiner, Cincinnati, Ohio.

2,338.—PARLOR STOVE.—C. Harris and P. W. Zoiner, Cincinnati, Ohio.

2,339.—COAL STOVE.—C. Harris and P. W. Zoiner, Cincinnati, Ohio

PATENT OFFICE.

PATENTS GRANTED FOR SEVENTEEN YEARS.

MUNN & COMPANY.

In connection with the publication of the SCIENTIFIC AMERICAN have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *twenty 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 so many 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.

Judge Mason, formerly Commissioner of Patents, says, in a letter addressed to us:—"In all your intercourse with the office, I always observed a marked degree of promptness, *skill*, and fidelity to the interests of your clients."

Ex-Commissioner Holt says:—"Your business was *very large*, and you sustained and justly deserved the reputation of *marked ability* and *uncompromising fidelity* to the interests of your clients."

Ex-Commissioner Bishop says:—"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."

EXAMINATIONS.—If an inventor wishes our opinion in regard to its probable novelty of his invention, he has only to send us a pencil or pen-and-ink sketch of it, together with a description of its operation. For an opinion, without examination at the Patent Office, we make no charge, but if a

PRELIMINARY EXAMINATION AT THE PATENT OFFICE

is desired, we charge the small fee of $5. This examination involves a personal search at the Patent Office of all models belonging to the class, and will generally determine the question of novelty in advance of an application for a patent. Up to this time we have conducted over ELEVEN THOUSAND Preliminary Examinations, thus showing a more intimate knowledge of inventions at the Patent Office than can be possessed by any other person or firm.

If an inventor decides to apply for a patent, he should proceed at once to send us by express, charges prepaid, a model not over one foot in size, and substantially made. He should also attach his name and residence to the model

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

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 Reissue	$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

In addition to which there are some small revenue stamp taxes, Canadians have to pay $500.

FOREIGN PATENTS.—Messrs. MUNN & CO. have had more experience than any other solicitors in this country in procuring foreign patents, and have old established agents in London, Paris, Brussels, Berlin, Vienna, and other large cities. Foreign business should never be intrusted to other than experienced agents.

Messrs. MUNN & CO. give special attention to the preparation of Caveats, and to the prosecution of the EXTENSION OF PATENTS Reissue of DEFECTIVE PATENTS, REJECTED CLAIMS, INTERFERENCES, and DISCLAIMERS. They also prepare ASSIGNMENTS, LICENSES, AGREEMENTS, and CONTRACTS, in reference to Patents, and will advise patentees when their rights are infringed in reference to bringing suits against INFRINGERS. In connection with a Patent Lawyer of eminent ability, they prepare and conduct cases in the United States Courts. Indeed, there is no branch of Patent business which MUNN & CO. are not prepared to undertake.

If an inventor wishes to apply for a patent, all he has to do is to write to us freely for advice and instruction, and he will receive prompt attention. If his invention contains any patentable features, he can depend upon getting his Letters Patent. All communications considered confidential. Send models and fees addressed to

MUNN & CO.,
No. 37 Park Row

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

NEW RATES OF ADVERTISING.

FORTY 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, except on payment of one dollar a line each insertion, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

PARTIES HAVING FLOUR PACKERS FOR SALE will address [1*] OLIVER J. BOLLINGER, Glenrock, Pa.

WANTED.— $200 PER MONTH Paid to Agents to Introduce our New $15, $18, and $20 Sewing Machines, Ke.chum's Patent. Addre s, with stamp, MONADNOCK SEWING MACHINE CO., 25 13] Winchendon, Mass.

I WANT SMALL SPIRAL SPRINGS.—MANUFACturers please send your address to 25 1 J. H MARTIN, Hartford, N. Y.

TWIST DRILLS—ALL SIZES FOR STUBBS'S WIRE and Machinist's use, on hand for sale by 25 13] LEACH BROTHERS, 102 Liberty street, New York.

FOR SALE CHEAP.—12 NEW FINE-COMB SAWing Machines adapted to any style Horn or Rubber Comb. A rare opportunity. Address J. H. PRATT. 25 1] 86 Chambers street, New York.

SWEET'S REPORT ON COAL!

Now Ready:
SPECIAL REPORT ON COAL, SHOWING ITS DISTRIBUTION, CLASSIFICATION AND COST,
Delivered over Different Routes to various Points in the State of New York, and the Principal Cities on the Atlantic Coast.
By S. H. SWEET.
Late Deputy En ineer and Surveyor of the State of New York. Transmitted to the Legislature March, 1865. 1 vol. 8vo, cloth, with maps.....$3 00.

D. VAN NOSTRAND, Publisher, 192 Broadway, New Yor
☞ Sent free by mail on receipt of price. 25 1

STATE RIGHTS OF A VALUABLE PATENT FOR Sale. Apply to S. HARISHORN, No. 62 Center street. 1*

INCRUSTATIONS EFFECTUALLY PREVENTED BY Winans' Incrustation Powder. Cost 3 to $5. 11 Wall-st., N. Y. 25 5*

PATENT FOR SALE.—PERPETUAL CALENDAR Trade Emblem Pins, Keys, Charms, and Tablets, sixty saleable patterns. H. C. FOOTE, 15 Laight street, New York. 1*

PLATINUM.—IN ALL FORMS, FOR ALL PURPOses, wholesale and retail. H. M. RAYNOR, Importer, 748 Broadway, New York. Scrap and Ore purchased. 25 e o w 5*

HOW TO PREVENT BOILERS AND STEAM PIPES from Rusting. Use Temple's Liquid a few days before Stopping. Address A. TEMPLE, Bridgeport, Conn. 25 4*

THE PHRENOLOGICAL JOURNAL FOR JUNE— Contains Portraits of Hon. Solomon Foot, Thomas Jefferson, Aaron Burr, Constance Emily Kent, Jenny Lind, a Group of Moquis or Utah Indians, with upwards of twenty illustrations and sketches of character; also Practical Physiognomy, Love and Lovers, Marriage and Divorce, Celibacy, Revelation and Science, Your Likeness, Strong Men, Hints to Preachers and Sextons, Physical Culture, True Politeness, How to Talk, Fashions, etc. $2 a year, or 20 cents a number. A new volume,—the 44th,—begins with the next number. Address, FOWLER & WELLS, 24 2 389 Broadway, New York.

$10,000 WORTH OF PUMPS, HYDRAULIC RAMS, etc., of every description. Best makers in store, and will be sold at a large discount, by J. B. FULLER, 24 4] No. 8 Dey street, New York.

CHARLES A. SEELY, CONSULTING AND ANAlytical Chemist, No. 26 Pine street, New York. Assays and Analyses of all kinds. Advice, instruction, reports, etc., on the useful arts. 22

WANTED.—A PRACTICAL ENGINEER, OF 20 years' experience, desires to engage with some reliable Mining or Manufacturing Company as Mechanical Superintendent. First-class References in New York, Brooklyn, and Boston, Address L. S. H., 25 2*] West Sutton, Mass.

GOVERNORS.

THE GILLESPIE GOVERNOR COMPANY, OF BOSton, are now manufacturing GILLESPIE'S PATENT HYDRAULIC GOVERNOR, for Water Wheels of every description.
After a test of five years' service, this Governor has proved itself far superior to any other hitherto in use: practically accomplishing for Water Power the same as a Cut-off for Steam Power.
Every Machine guaranteed to give entire satisfaction to the purchaser, or no sale.
Office 13 Kilby street, Boston, Mass.
JOHN S. ROGERS, Treasurer.
TIMOTHY S. HOLTON, Selling Agent.
For sale in New York by J. E. STEVENSON, 40 Dey street, and GEO. TALCOTT, 69 Liberty street.

☞ A few of the many testimonials which the Company has received, in regard to the operation of their Governors, were published May 19, 1866, in No. 21 of this paper, to which reference is made. 25 13

IRON PLANERS, JUST FINISHED, FOR SALE.—

One	20 foot	Bed	48x48 inches.
One	12 "	"	36x36 "
Two	8 "	"	30x30 "
Two	6 "	"	24x24 "
Two	4 "	"	20x22 "

All New and First-Class Tools, for sale Low and ready for immediate shipment, by J. B. FULLER, 24 4] 8 Dey street, New York.

NYE'S IMPROVED DAMPER.—THIS ARTICLE, JUST patented, is one of great practical utility, which every consumer wants, and which has been pronounced by the most scientific and practical men to be superior to anything of the kind before produced—being adapted alike to the Stove Funnel and Chimney Flue, and must meet an immense sale throughout the country. State, County, and Town Rights for sale. Apply to either of the undersigned.
S. R. NYE, } Barre, Mass.
F. G. BATES, }
WM. H. HAMILTON, Petersham, Mass
or H. CARRUTH & CO., 24 4 46 Hanover street, Boston.

STATE RIGHTS OR HALF THE ENTIRE RIGHT OF Smith's Patent Fire-Lighter for sale. A useful article, wanted for daily household consumption. The best and most convenient ever got up for the purpose. A small box a few inches square will light more fires than a barrel of shavings. People are obliged to have something to light their fires with so they generally keep shavings upon their premises for this purpose, which no person, cautious against accidental fires, would do, were these Fire Lighters manufactured and for sale.
Wholesale profits 300 or perhaps 400 per cent. each transaction.
N. B.—If a reasonable price be not offered soon, he will accept a Partner with a moderate cash capital.
Address J. SMITH, Providence, 26 1* R. I.

VAN DE WATER CELEBRATED WATER WHEEL for sale at the Eagle Iron Works, Buffalo, N. Y. Send for Circulars. [26 8t] DUNBAR & HOWELL.

SETTING VALVES.—FOR FIVE DOLLARS I WILL give full written directions for setting locomotive valves. Having had several years' constant practice, I can give practical information that cannot be found in books. Address JOHN ASKWITH, 26 1* Chicago, Ill.

BUERK'S WATCHMAN'S TIME DETECTOR.—IMportant for all large corporations and manufacturing concerns—capable of controlling with the utmost accuracy the motion of a watchman or patrolman, as the same reaches different stations of his beat. Send for a circular.
J. E. BUERK.
26 18* P. O. 1,057, Boston, Mass.



MORANDI'S PATENT CHARCOAL FUEL SAVER!

Just the article for the warm season, with the least possible heat, and the smallest amount of expense—not to exceed two cents per hour.
Samples can be obtained of the subscriber.
Also State and county rights for sale, by F. MORANDI, 26 3t No. 65 Union street, Boston, Mass.

IMPORTANT TO MANUFACTURERS AND INVENTORS.—SMITH & GARVIN, No. 3 Hague street, New York, Machinists and Model Makers, are now ready to make proposals for building all kinds of Light Machinery, Manufacturers' Tools, Models, etc. Satisfactory reference given. 26 4*

MACHINERY AND MACHINISTS' TOOLS, ALL kinds, including the LEONARD & CLARK PREMIUM LATHE. Also, Steam Engines, Saw Mills, Wood Cutting Machinery, etc., etc. Steamboat and machinery repairing at the 26 3* QUASSAICK MACHINE SHOP, Newburgh, N. Y.

VOSSMARK & MEISSNER, CONSULTING AND Mechanical Engineers and Brokers of Machinery, furnish Calculations, Estimates, General Working and Patent Drawings. Particular attention paid to the practical development of new inventions. [26 4*] 5 Tryon Row, Room 2.

SOMETHING NEW.—MOORE'S PATENT.—FOR Sale—The Patent Right of a Horse Hay Rack. The model can be seen, and all information given, at JOHN FORGE'S, 26 2t 133 Center street, New York.

TO WRENCH MAKERS.—FOR SALE, UPON reasonable terms, a valuable patent on a Pipe-Wrench. Address, [26 tf] A. B., New York City, Box 773.

CLEMENS'S CIRCULAR SAW MILL.—MANUfacturers, or parties wishing to engage in the manufacture of the best Saw Mill ever invented and put in practical operation, can obtain a license to build the same, with complete working drawings, upon application to the inventor.
G. H. CLEMENS,
Post office Box 2,442,
26 4* Cincinnati, Ohio.

WANTED.—LADIES OR GENTLEMEN IN EVERY town or village can exchange a few hours' labor for a few dollars in money by securing an agency to distribute the American Pen Fountain. Particulars sent free or sample ten cents. Apply to HADLEY & PIERCE, 26 1 47 Hanover street, Boston, Mass.

REYNOLDS'S TURBINE WATER WHEELS!

REYNOLDS'S PATENT SWEEPS THE FIELD! New Improvements; Low Prices; Does not Clog; Has no Complications of Gates or Costly Flume Work; Compact for Shipment; Great Water Saver; THE ONLY WHEEL THAT EXCELS OVERSHOTS. Gold Medal awarded by American Institute for Superiority. Agents wanted in every county. GEORGE TALCOT,
21 13* Late TALCOT & UNDERHILL, No. 96 Liberty street.

WANTED—A SITUATION BY A MACHINIST WHO has been accustomed to superintend Bolt Cutting Machines; also hot pressed Nut Machines. Has worked both solid and open dies for bolt cutting. Address SAMUEL COBURNE, 26 1 Box 624, Pittsburgh, Pa.

WANTED—THE EXCLUSIVE AGENCY OF A LATE and useful Patent for sale by State rights—price about $1000 for United States. If article suits will pay all expenses of making sale. Answers must describe patent, date of issue, and price. Address KENYON & CO., 15 Broadway, New York
☞ Refer to JACOB MILLER, Director Citizen's Bank, N. Y.; A SHERMAN, President First National Bank, Glenn's Falls, N. Y.; GEORGE HARVEY, President Farmer's Bank, Fort Edward, N. Y. 26 1*

VALUABLE AMERICAN AND ENGLISH PATENTS sold for cash on commission. We have the best paying patents in this market, for sale. Agents can make $5,000 a year. Address KENYON & CO., 26 1* 151 Broadway, New York.

WHEELER & WILSON, 625 BROADWAY, N. Y.— Lock-stitch Sewing Machine and Button-hole Machine. 1ti

WIND MILLS—SELF-REGULATING, FOR PUMPing, Grinding Grain, and other purposes, from one to thirty horse power. Also, ORVIS'S AMERICAN FARM MILL for Grinding, manufactured by the EMPIRE WIND MILL MANUFACTURING COMPANY, 21 8 Syracuse, N. Y.

M. BAILEY & CO., PROVISION BROKERS, NO. 40 West Fourth street, Cincinnati. Orders for Provisions, Lard, Tallow, Grease, Oils, etc., carefully and promptly filled. 1 33*

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

STEAM ENGINES—WITH LINK MOTION, VARIABLE automatic cut-off, of the most approved construction; Mill Gearing, Shafting, Hanger, Etc. Address M. & T. SAULT, 7 26* New Haven, Conn.

IMPORTANT TO MANUFACTURERS USING STEAM FOR POWER.
KELLEY & LAMB'S Improved Steam Engine Governor, the only Governor that will give the same speed, with high or low pressure of steam, or the Engine being light or heavy loaded—is considered by those who have used it to have no equal, and is warranted to give satisfaction. Send for Circular
LAMB, COOK & CO., Proprietors.
20 26 Slatersville, R. I.

A STRONG TOOL.—VERY SUPERIOR IRON PLANers, 4½x2; 6½x3¼; 8½x3 feet. Send for Circular before purchasing. (25 5*) L. E. OSBORN & CO., New Haven, Conn.

SAWS! SAWS!! SAWS!!!
WOODROUGH & McFARLIN
MANUFACTURERS OF
PATENT GROUND SAWS,
Dealers in Files, Gummers, Belting, etc.
OLD SAWS REPAIRED PROMPTLY.
Works, Hamilton, Ohio.
Warehouse, No. 10 West Second street, Cincinnati, Ohio. 18 9*

ENGINEERING SCHOOL, FRANKLIN, N. Y., HAS full equipment, and offers thorough instruction. Special advantage—the small cost of living. For Circulars address 21 12* G. W. JOSES, A.M

OXY-HYDROGEN STEREOPTICONS, OXY-CALCIUM STEREOPTICONS, DISSOLVING LANTERNS, MAGIC LANTERNS, Etc. Etc.
A Large Assortment of American, European, and Foreign Photograph Views for the same!! A Priced and Illustrated Catalogue, containing 15 Cuts and 56 Pages, will be sent free by Mail on application.
WILLIAM V. McALLISTER,
21 52 728 Chestnut street, Philadelphia.

GODDARD'S BURRING MACHINE WORKS,
Office, No. 3 Bowling Green, New York,
manufacture the
Patent Steel Ring and Solid Packing
BURRING MACHINES,
Patent Mexican Wool-burring Pickers, Shake, Willows, Wool and Waste Dusters, Gessner's Patent Gigs, Etc.
Orders respectfully solicited, and prompt attention given, by addressing C. L. GODDARD,
12 tf No. 3 Bowling Green, N. Y.

WANTED.—A FIRST-CLASS COACH BODY MAKER. Address Box 357, Cincinnati, O. 1*

$150 A MONTH! NEW BUSINESS FOR AGENTS. [19 13*] H. B. SHAW, Alfred, Me.

TO INVENTORS.—
J. B. TURCHIN & CO., Patent Office 92 and 94 Dearborn street, Chicago, Ill. Patents procured, etc. Branch Office in Washington. Direct Agencies in Europe. Unusual facilities to procure and sell Patents in France, and particularly in Russia. 24 2*

UNION IRON WORKS, RHINEBECK, N. Y.,— Manufacturers and Dealers in Cotton and Woolen Machinery of every description. Card Clothing, Belting, etc. New York Office 91 Maiden Lane. 24 4*

$10,000. I HAVE AMERICAN AND FOREign Patents recently issued, on an article much in demand. The business is a monopoly. I desire to send models to the Paris Exposition, and will sell one half interest in my Foreign Patents giving a party a rare opportunity to make money. Address for particulars, "O. W. T., Care W. B. & Co.," 23 53 Broadway.

TURNING TOOLS.—MY SUBSTITUTE FOR THE slide rest meets with approval from practical men. It is intended for small lathes and light work; will bore out any hole six inches in diameter and two and a half inches deep; will face flanges, turn a piece in the chuck, or round out a curve. Price $10.
EGBERT P. WATSON, Box 773, New York.

GREAT ECONOMY IN FUEL IS OBTAINED BY CARVALHO'S IMPROVED STEAM SUPERHEATER. Priming is prevented, and PURE Steam furnished to the Engine. Highly superheated steam, of any temperature, for Manufacturing or Chemical purposes, produced when required. Is easily attached and very durable. Address HENRY W. BULKLEY, 57 Broadway, N. Y. 24 4*

LENOIR GAS ENGINES, FROM HALF HORSE TO Four Horse-power. Manufactured at the DRY DOCK IRON WORKS, No. 435 East Tenth Street, New York. 17 10*

TO DYERS AND INK MANUFACTURERS.—THE Cheapest form in which you can buy "Tannin," for making a Black Dye, or Ink, is N. Spencer Thomas's Extract of Hemlock Bark. It also colors a beautiful Tan Color. Price only Ten Cents per pound. Send for a Circular. Address the Manufacturer.
N. SPENCER THOMAS,
21 eow tf Painted Post, Steuben county, N. Y.

FINE POWERFUL DOUBLE-LENS MICROSCOPES, of which Prof. Hosford, of Harvard University, says:—"It works well, and you have got it up very neatly." Free by mail for 65c. "The Square Lehs Microscope," 50c; "Little Wonder," 40c. One of each for $1. J. EDWIN KING, Box 2,552, Boston, Mass.
10 9* eow

IMMENSE IMPROVEMENT IN STEAM.—W. C. HICKS'S PATENT STEAM ENGINES save 75 per cent in space, weight friction and parts, with great economy in steam. Adapted to all uses. For circular address the
HICKS ENGINE CO.,
23 eowtf No. 88 Liberty street, N. Y.

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

FOR BEDSTEAD AND FURNITURE MACHINERY, Friezzing, Shaping and Molding Machines, address J. A. FAY & CO., Cincinnati, Ohio. 3atf

ENGINE LATHES, NEW AND SECOND-HAND, 16 to 48 inch swing, 5 to 25 feet bed, first-class tools. Scroll and Screw Chucks, all sizes, Stubbs' Twist Drills and Sockets, Stocks and Dies, Ratchets, Hammers, and all kinds of Machinists' Tools, in store, at the lowest rates, by J. B. FULLER, 24 4] No. 8 Dey street, New York.

SETS, VOLUMES AND NUMBERS. Entire sets, volumes and numbers of SCIENTIFIC AMERICAN (Old and New series) can be supplied by addressing A. B. C., Box No 773, care of MUNN & CO., New York. 5 tf

MODELS, PATTERNS, EXPERIMENTAL AND other Machinery, Models for the Patent Office, built to order by HOLTKE & KNEELAND, Nos. 5 & 7, 530, and 5 2 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN Office 11 tf

MANUFACTURERS OF TEXTILE FABRICS, DUTCHER'S PATENT TEMPLES, adapted to weaving all kinds of goods. Also, THOMPSON'S PATENT OIL CANS, for oiling Machinery; neat and economical. Furnished by 21 13 eow* E. D. & G. DRAPER, Hopedale, Mass.

PATENT POWER AND FOOT-PUNCHING PRESSES, the best in market, manufactured by N. C. STILES & CO., West Meriden, Conn. Cutting and Stamping Dies made to order. Send for Circulars. 17 10*

NEW PHYSIOGNOMY; OR, SIGNS OF CHARACTER—as manifested through Temperament and External Forms, and especially in the Human Face Divine. With more than 1,000 illustrations. By S. R. WELLS, Editor of the PHRENOLOGICAL JOURNAL. In one volume, handsomely bound, $5. Address FOWLER & WELLS, No. 389 Broadway, N. Y.

This work systematizes and shows the scientific basis on which each claim rests. The "signs of character" are minutely elucidated, and so plainly stated as to render them available. It is in the delineation of individual character that the system finds its most useful application The various races and nations are described The Teuton, Celt, Scandinavian, Greek, Mongolian, Indian, Patagonian, African, etc. has each his representative. Portraits, in groups, of distinguished persons of ancient and modern times with biographical sketches and delineations of character, render the work of interest to all. DIVINES ORATORS, STATESMEN, WARRIORS, ARTISTS, POETS, PHILOSOPHERS, INVENTORS, PUGILISTS, SURGEONS, DISCOVERERS, ACTORS MUSICIANS etc., are given. It is an ENCYCLOPÆDIA of biography, acquainting the reader with the career and character in brief, of many great men and women of the past 1,000 years and of the present—such, for instance, as Aristotle, Julius Cæsar Shakespeare, Washington, Napoleon, Franklin, Bancroft, Bryant, Longfellow, Barnes, Irving, Rosa Bonheur, Theodosia Burr Cobden, Bright, Lawrence, Bolivar, Whately, Thackeray, Dow, Knox, Richelieu, Hopper Buckle, Dickens, Victoria, Wesley, Carlyle Motley, Mill, Spencer, Guthrie, Thompson, Alexander etc. Every feature of the book where practicable, has been illustrated with neat and finely executed engravings. AGENTS WANTED. 25 2

THE VALUABLE MILLING PROPERTY, IN THE City of Richmond, at the corner of Arch and Eighth streets, known as the

"FRANKLIN PAPER MILLS,"

for Lease or Sale.

At the request of the owners, we offer for Lease for a long term of years, the above valuable property, the buildings on which were destroyed by fire April 3, 1865. The lot contains an half acre, and is supplied with water from the basin of the James River and Kanawha Company, at an annual rent of three hundred dollars. It has ample water power, which can be applied at three different points, and is never affected by freshets in the river. The property is also supplied with pure Spring Water conveyed to it through iron pipes. The stone and brick walls are still standing, and contain a large quantity of valuable materials suitable for rebuilding. The site is admirably adapted for a first-class paper mill or flouring mill, or other manufacturing purpose, and being in the heart of the city, is believed to be the most valuable mill-site on the market, for the reason that the water rent is cheap and the power superior. For thirty years before its destruction by fire, it was successfully worked as a first-class paper mill. Should a Purchase of the property be desirable, by an incorporated Company, or an association of Capitalists, the owners would be willing to take Stock therein to the amount of the purchase money.

Terms Accommodating, and made known on application to HARRISON, GODDIN, & APPERSON.

P. S.—Northern Capitalists wishing any further information in regard to this truly valuable property, are referred to Messrs. Harrison, Garth, & Co., No. 18 New Street, N. Y. [25 2] H. G. & A.

FOR SALE CHEAP.—THE COPYRIGHT OF AN ENtirely new article that pays a profit of 800 per cent. Particulars can be had of the Proprietor, F. C. FLOYD, 1*j Post-office box 1204, Boston Mass.

WATER WHEELS.—VALENTINE'S PATENT IMproved Turbine is Superior to the Journal Turbine, combining freedom from choking up, cheapness, and durability with great economy of water. Send for Circular. VALENTINE & CO., :5 3* Fort Edward, N. Y.

STEAM BOILER EXPLOSIONS PREVENTED BY the use of Ashcroft's Low Water Detector. Over 5,000 in use. Send for Circular. JOHN ASHCROFT, 50 John street, N. Y. :5 12*

TOBACCO CUTTERS, HAND MACHINES, SUITABLE for Tobacco Dealers and Growers. Will cut chewing and smoking. Manufactory 15 East 27th-st., N. Y. J. THOMPSON. 25 2*

1,500 AGENTS WANTED TO INTRODUCE THE most useful Labor-saving Machine known: RIP, CROSS-CUT, AND SCROLL SAW COMBINED, Self-feeding. Warranted to do the work of three men. Send for Circular. [1*] WM. H HOAG & BRO., 222 Pearl street, N. Y.

R. BALL & CO., SCHOOL STREET, WORCESTER, MASS., Manufacturers of Woodworth's, Daniels's, and Gray & Wood's Planers, Sash Molding, Tenoning, Mortising, Upright and Vertical Shaping, Boring Machines, Scroll Saws, and a variety of other Machines and articles for working wood.
Send for our Illustrated Catalogue. 25 52

BURGH'S MODERN MARINE ENGINEERING— APPLIED TO PADDLE AND SCREW PROPULSION.
By N. P. Burgh, Engineer.
PART V. NOW READY.
To be completed in Fifteen Monthly Parts, and Illustrated with 30 correctly Colored Plates and numerous wood cuts.
Price $1 50 each part.
D. VAN NOSTRAND, Publisher, 25 1 192 Broadway, New York.

FOR SALE.—CLAYTON'S PORTABLE CIDER MILL, Patented July 11, 1865, illustrated in the Scientific American May 5, 1866. It has no equal. Rights for sales. Address W. & L. CLAYTON, Walnut street, 1* between 36th-st and Darby road, West Philadelphia, Pa.

TO PATENTEES AND DEALERS.—BRASS, TIN, and Zinc Goods, of all descriptions, made and introduced to the Trade. Cutting and Stamping Dies, Tools, and Machinery, to order. Prompt attention and satisfaction guaranteed.
J. H. WHITE, Newark, N. J., 25 4* Late with Edward Miller, Meriden, Conn.

INCRUSTATION IN STEAM BOILERS.—TEMPLE'S Liquid removes and prevents Scale from forming. Prevents Corrosion of the Iron. Price reduced. Address A. TEMPLE, Bridgeport, Conn. 25 12*

10,000 AGENTS WANTED, MALE OR FEmale—in every Town, County, and State—to sell Topliff's Perpetual Lamp Wick. Samples sent for 20c; two for 30c. Address, or call on MURPHY & COLE, 25 tf 81 Newark Avenue, Jersey City, N. J.

LOUIS J. CLAUDE, MECHANICAL AND CIVIL ENgineer, will be in Europe, principally in England, for the next twelve months, and will be prepared to undertake any Engineering work, collect any Information required as to Public Works, Manufactures, or Patents, at reasonable rates. Address, care of A. S. WHITON, 19 Broad street, New York.
Refers to Julius W. Adams and E. Worthen, 128 Broadway; A. Craven, Engineer Croton Water Works, New York. 25 2*

TWENTY-FIVE PER CENT OF THE COST OF FUEL Saved annually by the use of Hair and Wool Felt as applied and for sale by JOHN ASHCROFT, 50 John street, New York.
Send for Circular. 25 12*

STEAM AND WATER GAGES, GLOBE VALVES and Cocks, Steam Whistles, Steam and Gas Fitters' Tools, Oil Well Machinery, etc. Wrought Iron Pipe and Fittings, for sale at the lowest rates by JOHN ASHCROFT, 50 John street, New York.
Send for Circulars 25 12*

TWO POWERFUL HYDRAULIC PRESSES FOR Sale by T. W. KRAUSE, 25 eow tf 74 and 76 West Washington street, Chicago, Ill.

TO RAILROAD COMPANIES AND MACHINISTS.—Lathes, Planes, Shapers, and Drill Presses of the most improved design and construction, on hand, for instant delivery.
25 4 E. & A. BETTS, Wilmington, Del.

WANTED,—A PARTY TO BRING OUT AND INtroduce two new Shuttle Sewing Machines (wheel and drop feed). Also, to assist in taking out two or three other Patents. For further information, address Y. L. MELONE, 25 3* Oxford, Ohio, (late of Granville, Ohio.)

PIPE & BOLT CUTTERS, WITH DIES AND TOOLS, in Store, ready for delivery. Steam and Water Pipe, Valves, and all kinds of Steam and Water Fittings, for sale low by J. B. FULLER, 25 4 No. 8 Dey street, New York.

CIRCULAR AND GANG SAW MILLS OF THE MOST approved construction. Grist Mills and Mill Fittings, Wood Working Machinery of all descriptions, in store and for sale low, by J. B. FULLER, 25 4 No. 8 Dey street, New York.

IRON MANUFACTURERS' GUIDE.

LESLEY'S (J. P.) IRON MANUFACTURERS' GUIDE TO THE Furnaces, Forges, and Rolling Mills of the United States, etc. 1 thick 8vo volume. Plates..... $8 00.
Published and for Sale by JOHN WILEY & SON, No. 535 Broadway, New York.

☞ Fresh supply of MUSPRATT'S CHEMISTRY, 2 vols. 8vo, cloth, $25 00. 26 2

CIRCULAR SAWS,— WITH EMERSON'S PATENT MOVABLE TEETH.
Require less power, less skill, less files, saw smoother and better, cut less kerf, the saw always retains its original size Send for descriptive pamphlet, containing information of value to all parties interested in lumber and sawing of any description. Address AMERICAN SAW COMPANY, 25 4* 2 Jacob street, near Ferry street, N. Y.

CAN I OBTAIN A PATENT?—FOR ADVICE AND instructions address MUNN & CO., No. 37 Park Row, New York (or TWENTY YEARS Attorneys for American and Foreign Patents. Caveats and Patents quickly prepared. The SCIENTIFIC AMERICAN $3 a year. 10,000 Patent Cases have been prepared by M. & Co.

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. 4 1y

PORTABLE AND STATIONARY STEAM ENGINES, 5 to 250 Horse-Power. New and Second-hand with or without Boilers, of all kinds, ready for immediate delivery. Shafting Belting, Pulleys, Hangers, Mill Machinery of all kinds, in store and for sale low, by J. B FULLER, 24 4] No. 8 Dey street, New York.

A GERMAN METALLURGICAL ENGINEER, WHO has completed his Academical as well as Practical Studies and who has been, for several years, in the most accomplished and extensive Iron Works in Germany, wants a situation.
He is also very well acquainted with the manufacture of coke, and could make himself useful as a chemist.
Address "ENGINEER," at Mrs. William Kobbé's, Leonard street, New York. 1*

FOR SALE.—A NEW PATENT RIGHT, (March 1866,) on an IMPROVED WEATHER STRIP OR MOVABLE TILE, adapted to French or Casement windows and doors, opening inwards May be constructed of wood or metal. See description and cuts illustrating the improvement in the Scientific American of June 9th. Apply to E. C EVANS. 25 2* Cabinet Post-office, Montgomery county, Pa.

LENOIR PATENT GAS ENGINES,—WITHOUT FIRE, coal, smoke, or noise. Operated by petroleum, or coal gas Ignited within the cylinder by the electric spark. Half-horse to four horse-power for pumping, sawing, turning, hoisting, grinding, etc With portable gas generators for farms and plantations. Manufactured exclusively at the LENOIR GAS ENGINE WORKS, 25 10 435 East Tenth street, near Avenue D, New York.

PATTERN LETTERS AND FIGURES (METALLIC)— For Founders, Machinists, Pattern Makers, and Inventors, for lettering Patterns, etc. All sizes, wholesale and retail.
20 10* KNIGHT BROS., Seneca Falls, N. Y.

THE AMERICAN TURBINE WATER WHEEL, PATented and manufactured by Stout, Mills & Temple Dayton, Ohio, possesses new and valuable improvements, and remedies defects which exist in all other wheels classed under the name of turbine. Per cent of power equal to overshots guaranteed. For descriptive circulars address STOUT, MILLS & SEMPLE, Dayton, Ohio or Oliver, Bro. & Co., agents, 45 Liberty street, N. Y., where sample wheels may be seen. 18 8*

KEEP YOUR CARRIAGES AND WAGONS PROPERly washered, thereby saving 50 per cent of the wear, and making them run easy and still. Use the Patent Washer Cutter, for cutting carriage washers, pump packing, etc.
18 10* KING & SMITH, Middletown, Conn.

$250 A MONTH MADE WITH THE BEST STENCIL TOOLS. For samples and prices address E H. PAYN, Payn's Block, cor. Church and Cherry sts., Burlington, Vt. 18 tf

ROCKWOOD & CO., PORTRAIT, LANDSCAPE, and mechanical photographers, 839 Broadway, New York. This establishment received two Medals, the highest Premiums awarded at the last Fair of the American Institute, for mechanical photographs. Models, letters-patent, and drawings photographed. 19 3m

THE CELEBRATED "SCHENCK" WOODWORTH Planers, with new and important improvements, are manufactured by the Schenck Machine Co., Matteawan, New York. T. J. B. SCHENCK, Treas JOHN B SCHENCK, Prest. 17 tf

GOULD MACHINE COMPANY, NEWARK N. J.
IRON AND WOOD-WORKING MACHINERY, STEAM FIRE ENGINES.
SEND FOR A CATALOGUE. 13 13

AMERICAN PEAT COMPANY.—THIS COMPANY, having the right to operate under five patents, are now selling Machinery and Territorial Rights to the same, to manufacture fuel of the best description for steam or domestic use.
12 26* ALBERT BETTELEY, Agent, 42½ Kilby st., Boston.

$1500 PER YEAR, paid by SHAW & CLARK, Biddeford Me., or Chicago, Ill. 19 13*

CAMDEN TUBE WORKS (OFFICE AND MANUFACtory Second and Stevens streets, Camden, N. J.), Manufacturers of Wrought Iron Welded Tube of all sizes; Peace's Improved Gas Pipe Screwing Machines for both Hand and Power; Pipe Vises, Stocks, Dies, Taps, Reamers, Tongs, and all other tools used by steam and gas fitters Also Upright Drill Presses for both hand and power, constantly on hand and ready for delivery. 22 4*

WOODWORTH PLANERS, BARTLETT'S PATENT Power Mortise Machine, the best in market, Wood-working Machinery, all of the most approved styles and workmanship. No 24 and 26 Central, corner Union street, Worcester, Mass.
17 11* WITHERBY, RUGG & RICHARDSON.

STEAM GAGES—BATES'S PATENT—GOVERNMENT and City Standards.—The cheapest and best steam gages ever offered in this market Also Water Gages, Marine Clocks, Registers, Etc. Model making and repairing promptly attended to. Call and Examine, or send for circular before purchasing elsewhere.
KEEN BROTHERS No. 218 Fulton st.
REFERENCES.—Messrs. Hopper and Douglas U. S. Inspectors; Capt. Lord, M. P. Inspector; Messrs. Todd & Rafferty, No. 4 Dey street; New York S. E. Works, Twenty-third street, E. R.; Wash. I. Works, Newburgh. 20 tf

PORTABLE STEAM ENGINES—COMBINING THE maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 300 being in use. All warranted satisfactory or no sale Descriptive circulars sent on application. Address J. C. HOADLEY & CO., Lawrence, Mass. 1 tf

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 unequaled. They are compact, require little power, and are not liable to get out of order. For descriptive pamphlet address
1 tf W. D. ANDREWS & BRO., No. 414 Water street, N. Y.

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

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

OIL! OIL! OIL For Railroads, Steamers, and for machinery and Burning, PEASE'S Improved Engine Signal, and Car Oils, indorsed and recommended by the highest authority in the United States and Europe. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The "Scientific American," after several tests, pronounces it "superior to any other they have used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No 61 and 63 Main street, Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the world. 1tf

PRESSURE BLOWERS.

PRESSURE BLOWERS—FOR CUPOLA FURNACES, Forges and all kinds of Iron Works. The blast from this blower is four times as strong as that of ordinary fan blowers and fully equal in strength to piston blowers, when applied to furnaces for melting iron. They make no noise and possess very great durability, and are made to run more economically than any other blowing machine. Every blower warranted to give entire satisfaction. Ten sizes, the largest being sufficient to melt sixteen tuns of pig iron in two hours. Price varying from $40 to $345.
FAN BLOWERS, from No. 1 to No. 45, for Steamships, Iron Mills, Ventilation, Etc., manufactured by B. F STURTEVANT, 1 tf No. 72 Sudbury street, Boston, Mass.

ANDREWS' PATENT OSCILLATING ENGINES.—Double and Single Engines, from ½ 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., 1 tf No. 414 Water street, N. Y.

IMPORTANT TO RAIL ROAD TRAVELERS.—THE PORTABLE RAILWAY HEAD-REST or POCKET-BERTH Patented July 4th, 1865. SUBSTANTIAL, SIMPLE, COMPACT.
By means of the above invention, Railroad travelers may sleep at their pleasure, and ride days and nights continuously without experiencing fatigue. To Railway Companies, Railroad Agents, and Hotel Proprietors a liberal discount is made Agents wanted in all the principal cities. Address JOHN R. HOOLE, Selling Agent, 19 13* No. 124 Nassau street, New York.

IMPORTANT TO MANUFACTURERS AND INVENTORS—SMITH & GARVIN, No 3 Hague street, New York, Machinists and Model Makers, are now ready to make proposals for building all kinds of light Machinery, Manufacturers' Tools, Models, etc Satisfactory reference given. 22 4*

PEQUOT MACHINE CO., MYSTIC RIVER, Conn.,
Manufacture the most improved LOOMS
FOR WEAVING TAPES, BINDINGS, WEBBING, RIBBONS, ELASTIC GOODS, AND ALL KINDS OF NARROW FABRICS.

Our Looms will run faster, do more work, are less liable to get out of order than other kinds, and are warranted superior to all others in every respect. Supplies of all kinds furnished for the same. 23 8*

TOWERS' ALCOHOL PROCESS OF TANNING.
Patented Dec., 1865; requires but one-third the time necessary by any other process. It will tan the heaviest hides in less than two months
It will make better leather and more of it. Calfskins tanned by it will average a quarter of a pound more weight than can be obtained by any known process. The leather is better Everyone knows the preservative effect of alcohol upon all animal matter.
It is applicable either to limed or sweated skins or hides. From sweated skins can be made upper leather as pliable and sole leather as easily sewed, as any limed leather in the market.
No complicated or expensive machinery is needed. Any tannery may be adapted to the use or this process, for less than one hundred dollars.
Specimens of the leather and the operation of the process may be seen, and any further particulars obtained, at the office, No. 30 Hanover street, Boston.
21 13* L. FREDERICK RICE, Agent.

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 WM. D. ANDREWS & BRO., 1 tf No. 414 Water street, N. Y.

STIMPSON'S SCIENTIFIC STEEL PENS. PATENTed March 20th, 1866. Agencies wanted in every city of the Union. For Terms address WM B. STIMPSON 24 2* General Agent, 37 Nassau street, Room 38, New York.

CASTINGS—STOVE AND LIGHT MACHINERY, ALL varieties on short notice and at low rates. Freehold Iron Foundery and Machine Shop, Freehold, N. J. Orders received by 22 4* OAKLEY & KEATING, 184 Water street New York.

OLMSTED'S PATENT FRICTION CLUTCH PULLEY is adapted to any machine that runs with a belt and especially to the driving of lines of shafting where it is desirable to occasionally stop a whole line without stopping the main line.
Its distinguishing features are simplicity, durability and adjustability, as it can be adjusted to set in motion heavy bodies gently, or to speed up instantly.
Parties wanting these Pulleys are invited to correspond with WM. M. BETTS, Sole Proprietor, Stamford Machine and Tool Works, 19 13 Stamford, Conn.

ANDERSON & SCHERMERHORN, PATENT AND Model Makers, Gearing Cocks, Valves and Engine, Patterns of every description. Rear No 47 Ann street, second floor 21 4*

IMPORTANT TO COTTON AND WOOLEN SPINNERS. William C Davol's patent mode of working the cam shaft, with other valuable improvements, on Sharp & Roberts's Self-acting Mule. The above mentioned improvements can be seen on application to MARVEL DAVOL & CO.'S Machine Shop, Office on Pond street, Fall River, Mass. 23 4*

ERICSSON CALORIC ENGINES OF GREATLY IMPROVED CONSTRUCTION.—Ten years of practical working by the thousands of these engines in use, have demonstrated beyond cavil their superiority where less than ten horse-power is required. Portable and Stationary Steam Engines, Grist and Saw Mills, Cotton Gins Air Pumps, Shafting, Pulleys, Gearing Pumps, and General Jobbing. Orders promptly filled for any kind of Machinery. JAMES A. ROBINSON, 164 Duane street, cor. Hudson, New York. 10 1y

IRON CASTINGS AND STEAM BOILERS.—THE HINKLEY AND WILLIAMS WORKS, No. 416 Harrison avenue, Boston, are prepared to manufacture common and gun-metal castings, of from ten pounds to thirty tuns weight, made in green sand, dry sand or loam, as desired; also Flue and Tubular Boilers, and "Hinkley's Patent Boiler," for locomotive or stationary engines, warranted to save a large percentage of fuel over any boiler now in use. 13 6*

THE MOST VALUABLE MACHINE FOR BUILDERS and Carpenters, Furniture, Carriage, Agricultural Implement, Sash and Door, Waived and Straight Moulding, 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 20 good mechanics, called the Variety Moulding and Planing Machine. We own 9 patents covering the valuable inventions for machines with upright mandrels. 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.

These machines are manufactured for America and Europe, only at the Hamilton Machine Works, No. 211 East Twenty-second street, New York. All communications addressed there will receive prompt attention. Agents solicited. Send for circular giving full description 15 13*

GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, New York 1 tf

STEAM BOILERS CLEANED AND KEPT CLEAN.—N. SPENCER THOMAS'S Extract of Hemlock Bark. Cheapest and Best article ever discovered for removing and preventing Scale in Boilers. Acts like a charm. Price only Ten Cents per pound. Send for circular. Address the Manufacturer,
N. SPENCER THOMAS,
20 eow tf Painted Post, Steuben Co., N. Y.

CLOCKS FOR TOWERS, OFFICES, ETC., ALSO Glass Dials for illuminating. Address
7 13eow* JOHN SHERRY, Oakland Works, Sag Harbor, N. Y.

SCHOOL OF THE MASSACHUSETTS INSTITUTE OF Technology, Boston.—A professional school for the Mechanical, Civil, or Mining Engineer, Practical Chemist, Builder, and Architect; also provides a general education founded upon the Sciences, Modern Languages, and Mental and Political Philosophy. Requisites for admission:—Arithmetic, Algebra, Geometry, English Grammar, Geography, and the rudiments of French. Examinations for admission, June 4 and Sept 20. Special students admitted to partial courses without examination. For catalogue apply to
6 13eow* WM. P. ATKINSON, ry Secreta

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

THE HARRISON BOILER—A SAFE STEAM BOILER. This new Steam Generator, combines essential advantages in Absolute safety from explosion, in first cost and cost of repairs, durability, economy of fuel, facility of cleaning, and transportation, not possessed by any other boiler.

It is formed of a combination of cast-iron hollow spheres,—each 8 inches in external diameter, and 3/8ths of an inch thick, connected by curved necks. These spheres are held together by wrought iron bolts with caps at the ends. The form is the strongest known: its strength to resist internal pressure very great—unweakened as it is by punching or riveting, which lessens the strength of the wrought iron boiler plate about forty per cent. Every boiler is tested by hydraulic pressure at 400 pounds to the square inch. It cannot be burst under any practicable steam pressure.

Under pressure which might cause rupture in ordinary boilers, every joint in this becomes a safety valve. No other steam generator possesses this property of relief, under extreme pressure without injury to itself, and thus preventing disaster.

It is not affected by corrosion, which soon destroys the wrought-iron boiler. Most explosions occur from this cause. It has economy in fuel equal to the best boilers, arising from the large extent and nearness to the fire of its heating surface, as also from the waved line of this surface which, thoroughly mixing the gases, induces better combustion, and breaking the flame, causes the heat to be more effectually absorbed than in the ordinary tubular or cylinder boiler.

It gets up steam quickly, and with little fuel. It produces superheated steam without separate apparatus, and is not liable to priming or foaming.

It is easily transported, and may be taken apart so that no piece need weigh more than eighty pounds. In difficult places of access, the largest boiler may be put through an opening one foot square. It is readily cleaned inside and out. Under ordinary circumstances, it is kept free from permanent deposit by blowing the water entirely out, under full pressure once a week. It requires no special skill in its management. Injured parts can be renewed with great facility, as they are uniform in shape and size. When renewed the entire boiler remains as good as new. The greater part of the boiler will never need renewal, unless unfairly used.

A boiler can be increased to any extent by simply adding to its width, and being the multiplication of a single form, its strength remains the same for all sizes. It has less weight, and takes less than one-half the ground area of the ordinary cylinder boiler, without being increased in hight.

Any kind of fuel may be used under this boiler, from the most expensive to refuse coal dust.

Drawings and Specifications free of charge. For descriptive circulars or price address JOSEPH HARRISON, JR.,
Harrison Boiler Works, Gray's Ferry Road,
18 13* Adjoining U. S. Arsenal, Philadelphia.

BOLT, SPIKE, AND RIVET MACHINES.—2,000 Bolts of any length, with head of any shape used in the trade, made from inch round or square iron, or under that size, are made per day of ten hours, by one man and boy, on Hardaway's Improved Patent Bolt Machine.

Our Spike Machine, for simplicity, durability, quality, and quantity of work turned out, is unequaled.

Our Rivet Machine is simple, durable, and does good work.

Shop and Territorial Rights for sale by Assignees of Hardaway & Sons.
WHITE & BUTTERWORTH,
P. O. Box No. 292, Baltimore Md.,
17 tf Office No. 2 Exchange Building.

A MESSIEURS LES INVENTEURS.—AVIS IMPORTANT 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 confidence. MUNN & CO.,
Scientific American office, No. 37 Park Row New York

JUST PUBLISHED—THE INVENTORS' AND MECHANICS' GUIDE.—A new book upon Mechanics Patents and New Inventions. Containing the U. S Patent Laws, Rules and Directions for doing business at the Patent Office; 12 diagrams of the best mechanical movements, with descriptions; the Condensing Steam Engine, with engraving and description; How to Invent; How to Obtain Patents; Hints upon the Value of Patents; How to Sell Patents; Forms for Assignments; Information upon the Rights of Inventors, Assignees and Joint Owners; Instructions as to Interferences, Reissues, Extensions, Caveats, together with a great variety of useful information in regard to patents, new inventions and scientific subjects, with scientific tables, and many illustrations. 108 pages. This is a most valuable work. Price only 25 cents. Address MUNN & CO., No. 37 Park Row N. Y. 15 tf

ATMOSPHERIC TRIP HAMMERS. Persons intending to erect, or those using hammers, are invited to call and examine Hotchkiss's Patent Hammer, made by CHARLES MERRILL & SONS, No. 556 Grand street, New York. They are very simple in construction, require less power and repairs than any other hammer. The hammer moves in vertical slides; each blow is square and in the same place. For drawing or swaging they are unequaled, and many kinds of die work can be done quicker than with a drop. They are run with a belt, make but little noise, and can be used in any building without injuring the foundation or walls. The medium sizes, for working 2 to 4 inch square iron, occupy 28x56 inches floor room. Send for circular giving full particulars. 6 tf

"POWER-LOOM WIRE CLOTHS" AND NETTINGS, of all widths, grades, and meshes, and of the most superior quality, made by the CLINTON WIRE CLOTH COMPANY, Clinton, Mass. 10 52*

IMPROVED STATIONARY AND PORTABLE STEAM Engines and Boilers, also Saw Mills, Cotton and Hay Presses, Corn and Flour Mills, on hand and in process of construction. Marine Engines, Iron Steamers, Light-draft River Boats, Barges, Iron Bridges, Tanks, and general iron work constructed to order. Address T. F. ROWLAND,
9 26* Continental Works, Greenpoint, Brooklyn, N. Y.

FOR PATENT STAVE AND BARREL MACHINERY Shingle Machines, Etc., address J. A. FAY CO.,
4btf Cincinnati, Ohio.

Zur Beachtung für deutsche Erfinder.

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

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

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

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

Die Patent-Gesetze der Vereinigten Staaten,

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

Preis 20 Cts., per Post 25 Cts.

INDEX.

ILLUSTRATIONS.

Anchor tripper, Gibson's..... 390
Bed, spring, Cronk's..... 46
Bedstead, invalid, Furman's..... 354
Beefsteak crusher, Doyle's..... 102
Belt stretcher, Rogers's..... 51
Bit fastening, Gordon's..... 342
Bit for horses, Baker's..... 70
Blacking box holder, Jelliffe's..... 91
Blacking boxes, method of riveting, Painter's..... 207
Blind fastener, self-adjusting, Dowell's..... 294
Bolt cutter, Seaman & Thomas's... 390
Bolt cutter, Merriman's..... 338
Bolt cutter, Sweet's..... 423
Bolt header, Davis's..... 190
Boring machine, portable, Allison & Bannan's..... 398
Boring tool, Koch's..... 99
Bow iron, Bidwell's..... 319
Bridge, combination, Lockwood's. 175
Brick machine, Gard's..... 238
Bridle, safety, Hartman's..... 63
Broom head, Silvers's..... 178
Buckle, Frye's..... 318
Button, Barnum's..... 51
Calipers, registering micrometer, Soper's..... 218
Caloric engine, Ericsson's..... 318
Car axles, rolls for making, Cooper's..... 14
Car spring, Douglass's..... 6
Car wheels, system of rolling, Vanstone's..... 47
Carpet fastening, Andrews & Burnham's..... 319
Carriage jack, Woodworth's..... 195
Carriage wheel, Curtis's..... 262
Carte de visite frames, machine for beveling, Bedell's..... 143
Centre board, Hall's..... 242
Chair, nursery, Rainey's..... 262
Cherry stoner, Van Kanel's..... 226
Chimney top, Horton's..... 38
Churn, Ryerson's..... 406
Churn, White's..... 342
Cider mill, Clayton's..... 295
Clamp for stretching shoe uppers, Shaw's..... 362
Condensing and molding mill, Leavitt's..... 95
Connecting link, Kirk's..... 115
Corn harvester, Butterworth's..... 142
Coupling, shaft, Waterhouse's..... 214
Cradle, self-rocking, Helmkamp's. 314
Crutch, Bugbee's..... 314
Culinary vessel, Dembois's..... 382
Dish stand, Lamb's..... 374
Doubletree, Dowell's..... 294
Dough kneader, Loveland's..... 118
Drilling and pumping machine, Clapham's..... 375
Evaporator, sorghum, Skinner's... 254
Evaporator, tubular, Hawley's..... 430
Fishhook, Livermore's..... 102
Fodder cutter, Schooley's..... 302
Foot press, Stiles's..... 254
Forge, mist, Gould's..... 102
Fractures, apparatus for the reduction and retention of, Latta's... 255
Fruit can, Illig & Neuberger..... 278
Fruit jar, Chrysler's..... 282
Furnace for puddling iron, Williams's..... 191
Gage, standard steam, Keen Bros.. 378
Gage, steam, Low's..... 315
Gage cock, Broughton's..... 54
Gage cock, Walker's..... 14
Gas heater, Birkey's..... 162
Governor, automatic stop, Gardner & Robertson's..... 126
Governor, self-closing, Brown's.... 322
Grate, elliptic, Habermehl's..... 67
Grinder and driller, Soper's..... 86
Grindstones..... 223
Grooving tool, Taylor's..... 166
Hammer, atmospheric, Hotchkiss's 258
Hay band machine, Parmelee's..... 210
Hay fork, Garrett's..... 179
Hay fork, Reynolds's..... 131
Hay raking and loading device, Heany's..... 391
Hen's nest, Campbell's..... 122
Hoisting machine, Marvin's..... 79
Horse rake, Adelsberger's..... 62
Horse rake, Hardgrove's..... 78
Hot-air furnace, moist, Dayton's... 239
Hub, metallic, Abbott's..... 214
Jar arrester, McNamee's..... 162
Lamp trimmer, kerosene, Brooks's 126
Lock, Stafford's..... 110
Lock, hoop, Quant's..... 158
Lubricator, open-top suet, Storer's 426
Mail bags on railway trains, apparatus for delivering and receiving, Chavanne's..... 275
Mandrel, expanding, Critchley's... 322
Millstones, method of ventilating, Kemp's..... 362
Mowing machine attachment, Fraley's..... 18
Oars, rigged, Smith's..... 50
Oil cup, Hare's..... 54
Oil wells, packing for, Fowler's.... 150
Oil wells, packing for, Fowler & Morgan's..... 102
Oiler, Broughton's..... 130
Orchestron, Pries's..... 158
Oven, annular, Hoffman's..... 414
Oven, steam, Whitlock's..... 255
Paddle wheel, Choate's..... 342
Paddle wheel, radiating, Haight's. 134
Paddle wheel, self-feathering, Keene's..... 374
Pea sheller, Lewis's..... 174
Pencil sharpener, Shaver's..... 131
Petroleum as fuel..... 82
Pipe, Jeanne's..... 302
Piston packing, Goodfellow's..... 198
Plow, sulky, Pratt's..... 94
Plows, Green's..... 115
Pressure test, Justice's..... 174
Pulley, friction, Brown's..... 354
Pump, Bellingrath's..... 150
Pump, Hooker's..... 214
Railway check, Thomas's..... 246
Refrigerator, Esquimaux, Bunn's.. 422
Road scraper, Blodgett's..... 336
Ruler, parallel, Smith's..... 206
Saw gage, gang, Tracey's..... 114
Saw mill, hand, Talpey's..... 2
Saw, scroll Talpey's..... 230
Saws, device for centering, Rand's 298
Sawing machine, Logan's..... 246
Sawing machine, shingle and barrel head, Low's..... 407
Scissors sharpener, Russ's..... 38
Sewing machine, the Florence..... 1
Sewing machine, motion for, Folsom's..... 274
Sewing machine, three-stitch embroidery attachment for the Wheeler & Wilson..... 159
Shears for plate iron, Hornig's.... 15
Shingle roofing, the Burlington.... 374
Ships, method of ventilating, Wells' 194
Shock arrester, Ladenberger's..... 314
Show case, cigar and tobacco, Brown's..... 222
Skates, parlor and ice, Plympton's. 182
Spinning rollers, Hall's..... 6
Spoke-tenoning and felly-boring machine, Dole's..... 282
Steam, apparatus for superheating, Carvalho's..... 98
Swarm alarm, Snell's..... 46
Tea or coffee pot, condensing, Beaumont's..... 342
Thrasher and separator, Brown's.. 182
Thrashing machines, gearing for, Hubbell's..... 142
Tile machine, Evans, Collins & Smedley's..... 127
Toggle joint and screw press, Griffin's..... 382
Trap, steam, Wilson's..... 19
Tube expander, McConnell's..... 70
Type-setting and type-distributing machine, Alden's..... 22
Valve, balanced slide, Richards's.. 31
Valve, globe, Powell's..... 86
Valve, globe, Chesley's..... 179
Valve, safety gas, Jacobs's..... 410
Valve, slide, Green's..... 338
Valve gear, Woodruff's..... 334
Vise, bench, Jones's..... 411
Wagon brake, Hamilton's..... 335
Wagons, shifting top for, Morse's.. 190
Washing machine, Lutes's..... 339
Washing machine, hand, Van De Mark's..... 38
Washer, improved, Hickman's..... 294
Water cooler, Hopkins's..... 274
Water elevator, Perrine's..... 6
Water wheel regulator, Lakin's.... 226
Watch key, Remington's..... 354
Watch key, Mershon's..... 430
Weather strip, Evans's..... 406
Wood, apparatus for preserving, Robbins's..... 111
Wrench, screw, Conner's..... 406
Wrench, screw, Furlong's..... 110
Wringer and mangle, combined, Palmer's..... 19

MISCELLANY.

A

Absorption, the physics of..... 95
Academy of Sciences..... 274
Acid in spring water, sulphuric.... 211
Acid, new method of making sulphuric..... 166
Acid, phenic..... 425
Activity of Pittsburg, industrial... 220
Advertisement, a telling..... 300
Advertising, advantages of..... 21
Aereon, ascent and return of the.. 381
Aeronautical society of Great Britain..... 280
Agates..... 150
Agent, a new intensifying and toning..... 326
Agnew, note from Dr..... 148
Air by compression, heating of..... 193
Air, inspiring of..... 79
Air in wine tuns..... 261
Air, seeing..... 211
Air, the flickering of hot..... 164
Album for porcelain pictures..... 282
Alden machine, the..... 23
ALGONQUIN and WINOOSKI, the official report of the chief engineers..... 149
Alloys and their discovery, fusible 20
Alloys, composition of..... 261
Amalgamating, improvements in gold and silver..... 229
American Institute, the.....118, 119
Ammonia as a manure, the use of.. 81
Anæsthetic, a new—another use for petroleum..... 297
Apprentice answered, an..... 68
Apprentice seeks information about his trade, an..... 20
Arms, breech-loading..... 222
Art, extension of the photographic 150
Artificial limbs..... 215
Artesian wells of Chicago, the wonderful..... 94
Arts found, one of the lost..... 382
Asbestus..... 422
Association for the prevention of boiler explosions, the..... 195
Astronomers, a suggestion to..... 21
Axle grease, costly..... 198

B

Babbitt metal, how to make..... 196
Balloons, on..... 340
Ballooning in England..... 222
Ballooning, science of..... 200
Bank note plates, renewing worn.. 385
Barley as food for stock, unmalted and malted..... 238
Barometers, testing..... 101
Battery, thermo-electric..... 64
Beef concentrated..... 23
BELLEROPHON, the funnel of the.. 211
*Belt, to lace a..... 52
Belts, concerning..... 55
Beeswax, purifying..... 302
Blast furnace, bursting of a..... 206
Blue vision..... 361
Blue obtained by the reduction of chloroxynaphthalic acid..... 345
Board measure..... 320
Boiler, a collapsed cylinder..... 194
Boiler explosions..... 36
Boiler explosions in western states 231
Boiler incrustations, Prof. Chandler on.....7, 17, 32
*Boiler tubes, cleaning..... 227
Boilers, blowing out..... 84
Boilers, destruction of, by unequal expansion of iron..... 40
Boilers, explosion of in blast furnaces..... 52
Boilers rusting..... 361
Boilers, tubular.....167, 174
Bolides..... 276
Bolts, something about..... 110
Borax in California, discovery of.. 14
Bottles with gelatin, capsuling..... 197
Bounties, tax for equalizing..... 344
Break-down in England, financial.. 379
Breech-loaders in Switzerland, American..... 15
Bridge building—the bridge of the Hartford, Springfield, and New Haven railroad over the Connecticut..... 409
Bromide of potassium..... 24
Buildings, plan for cooling and ventilating..... 49
Bullet, erratic course of a..... 70
Business, humors of..... 398
Butter, the proper temperature for churning..... 231

C

Cable, the new.....115, 190
Caloric, bottled..... 398
Cannon in Europe, American breech-loading..... 210
Can, milk-preserving..... 106
Car axle, a crystalline..... 244
Car wheels, casting..... 68
Car wheels, casting—invention wanted..... 84
Cars, cork springs for..... 424
Carbon through animal and vegetable life, the circuit of..... 71
Cast iron on melted cast iron, cold 132, 163, 231, 245, 380
Cast steel, working..... 56
Cast steel—magnesium crucibles... 263
Cascade of light, the..... 260
Cascade of light in Boston, the..... 244
Castings smooth, to make iron..... 212
Cattle plague, etc.....14, 69, 225, 396
Cavendish society..... 213
Cavern under Lancaster, Pa., probable existence of a great..... 228
Cement, gutta-percha..... 340
Champagne and its production..... 48
Channel ferry, the proposed..... 120
Challenge, water wheel..... 69
Chemistry, the practical value of agricultural..... 198

Chinese workmen..... 208
Chloride of lime for vermin..... 115
Chloroform—describing a circle... 300
Cholera coming, the..... 87
Cholera, cure for..... 320
Cholera, treatment of..... 295, 315
Cholera, the..... 302, 283
*Chuck, spur..... 339
Chrome yellow, preparation of.... 424
Chuck, to tighten a scroll..... 197
Cigar ship at sea, a..... 301
Cigar steamer, launch of Winans's fourth..... 199
Cigar steamer, the..... 245
Cigar vessels not perfect yet..... 150
Cipher writing..... 361, 410
*Circle with a pencil, to strike a... 163
Cisterns, steam in cemented..... 244
Cloth, uninflammable, rendering.. 62
Coal and a substitute..... 399
Coal fields, exhaustion of British.. 383
Coal, its use and abuse..... 15
Coal, the theoretical and actual power of a pound of..... 103
Coating iron with copper—secret processes..... 149
Coffee..... 151
Coffee, a novel mode of treating... 359
Coffee, novel mode of treating..... 430
Coffee, how to make..... 357
Coffee, Liebig on..... 129
Coffee, still nearer perfection..... 427
Coffee, to prevent the loss of aroma in roasting..... 245
Coin and feather in vacuo, a..... 280
Collodio-bromide of silver plates, on the manipulation of..... 208
Collodion without bromine, photographic..... 68
Colors from coal tar..... 178
Commissioner of Patents, report of the..... 176
Commissioner of Patents, report, remarks on..... 199
Compass in iron ships, deviation of the..... 239
Convention, continental telegraphic..... 81
Cooking academy, Prof. Blot's..... 72
Correspondence, our special...378, 392
Cotton crop, estimates about the.. 394
Court houses, the foulness of..... 230
Counter-weighting machinery..192, 228
Crank motion, the..... 5
Cranks, a question of..... 69
Cream, burying..... 180
Creosote for preserving timber..... 36
Crimean war, projectiles used during the..... 244
Croquet, the game of..... 362
Crucibles, manufacture of..... 436
Crucibles, making in molds..... 24
*Cryptography..... 295, 395
Currency, Clark on the..... 150
Currency delusion, the..... 243
Curiosity made useful, a natural.... 294
Curtains for theaters, steel..... 78
Cylinder, a large steam..... 53

D

Day changes, where the..... 228
Dead letters at auction, sale of..... 83
Developer, another new..... 390
Dies, hardening..... 280, 339
Disinfectants and the cholera..... 343
Disinfectants, Dr. Vœlcker on..... 145
Disease, popular remedies for..... 280
Do it well..... 215
Dome, lighting up of the Capitol... 97
*Drawing, mechanical..... 340
Drill for hard wood, the best..... 212
Dust from shops, drawing..... 212
Dyeing, a new process for indigo.. 281

E

Earth, a body falling through the.. 339
Economy, system a means of..... 415
*Elbow, to turn an..... 165
Electricity from combing the hair. 244
Electricity in a cotton mill..... 238
Electricity in deep sea sounding... 254
Electricity to paddle engines, application of..... 343
Electricity, two kinds..... 50
Electrotyping, preparing casts for. 357
Engine, a new gear-cutting..... 2
Engine, a petroleum..... 84
Engine, Baird's simplification of the screw..... 361
Engine shop in France, the largest. 147
Engine, the Avery..... 164
*Engine, the Lenoir gas..... 259
Engines and boilers, patching..... 203
Engines, experiments with traction 225
Engines, improvements in gas..... 266
Engines, tank..... 19, 54
Engines, traction..... 36
Engineers, hot..... 303
Engineers, incompetent..... 412
Engineering job, a stubborn..... 382
Engineering, modern marine..... 304
Enterprise in China, American..... 306
Enterprise, newspaper 165
Enterprise, Western..... 148
Examiners' pay, increase of..... 317
Excursion, the European naval.... 393
Exhibition, Austrian industrial.... 72
Exhibition, Australian intercolonial..... 362
Exhibition in Brazil, agricultural 393, 395
Exhibition, report on the French.. 119
Exhibition, the great Paris..... 23, 71
Exhibition, what to send to the French..... 167
Experiments, a brilliant series of.. 247
Explosions, prevention of steam-boiler..... 52
Explosions, record of boiler..... 128

F

Factories, hours of labor in English..... 103
Fair, exhibitors at the French..... 87
Family, a happy..... 151
Farmer's club..... 114, 183
Feed for low-pressure boilers, heating..... 21
File-cutting machinery..... 23
Fire-arms, breech-loading..... 116
Fire, St. Elmo's..... 322
Fishhooks, how they are made..... 396
Fleet, failure of the machinery of the new screw..... 344
Flower seeds, planting..... 179
Flue, collapse of an English..... 324
Flues, weakness of large..... 276
Fly wheels for long shafting..... 215
Food and its adulterations..... 379
*Foot lathe..... 3, 18, 34, 50, 66, 83, 99
Fortifications, granite and iron.... 35
Franking privilege, abuse of the.. 428
France, new things in..... 213, 261
Freights, improved facilities in railroad..... 379
Fuel, water..... 334

G

Galvanic battery, a cheap..... 284
Gardening, items for lovers of..... 326
Gas explosion 339
Gas lighting 87
Gas mains, wrought iron 46
Gases, utilization of blast furnace.. 177
Gears, on 193
Gears, relating to 209
Gears, table for the teeth of..... 85
Gear wheels 148
Genius, another tax on 323
Geology of the central railroad waters 71
Geological periods, length of..... 212
Gilders' composition for frames, etc..... 148
Glass, thallium 345
Gleanings from the Polytechnic discussions..... 377, 411
Glutinous substances, on a method of drying 63
Gold and silver, manufacture of... 426
Gold and silver, production of.... 256
Gold from solutions, to recover.... 260
Goiter, artificial production of..... 424
Grenade, hand..... 300
*Grindstones 223
Grocery, the right kind of a..... 323
Gun-cotton 21
Gun-cotton, storage of..... 396
Gunpowder..... 4
Gutta-percha and india-rubber, decay of..... 26

H

Hats are made, the way felt..... 427
Hay in the mow, weight of..... 98
Health and how to keep it..... 96
Heat, one thing about..... 103
Heat of steam, utilizing the 294
Heat through water, the passage of 183
Hoist, a steam..... 266
Housekeepers and others, useful hints to..... 165
How does he do it? 340
Hydrogen, sulphureted..... 345

I

Ice, a steam car upon..... 54
Ice, formation of anchor..... 227
Ice-making apparatus, Keller & Henderson's..... 67
Ice, strength of..... 266, 244
Implements, ancient war..... 395
Incrustations, Mr. Winans on..... 84
Induction coils..... 338
Industry, New England..... 337
Information wanted 151
*Injector, the Giffard..... 211
Ink, indelible..... 256
Ink, permanent for writing in relief on zinc 378
Insurance company, the Midland steam boiler..... 263
Insurance companies, prosperity and adversity of..... 87
Internal revenue commission, report of the..... 103
Invention, a spiritual..... 282
Invention, novelties in..... 264
Invention, use of an..... 148
Inventors..... 302
Inventors, bill to tax..... 428
Inventors, taxing..... 320, 322, 343, 360
Inventors for appealing from one set of examiners to another set, bill to fine..... 320
Investment, a paying..... 262
Iron, an experiment with clean.... 260
Iron, exceedingly hard..... 62
Iron, rusty..... 163
Iron, smelting..... 424
Iron, some facts in relation to..... 16
Iron, straightening railroad..... 68
Iron, the maximum strength of.... 212
Iron workers, African..... 164
Ironclads, English..... 7, 261
Ironclads, the French..... 177
Ironclad navy, French..... 285
Iron-plating of granite forts 15
Items..... 197

J

Jack at Westminster, a steeple..... 163

K

Kangaroo on a tread-mill..... 257
Ketchup, mushroom..... 192

L

Laquers..... 377
Lake Superior mining..... 147
Lamp, explosion of a petroleum... 263
Lamp wicks, negative slip of kerosene..... 6
Lathe, a seven-tool..... 282
Lathe tools, hand..... 428
Lathes, to makers of..... 20
Launch, failure of a..... 284
League, American riflemen's..... 325
Lectures, Prof. Doremus's 278, 289, 325
Letter boxes on horse cars..... 314
Letters patent, changes in forms of 399
Lice on cattle..... 116
Lifts, cupolas for hydraulic..... 197
Light, Arago's plan for proving the true theory of..... 80
Light, a powerful source of artificial..... 424
Light in a bowl of water..... 196
Light to a large audience, exhibition of polarized..... 67
Light, velocity of..... 49
Light, regulating electric..... 164
Lightning, on deaths by..... 207
Liquors, the difference between distilled and fermented..... 7
Lock, Capt. Turner's trigger-guard 197
Lock-outs, an English capitalist on 266
Locomotive, another huge..... 135
Locomotive, improved by practice, not by theory, the..... 314
Locomotive, Fairlie's double..... 70
Locomotive for the Mont Cenis railway..... 130
Locomotives, difference in the operation of..... 424
Locomotives, the "Scientific American" on..... 213
Locomotives, trussed connecting roads for..... 225
Logs, measuring..... 430
LORD CLYDE, the..... 7
Lottery and gift swindles..... 245
*Lumber, sawing..... 319, 396

M

Magnesium amalgam, curious properties of..... 317
Magnets, the way to make..... 228
Manganese, alloys of..... 117
Mandrels, lateral motion for saw.. 300
Manias..... 39
Manufactures, statistics of..... 86
Manufacturers, prosperity of our.. 48
Mapes, death of Prof..... 55
Matches, composition of lucifer.... 117
Match making..... 278
Machinery, power required to drive..... 109
Machinery, second-hand..... 135
Meat, appearances of good and bad 345
Mechanism, velocity of..... 231
Melting pots..... 245
Metals, effects of heating, rolling, hammering and annealing..... 52
Meteoric stones, the composition of 213
Metrical system, the, etc 212, 320
Metric system, adoption of the.... 415
Might and magnitude..... 376
Mill picks, how to make..... 116
Miners' ways and formation of..... 207
Mint, the British..... 146
Mistake, a slight..... 361
Model from Freeport, Ill., destroyed..... 16
Molders, co-operative..... 265
Molders, hints to..... 163
Molders, query for..... 116
Monitors in England..... 394
MONADNOCK, the ironclad..... 243
Money market, the way it is supplied..... 86
Motion, all things in..... 279
Motion, the crank..... 5
Motor, exhibition of a new electro-magnetic..... 263
Motors, hydraulic..... 36
Movement, recent photographic... 392
Music Hall, new..... 410

N

Nations, educating other..... 299
NAUTILUS, the..... 285
Navigation, experiments in aerial. 363
Negatives, retouching..... 381
Newspaper, how to circulate a.... 134
Newspapers, how to preserve..... 303
Nitro-glycerin..... 302, 375
Nitro-glycerin again—how to make it safe..... 410
Nitro-glycerin, another explosion of..... 283, 284
Nitro-glycerin for blasting..... 166
Nitro-glycerin, or blasting oil, experiments with..... 322
Nitro-glycerin, the cause of its premature explosion..... 304
Nitrous-oxide as an anæsthetic..... 225
Nott, death of Dr..... 104
Novelty, a..... 362
Novelties in invention..... 364
Nuisance, the cinder..... 148

O

Observatory, U. S. naval..... 3
Oil cup, Broughton's..... 210
Oil, extraordinary discoveries of.. 131
Oil, lard..... 4
Oil well on fire, an..... 129
Oil smellers..... 181
Oils, oxidation of vegetable..... 214
Oils, production of odoriferous.... 359
Opal mine in California, the..... 78
Organ, pneumato-electric..... 285
Oxygen and binoxide of hydrogen, experiments and observations on..... 358
Oxygen, the industrial application of..... 306
Ozone and cholera..... 84
Ozone, Schonbein on..... 277

P

Paddle wheel, summit radiating... 182
Pain, new agent for deadening.... 305
Paint, water proof..... 78
Painters, query for..... 340
Paper from wood..... 366, 277
Patent law, should there be a..... 426
Patent office, administration of the 54
Patent office, a reform needed in the..... 358
Patent office, condition of the..... 119
Patent office, Confederate States.. 340
Patent office, work at the..... 182
Patent office reports, illustrations for..... 70
Patentees, bills concerning..... 321
Patents, extension of..... 274
Patents in Congress, legislation about..... 363
Patents, suggestions relative to legislation on..... 215
Patents, the limited nature of..... 383
Patterns, casting from iron..... 196
Patterns, milling tool..... 149
Pear and apple, the best for general cultivation..... 52
Pearl fishery, what I saw of the.... 276
Perpetual motion, etc., 38, 260, 261, 299, 319*, 344 361
Petroleum and its products..... 412
Petroleum as a fuel..... 82*, 87
Petroleum as a steam fuel..... 317
Petroleum as fuel for steam engines to be tested..... 247
Petroleum as a damaging lubricator..... 426
Petroleum, coal oils and..... 345
Phenomena, periodic..... 242
Photographs, copper..... 324
Photography in colors..... 79
Photographs, sun..... 102
Photo-lithography with half-tone.. 281
Photo-miniature, the—Beecher's formula..... 115
Photographic manipulation..... 143
Photographic process for printing, new..... 127, 206
Photographic washing apparatus, a new..... 357
Photography, magic..... 380
Photography on silk..... 319
Photography, white enameled plates for..... 319
Piano, a flint..... 284
Pipes and cut-outs, steam..... 300
Pipes, meerschaum..... 138
Piston motion and fly wheel..... 68
Pitch of gears, the..... 4
Plating iron with copper..... 39, 68
Point overlooked, a..... 183
Polish, black walnut..... 116
Portraits, on the artistic coloring of photographic..... 337
Power required to drive machinery, the..... 20, 247
Power required to start a train.... 315
Press, opinions of the..... 5
Press, sterhydraulic..... 380
Press, the principle of the hydrostatic..... 148
Primaries, Prof. Mapes's theory of the progression of..... 119
Prints from photographs, ink..... 97
Projectiles, cast iron..... 408
Projectiles, collection of..... 226
Progress, some steps in engineering..... 96
*Proteus—the new optical deception..... 179
Pulley blocks, differential..... 65
Pulleys, large and small..... 227, 132
Pulleys, popular fallacy of large... 180
Pulleys, size of..... 69
Pumps, a question in relation to... 109
Pumps, inefficient..... 317
Pumps twenty-four feet under water, inspecting..... 297

Q

Question, the eight-hour..... 297
Question, our position on the expansion..... 55
*Question reviewed, the gear..... 299
Question, the cast-iron..... 302
Question, the patent beer..... 132
Questions, several..... 280

R

Race, the naval..... 119, 153
Rails, Bessemer steel..... 142
Railroad around New York, great plan for a steam..... 231
Railroad trains, atmospheric resistance to..... 436
Railway trains, speed of..... 52
Railway, the Broadway subterranean..... 135
*Railways for streets, elevated..... 318
Razor, shaving with a wooden..... 269
Razors 317
Readers, a word to our youthful... 160
Recipes, useful..... 34
Reciprocity with the Canadas..... 87
Reformers, city..... 303
Refuse matter, utilization of..... 408
Reviewer reviewed, the..... 260
Rifles for sportsmen, breech-loading..... 399
Rollers, printing..... 206
Rolling mills, Pittsburgh..... 180
Ropemakers work, how..... 202

S

Safe, a magnetic..... 245
Salt and soda..... 294
Salt mine, an extensive..... 294
Salt, the solubility of..... 227
Sanitary museum, American..... 85
Sanitary regulations, effects of..... 53
Saws and other articles, hardening 144
Saws, information for running circular..... 260
Sawyer answered, a 245
Sawyers, to..... 212
Schools, effects of free..... 51
Schuylkill, natural purification of.. 68
Screw cutting..... 4, 84
Screw cutting, gears for..... 132
Securities, explaining government. 67
Serpents, Pharaoh's..... 52
Serpents, a substitute for Pharaoh's 69
Serpents' eggs, the way they are made..... 30
Sewerage as a manure, town..... 183
Shellac, solvent for..... 21, 100, 163, 212
Ship, a tight 143
Ship launching 366
Ship yards, our..... 134
Ships at sea, armor-clad turret..... 158
Ships' boats, safety apparatus for lowering..... 134
Ships by the force of the wind, pumping..... 324
Ships from rust, to preserve..... 167
Ships, ill-ventilated, over-crowded. 303
Ships, safe passenger..... 166
Shoes, new substance for soling..... 143
Silex or silica, pure 211
Silk, spider 115
Silk worm, a plea for the ailanthus 213
Silver, dead surface on..... 227
Silvering, a simple process for 246
Skating, comfortable 72
Skylights, engine-room..... 160
Smoke, burning..... 114
Smoke of the river, the..... 71
Snow storm in a house..... 34
Sodium amalgam..... 323
Sodium dangerous—the sea set on fire 378
Solar system, the..... 277
Solutions, hot and cold..... 281, 320
Solvents for gold, new..... 301
Something really novel..... 37
Spinning, improvements in ring.... 68
Stamps, something about..... 52
Statistics of Ohio..... 225
Starch works, a visit to the Oswego 341
Steam boilers on the Mississippi, trouble with..... 299
Steam boilers, western..... 282, 300
Steam boilers, safety apparatus for 325
Steam in cemented cisterns..... 244
Steam, visibility of..... 330
Steamers, foreign and American... 283
Steel, blueing..... 52
Steel pens, scientific..... 392
Steel, tool..... 150
Steel, the way it is made in Jersey City..... 39
Stillman, Thomas B..... 35
Stockings, American cotton..... 193
Stomatoscope 319
Store, a novel..... 86
Strike, effect of a..... 306
Strikes..... 357
Strikes will succeed, when 363
Stubborn engineering job, a..... 382
Stuffing box..... 158
Sugar, making maple..... 192
Sugar, the manufacture of beet.... 425
Suggestions..... 69
Sunbeam, engineering with a 64
Suspension bridge at Cincinnati, description of the 353
Suspension bridges of the world... 224
Swindle, another patent..... 165
Swindles, lottery and gift..... 245
Switch, Tyler's safety..... 260
Switches, safety..... 49
Sword blades in India, manufacturing and tempering..... 47

T

Taps 280
Taps for cast and wrought iron, the manufacture of..... 412
Taps, how they are made in New England 340
Taps, machine..... 244
Taps, relating to screw..... 196
Target, the HERCULES..... 31
Technology, Massachusetts institute of..... 209
Telegraph, the Atlantic, meeting of the new company..... 240
Telegraph, the Russian..... 117
Telegraphing, queer..... 38
The long and the short of it..... 280
Thread manufactory, an extensive. 63
Timber, creosote for preserving... 84
Timekeeper, European pocket..... 230
Titanium, metallic..... 67
Tomato, healthful effects of the,... 391
Tools speed of cutting 300
Torpedo boat, remarkable history of..... 406
Torpedoes and schoolboys..... 164
Torpedo experiments in England.. 407
Toy, a new scientific..... 340
Tree, the twenty-five thousand dollar..... 191
Trichina 190
Trichina in American pork..... 276
Truth, an unpalatable..... 324
Tubes, the manufacture of steel.... 257
Tunnel, a long..... 335
Tunnel, Mont Cenis..... 131
Tunnel, the lake..... 94
Turpentine as fuel, novel application of..... 324

U

Universe, room in the..... 215

V

Vacuum and the indicator..... 206
Vacuum, filling a..... 164
Varnish, a submarine..... 378
Varnish, five hundred dollars reward for a..... 7
Varnishes for oil paintings and lithographs..... 19
Varnishes, the way, are made..... 85
Velvet, American..... 49, 394
Verd-antique in the United States. 4

W

Wafers, manufacture of..... 342
Wages, high..... 283
Wages in Pittsburgh..... 364
Walnut, the finish of unvarnished. 85
Watch factory in Illinois, a..... 117
Watch hands, how to color red.... 197
Watches, winding..... 212
Water freezing at a depth of twenty-five feet..... 178
Water, gigantic scheme for supplying London with..... 71
Water supplied to cities, filthy..... 21
Water wheels, a question in relation to..... 21
Water wheels for the South..... 240
Weights and measures..... 393
Weights and measures, probable adoption by the present Congress of the French system of.. 169
Weights and measures, name of.... 305
Weights and measures, the decimal system of..... 264
Well, a sulphur..... 266
Whisky, a large yield of..... 54
Whistles as signals on trains..... 323
Whitewash, a good..... 235
Williams, death of C. Wye..... 316
Wire drawing, new patent process in..... 266
Wire manufactory, large..... 178
Witch hazel, a believer in..... 163
Witch hazel, the truth in regard to 228
Wood, Burnetizing..... 119
Wood turning at high speed..... 423
Work for boys..... 344
Works, new and valuable scientific 21
Workmen coming to America, English..... 298
Workingmen's associations..... 430
Workingmen, education of..... 393
Workshops, discipline of the..... 96
Workshops, fire-proof..... 199
Workshops of Clinton, Mass., the.. 146
Workshops of Manchester, England..... 160
World growing larger, is the..... 427
World move, how fast does the.... 383

Z

Zinc, way to granulate..... 212
Zinc plates, ready mode of amalgamating 246
Zinc plates for preserving boilers from corrosion..... 247

PATENT CLAIMS.

A

Air, apparatus for supplying a continuous flow of..... 218
Air, apparatus for carbureting, 41, 57, 74, 233, 234, 267, 268, 308, 418
Album, porcelain and card..... 218
Alkali, manufacture of caustic..... 402
Alkali, process of recovering waste 268, 307
Alkali, putting up and preserving caustic..... 122, 170
Alphabeticon..... 42
Altiscope..... 200
Amalgamator, 169, 202, 232, 267, 289, 290, (4), 401
Amalgamating pans, composition for coating..... 73
Anchor..... 384, 435
Anchor tripper..... 88
Animal and vegetable substances, apparatus for packing..... 218
Aniline, coloring matter from..... 203
Ankle supporter..... 216
Annealing box..... 328
Annunciator..... 41
Apple corer and slicer, etc..... 153, 186
Artificial limbs, 9, 57, 74, 185, 202, 270, 328, 386
Ash box..... 309
Ash sifter..... 308
Auger, etc..... 56, 74, 89, 251, 269, 401
Augers, gages for..... 402
Auger, hollow..... 419
Awning..... 263
Ax..... 201
Axes to their handles, attaching... 420
Axes, machinery for hammering heads of..... 227
Axle box..... 73, 201, 248, 369 (2)
Axle box cover..... 266
Axles for vehicles and journals for machinery..... 137

B

Baby walker..... 434
Bag fastener..... 226
Bag frame..... 309, 434
Bag holder..... 105, 250, 267
Bag, traveling..... 89
Baggage check..... 218
Baker, griddle-cake..... 251
Balance..... 185
Baling press..... 170, 350
Band machine..... 10
Banjo 311
Bank notes, manufacturing, etc. 371 (2)
Bark, apparatus for making extracts from..... 386
Barrel head..... 89
Barrel head machine..... 154
Barrels and other vessels..... 287
Barrels, composition for lining..... 400
Barrel, machine for compressing the cylinders of casks upon their heads to make a tight..... 419
Basket 170
Bath, compressed air..... 351
Bath, steam..... 402
Bath tub, electrical 37
Bayonet attachment..... 268
Bed bottom, 26, 42 (3), 58 (2), 121, 151, 152, 171, 200, 234, 251, 252, 268, 269, 326 (2), 320, 348, 349, 366, 368, 369, 384 (2), 385, 419, 422, 435
Bedstead, sofa, folding, etc., 41, 73, 122, 137, 169, 249
Bedstead fastening..... 287
Bedstead, invalid..... 184, 186, 234, 348, 433
Beehive..... 9, 25, 137, 138, 233, 267, 327
Beer, apparatus for preserving..... 402
Beer faucet..... 41, 216, 250, 307, 338, 368
Beer, process for making..... 187
Bell, call..... 40, 233, 419
Bell, house..... 434
Bells, harness..... 74
Belt coupling..... 89
Belt fastening..... 9
Belt stretcher..... 57
Belting for machinery..... 200
Beverage..... 368, 401
Billard cue..... 88
Billard indicator..... 73
Billiard register..... 121, 370
Bit brace..... 351, 419
Bit, curb..... 88
Bit for boring holes..... 89
Bit holder for braces..... 11, 73
Bit stock..... 42
Bits in braces, securing..... 387
Bits, machine for making auger.... 385
Blacking brush..... 154, 320
Blacking for harness..... 320
Blacking, manufacture of..... 120
Blast furnace..... 310
Blasting, etc..... 11 (2), 400
Blasting, plug for..... 188

Blind fastening, etc.....122, 217, 387, 435
Blind slats, machine for wiring.... 104
Blind slats, tenoning..... 310
Blind splint machine..... 122
Blinds, machine for boring..... 121
Block disengaging hook..... 158
Blower, steam, etc.....89, 187, 249
Blow pipe.....201, 249
Boats, detaching from davits, 235 270, 417
Bobbin for spinning.....42, 330
Bobbin, weft..... 250
Boiler feeder.....170, 290, 370, 418
Boiler for culinary purposes....232, 386
Boiler furnace, steam..... 218
Boiler flanges, machine for turning 403
Boiler heads, machinery for forming flanges upon..... 385
Boilers, guard plate for..... 155
Boiler thimble..... 368
Boiler tube..... 327
Boiler tubes, apparatus for cleaning.....187, 202
Boiler tubes, tool for cutting off.217, 419
Bolt..... 137
Bolt fastening.....307, 327
Bolt-heading machine, 120, 123, 158, 170, 217, 267, 268, 433
Bolt, spring..... 403
Bolt, screwing machine, etc.....8, 121
Bolt, sash and door..... 420
Bolts, machine for making.....234, 268
Bone black, purifying..... 369
Bones for manure, etc., mode of grinding..... 350
Bonnet frame..... 216
Books, machine for curving the backs of..... 432
Boom jaws, guide for..... 387
Boot and shoe.....57, 154, 403
Boot blacking, etc.....120, 184, 200
Boot crimp..... 120
Boot-jack, etc.....288, 386
Boots and shoes, machine for making, etc.....155, 169
Boots and shoes, process of preparing wood for..... 327
Boots and shoes, mode of securing tips to..... 201
Boots and shoes, piping for..... 250
Boots, crimping..... 234
Boots, cutting uppers for balmoral.....57 (2)
Boots, mode of lacing..... 184
Book-leaf turner..... 41
Bosom and collar, paper..... 432
Bottle filler..... 416
Bottle, graduated..... 122
Bottle handle..... 107
Bottle stopper, etc..104, 154, 185, 217, 287, 421
Bottles, frame for securing liquor and other..... 235
Bottles, tool for holding glass..... 387
Bottling liquid, apparatus for..... 185
Bouquet holder..... 216
Bow irons for carriages..... 73
Box rail, railroad..... 10
Boxes, detecting check..... 384
Brad-awl handle..... 122
Braiding machine.....137, 171
Braiding machines, carrier for.... 435
Braiding machines, yarn-delivery apparatus for..... 416
Bran duster..... 169
Branding tool..... 90
Brazier for cooking stoves or ranges..... 136
Bread and meat cutter..... 268
Bread, apparatus for making aerated..... 91
Bread, the manufacture of..... 11
Bread, soap, and black lead, machine for cutting..... 138
Breast collar..... 74
Brick machine, etc, 88, 90, 152, 155 169, 202, 248, 269, 288, 330, 347, 350 368, 369, 386, 402 (2), 416 (2), 417, 419, 420 (2), 435
Bridle, safety, etc.....88, 416
Bridges, method of turning.....416 (2)
Bristles, machine for combing, etc.....154, 289 (2), 349
Bridge.....136, 288
Bronze powder, manufacture of... 248
Broom.....40, 310, 420
Broom clasp.....10, 385, 418, 419
Broom corn and sorghum strippers..... 200
Broom head, 11 (2), 16, 25, 41, 57, 104, 106, 168, 216, 217, 233, 248, 249 (2), 267, 269, 287, 289, 307, 309, 327 (2), 329, 347, 349, 369, 385, 418, 433
Broom heads, stocks for..... 417
Brush (various kinds), 75, 168, 309, 326, 330, 347, 367, 402
Building block..... 185
Bugle, horn, cornet, etc..... 137
Buckle, 5, 26, 75, 88, 137, 138, 139, 268, 327, 347, 370, 385, 401 (2), 418, 434
Buckle clasp..... 403
Buckles, machinery for making.... 10
Bucket, elevator..... 10
Bucket for wells, self-tilting..... 400
Bullets for small arms..... 248
Bullets, machine for molding..... 185
Bullion, process for refining..... 217
Bung for beer casks..... 385
Burglar alarm, 185, 186, 201, 203, 328, 348, 402, 419
Burning fluid.....137, 251, 290 (2), 347
Burial bar, air-tight..... 434
Burial case.....154, 169, 327
Burner, hydro-carbon..... 218
Burnishing machine..... 106
Butter mold..... 290
Butter worker.....202, 326
Button, 130, 138, 187, 233, 289, 290, 327, 348, 368
Button attachment for apparel..... 309
Button fastening.....288, 349
Button-hole cutter..... 249
Button, swivel..... 217
Buttons, apparatus for securing to fabrics.....169 (2)
Buttons, machine for pressing glass 267

C

Cable stopper..... 418
Cage for hoisting purposes, etc..... 347
Calculating machine..... 57
Calipers.....26, 57
Camp stool..... 121
Canal propulsion, device for..... 187
Candy, manufacture of..... 269
Cane mill..... 336
Cane stripper.....267, 384
Can for tea, sugar, etc.....10, 310
Cans, apparatus for expelling air from..... 267
Cans, manufacture of..... 266
Canvas stretcher..... 435
Canteen and lunch box..... 122
Capstan by steam, working a..... 153
Carbonic acid from mixtures of gases, method of separating.... 400
Carbonic acid, method of charging water with..... 400
Carbonic acid gas, method of preserving and storing..... 400
Carbureting machines, apparatus for forcing air into..... 347
Caramel, manufacture of dry..... 203
Carpet bag..... 170
Carpet bag frame..... 417
Carpet lining, fastener, stretcher, etc.....8, 42, 168, 184, 327, 402 (2)
Car axles, machine for determining the load of..... 139
Car break 25, 40, 74, 105 (3), 123, 169, 185, 200, 203, 218, 235, 287, 308, 327, 344, 400
Car coupling 8, 10, 25, 75, 90, 137, 153, 184, 186, 202, 248 (2), 249, 252, 310 (2), 367, 385, 386, 401, 417, 434
Car seat, spring, truck, etc. 202, 216 (2), 218, 307 (2), 310, 402, 418, 420
Car wheel for lubricating purposes 385
Car wheel, etc.....106, 138, 152, 184, 309
Cars, mode of stopping and starting.....338, 432
Cars on railways, improved method of propelling..... 348
Cars on springs, mode of suspending..... 432
Cars, wooden mat for..... 433
Carriage, etc.....248, 307, 329
Carriage axles, device for lubricating..... 310
Carriage bows, attaching props to. 369
Carriage doors, landau..... 187
Carriage seat, spring, wheel, hub, top, etc. 26 (2), 42, 88, 90, 121, 168, 170, 202, 232, 248 (2), 308, 309, 310, 350 (2), 369, 384
Carriages, attaching and detaching breeching straps from..... 41
Cart..... 184
Cartridge.....11 (2), 107, 233, 416
Cartridge cases, machine for making..... 310
Cartridge, metallic, etc.....168, 310
Cartridges, priming..... 201
Carding machines, card for..... 330
Casks, barrels and kegs, manufacture of..... 402
Caster for furniture.....26, 121, 419
Casters to furniture, mode of attaching..... 104
Castings, method of making molds for..... 417
Castings, apparatus for molding... 433
Cast iron, method of combining wrought iron with..... 384
Cattle, device for watering..... 202
Cavalry accoutrements..... 74
Cellars, apparatus for draining.... 248
Cement, etc.....42, 105, 197
Centrifugal machine....137, 233 (2), 432
Ceramic ware, mode of securing photographic pictures on..... 123
Chair, etc. 9, 121, 122, 186, 310, 369, 370, 384 (2)
Chair and walker for children..... 348
Chairs, construction of..... 290
Chain, elastic..... 329
Chain hook or cable..... 120
Chain links, machine for stamping. 307
Chains, die for working links into. 434
Chamber pot, etc.....105, 249, 419
Charcoal, animal..... 234
Chase, printer's..... 42
Check hook..... 251
Cheese box, etc.....330, 402
Cheese, manufacture of..... 267
Cheese, preparing for market..... 186
Cheese, turning..... 186
Cherry stoner..... 370
Chess board..... 170
Chimney cap.....89, 106, 216
Chimney holder and fastener..... 120
Chisels, holder for..... 269
Cholera, method of treating..... 252
Chronographs, electro-ballistic.... 43
Chuck..... 369
Chuck, etc., screw-cutting.....105, 154
Churn 42, 74 (2), 75, 104, 105, 106, 122, 152, 154, 170 (2), 200, 201, 217 (2), 218, 232, 233, 234 (2), 248, 266, 269, 289, 307, 327, 350 (2), 384 (3), 417 (2), 418, 419, 420, 433 (2), 434 (2)
Churn, etc...233, 287, 369, 384 (2), 401, 402, 418, 432
Cider mill.....89, 137, 417
Cigar lighter, gas-jet..... 122
Cigar machine.....9, 58, 168, 385, 403
Cigars, machine for making fillers for..... 330
Clamp, molder's, etc., 48, 58, 154, 184 (2), 266, 327, 330, 417, 420, 434
Clasp, etc.....56, 168, 234, 250, 289
Clay, machine for grinding..... 268
Clinching iron..... 403
Clock, calendar..... 309
Clock escapement..... 326
Clock, musical..... 309
Cloth, machine for cutting..... 367
Cloth, manufacture of enameled... 58
Cloth-measuring machine..... 120
Cloth, machine for fulling and finishing felted..... 42
Cloth, composition for stiffening felted..... 402
Clothes boiler, drainer, etc..... 11
Clothes drier 216, 235, 250, 267, 368, 385, 403
Clothes sprinkler.....171, 370, 387
Clothes wringer, 26, 42 (2), 121, 169, 200, 350, 369, 432
Clothes wringer, etc.....138, 185, 200
Clutch, etc.....11, 24, 106
Coal ashes sifter..... 122
Coal dust, mode of utilizing..... 137
Coal for welding iron, desulphurizing..... 152
Coal hod.....169, 218
Coal sifter..... 216
Coal minerals, etc., method of mining..... 371
Coal oil burners, apparatus for cooking by..... 388
Coffee, apparatus for making..... 433
Coffee, making, etc.....203, 385
Coffee mill, pot, etc.....26, 200, 201 (2)
Coffer dam.....270, 416
Coffin..... 121
Coffin handles..... 25
Coin holder..... 401
Collar and neck tie..... 309
Collar and neck tie supporter..... 418
Collar, waterproof..... 267
Collars, men's..... 233
Comb.....104, 420
Composition for waterproofing.... 386
Composing stick..... 386
Concentrator..... 288
Condenser, etc.....234 (2), 288, 329, 402
Confectionery, manufacture of.... 326
Connecting-rod joint..... 122
Cooking apparatus by lamps, portable..... 327
Cord into a series of united skeins, machine for winding..... 120
Cords, machine for weaving a covering for..... 218
Cork and other materials, waterproofing..... 330
Corkscrew..... 350
Corks in bottles, method of fastening..... 187
Corks, machine for cutting....9, 58, 385, 400
Corn from the cob for table use, machine for stripping..... 250
Corn horse for stacking corn..... 8
Corn ground for planting, machine for marking..... 26
Corn, machine for husking..... 9
Corn on the cob, method of preserving and drying green..... 268
Corn planter, 9, 100, 105, 121, 122, 169, 201 (2), 233, 289, 308, 330, 347, 350 (2), 385, 420
Corn sheller.....74, 152, 248, 366, 419
Cornstalk cutter.....105, 268
Corset and bustle, combined..... 327
Corset busk clasp..... 251
Cotton and other fibrous substances cleaning..... 58
Cotton, bleaching stained..... 249
Cotton bale tie.....88, 268, 367, 419
Cotton, etc, picker house for opening and cleaning..... 401
Cotton gin.....43, 57, 73, 252, 269, 350, 434
Cotton, linen and other fabrics, to prevent them burning, solution to be applied..... 329
Cotton picker..105, 169, 201, 233, 269, 417
Cotton seed machine, etc..26, 75, 105 (2)
Cotton seed planter. 105, 218, 386, 419 (2)
Countersink..... 154
Counting machine..... 152
Cough sirup..... 307
Coupling (for various purposes) 56, 73, 88, 89, 105, 121, 137, 138, 154, 201, 268 (2), 309, 347, 403 (3), 419
Court plaster, preparation of..... 327
Cow and sheep rack..... 368
Cow milker..... 384
Cows upon railroad tracks, shooting gravel at..... 369
Cradle.....88, 416
Cradle, baby walker and..... 40
Cradle, self-rocking..... 370
Cradle, stool and chair..... 420
Crane..... 186
Cranks and rods, machine for bending..... 203
Cracker machine..... 416
Cravat..... 232
Cream paste, etc., press and strainer for..... 152
Crimping machine..... 368
Croquet, apparatus for parlor..... 402
Croquetrie..... 384
Cross head..... 330
Crucibles, apparatus for molding.. 309
Culinary cabinet..... 216
Cultivator 9, 25, 26, 40, 73, 74 (3), 89, 90 (2), 106, 121 (2), 122, 135, 136 (2), 138, 154 (2), 170, 185, 202 (2), 217, 232, 233 (2), 234, 248, 250, 268, 269, 287 (2), 307, 308, 309, 326, 327, 348, 350, 366, 369 (2), 384, 402, 403, 416, 419
Cultivator and gang plow..... 401
Cultivator blades, mode of attaching..... 348
Cupola furnace.....152, 330, 348, 403
Curry comb..... 434
Currying, process for preparing stuffing for.....420
Curtains, blinds, and maps, mode of hanging..... 137
Curtain fixture 10, 105, 250, 251, 329 (2) 418, 432
Cutting box..... 185
Cutting machine..... 418
Cutter grinder..... 289
Cutlery.....11, 136
Cutlery, edge tools, etc., substance for making..... 26
Cutlery, metalic handle for..... 235
Cut-off and horse-power indicator, adjustable..... 330
Cut-off, rain-water..... 400

D

Dairy house..... 234
Damper regulator and indicator... 75
Darning spool..... 139
Dead bodies, apparatus for preserving..... 387
Decanter stopper, self-acting..... 401
Deflector for car windows, portable 330
Dentistry..... 73
Dental drill, chair, etc....9, 203, 217, 250, 419
Dental impression cup..... 432
Derrick..... 154
Desk, reading..... 385
Desk, revolving..... 433
Desk, school.....26, 233, 417
Developing stick..... 153
Dies (various kinds) 267, 328 (2), 350, 368, 385, 420
Dinner pail..... 370
Diseases in vacuum, medical apparatus for..... 348
Disinfecting apparatus..... 310
Disinfecting composition, etc...327, 385
Dyspepsia, compound for the cure of..... 290
Dish drainer and dryer..... 186
Dish stand..... 137
Dish-washing machine..... 234
Distilling, etc. 42, 218, 248, 249, 287, 308, 310 400
Distillation, etc., apparatus for..88, 328
Ditching machine. 42, 216, 251, 267, 287, 370
Doffer comb of carding engines, means of operating the..... 400
Doll, fancy..... 154
Dolls, process for manufacturing.. 327
Door bell, latch, etc. 57, 73, 74, 106, 122, 123, 218, 232, 248, 417
Door fastening, portable..... 432
Door for puddling and other furnaces..... 269
Door knob to spindles, adjusting.. 401
Dough roller, etc.....8, 57, 74, 152
Dovetailing machine..... 416
Draft equalizer, three-horse..... 10
Drawing roller, etc. 43, 368
Drawings, etc., photographic process for copying..... 435
Dredging boats, steam.....418 (2)
Dress elevator..... 217
Dressing rolls, manufacture of..... 233
Drill (various kinds and for various purposes) 41, 58, 88, 218, 248, 288, 290, 310
Drilling machine...168, 185, 201, 202, 288
Driving apparatus of metal or wood into the ground..... 155
Drop-light fixture..... 403
Drying or evaporating device..... 309
Dust and ashes from air, apparatus for removing..... 186
Dust range or receptacle..... 432
Dust screen for stove and furnace doors..... 138
Dyes and colors, manufacture of... 386

E

Earth borer..... 104
Eaves trough, etc.....121, 288, 369
Edge plane for boots and shoes.... 169
Edge tools, machine for holding and grinding..... 251
Egg beater, etc. 26, 41, 232, 251, 308, 329, 369 (2)
Eggs, method of preserving, etc. 74, 218, 433
Electric pile, secondary..... 250
Elevator..... 186
Elevator, coal..... 434
Embroidery, imitation..... 11
Emery wheels, process of making. 186
Engine, rotary, air, etc...73, 75, 200, 252, 270, 288, 290, 308, 401, 417, 435
Engine and stamping machine, spring and weight piston for... 26
Envelope and letter sheet, combination..... 10
Envelopes for bottles and jars, manufacture of..... 290
Envelopes, machine for gumming and printing..... 434
Essential oils, machine for extracting..... 154
Evaporator 25, 41, 121, 137, 184, 202 (2), 217, 232, 269, 288, 310 327
Evaporators, adjuster for..... 232
Evaporating solutions of salt, sugar, etc..... 368
Exercising machine..... 269
Expanding tool,..... 9, 74
Extracts, apparatus for making.... 91
Eyelet.....89, 138, 203, 420
Eyelet machine..90, 187, 267, 270, 310, 330
Eyelet stock..... 350

F

Fabric for carpets and other purposes..... 168
Fabric, waterproof.....88, 170
Fabrics, etc., instrument for punching..... 417
Fabrics, machine for making netted and lace..... 26
Facing for stair treads..... 202
Fan, etc.....75, 309, 370
Fan blower..... 201
Fanning mill.....168, 433
Fastening for garments.....217, 233, 400
Faucet measure..... 138
Fire-arms, nippled cartridge for breech-loading..... 434
Faucet, self-inserting..... 417
Feed apparatus for steam generators..... 75
Feed cutter..... 201
Feed rack, portable..... 249
Feed water apparatus, etc.....268, 385
Feeder, automatic boiler, etc. 75 (2), 107, 186, 203
Felly clamp and spoke support for carriage wheels..... 10
Fence (various kinds of) 25, 73, 74, 138 (2), 153, 154, 168, 184, 201, 232, 249, 330, 369 (2), 370, 387, 400, 401, 418
Fence posts, device for driving.... 168
Fence posts, machine for boring... 24
Fibers, process for disintegrating 203 (2)
Fibrous substances, process for bleaching..... 90
File blanks, machine for rolling 185, 327
File clasp for documents, etc.....106
Files, machine for cutting 155, 170, 200, 202, 249, 350
Files, process for hardening..... 122
Filter, etc.....25, 216, 232, 329, 385
Filtering, etc.....249, 327
Fire alarm.....252, 309
Fire-arm, breech-loading 26, 41, 57, 58, 104, 136, 137, 139, 153, 169, 170, 201, 234, 235, 307, 349, 367, 382 (2), 385, 433
Fire-arm, magazine.....171 (2), 290, 387
Fire-arm, revolving 10, 25, 26, 29, 41, 58, 90, 235, 269, 287
Fire-arms, cartridge retractor for 75, 88, 152
Fire boxes for steam generators... 171
Fire engine and pump..... 310
Fire-kindling composition..... 216
Fire-lighting attachment for stoves 9
Fire, mode of extinguishing..... 368
Fire screen..... 368
Fireplace.....107, 153, 269
Finger nails, instrument for cutting 386
Fishhook.....11, 57, 310
Fishing tackle..... 367
Flat iron.....136 (2)
Flax, cotton, etc., treating..... 169
Flax-dressing machine..... 432
Flax, machine for preparing....11, 416
Flax-spinning machine..... 123
Fliers for spinning..... 269
Float for boats.....233, 266
Floor attachment for furniture.... 232
Floor cloth, manufacture of.....41 (2)
Floor clamp..... 370
Flour barrel..... 330
Flour packer..... 400
Flour sack..... 26
Flour sifter, etc. 9, 11, 26, 42, 43, 58, 104, 153 (2), 216, 249, 288, 307, 349, 350, 369, 384, 387
Flouring mills, bolt for..... 57
Flower pot, supporter for..... 89
Flues for setting open boilers..... 56
Fluid regulator..... 329
Flush bolt..... 328
Fluting machine.....249, 432
Fly and mosquito bar..... 201
Flyer boards for spinning frames.. 89
Flyer for spinning machinery..... 233
Flying machine..... 387
Fodder cutter..... 385
Foot press..... 234
Foot scraper..... 288
Foot warmer.....8, 137
Forging apparatus..... 122
Forging, shearing, and punching device..... 416
Forks, machine for forming the shoulders on..... 216
Fountain, portable.....10, 347
Frames, machine for preparing oval, etc.....217, 385
Fruit and vegetables, preparing for preserving..... 184
Fruit boxes, fastening for..... 432
Fruit cans, device for opening..... 385
Fruit cans, machine for making tin 385
Fruit jar, basket, etc...10, 40, 42, 89, 120, 136, 201, 232, 250, 289, 307, 329, 348, 349, 350, 367, 400, 402 (2), 416, 433, 434, 435
Fruit ladder, extension..... 369
Fuel, artificial...41, 120, 132, 137, 167, 375, 419
Fuel, composition for..... 330
Funnel, alarm..... 434
Fur blower..... 187
Fur, process for treating..... 88
Furrowing machine.....122, 138
Furnace.....56 (2), 329, 400
Furnace for treating auriferous ores..... 235
Furnace grate..... 90
Furnace grate bars..... 269
Furnace door..... 10
Furnace door regulator..... 152
Furnaces, regulating draft..... 402
Fuse, safety..... 24

G

Gage cock.....187, 248
Gage lock for steam generators.... 217
Gaging rod..... 310
Galley, printer's..... 42
Galvanic battery, etc.....138, 421
Game, social..... 248
Gas apparatus.....154, 233, 419
Gas, apparatus for preparing nitrous oxide..... 329
Gas, apparatus for carbureting.... 288
Gas burner.....309, 386
Gas burners, regulating attachment for..... 349
Gas fixtures, attachment to..... 385
Gas-heating apparatus..... 267
Gas generator, etc.....252, 418
Gas, generating and supplying illuminating..... 419
Gas inhaler..... 433
Gas, manufacture of illuminating.....170, 171
Gas regulator..... 11
Gas retort..... 170
Gas stand, portable..... 432
Gases, apparatus for inhaling..420, 434
Gases, method of delivering liquid. 122
Gases to be used for motive power, process of generating..... 250
Gate, farm, etc. 41 (2), 57, 152, 153, 154, 186, 187, 216, 232, 268, 289, 329, 347, 349, 350, 370, 400, 402, 416, 418, 432 (2)
Gate, fastening, etc.....25, 41
Gear, tube..... 289
Gearing and thrashing machine.... 73
Gearing (for various purposes), 203, 251, 348, 349
Gig tree..... 248
Gilding and ornamenting surfaces. 152
Glass, manufacture of.....170, 402
Glass mold.....106, 350
Glass, porcelain, etc., method of printing on..... 121
Gluing and cementing machine.... 418
Gold, etc., process for amalgamating..... 248
Gold and silver, mode of separating from their ores.....41, 248, 370
Gold, silver, and copper, process for separating..... 106
Gold and silver washing apparatus. 169
Gold and silver with lead, apparatus for amalgamating..... 417
Gold size, composition for..... 347
Governor, atmospheric..... 402
Governor, steam engine, 26, 105, 290, 327, 329
Grain binder, drill, drier, separator, cleaner, fertilizer, sower, etc., 10 (2), 25, 42, 74, 89, 105 (2), 153, 168 (2), 169, 185, 200, 216, 234 (2), 248, 251, 269, 290, 309, 310, 307, 311, 327, 329, 370, 385, 402 (2), 403, 416
Grain, mode of ventilating..... 386
Grain, weighing and measuring.... 248
Granaries, fruit houses, etc..... 200
Grape trellis..... 89
Grape-vine protector..... 327
Grate and grate bar, 89, 136, 170, 186, 287, 290, 327, 329, 368, 400
Graver..... 154
Grease cup..... 287
Grinding cylinders of paper engines..... 248
Grinding mill, 9 (2), 10, 218, 249, 288, 311 (3), 347, 348
Gripe band..... 289
Grubbing machine.....184, 288
Guide for folding and uniting the edges of two pieces of cloth.... 153
Gun carriages, operating..... 88
Gun locks, safety stop for..... 435
Gun lock.....10, 217, 289
Gun stock..... 350
Gun, toy spring..... 401
Guns, breech-loading needle..... 171

H

Hair, apparatus for crimping...186, 232
Hair curling fluid..... 307
Hair, imitation of braided human. 307
Hair, instrument for parting ladies' 201
Halter apparatus, tethering..... 368
Halter, neck rope..... 9
Hame.....268, 270
Hammer, atmospheric..... 329
Hammer, power.....170, 329, 349
Handsaw..... 88
Handle for coffee, spice, and other small mills..... 368
Handle for milk can, etc..... 249
Hanger for shafting..... 326
Harness nails, die for forming metal heads on..... 434
Harness snap..... 367
Harpoon, rocket..... 309
Harrow, etc., 26, 90, 267, 268, 329, 350, 369, 387, 418
Harvester, 9 (2), 58, 73 (2), 89, 104, 106 (4), 120 (2), 136, 152, 153, 168 (3), 169, 170, 187, 200, 132, 249, 251 (2), 268 (2), 287, 328 (2), 329, 330, 350, 368, 369, 384, 386 (2), 417, 420
Harvester cutter..... 401
Harvester crank motion..... 329
Harvester rake, 9, 120, 152, 186, 200, 201, 233, 251, 270, 287 (2), 310, 326 (2), 329, 369, 384, 400 (2), 432, 434
Harvesters, construction of finger bar for..... 400
Harvesters, dropper for..... 235
Harvesters, etc., pitman head for.. 421
Harvesters, manufacture of guard finger for..... 367
Harvesters, pitman couplings for.. 216
Harvesters, raking and binding attachment for.....367, 419
Harvesters, ratchet attachment for 367
Hatchway door..... 384
Hat and cap.....289, 386
Hat and cap band, india-rubber.... 270
Hat block..... 349
Hat bodies, machine for felting.... 123
Hat-forming machine..... 202
Hat-pressing machine..... 267
Hats, apparatus for pressing, etc., 187, 232, 234
Hats, apparatus for pounding, etc., 153, 250
Hay and pruning knife..... 105
Hay and straw cutter.....249, 309
Hay, apparatus for preparing for market..... 384
Hay fork.....89, 329
Hay loader.....57, 233, 290, 368, 400
Hay, machine for raking and loading.....138, 168, 233, 308, 329, 401
Hay press, etc., 10, 25, 74, 125, 154, 309, 386
Hay rack.....267, 288, 385
Hay spreader.....11, 251, 348
Hay wagons, loading attachment for..... 289, 385
Head block for saw mills. 232, 327, 329 369
Head block for holding boots and shoes..... 152
Head lights, etc.....289, 368, 384
Head lights, reflector for..... 184
Head for picture nails..... 154
Head rest, portable..... 58
Heat by combustion of fuel of various kinds, mode of raising.... 200
Heat-generating apparatus for cooking purposes..... 418
Heat radiator..... 385
Heater for chimneys..... 266
Heater, smoke consuming..... 368
Headdle-motion, etc., for looms, 36, 387
Hedge cutting machine..... 186
Hedge-plant grab..... 287
Heel breasting machine..... 185
Heel calk..... 74
Heel cutter..... 121
Heel polishing machine.....122, 123 (2)
Heliotrope, automatic..... 433
Hemp brake..... 168
Hemp or flax, or flax waste, in a sliver of longer staple, envelloping..... 328
Hen's nest.....152, 386
Hides, apparatus for treating, etc., 249, 418
Hinge. 10, 25 (2), 139, 232, 249, 309, 350, 433
Hinge and lock, trunk.....269, 289, 384
Hitching post..... 421
Hoe, etc., 43, 74, 136, 217, 307, 368, 385, 419
Hoes, rakes, etc., device for attaching handles to..... 387
Hog scalder, portable..... 26
Hoisting apparatus.....25, 26, 329, 330
Hominy mill..... 249
Hook and button, combined..... 420
Hoop skirts, clasps for..... 138

Hoops of compressed bales, machine for securing and tightening... 370
Hoops of wood, machine for coiling... 370
Hop vines, training... 402
Horse collars, machine for forming... 168
Horse hay fork, 9, 57, 74, 88, 155 (2), 187 (2), 216 (2), 217, 250, 269, 288, 289 (2), 329, 400, 416 (2), 420, 434
Horse power...154, 184, 218, 250, 329
Horse rake, 57, 75, 88 (2), 106, 122, 201, 308, 310, 330, 349, 384, 386 (2)
Horse rake teeth...152, 329
Horseshoe, 26, 40, 56, 267, 270, 327, 387, 400, 416, 419
Horseshoe calking vise... 251
Horseshoe nail... 417
Horseshoe-nail machine...58, 74, 310
Horseshoes, attaching sole to... 401
Horseshoes, calks for... 385
Horseshoes, device for forming, etc...58, 330
Horseshoe, machine for bending... 400
Horses, elastic cushion and guard for the feet of... 327
Horses and carriages, mode of releasing... 57
Horses kicking, apparatus to prevent... 385
Horses, method of attaching shoes to... 403
Hose, covering for... 201
Hose protector... 434
Hot-air engine... 105
Hot-air furnace...139, 152, 153, 370, 434
Hub, metallic for vehicles... 104
Hub or spool for curtain rollers... 233
Hubs, machine for boring...202, 232, 420
Hub boxes, mode of preparing molds for... 417
Hubs, securing boxes in... 348
Hydrant...154, 284, 287, 384, 402, 419
Hydrant stop cock... 251
Hydrocarbon vapors, machine for charging air with... 169
Hydro-carbons, apparatus for burning liquid... 252
Hydro-carbons, separating... 146

I

Ice creeper...88, 435
Ice pick, etc...351, 384
Illuminating apparatus... 348
Incrustation in steam boilers, method of preventing... 27
Index, universal... 349
India-rubber gutta-percha compound, colored...42 (4)
Indicator for steam generators, water... 402
Induction coil... 74
Injector, feed-water... 403
Ink, etc., manufacture of...169, 218
Inkstand...56, 251
Inner sole...153, 416
Insects, composition for destroying...106, 348
Iron and steel, process, etc., for refining...88, 250
Iron and steel, plating... 26
Iron and steel, apparatus for the manufacture of...137 (2)
Iron and other metals, composition for... 432
Iron, composition for coating... 217
Iron chips, turnings, etc., mode of melting and aggregating... 201
Iron holder... 88
Iron, manufacture of... 139
Iron, machinery for rolling... 185
Iron, process for hardening... 26
Isingglass, purifying... 249

J

Jaw for brooms and gaff for vessels... 328
Jack, hydraulic...90, 106
Jack, pegging...75, 328
Jars, mode of grinding the mouth edges of glass... 202
Jars, sealing ring for preserving... 40
Journal box...11, 153, 185, 308
Journal boxes, composition for, etc...25 (3), 168
Journals, lubricating... 419
Jug top... 187

K

Kaolin, etc., apparatus for washing 328
Kettle bottom... 402
Key...367, 435
Key in locks, fastening... 401
Keyboard for organs, etc... 251
Kiln, drying... 136
Kite... 42
Knife cleaner, sharpener, etc., 8, 27, 40, 137, 216, 268, 309 (2), 348, 350
Knife, currier's, etc...57, 123
Knitting machine, 10, 11, 185 (2), 202, 218, 224, 370, 387, 401, 416, 420 (2), 421
Knitting machine burr, self-lubricating... 400
Knitting machine needle...9, 104
Knitting machines, stop motion for 418
Knitting machines, take-up mechanism for circular... 420
Knob latch...89, 218, 234, 251
Knob lock... 433
Knuckle joint...170, 184

L

Label, direction... 203
Labels to bottles, applying... 266
Lace paper, manufacture of... 288
Lacing device... 139
Ladder... 369
Lamp (various kinds), 42, 73, 105, 107, 122, 153, 187, 200, 234, 250, 287, 330, 385, 400, 402, 416, 417, 419, 434
Lamp burner, chimney, wick, etc., 10, 41, 90, 138, 154, 217, 249, 250, 267, 269 (2), 287, 310, 400, 417, 419, 432, 434
Land roller, etc...288, 328, 329
Lantern...41, 57, 185, 267, 290
Last... 234
Latch fastening... 40
Latch, gate... 418
Lathe (for various purposes), 9, 90, 170, 185, 218 (2), 250, 288, 289, 309, 420
Lathe chuck... 232
Lathes, device for securing the tail stocks of... 186
Laths, machine for cutting... 309
Leather splitting machine, 251, 266, 289, 349
Leather, artificial... 27
Leather (various things relating to), 135, 153, 169, 170, 267, 349, 370, 401
Leather, harness, etc., blacking for 403
Leggins... 202
Lemon squeezer... 170
Lens... 152
Lenses, combination for photographic purposes...42, 403
Letter and paper file...200, 267
Letter boxes... 248
Let-off for looms...154, 290
Level, etc...9, 24, 232, 267
Leveling streets, machine for... 170
Lever scale, bent... 401
Lever power for windlasses, etc... 307
Libraries, system for... 41
Library step ladder... 90
Life preserver... 57
Lifting jack, 26, 41, 57, 75, 138, 368, 401, 420
Lightning rod... 106
Lime kiln...74, 368, 386
Linchpin... 202
Linen bosoms, apparatus for folding... 168
Liniment...152, 154, 418
Link, adjustable... 11
Link motion for steam engines... 154
Liquid cooler...187, 216, 250 (2), 289, 368
Liquids, apparatus for measuring.. 348
Liquids, thiefs and tests of... 42
Liquors, compound for refining, purifying, and mellowing spirituous... 171
Locks (various descriptions of), 26, 40, 58, 89, 90, 107, 169, 185, 187 (2), 308, 326, 329, 386, 400 (2), 416, 420, 432 (2), 434
Lock or latch, reversible... 400
Locks, keeper for door... 10
Locks, key guard for... 10
Locks, wagon shoe... 9
Locomotive...26, 75, 121
Locomotive axles, bearing of, etc., 185, 268, 289
Locomotives, draft pipe for... 432
Looms (various kinds), 56, 88, 89, 105, 138, 216, 217, 232, 268 (2), 287, 347, 368, 387
Looms, harness motion for...290, 366
Loop, thill-holding... 89
Low water detector...26, 89, 348, 416
Lubricator, etc...202 (2)
Lunch box, folding...57, 205

M

Magnesium for burning, method for preparing... 311
Mail bag... 420
Mail bags, apparatus for receiving and delivering...232, 378
Mail lock... 200
Mail pouch or box... 369
Malt, apparatus for sprouting... 200
Mallet, elastic... 152
Manacles... 153
Mangle and wringer, etc...248, 348
Marble, machine for cutting and finishing...267, 268
Mariner's compass... 269
Marking stock... 307
Marking wheel... 89
Mash machine... 248
Masts, boom-connection for... 433
Match compound... 233
Mat, table... 420
Measuring distances, instrument for... 232
Measuring funnel...268, 326
Meat and vegetable chopping machine, etc...122, 310, 326, 366, 416, 420
Meat under lime, device for keeping... 432
Meat safe... 9
Medical compound, etc., 56, 73, 74, 136, 154, 217, 248, 268, 287, 307, 327, 348, 386, 401, 402, 403, 416, 432 (2), 434 (2)
Medicines, apparatus for administering... 267
Metal, apparatus for punching corrugated... 349
Metal brand, machine for perforating... 202
Metal, machine for spinning... 350
Metal, manufacture of plated... 25
Metals, apparatus for rolling... 138
Metals from other substances, apparatus for separating...269, 368
Metals from ores, apparatus for separating... 416
Metallic bar, ribbed... 384
Meter, water... 234
Microscope... 170
Milk can...152, 216
Milk, condensing... 26
Milk, method of preparing vacuum vessels for condensing... 386
Milk shelf... 234
Mill Mick... 152
Mill stones, hammer or burr for facing... 310
Mill stones, method of ventilating. 311
Milling tool... 234
Mirror, hand... 137
Mirror for photographic purposes, solar... 307
Miter box... 435
Mitering machine... 10
Miter-joints, machine for trimming 433
Mitten and stocking, machine-made knitted... 307
Molasses faucet...90, 153
Molasses, manufacture of... 269
Mold for casting flanged pipe... 250
Mold, pipe... 184
Molds, machines for preparing axle-skein... 417
Molding and casting apparatus... 269
Money drawers, catch for... 268
Mop... 420
Mop head, wringer, etc., 88, 153, 233, 250, 308, 330, 384, 402, 420
Mordant... 309
Morocco, machine for graining... 328
Mosquito guard, etc 217, 310, 349, 367, 432
Motion, converting rectilinear motion into rotary... 41
Motion, mechanism for obtaining intermittent rotary... 217
Motion, treadle... 186
Motion, transmuting... 106
Motive power...105, 310, 387, 418
Motor, water, etc...122, 168
Movement, mechanical...217, 386
Mowing machine...26, 105, 186
Mowing machine guards, manufacture of... 351
Mowing machines, track-clearer for... 307
Muff...252, 416
Mule...56, 186, 367
Music, apparatus for turning the leaves of... 58
Music stools, means for attaching legs to... 248
Musical instrument...58, 218, 267, 329
Musical staff... 136

N

Nail extractor... 401
Nail machine...122, 386
Nail plate feeder... 270
Napkin rings, machine for embossing... 348
Napkin, table... 233
Neck tie...137, 202, 216, 348, 350
Neck yoke... 367
Needle wrapper... 384
Needles into paper, machine for stitching... 267
Newspaper file... 327
Nozzle for fire engines...200, 201, 417

O

Offal, deodorizing... 169
Oil, apparatus for collecting floating...289, 402, 419
Oil and water to assist the combustion of coal, etc., apparatus for applying... 310
Oil and other wells, grab for... 121
Oil cloth, apparatus for printing... 43
Oil cloth, instrument for cutting... 90
Oil cup, lubricating... 290
Oil from leather, etc., method of extracting... 327
Oils from streams, apparatus for collecting floating...202, 419
Oil from wells, etc...90, 384
Oil for lubricating...105, 170, 209
Oil, paraffine, wax, etc., apparatus for bleaching... 136
Oil, process of extracting from minerals...105 (2)
Oil, etc., refrigerator for cooling... 434
Oil tank, etc...268, 310
Oil tools, socket joint for... 401
Oil, treating... 386
Oil wells, balance beam for the boring of... 332
Oil wells, collecting light oils from 385
Oil wells, electro-magnet, etc., for 26, 169, 187, 289
Oil wells, mode of securing pipes and bolts in... 138
Oil wells, method of boring...308, 351
Oils, method of purifying hydrocarbon...311, 386
Oiler...184, 329, 348
Optical instrument... 348
Ordnance... 403
Ordnance, breech-loading... 185
Ore crusher, separator, washer, etc. 186, 202, 367, 384
Ores (various processes and appliances relating to) 11, 24, 74, 88 (2), 89, 123, 168, 169, 216, 234, 251 (2), 287, 329, 350
Organs, etc., valve arrangement for... 434
Organ, etc...138, 170, 171
Organs and melodeons, knee swell for... 106
Organs, mechanism for operating swell or reed... 154
Oven for annealing iron... 138
Oven, steam... 90
Oyster boats, dredge roller for... 416
Oyster cracker... 349
Oxbow pin... 170
Ox yoke... 309

P

Packing, elastic... 348
Packing for pump pistons... 326
Padlock...9, 402 (2)
Paddle wheel...185, 267, 421
Paint... 433
Paint and drug mill...184, 434
Paint, composition... 218
Paint, method of applying to surfaces... 328
Paper boards, pipes, etc., manufacture of... 290
Paper boxes, fastening for... 155
Paper boxes, machine for making. 121
Paper bosoms...168, 170, 233
Paper bosom machine... 249
Paper clamp... 121
Paper collars, etc. 88, 138, 152, 157, 329, 368
Paper collar machine...154, 310, 349, 387
Paper collars, button holes for.138, 269
Paper cutting machine...11, 201
Paper for postage stamps...187
Paper for telegraphs, machine for punching... 400
Paper holder...106
Paper, manufacture of...26, 27, 200
Paper neck tie... 384
Paper pulp (various methods and materials for making, etc.) 27(4) 41(2), 36(4), 152, 171, 185, 201(2), 249, 327 (2), 348, 385, 387(2), 420
Paper, roll for pressing, sizing and calendering... 56
Paper tin... 367
Paring, cutting and coring machine 252
Paste for bookbinders, etc., prepared... 154
Pea and bean sheller, etc...106, 287, 385
Peaches, machine for cutting and stoning... 249
Peat, apparatus for molding... 434
Peat machine, etc. 56, 122, 185, 186, 235 (2), 266, 270, 307, 309, 329, 366, 384, 387, 403, 418
Peat machine, material for dusting the molds for... 185
Peat, method of preparing and feeding to furnaces... 289
Peg rasper, etc...202, 367
Pegs for shoes, manufacture of..... 200
Pen... 249
Pen for weaning calves... 248
Pen-handle tubes, machine for finishing the ends of... 330
Pen holder springs, machine for forming... 328
Pens, manufacture of... 218
Pencil pocket... 201
Pencil sharpener... 42
Pentagraphic machine... 369
Pepper box... 348
Percolator... 269
Percussion caps, machine for varnishing and lining... 121
Percussion fuse for explosive shells 289
Petroleum burner for cooking purposes... 42
Petroleum, car for transporting 267, 269
Petroleum, composition for coating vessels for... 216
Petroleum, distillation of... 201
Petroleum, method of deodorizing 250
Petroleum, refining...9(2), 329
Petroleum, still for... 186
Petroleum, vessel for...73, 351
Photography... 249
Photographs, mode of printing.... 155
Photographic apparatus...90, 433
Photographic bath... 435
Photographic lenses, mode of combining... 88
Photographic pictures, process and composition for printing... 267
Photographic printing frame 25, 170, 329
Photographic rest... 421
Photographic sensitizing box... 41
Piano...138, 419
Pianos (various things relating to) 9(2), 153, 250, 329, 348
Pickerstaff arrester for looms... 107
Pickerstaff of looms, means of operating... 269
Picture holder... 434
Pigments, manufacture of opaque. 9
Pile fabric... 384
Piles, mode of driving... 435
Pins, device for feeding... 202
Pincers, lasting... 74
Pipe, mold for casting... 370
Pipe, manufacture of water... 10
Pipe, steam, water or other... 327
Pipes, machine for pressing lead... 418
Pistol and pocket knife, combined. 233
Piston packing, etc...139, 153, 235, 387
Piston, steam engine... 10
Piston rods for deep wells, wooden. 106
Pitcher, beer... 400
Plane, carpenter's... 403
Plane, saw rebate... 122
Planes for making blind slats... 269
Planing machine 233, 330, 348, 417, 419, 420
Planter and seeder... 123
Planter, hand corn..89, 251, 268, 387, 433
Plants, box for propagating... 233
Plants, implement for setting out.. 250
Plated ware, fastening handles to.. 350
Plow beams, metallic fastening for 137
Plow clevis... 88
Plow colter... 432
Plow, rotary, gang, steam, etc. 8(2), 25, 41(2), 42(2), 56, 73, 75, 90, 121, 125, 136, 137, 138, 139, 155, 170, 184(2), 186, 200, 217(2), 232, 233(3), 248(2), 249, 266, 269, 289, 307(2), 310, 330, 350, 367, 369, 370, 386, 400, 401, 417, 418
Plows, attachment in... 251
Plowshare... 248
Plug to prevent barrels from bursting, safety... 184
Pocket book... 152
Pole and thill for carriages, etc.... 233
Polishing wheel... 267
Portfolio... 216
Postage stamps, etc...27, 251
Potassa and soda, putting up and preserving caustic... 122
Potato digger, etc. 9, 26, 121, 168, 184, 217, 386, 403, 418, 419
Potato rot, mode of preparing potatoes to prevent... 201
Pottery ware, machine for making 104
Powder, composition for core..... 233
Powder flask charger... 88
Power, transmitting...270, 417
Press...26, 137, 250
Press, copying... 74
Press for striking up metal... 57
Press, gluing... 418
Press plate... 170
Press, printing... 328
Presses, bed for lithographic..... 217
Preservatory... 139
Preserve can... 435
Printing, typographic... 248
Printing wheels, etc., construction of... 417
Propeller, etc..10, 57, 105, 252(2), 347, 370
Propeller wheel...216, 269
Pruning hook, etc...43, 106, 432
Pruning shears.. ... 400
Puddling furnace... 168
Pulley, clamp... 205
Pulley, coupling or clutch... 10
Pulley for fishing boats, self-adjusting... 138
Pulley, self-stopping... 217
Pulleys, construction of... 251
Pulverizing and furrowing device. 26
Pump, rotary, railway, oscillating, 10, 25(2), 26 (2), 42, 56, 57, 73(2), 74, 106, (2), 120, 121, 122(2), 152, 153 (2), 185, 200(2), 201(2), 216, 218, 233, 251, 267, 270, 288(2), 326(2), 327(2), 329 (2), 347, 349(2), 350, 368, 384, 385, 387, 400, 402, 418, 419, 420
Pump filter... 89
Pump pistons, packing... 58
Pump valve... 11
Pumps, adjustable packing for..... 41
Pumps in deep wells, protecting... 347
Pumps, pressure head for siphon and force... 250
Punch, hand... 216
Punch mixer and egg beater..... 287
Punch, spring... 234
Punching machine...10, 168, 387

Q

Quartz comminuter... 289
Quartz crusher, mill, etc. 8, 9, 10, 106 (2), 136, 153, 154, 168, 203, 217, 248, 347, 348, 402

R

Rail for railroads...233, 250, 384
Rails, machine for welding ends of railroad... 123
Rails, roll for manufacturing three-headed railroad... 327
Railroad axle box, car, truck, frog, wheel, brake, chain, switch, etc. 25, 43, 75, 57, 58, 88, 89, 106 (2), 153, 168, 184, 202, 203 (2), 217, 218, 234, 248, 249, 250 (2), 267, 307, 310 (2), 348, 349, 366, 369, 384, 386
Railroad cars, heating and ventilating... 402
Railroad cars, mode of starting.... 10
Railroad cars, seat and couch for.. 432
Railroad cars, ventilating window for... 9
Railroad spikes, instrument for drawing... 41
Railroad station indicator...56, 153, 249
Railroad tickets, machinery for printing... 403
Range, cooking... 329
Razor strops, composition for..... 56
Reach for lumber wagons... 104
Reaping and mowing machine 89, 186, 200, 202, 328, 384, 421, 432
Reaping machines, binding attachment for... 89
Rectifying apparatus... 269
Reel for grain binders... 153
Hook, coat or hat... 184
Hooks, fastening for bail... 202
Hoop skirt...121, 138, 369, 387, 417
Hoop-skirt wire and frames...138, 433
Refrigerator, etc. 104, 121, 185, 186, 307, 330, 401
Register, passenger... 73
Register, lumber... 418
Rendering apparatus... 139
Reservoir for wells... 248
Retort for generating gases from oils... 309
Rivet or bolt cutter... 419
Riveting machine... 384
Rocking chair and fan... 121
Rocker for chairs, detachable..... 153
Rock drill, etc. 10, 45, 105, 168, 184 (2), 217, 248 (2), 249, 310, 330, 386, 387, 400, 417 (2), 432
Rocket... 270
Rock, machine for tunnelling..... 433
Rods, parallel or other... 25
Roller for wringers...88, 351, 400
Roller for destroying insects, garden... 233
Roller temple for looms...232, 311
Rollers for spinning machine..... 290
Roofs, composition for painting metallic... 329
Roofing...136, 137, 138, 201
Roofing cement...184 (2), 201 251, 403
Roofing compound... 216
Roofing, tubing, tanks, wainscoting, boats and other structures, material for... 26
Roots for feed, machine for cutting succulent... 402
Rope machine... 56
Rope guard... 433
Row lock... 418
Rubber, apparatus for filling molds for hard... 42
Rubber, manufacture of hard..... 249
Rubber, manufacture of, for dental purposes... 10
Rubber, mold for vulcanizing..... 186
Rubber or gutta percha for articles of dress, hard... 270
Rubber packing... 348
Rudder...270, 288, 330, 387
Ruler...10, 122, 287
Ruler, blotter, and paper cutter combined... 268
Rulers, parallel... 138
Ruling machines, electro-magnetic attachments to... 435
Runners to wheels and wagons, attaching... 170

S

Sacks, paper... 136
Saddle and harness... 270
Saddle seat, harness... 418
Saddle, spring... 268
Saddle tree... 106
Saddle trees, crupper loop for..... 170
Sad iron...136, 309, 349
Sad iron holder... 308
Sad irons, hand projector for..... 384
Sail... 416
Sail board, self-locking... 90
Sails, apparatus for reefing fore-and-aft... 136
Sails, bending fore-and-aft... 403
Safe...56, 122
Safe and table, provision... 269
Saline meter pot... 290
Salinometer... 56
Saltpeter, manufacture of... 88
Salve... 41
Sand bars from rivers, method of removing... 347
Sand box for locomotive engines.. 201
Sand distributor for railroad cars. 10
Sand, machine for sifting... 216
Sand paper, manufacture of... 42
Sand paper holder... 200
Sand pump...26, 368, 384
Sandal, adjustable... 370
Saponifier... 268
Sash supporter, fastener, etc., 58, 75, 90, 120, 123, 268, 269, 308, 326, 328, 334, 336(2) 387, 400, 402, 417, 432
Sash, greenhouse... 25
Shashes and frames for windows... 41
Sashes for ventilating windows, device for operating... 370
Saw...201, 370, 419, 420
Saw-filing machine...309, 368
Saw-grinding machine...200, 251, 370
Saw-mill...288, 367, 433
Saw-mills, head block for...136, 170
Saw set...90, 138, 348
Saw teeth, swage for sharpening.. 416
Saw teeth, tool for upsetting..... 289
Saws to their handles, manner of attaching... 105
Saws, feed roller for circular..... 89
Saws to their arbors, mode of attaching circular... 369
Sawing machine, 42, 73, 105, 121, 233, 250, 267, 289, 350, 401, 403
Sawing staves... 43
Scale beam... 348
Scale for weighing...186, 433
Scale in boiler tubes, tool for removing... 386
Scissors... 251
Scoop for excavating... 350
Scoop, weighing... 217
Scoop, sifter, grater and holder.... 367
Scraper and knife and fork cleaner... 282
Scraper, barn-yard... 328
Scrapers for railroads, snow, ice and mud... 287
Screen for wool driers... 104
Screw and bolt... 138
Screw blanks, machine for threading, etc...309, 384
Screw cutting machine...402, 434
Screw for stools, etc... 368
Screw top... 307
Screw heads, nicking... 433
Screws, capping wood... 417
Screws, machine for nicking..... 249
Screws, machine for shaving wood 249
Screws, machinery for forging..... 367
Screws, tacks, etc., casting heads upon... 154
Scroll biscuit, apparatus for making...73, 105
Scroll sawing machine... 26
Scrubber and tender... 347
Scrubbing machine... 90
Sealing boxes, etc... 234
Sealing for fruit cans and other vessels... 309
Seat and back for chairs... 327
Seat for harvesters, etc... 310
Seat for vehicles... 217
Seats to beds of vehicles, attaching 218
Seeding maching, drill, planter, etc. 26, 88, 90, 105, 122, 137, 138, 184, 187, 217, 249, 269, 308, 347, 387, 402
Seeding raisins, machine for..... 268
Settee and table... 308
Sewer... 349
Sewing machine, 10, 42, 107(2), 169, 203, 218, 251, 349, 367, 385, 387, 402
Sewing machines (various attachments for and improvements in) 8(2), 9, 11, 120(2), 139, 152, 169(2), 170, 171, 201, 234(2), 267, 270, 308, 328, 349, 368, 370, 384, 387, 420, 434
Sewing thread upon spools, winding... 43
Sextant... 367
Shade for gas burners and lamps, heating... 233
Shade hook... 386
Shaft for drilling... 307
Shafts, lubricating vertical..... 122
Shank laster...105, 120
Sharpener and polisher, knife and scissors... 420
Shears, sheep and other, 105, 153, 216, 348, 434
Sheathing for iron vessels..... 290
Sheep and other animals, machine for catching... 268
Sheep holder and shearing table, 282, 289, 347
Sheep, machine for shearing..... 216
Sheep rack, 42, 89, 217, 267, 308, 326, 328, 401, 419
Sheet iron, furnace for annealing.. 387
Sheet iron, manufacture of.....216, 233
Sheet iron, improved method of neutralizing acid for... 348
Sheet iron plates, method of treating... 139
Sheet metal boxes, machinery for manufacturing... 11
Sheet metal can...184, 251
Sheet metal spouts, machine for swaging... 234
Sheet metal to each other, mode of attaching the sides of..... 387
Sheet metal, seams for..... 387
Sheet metal ware, dies for the manufacture of... 42
Shelf, folding... 9
Shelf, rack and stove... 233
Shell, explosive... 105
Shirt bosom pattern... 170
Shirt collar... 136
Shirt fastener... 26
Shirts, paper... 329
Ship building... 75
Ships' boats, apparatus for lowering... 400
Ships' lights, means of closing..... 25
Ships' pumps, means for working.. 419
Ships, means of protecting the bottoms of... 252
Ships' windlasses, device for operating... 367
Shipper device... 74
Shingle... 58

Shingle machine, etc., 123, 267, 288, 289, 349
Shoe, etc., 75, 88, 233, 400
Shoe binding, manufacture of, 418
Shoe binding, tape, etc., machine for winding, 418
Shoe brushes, 58, 307, 336
Shoe jacks, 42
Shoe lacing, 133
Shoe lacing cutter, 308
Shoe soles, machine for cutting
Shoes and dies for grinding and amalgamating machines, 73
Shoes, manufacture of india rubber 334
Shooting boards, carpenters', 153
Shot and cartridge pouch, 308
Shot, device for separating, 58
Shoulder brace, 121
Shovel and tongs combined, 157
Shuttle-box motion in looms for weaving figured fabrics, 56
Shuttles, fastening, etc., 56, 249, 401
Shuttle and bobbin for looms, 330
Shuttle, tatting, 416
Shuttles for looms, manner of operating, 217, 218
Sieve, 42
Sieves, machine for making wire, 420
Silk from living spiders, mode of obtaining, etc., 58
Sirup, compound, 347
Sirup filter, 250
Sirup, pound or cup, 310
Skate, 73, 90, 106, 138, 232, 327
Skewers, machine for making, 200 (2)
Skirt hoop, 152
Skirt hoops, machine for attaching clasps to, 385
Skirt lifters, ladies', 347, 403
Skirt, skeleton, 120, 250
Skirt wire, 152
Skiving machine, 366
Slate frame, 234
Sled, 152
Sleeves and leggins, attachment for 349
Sleigh brake, 433
Slinging arm, 370
Slitting machine, 418
Sluice box, 154
Sluice for propelling vessels, 270
Sluice for quartz mill, 153
Smut machine, 251
Snap hook, 200, 216, 400, 416 (2), 434
Soap, 268
Soap mold, 249
Soda fountain, portable, 74
Soda, paper, 186
Soda water apparatus, 234
Sofa and crib, 417
Soles, waterproof, 234
Solder, compressed rod, 307
Solder, machine for the manufacture of rod, 307
Soldering iron, 235
Solutions, process for evaporating alkaline, 216
Solutions, vial for holding, 418
Sore eyes, remedy for, 42
Sorghum cane stripper, 90, 250, 369
Sorghum, curing, 137
Sorghum evaporator, 185, 309, 328
Sorghum funnel, 326
Sorting machine, 418
Spade and fork combined, 200
Spark arrester, 106
Spectacle bow, joint of, 326
Spectacles, manufacture of lenses for, 27
Specula for uterine disease, 73
Speculum, 433
Speed, device for changing, 202
Spelling, apparatus for teaching, 154
Spice sifter, 152
Spike, 43
Spike extractor, 73
Spikes, machine for rolling, 350
Spiles, tool for making, 370
Spinning machine, 347, 368
Spindles in spinning frame, mode of driving, 403
Spirit level, 137, 350
Spiral stair, 170
Spittoon, 9, 200, 350
Spoke machine, etc., 88, 250
Spokes in wagon wheels, machine for setting, 26
Sponge cup, 152, (2)
Spoon, invalid, 26
Spoon, steel metal, 348
Spring, bed, 248, 387
Spring balance, 386
Spring, carriage, 418
Spring for cars, pneumatic, 57
Spring furniture, 10
Spring, vaginal, 419
Springs, attachment for upholstering, 308
Springs for wagons, rubber, 25
Sprinkler, 367
Square and level, combined, 347
Squeezer, 433
Stair carpet pad, 248
Stair rod, etc., 218, 367
Staging for buildings, 266
Stamps, numbering, 400
Stamping head, 139
Staple, 326
Stove machine, etc., 202, 249, 267, 288 (2), 416
Steam and water motor combined, 330
Steam, device for superheating, 40
Steam engines, 9, 42, 58, 74, 122, 139, 154, 184, 248, 249, 250, 368, 385, 386, 401
Steam engines, packing slide valves for, 420
Steam engines, piston head for, 419
Steam gage, 58, 120, 201, 251
Steam gage cock, 122, 136, 368
Steam generator, 40, 90, 200, 216 (2), 232, 234, 249, 252, 290, 309, 351, 368, 369, 402, 416, 420, 434
Steam generators, try cock for, 217
Steamships, rotary, etc., 201, 217
Steam superheater, 184, 349
Stamp, hand, 152
Steel and other metal, process of annealing, 138
Steel, apparatus for tempering, 387
Steel, casting, 421
Steel, composition for welding and refining, 185
Steel for safes, manufacture of, 249
Steel, manufacture of, 217
Steel, process of tempering, 329
Steel, process for making, 154, 249
Steel springs, compound for tempering, 26
Steering apparatus for vessels, etc. 400, 416, 434
Steering apparatus, etc, 184, 268, 270, 288, 370
Stencil brush, 270
Stencil plate, 90
Step block for carriages, 217
Step for spindles, 267
Step ladder, 248, 329, 417
Stereoscope, 153, 400
Stereoscopic apparatus, 43
Stereotype block, 307
Stereotype plates, mechanism for setting type in making, 74
Still for distilling salt water, 122
Stirrups, 137, 328
Stirrup fastening, safety, 25
Stocking-heel protector, 307
Stone, artificial, 120
Stone, cement and plaster, manufacture of, 434
Stone and root digger, 239
Stone-dressing machine, 287
Stone for power printing, mode of preparing, 347
Stones for grinding and polishing, artificial, 350
Stop cock, 216, 249, 327
Stopper for bottles, 232, 250, 309
Stoppers from oyster cans, device for removing, 289
Stoves (various descriptions of) 10, 11, 25, 41, 58, 73, 90, 105 (2), 136, 216, 234, 250 (2), 288, 289, 307, 310, 327, 329, 330, 348 (2), 368, 370 (2), 384, 385 (2), 388, 416
Stoves, attaching and hinging covers to, 203
Stove, ash-sifting device for cooking, 435
Stoves, attachment for cooking, 234
Stoves, burner for gas, 307
Stove blacking cutter, 251
Stove door, 387
Stovepipes and water conductors, mode of connecting joints of, 349
Stovepipe damper, 122, 136, 185, 249, 269, 270, 309, 386, 387, 401
Stovepipe drum, 106, 152, 184, 186, 187, 267 (2), 287, 385, 420
Stovepipe elbows and dies for producing the same, 136
Stovepipe thimble, 403, 417
Stop adjuster, 9
Stop for steel railway cars, extension holding, 200
Straps for vests, adjustable back, 308
Strawberries, vase for cultivating, 432
Straw cutter, 89, 136, 232, 328, 348
Straw cutting knife, 330
Straw, machine for pressing, 168
Street sprinkler, 248
Street-sweeping machine, 169
Stump extractor, 104, 200, 216, 309, 402, 418
Submarine explorer, 330
Suction drill, 58
Sugar cane mill, 419
Sugar, centrifugal machine for draining and cleaning, 330
Sugar evaporator, 73
Sugar in refineries, machine for stirring and dissolving, 349
Sugar, manufacture of, 121
Sugar, machine for making cube, 184
Sulphur, process in refining, 349
Sugar mill, 88, 89, 326
Superheating apparatus, 369
Supporter, abdominal, 416
Switch and frog for railways, combined, 250
Switch, railroad, 432
Switch for replacing cars upon tracks, 330
Switch stand for railroads, 384
Switch, transfer, 433
Swing, 270
Swing jack for railway cars, 25
Swivel shackle, 402
Sword and pistol, combined, 123

T

Table cover, 329
Table cutlery, manufacture of, 234
Table, extension, 42, 266
Table, folding, 329
Table fork, 348
Table leaf support, 11
Table stand for articles of food, 42
Tables, machine for jointing the tops and leaves of, 185
Tack and nail machine, 201
Tackle block, 169
Tackle for raising sunken whales and other bodies, 250
Tailors' measure, 137, 184 (2)
Tag needle, 249
Tank, portable for oils, etc., 233
Tank, self-feeding water, 288
Tanning, etc., 11, 26, 122, 139, 250, 347
Taps, construction of screw, 433
Tap and reamer, expanding, 288
Tar, apparatus for burning, 310
Tassel hook, 169
Teakettle, 347
Teakettle covers, fastening for, 216
Teeth, artificial, 105, 106
Teeth of machine for picking cotton, 350
Telegraph cable, 186, 232, 250
Telegraph insulator 56 (2), 154, 202, 203, 232 (2)
Telegraphs, hydro-pneumatic for hotel annunciators, 42
Telegraph, ocean, 136
Telegraph post, 368
Telegraphic reporter, 434
Tenoning machine, 90, 369
Textile fabrics, composition for cleaning and scouring, 203
Thief alarm, 185
Thrashing and winnowing machine 218, 250, 268
Thrashing machines, device for elevating straw from, 330
Threads for parti-colored printing and for properly weaving the same, method of preparing, 311
Tide wheel, 74
Tightening rod, 136
Tile kiln, 327
Tile mold, 348
Timber for cutting into veneers, preparing, 249
Timber, preserving, 403
Timepiece, 201
Tin, machine for making folding, 349
Tin-can opener, 201
Tin cans, machine for, etc., 309, 366
Tinner's edging tools, 327
Tinman's forming tools, 327
Tinman's furnace, 218
Tire cooler, tightener, shrinker 10, 25, 287, 368
Tire-bending machine, 416
Tobacco-cutting machine 153, 289, 309, 402
Tobacco cutter and nut cracker, 402
Tobacco, composition for treating 184
Tobacco, machine for making plug, 200
Tobacco pipe, 41, 105 (2), 121, 418
Tobacco smoking device, 137
Toilet case, pocket, 152
Toilet glass, adjustable, 136
Tongs, gas pipe, 326
Tongs, pie or plate, 202
Tongs, smith's, 417
Tool for cutting gas pipes etc. 153, 217
Tool for making lighters, 89
Tool for trimming boot and shoe heels, 248
Tool for turning wood, 233
Tool holder for dentists, 384
Tools, mode of attaching handles to, 401
Tooth brush, 350
Top, toy, 435
Torch, lamplighter's, 403
Torpedo, submarine, 309
Tow lines, mode of detaching, 120
Toy and doll, 88
Toy blocks, 25
Toy boat, 267
Toy engine and whistle combined, 169
Track rope, hay elevator and carrier, 152
Trammel for ellipses, 234
Transit instrument, 420
Trap, animal 27, 56, 201, 310, 328, 329, 385, 416
Trap, fly, 73, 154, 217, 387
Trap, insect, 74, 348
Trap, steam, 73, 186, 400
Treadle, reversing attachment to 350
Tree protector, 250, 266, 268, 308, 310
Trimming for wearing apparel, 289
Troches, bronchial, 417
Trunk, etc., 74, 184, 186
Trunks, elastic shield for, 121
Trusses, 58, 234, 327, 347, 419
Trusses, spring for, 58
Tube, bending machine for, 330
Tubes, manufacture of india-rubber, 218
Tubing, manufacture of flexible, 385
Tumbler washer and cooler, 386
Tunnel and cock, combined, 187
Turpentine, method of extracting from wood, 200
Tweer 25, 123, 217 (2), 234, 311, 349, 403, 416
Type, construction and manufacture of printing, 417
Types, machine for setting and distributing printing, 91
Typographic printing, 248

U

Umbrellas, etc., 10, 250, 267
Undersleeves, ladies' paper, 369
Urinal, 233
Uterine support, 74

V

Vaccinator, 170
Vacuum pan, etc., 89, 350
Valve, cut-off, balance, slide, etc. 8, 10, 11, 90, 105, 153, 136, 137, 138, 170, 217, 232, 234, 251 (2), 252, 289, 307 (2), 308 (2), 327, 367, 368, 369, 384, 386 (2), 401
Valve gear for steam hammer 42, 90, 122, 152, 233, 248, 250
Valve gear, cut-off adjustable, 41
Vapor burner, 419
Varnish, for various uses, 43, 58, 330
Vats for tanning leather, arranging 350
Vegetable cutter, slicer, grater 185, 216, 232, 269, 386
Vegetable fibre, method of preserving, 419
Vehicle, 138
Vehicles, attaching shafts to, 138, 268
Vehicles, fifth wheel for, 386
Vehicles, propelling wheeled, 202
Velocipede, 309
Ventilator, 136, 401, 402
Ventilator for hats, 232
Ventilating houses, etc., system of 136
Ventilating railroad cars, apparatus for, 58
Vessels, apparatus for removing cargoes of, 58
Vessels, apparatus for raising sunken, 387
Vessels, device for expelling water from the holds of, 432
Vessels, constructing air-tight, 170
Vessels for holding gun-powder, mode of preparing, 201
Vessels, hanging center board for, 153
Vertical windlass, 201
Vinegar, manufacture of, 216, 289
Vise (for various uses) 136, 152, 251, 267, 328, 403
Vises, process for steel facing, 169
Vulcanizing flask, 75, 250
Vulcanizing vessels for dentists' use, 249

W

Wagon, etc., 288, 368
Wagon brake, 25, 138, 152, 153, 202
Wagon box, 57
Wagon, bolster for, 432
Wagon hubs, machine for boring 25, 369
Wagon seats, turn-out, 26
Wagon tire, machine for upsetting 42, 403
Wagon tires, device for tightening 308
Wagon wheel, 26, 106
Waistband, 200
Walls for buildings, process of building concrete and mortar, 385
Wardrobe, 368
Wardrobe and bedstead, 434
Wash basin, 368
Wash board, 10, 217
Washing machine, etc., 9 (3), 10, 41, 57, 58, 73 (3), 74, 75, 88, 89 (2), 104 (2), 121, 136, 153, 186 (2), 200 (2), 201 (3), 216, 217, 249 (3), 267, 268, 288, 328, 330, 349 (2), 350, 369, 385, 386, 400 (2), 402 (2), 417, 418
Washing machine, plug for, 367
Washing tumblers, apparatus for, 137
Washing wool, etc., machine for, 43
Waste coal, method of burning, 202
Watch, etc., 90, 123, 137, 308, 370
Watch backs, manufacture of, 308
Watch die, 348
Watch hand, 169
Watch hands, blocks for polishing and glossing, 401
Watch key, etc., 152 (2), 310
Watch rims, manufacture of, 308
Watches, safeguard for, 248
Watchman's register, 269
Water by waves, apparatus for raising, 329
Water can for railroad cars, 251
Water closets, 137, 200, 217, 347, 369
Water cooler, etc., 288, 327, 400
Water drawer, 132, 349, 387
Water elevator, 56, 168, 233, 234, 249, 250, 310, 326, 349
Water meter, 434
Water wheel, 26, 73, 90, 104, 106 (2), 137, 138, 154, 267, 269, 307 (2), 326, 349, 350, 366, 369, 385, 418
Wave power propulsion, 307
Weather strip, 137, 200, 370
Webbing, elastic, 309
Well boring apparatus, etc., 41, 56, 58, 75, 121, 138, 139, 152, 167, 168, 169, 202, 384
Well boring, 58, 186 (2)
Well curb, 327
Well tube packing, 57
Well tubing, method of sinking, 154
Well windlass, 310
Wells, apparatus for drawing pipes from, 41
Wells, constructing, 266
Wells, drills for oil and other, 168, 234
Wells, mode of boring artesian, 250, 251, 308
Wells, mode of sinking, 56, 90, 122, 169
Wells, operating bored, 41
Wells, packing for deep, 122
Well, pump for oil, 171
Wells, sinking tubular, 170
Wells, subterranean reservoir for, 402
Wells, tubing for oil, 387
Well-trimner, 121
Wheel and axle, 74
Wheel for railroad car, 171
Whey from curd, apparatus for separating, 10, 232, 401
Whiffletree, 25
Whiffletree attachment, 121
Whip socket, 153
Whip handles, machine for weaving covering for, 385
Whistle, alarm, 370
Whitewashing apparatus, 88, 187, 248, 416
White lead, etc., manufacture of, 232
Wick trimmer, 133, 329
Wind mill, 416
Wind power, 120, 154
Wind wheel, 90, 184
Window, 159, 232, 329
Window blind, 106, 200
Window blinds, device for operating, 137
Window curtain, 106
Window sash, mode of operating, 56
Window sash fastener, 434
Window sash, hanging, 385
Window sash spring, 73, 267, 285
Window shade, 41
Window shutters, bolt for, 153, 216
Window screen, 73
Windlass, 89 (2)
Wine press, 416
Wire, attaching hoopskirt, 307
Wire fence, device for tightening, 348
Wire, machine for cutting, 123
Wires, machine for reducing or pointing, 349
Wisps for brooms, method of preparing, 27
Wood, apparatus for graining, 154
Wood bending machine, 41 (2), 58, 122, 171, 289, 327, 329, 417 (2)
Wood, cloth, paper, etc., with paraffin, process for saturating, 73, 309
Wood, composition for filling, 9
Wood drier, 401
Wood, etc., process of coloring, 401
Wood for the manufacture of carding engines, mode of treating, 401
Wood, machine for polishing, 73, 308
Wood, method of preserving, 202, 216
Wood, machine for slivering, 91
Wood, machine for shaping, 387
Wood screws, machine for shaving 249
Wood splitting machine, 90 (2), 106, 216
Wood, straw, etc., process of treating, 25 (3), 416
Wooden pin machine, 232
Wood-work, machine for sandpapering, 434
Wool for picking, carding, etc., apparatus for treating, 433
Wool, machine for oiling, 43
Wool packer, etc., 154, 307
Wool press, 401
Woven wire, mode of manufacturing articles of, 74
Wrench (various kinds), 10, 57, 75, 88, 122 (2), 170, 184, 185, 289, 309, 326, 330, 385, 400, 401 (3), 402, 403
Wrought iron, manufacture of directly from the ore, 88
Wrought iron, machine for forming corrugated, 308

Y

Yarn, dyeing, etc., 171
Yarns, machine for winding, 251

Reissues.

Abdominal supporter, 107
Air, apparatus for carbureting, 388
Artificial limb, 252
Animal and vegetable substances, process for preserving, 107
Auger, 75, 203
Augers to handles, attaching, 290
Bell, door, 27
Blasting compound, improved, 235
Bonnets, bonnet frames, etc., machine for pressing, 403
Capstan, steam, 187
Carding engines, machinery for cleaning top flats of, 203
Cement for slate roofing, improv'd 235
Chain, ornamental, 75
Clapboards, machine for sawing and edging, 371
Clothes wringer, 435
Condenser, surface, 388
Corn planter, 27, 290
Corn sheller, 218
Cotton picker, 27 (2)
Cylinder polisher, 435
Die for making lamp tops, rivets, etc., 421
Diseases, vacuum apparatus for treating, 421
Door knob, bank, and safe, 311
Dough kneader, 421
Drill, 43
Drilling machine, steam, 421
Eggs, process for preserving, 91
Engine, direct-action, 388
Extracts, making, 43
Eyelet for lacing shoes, 155
Fabric, felted, 388
Fabric, waterproof, 388
Feed-water heater and filterer, 91 (2)
Fibrous substances, process of bleaching, 252
Fire-arms, breech-loading, 203, 290, 331
Fire-arm, magazine, 388
Fire-arm, revolving, 235, 270, 351
Fire-arm, self-loading, 331
Fire-arms, cartridge extractor for 331
Gas holder, 91
Grains to different bins, distributing, 155
Harvester, 270, 290, 403, 421 (6)
Hat, cork, 91
Hay spreader and elevator, combined, 203
Head block for saw mills, 187
Hook, self-mousing, 123
Horse rake, 75, 91, 403, 421
Horseshoe, 139
Hose coupling, 171
Hose, machine for making india-rubber, 203
Hot-water apparatus, mode of regulating the temperature of, 371
India-rubber cloth, process for rolling, 218
India-rubber, making hollow articles of, 139 (2)
India-rubber, process of rolling 421 (2)
Inking rollers, composition of matter for printer's, 203
Iron chips, mode of melting and aggregating, 388
Jar, preserve, 371
Kettles, machine for making, 139
Knitting machine, 270
Knob latch, 11
Lamp, locomotive, 11 (2)
Lamp trimmers and shears, 235
Lantern, 91, 139, 351
Lanterns, machine for making, 290
Lock, 91, 270
Locomotives, running gear for street, 203
Loom, power, 203 (2)
Meat mincer, 27
Metal, machine for making serrated sheet, 187
Milk, condensing, 290
Nails, machine for cutting, 43
Newspapers, printing names of subscribers upon, 107
Nozzle, 203
Paints and other materials, apparatus for straining, 435
Petroleum, car for transporting, 403
Photographic enlarging, 203
Pianos, stringing, 107
Pipes with tin lining, 252
Plane, carpenter's bench, 421
Plow, gang, 270
Portfolio, 203
Potato digger, 435
Press, power, 59
Press, punching, 27
Puddling furnace, 91
Puddling furnaces, fix for, 91
Railway cars, improved method of starting street, 235
Roller for wringers, 139
Rubber, manufacture of white, 155 (2)
Rubber, utilizing waste vulcanized 218
Ruler, 252
Sash stopper and lock, 203
Sawing machine, scroll, 203
Screws, capping wood, 435
Sewing machine, 235, 371
Sewing machine guide, 107
Screws, machine for shaving and nicking, 187
Ship, iron, 371 (2)
Shingle machine, 187
Shoe pegs, blank for, 435
Skirt wire, manufacture of, 421
Soda water, apparatus for operating, 155
Splints, machine for cutting, 139
Spoons, manufacture of, 403
Spring for ladies' dresses, 218
Spring, wagon, 421
Staple, wire, 187
Steam boiler, 11
Stone breaker, 59
Stone, machine for cleaning, 421
Straw cutter, 11
Stump extractor, 290
Tablet, writing, 388
Tanning, 435
Tape trimming, manufacture of, 187
Telegraph wires, insulating, 235
Thrashing machine, 43, 91 (2)
Tobacco press, 351
Tongs, pipe, 435
Tool, 123
Tubes, packing for, 351
Tunneling and quarrying, machine for, 11
Vise for carpenters' use, 11
Wagons, attaching springs to, 421
Watch, 187
Water closet valve, 371
Wood-bending machine, 139
Wood, machine for splitting, 11
Wool, machine for oiling, 235

Extensions.

Acid and naphtha from rosin, distilling, 59
Bell, electro-magnetic alarm, 426
Bridges, construction of, 330
Buckwheat pan, 330
Canal lock gate, 331
Car brake, railroad, 59
Cracker machine, 331
Drop press, 59
Fence, ornamental connection of parts of iron, 331
Floor cloth, machines for printing, 331
Grate bars, stove, 59
Grain, drying, 331
Harvester, 331 (2)
Kettles, etc., from disks of metal, machine for, 59
Looms, pattern card for jacquard, 331
Moldings, machine for enameling, 59
Oil from rosin, tanner's, 59
Oil from rosin for lubricating, 59
Oil press, 59
Planing machines, feed apparatus for, 331
Safe, iron, 421
Saw blades, etc., machine for grinding and polishing, 421
Screws, capping of, 331
Screws, machine for shaving, nicking, etc., wood, 59
Sieve, grain, 59
Smoothing iron, 331
Smut machine, 421
Smut mill and grain separator, 331
Speaking tube, 421
Spinner, ring, 331
Stammering, instrument for cure of, 59
Stove, air-heating, 331
Trap for beehives, moth, 331
Volutes, machine for sawing, 59
Zinc white, manufacture of, 331

Designs.

Ace of spades, 351
Alphabet of letters, 171, 252
Base of sheet metal vessel, 107
Bedsteads, 203
Bracket, 371, 435
Bust and clock case, 252
Card holder, 371
Cenotaph, military, 187
Chandelier, 403
Clock case, 252
Coffin, 155
Coffin handle, 235, 351
Collar, lady's tucked paper, 435
Composition in alto-relievo, 107
Cuff and collar, 252
Door lock, 139
Fan, 27
Floor oil cloth, 27, 235
Flour sifter, 107
Flowers, agricultural, 187
Furnace, portable, 203
Goblet, 388
Grant, medallion of Gen., 107
Group of figures, 107
Hand stamp, 331
Harvesting machine, wheel of a, 388
Hasp hook, 27
Hinge plate, 203
Hood, ladies', 351
Hook, coat or hat, 351
Knife handle, 371
Lincoln, bust of Abraham, 107 (2)
Paper collar, 107
Pen, 351
Piano stool, 139
Picture frame, 331
Pipe, tobacco, 235, 331, 351
Pitcher, 403
Pump, 252
Range, cook's, 107, 331
Railing, 331
Sewing and embroidering machine, frame for, 331
Shoe, quarter of a balmoral, 43
Spoon handle, 107, 421
Spoon or fork handle, 403
Statuette and clock case, 252
Statues, masonic group of, 27
Stove, 107, 403, 435 (3)
Stove, plates of a 43, 75, 107, 171, 235, 371 (7)
Trade mark 27, 75, 107, 171, 187, 203, 331 (3), 388, 403, 435 (2)
Type, printer's, 371
Watch, top plate of a, 171, 203
Weather boarding, 331