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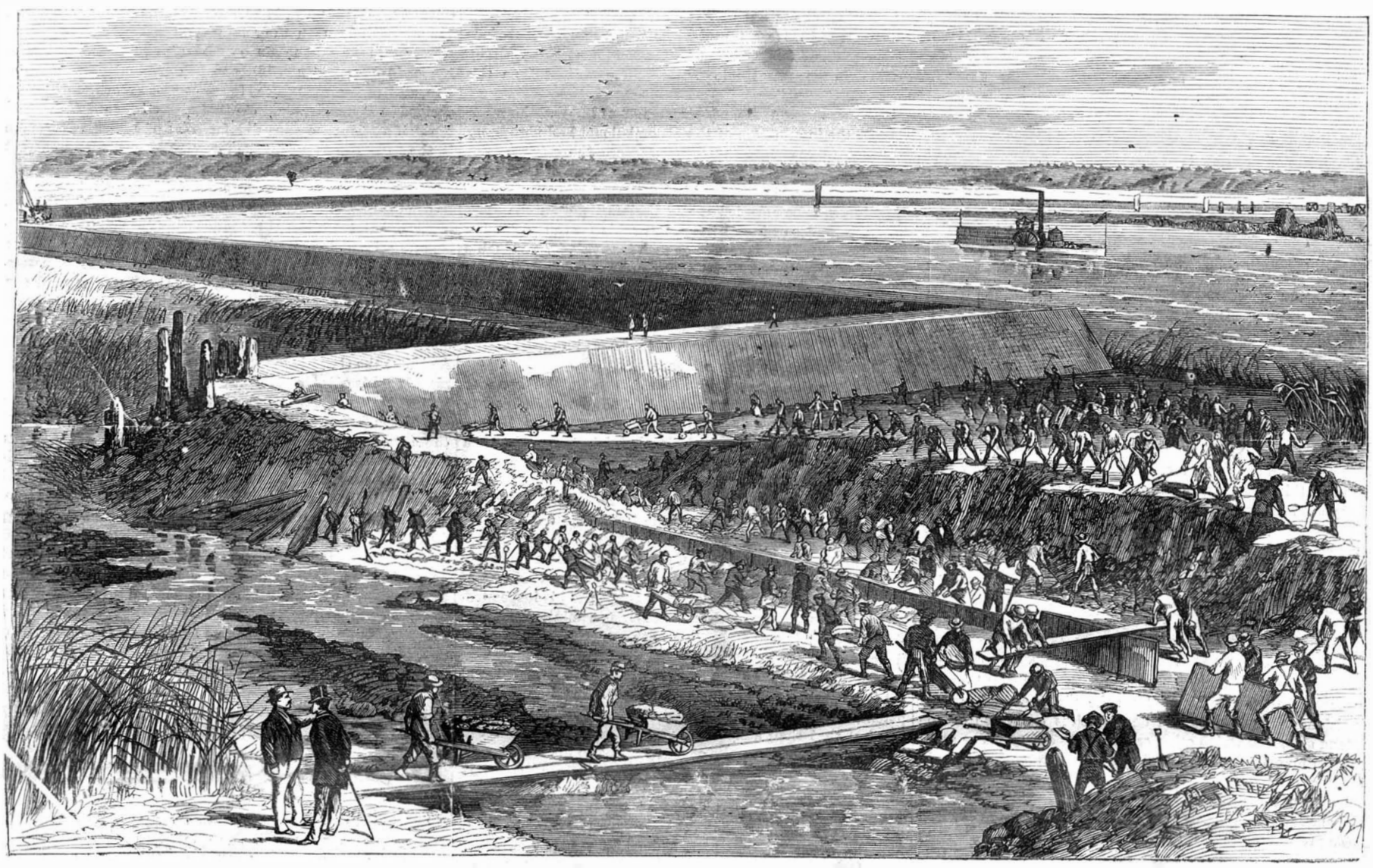
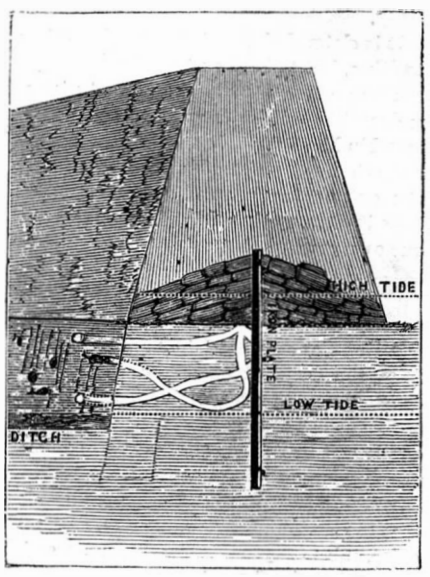


DIKING AND DRAINING THE NEW JERSEY MEADOWS.

SETTING A PLATE.

CHISELING.



SECTION OF EMBANKMENT.

Diking and Draining Salt Marshes.

The draining of swamp lands is not a new idea. Such lands are not only unproductive of anything which can subserve any important purpose, but they are productive of numerous evils. Teeming with miasms, the home of mischievous and annoying insects they are blotches upon the otherwise fair face of nature. To render them fruitful, and productive of good rather than evil, is a problem for which a solution has been anxiously sought, but heretofore only partially obtained. No system applicable to all cases has been discovered, and only three methods have been adopted in the past to any great extent; viz., the slow process of pumping, ditching, and the erection of dikes or levees. These methods are not only expensive at the outset, but inefficient and costly to maintain. The dikes of Holland are embankments made with heavy timbers and filled in with stone, the surfaces being covered with bundles of flags and reeds fastened down by stakes. Also piles are driven into the sand and protected by planking, as well as by earth, turf and stones. In some places wicker work is used to cover and protect slopes, and the willow is cultivated extensively to supply the material for this purpose. In places of great exposure, walls of masonry with piles driven upon the side towards the sea, are used to protect the embankments from the action of the waves

The fens of Lincolnshire and the Bedford level are examples of the reclaiming of worthless and unproductive swamp lands and transmuting them into fertile and productive fields.

These works are, however, not the results of private enterprise. In order to complete them, it was necessary to seek and obtain gov ernmental aid.

An annual expense of $30,000 each is required to keep the dikes of Helder and West Cappel, at the western extremity of the island of Walcheren, in repair. The annual expenditure in Holland for maintaining its dikes and the regulation of its water level is from two to two and one half millions dollars. Watchmen to patrol the dikes and to give the alarm when danger threatens, and engineers to apply the proper means in cases of emergency, are constantly employed.

As we have said, these measures are only partially success ful. Water percolates through such artificial embankments,

Even if practically water-proof at the outset, the rats and land crabs soon destroy their integrity, and what they commence the action of the tides accelerates, and thus the necessity of constant watchfulness and repair arises. The want of an impenetrable core which should defy the whole tribe of borers, individually or unitedly, has caused the failures in the science of draining which have hitherto marked its progress.

The iron dike invented by Mr. S. B. Driggs, of New York, seems to put an effectual barrier in the way of these destructive agents. It is constructed by driving iron plates into the soil and joining them end to end, thus presenting an unbroken and impenetrable iron wall, which may be extended to any required length, and the durability of which is unquestionable. If, from causes not taken into account, repairs should ever be needed, the replacing of one of these plates is an operation quickly and easily effected.

The invention of iron dikes seemed to be singularly applicable to the drainage of the Newark meadows. Accordingly, Mr. Driggs, purchased and secured, notwithstanding difficulties arising from the various owners and the opposition of the Tide Water Co., of New Jersey, 5,000 acres of these lands. This Tide Water Co. had most exclusive and oppressive privileges granted to them by charter; one of which was the power to reclaim any land at will, and to tax the owner twelve dollars per acre in perpetuity. Mr. Driggs fought this scheme of extortion until he obtained the entire abrogation of their iniquitous charter. At this stage of proceedings, Mr. Driggs secured the hearty coöperation of Mr. Samuel W. Pike, of opera house fame, who saw sufficient promise in the system to give it his most earnest and hearty support. The work was now prosecuted with great vigor, and the result has been that owners of land only a few months since valued at fifty dollars an acre, have in some cases recently refused offers of enormously increased prices. The accompanying description, together with the cuts, will give a good idea of the nature of this improvement.

We have already said that these dikes are constructed with iron plates driven into the soil. The plates are so constructed and driven as to form a continuous wall. They are of cast iron, as thin and sharp at the bottom as the metal will run They are made of sufficient width to reach both the high and low water marks, and are pressed or driven into the soil by any convenient power. The weight of workmen transferred by means of an ordinary fence rail, or blows upon the tops with stones, is sufficient in very soft mucky soils, while in stiff soils some superior force might in some cases prove necessary. The plates are so joined to each other as to prevent their overlapping, and the earth forced into the joints renders them sufficiently tight. When the turf is too tough and unyielding to drive these broad plates with facility, it is cut by a process called chiseling. After the plates are driven to a sufficient depth, a large and deep ditch is excavated on the inland side, into which other cross ditches empty. The earth thrown up over the iron wall forms a fine substantial embankment, covering the portion of the iron left exposed in driving. The bank is protected from the action of weather by grass and such creeping plants as have long interlacing roots.

To prevent oxydation, the iron used is refined so little as to be scarcely changed in character from the crude metal. It is well known that refining iron increases its tendency to oxydize, and it is claimed that the iron used for these plates will at least rust so slowly as not to materially affect their durability.

It is claimed that this improvement is applicable not only to dikes, but to banks of canals.

There can be little doubt as to its applicability to the reclamation of the large tracts of waste swamp lands to be found in Mississippi, Louisiana, Arkansas, Missouri, Tennessee, and other parts of the United States. Experience has proved the extraordinary fertility of lands thus reclaimed, and the benefit of iron dikes may thus prove to be a boon not only to our own country, but to the world at large.

POWERS OF THE COMMISSIONER OF PATENTS.

A singular case has lately arisen in the Patent Office, which from the frequent opportunities of its occurrence involves consequences of considerable general importance.

The owner of a patent applies to the office for a reissue, and is met by the answer that there appears upon the records of the office an assignment of the whole patent to another party, who has already obtained a reissue. To this he replies that the assignment is a forgery, and at the request of the office, substantiates his statement by satisfactory proofs, and claims that the Commissioner should at least again reissue the patent, and place him upon an equal footing with the forged assignee.

The Commissioner rejoins, that this is impossible. First, because he has no power judicially to consider the question as to who is the owner of the patent, aside from the records of his office, and, second, because the original patent having been surrendered by the fraudulent assignee, it has now no existence to be again surrendered for a reissue, and that the only remedy for the rightful owner is in the courts.

It becomes our duty to consider these questions in their order:

First—What are the powers of the Commissioner of Patents in determining who *is* the assignee of a patent upon the application by a person of that class for a reissue?

The provisions of the Patent Law upon the subject of reissues, in this instance, are as follows:

After detailing the prerequisites of a reissue, the act continues, "and in case of his (the patentee's) death, or any assignment by him made of the original patent, a similar right shall rest in his executors administrators, or assignees." Act of 1836, §13.

The power here conferred upon the Commissioner to reissue a patent to the assignee thereof, necessarily invokes the power to determine who is an assignee. Of this there is no dispute, indeed the objectors in this case concede the right, though they insist that the Commissioner can have resort only to the records in his office for information.

Let us inquire, then, whether such is the limitation of evidence in this instance.

The powers of the Commissioner of patents are largely judicial. Questions of novelty, utility, adequate compensation, equivalent devices, and construction are under his constant supervision.

In no single case is he expressly limited by law to the information on hand in his office. Indeed by far the greater number of classes of questions presented to him, depend upon information wholly outside his records.

The Act of 1836 (sec. 11), provides, "that every patent shall be assignable in law, * * which assignment * * shall be recorded in the patent office within three months from the execution thereof."

What was the purpose of this enactment? Was the recording for the information of the Commissioner? Judge Story in a leading case in Massachusets, where the effect of not recording an assignment was fully discussed, supplies us with the answer. The learned judge there says, "Why should an assignment be recorded at all? Certainly not for the benefit of the parties or their privies, but *solely* for the protection of *purchasers* who should become such *bonâ fide*, for a valuable consideration, without notice of any prior assignment." (Pitts *vs.* Whitman, 2 Story, 609). And this is the settled law to day. If, then, "Every assignment shall be recorded" "*solely* for the protection of purchasers," under what color of right can the Commissioner say that the enactment impliedly limits him to the record itself for evidence.

But again, the Act says, in case of the patentee's death, or any assignment by him, a similar right shall rest in his *executors, administrators*, or assigns.

Suppose a patentee dies, and his administrator applies for a reissue, must not the Commissioner determine if the party applying *is* the administrator; and in order to do this is he confined by any requirements of the Patent Law to any records in his office to determine the fact? Manifestly not, for there are no such records, the whole range of legal evidence which might be adduced in a Court of Justice is at hand to aid him in his decision. Primary and secondary evidence of all kinds in their appropriate places is open to his inspection. And if this is the case with an executor or administrator, why should we apply a different rule to the assignee who is mentioned by the Act in the same breath.

And again, many assignments are incapable of record, and yet it seems hard that such assignees, the legal owners of a patent, should be precluded from the benefit of a reissue by the fact that their assignments are not recorded, which will be the case if the Commissioner is limited to his record, such as assignees in bankruptcy, insolvency, or receivers. Or a veritable assignee may have lost or been deprived of his assignment, and may be unable either to procure a copy or a new original, yet it can hardly be the policy of the law to deny to him the whole benefit of his patent, by refusing to admit other legitimate proof of his ownership as a foundation for an apolication for reissue.

This very objection of being limited to the records of his office was made by the Commissioner in the analogous case of *ex parte* Dyson, decided on appeal from the patent office in 1860, and Judge Dunlop then held that "the legislature has not said by what proof the applicant shall show that his invention claimed on reissue is the same invention made and intended to be patented on his original application. He is not limited by the statute to prove it by the specification, models or drawings, any legal proof to show it to be the same invention, whether found *in the record or aliunde*, ought to be received and weighed by the patent office. No authority is given to the patent office to limit the applicant's proof, if it is such as upon the law of evidence is held sufficient to prove facts before other legal tribunals." If, then, the applicant for a reissue is not limited to his specifications, drawings and model, upon the question of ideatity, why should he be confined to the record of assignments upon the question of ownership.

If, then, these authorities and illustrations have any weight, it would seem to be an undeniable proposition, that upon an application for a reissue of a patent, the Commissioner is not confined to the record alone to determine the legal ownership of the patent, but may resort to all those ordinary departments of evidence which afford themselves to every one charged with the decision of judicial questions, indeed, any other constuction would lay the Patent Law open to the charge of depriving citizens of their right to a reissue (which is their *property*), without "due process of law."

This view is strengthened by referring to the provision of the law of 1861, (chap. 88), which provides "that the Commissioner of Patents may establish rules for taking affidavits and depositions required in cases pending in the patent office," supplying him with ample facilities for satisfying his mind of any doubts in this or similar cases, a provision evidently intended to apply to proceedings before the office different from the "contested cases" mentioned in section 12 of the Act of 1839, or the subsequent clauses of the Acts of 1861. It remains then, only to consider under this head the question whether the record can be *contradicted* by evidence *aliunde*.

The evidence being admissible as above shown, there is no rule which will prohibit its use in the correction of the record.

The rule of the common law which prohibits the contradiction of a writing by parol evidence is one of interpretation merely, when the only question at issue is one of construction, but has no applicability to cases where the existence or authenticity of the instrument is disputed. (Greenleaf on evidence, §284. Act of 1839, or the subsequent clauses of the Act of 1861.)

We come, therefore, to the second question proposed, as an objection to the reissue under consideration.

Does the fact that the original patent has been surrendered by the fraudulent assignee form any obstacle to its reissue?

It is satisfactorily proven that the patent had been surreptitiously obtained from the owner for the purpose of surrendry. The surrender, therefore, was made by a person having no authority to make it, and was of consequence a nullity. It is one of the greatest absurdities to allege, that any person can, by falsely simulating another, rightfully deprive him of his property. But if no valid surrender of the patent was made, the proceedings upon the reissue to the fraudulent assignee were void, for a reissue can only be granted after a valid surrender (Act of 1836, sec. 13), and the original patent, therefore, still continues in force. In the case of French *vs.* Rodgers, decided in Pennsylvania, in 1851, Judges Grier and Kane held that "if a reissue was invalid for want of authority to make it, the surrender is ineffective for want of authority to accept it." Indeed, it has frequently been adjudged in the analogous case of the surrender of a patent, upon an insufficient basis of fact for a reissue, and the reissue being void in consequence, that the original patent continued in force, notwithstanding its delivery to the patent office. (Woodworth *vs.* Edwards, 3 Woodbury & Minot, 127.) The mere fact of possession by the office is nothing unless there was a valid surrender.

We have now seen that the surrender of a patent by a fraudulent holder is no bar to the legal title of the true owner. And that the Commissioner of Patents is not restricted to the records of his office in determining who is the assignee.

It would appear, therefore, to be his duty, upon being satisfied of the fact of the forgery of the assignment, by means of those ample provisions for securing evidence in cases before him, contained in the acts of 1839 and 1861, to reissue the patent to the party whom he is convinced is the rightful owner, thereby remedying the wrong that has been done him, at least so far as to place him on an equality with the wrong doer.

There are some badges of fraud upon the face of the forged papers in the particular instance before us, which need not be adverted to in this discussion of the general principles of the case; we will only remark in conclusion that it seems peculiarly appropriate, that where, as is at present the case, the door is left wide open for the perpetration of frauds of this nature, by the lack of any provision of the Patent Law for the identification of grantors and grantees of patents, prior to their assignments, that there should be a simple and summary method of correcting errors resulting from so manifest a defect.

THE GREAT AERONAUTICAL EXHIBITION.

The much talked of Aeronautical Exhibition, opened at the Crystal Palace, London, the 25th ult., with a large number of machines immediately and remotely connected with the subject of air navigation. Machines with wings, screw propellers, and tails, more or less in imitation of the structure of birds, seem to form the foreground of this collection of mechanico-ornithological devices. It is not our intention to reiterate the opinions in regard to the practicability of aeronautical machines, which have often been published in our columns. The exhibition inaugurated by the Aeronautical Society is a very good representation of the progress thus far attained. The secretary of the society in a communication to "*The Engineer*" says:

"It should be borne in mind, in the event of any ridiculous theory being illustrated in some of the objects now to be seen, that the study of aeronautics has been hitherto left to a class for the most part uneducated in mechanical laws, who have in consequence been wholly unable to give practical effect to their views, since they could neither themselves construct the apparatus they required, nor did there exist any organized scientific society from whose published proceedings they could gather confirmation or condemnation. Eminent naturalists, for instance, ignoring mechanical laws, have recognized as the main feature in the buoyancy and flight of birds, air cells and other peculiarities which render them of the same specific gravity as the atmosphere. The attempt to elucidate such a theory by any model would be quite as ridiculous as anything likely to be shown at this exhibition." Still it is hoped "if the ideas enunciated in some of the excellent papers read before the Society, do not result in some mechanical arrangements which shall to some extent be effective, that they will otherwise lead to more promising investigation."

The machines and devices exhibited are divided into seven classes: Class I. includes light engines and machinery.

In this class we notice

Rotary engine made of steel, one-horse power; dimensions, two feet by eighteen inches, and one foot high; weight about sixty pounds. Motive power, gun cotton.

A one-horse power turbine injector steam engine, weighing less than twelve pounds, with inclined vanes showing its adaptation for aerial purposes, with rudder and gear for working.

Light engine and machinery for aerial purposes, about half-horse power. Cylinder two inches in diameter, three-inch stroke; generating surface of boiler, three and one half feet; starts at one hundred pound pressure in three minutes, works two propellers of three feet diameter about three hundred revolutions per minute. With three and a half pints of water

and eighteen ounces of liquid fuel, works about ten minutes. Weight of engine, boiler, water, and fuel, sixteen and one fourth pounds.

Aluminum steam engine.—Viscount de Pouton d'Amecourt, 36 Rue de Lille, Paris.

Working model of the Brighton oil engine (Dr. Money's patent). In this engine power is derived from explosion within the cylinder of inflammable gas or vapor mixed with atmospheric air, The vapor is produced by volatilization of certain liquid hydrocarbons, the heat resulting from the explosion being made available for this purpose.

CLASS II.—*Complete working aerial apparatus.*

Flying machine, which, being attached to the body, enables a person to take short flights.

Complete working aerial apparatus by muscular power.

CLASS III.—*Models.*

Model of a balloon, with a ring or belt attached which, in ascent or descent, is placed in an inclined position, relative to the axis of the balloon, the current of air rushing through the open side of the bell, urging the whole in that direction.

Model of the framework of a car, adapted to receive the machinery described in a drawing (class 5), the object of which is, by a system of levers, to raise the car two or three or more inches, according to the force required, which suddenly dropped on to its supports, produces a rapid succession of jerks, thereby effecting descent without loss of gas.

Model of an improved balloon. By this model it will be seen that the car is done away with, and that a structure of bamboo or wicker work is to be built round the balloon, which is used as an ascending agent only.

Model of the aeromotive, constructed for rising in and steering through the air by the rapid rotation of a screw (one on each side of the machine), which, by creating a reaction in the air, overcomes gravitation, and thus rises. Fixed to the top is a parachute for gradual descent in case of accident The aeromotive is propelled by a screw and guided like an ordinary vessel. The principle of the screw is the same as Rennie's conoidal.

Model of an aerial steamship, propelled by four wings, giving alternate stroke, and two screw fans, one of which is placed vertically for assisting in ascension, the other placed horizontally for propelling ahead, with internal space for gas.

Small model of a steam or hot air engine, chiefly constructed of vulcanized India rubber for aerial purposes.

Experimental model of a balloon, dispensing with gas and ballast.

Model in demonstration of a proposition to omit ballast in balloon ascents. By this proposition gas would be withdrawn from the balloon by an air pump, which would compress the gas into a chamber carried in the car when a descent becomes necessary. An ascent will be obtained by opening a tap, and thus allowing the compressed gas to escape from the chamber by a tube into the balloon. The advantages of this would be that the natural balance used by fishes would be applied to balloons, gas being reserved for use instead of escaping as now obtains.

Model of an aerostat or aerial float, eight inches long, twenty inches broad, and two inches deep, rendered rigid by inflation. When the two shorter ends are doubled together it assumes the form of an open boat or canoe, and will then balance itself in the air, and can be used as a parachute, for it will always descend with its convex side downwards, and in doing so may be propelled and steered in any direction. It is expected, however, that when made on a large scale, inflated with gas and propelled horizontally, it will support itself. The engine intended to be employed is an ammoniacal one.

CLASS IV.—*Working Models.*

INSIDE.

Working model to illustrate a mode of flying vertically by direct action on the air, without any screw motion in the wing. This machine will ascend in a vertical line.

Working model to illustrate natural flying, the wings being used to propel and sustain, the tail to sustain only. This model will fly horizontally for a short distance.

Working model of an air ship, lifting itself by motive power, and capable of being governed in every direction, based upon a system supposed to be not hitherto known, which enables it to work against any lesser currents of air; therefore a certain horizontal direction can be pursued, inasmuch as the cubic contents of the apparatus are comparatively little in proportion to its carrying powers. Each cubic foot of the space occupied by the apparatus is capable of carrying half a pound (Vienna weight).

CLASS IV.—*Outside the Main Buildings.*

A working model of an aerial machine, raising and sustaining itself in the air for several minutes, being worked by a power evolved from the combustion of materials similar to those used in the original fire annihilator, steam and gaseous products of combustion being intermixed within the boiler, and forced at high pressure into a rotary engine, turning, lifting, or driving fans.

CLASS V—*Plans and Illustrative Drawings.*

In this class we notice only the following, chiefly on account of its absurdity. The expectation that a body floating in a current of air, and propelled by no other force, could be guided by sails, is a folly which our readers will appreciate without further remark.

Drawing and plan of an aeronautic machine. — This machine consists of an oblong frame of light wood, which supports a platform and tent for the aeronaut. To this frame are attached two spherical balloons, fastened at their center to the frame in the usual way. A light shaft supported on the lower side of the frame gives motion to the steering apparatus, which is worked by hand, and by which the aeronaut can change the position of the machine at will. There are sails attached at the forward end of the machine by which it is expected an oblique course can be given to it.

CLASS VI.—*Separate Articles connected with Aeronautics.*

CLASS VII.—*Kites or other similar Apparatus proposed to be used in cases of Shipwreck, Traction, or in the Attainment of other Useful Ends.*

INSIDE.

A rough kite made of materials most likely to be found on board ship, suggesting to the unprovided mariner in peril of being driven upon a lee shore, a ready way of making a kite to be flown with 'two strings.' When about one third out, attach a small wooden weight to the second line; pay out again until the kite reach the distance required; then cut and let go the second line, which will swing to the shore, and communication is accomplished. On an uninhabited coast, attach the second line to the man swimming thereto. The inventor, John Neale, a working man, freely gives this very simple, rough, and common invention of "two strings to the kite" for the benefit of maritime populations of all nations, humbly requesting of all persons interested therein to extend, translate, and further advance the knowledge of the same.

Model apparatus for throwing a line of communication to persons in danger, either from fire or water.

OUTSIDE.

Rogers' patent projectile anchor and block, for launching life boats, etc., in rough weather, and for other life saving and useful purposes. Working model, scale $\frac{1}{16}$, with diagrams, to effect direct communication with a wreck on shore, or between a ship and the shore, or between two vessels at sea, or for assisting boats to leave the ship's side, when at anchor or in a rough sea, or for use in club hauling a vessel off a lee shore; also as a means of aid in case of fire occurring in high buildings.

An arrangement of kites showing Cordner's application to the saving of life, etc., from shipwreck, and to other purposes This consists in applying to the saving of life and property from shipwreck, etc., a set or succession of kites, or several combined sets, so arranged that the power exerted by the several kites of a set shall be at one point or upon a single line, the line of the first or uppermost kite being attached to the adjacent kite, and the line of this to the next adjacent, and so on through all the series.

A patent kite and apparatus showing, by experiment upon a smaller object, how it is possible for a man to ascend the line of a kite by the draft power of another kite attached to a car. The exhibitor has himself ascended by these means to the hight of several hundred feet.

The exhibition only confirms our doubts in regard to the practicability of aeronautic machines.

One difficulty which seems not to be fully appreciated by inventors in this field, we will briefly notice. It is the extraordinary velocity of air currents in proportion to the density of the medium. Did currents of equal velocity in proportion to density occur in water as occur commonly in air, no method at present known would enable us to navigate water. In extreme cases, birds, albeit adapted to flying as no human device can ever be, are driven miles by the force of winds, or compelled to take refuge from its fury.

MECHANICAL NOTES.

TO MAKE A "KNURL."

The "knurl," beading or milling tool, as it is variously named, is often called into requisition by the mechanic for the purpose of ornamenting the beads or swells of the work he is engaged upon. These knurls are generally purchased at some of the hardware stores, and are used by inserting them on the end of an iron shank, where they are free to be rotated by any moving body being held in contact with them, and if they be held rigidly enough they will make upon it a figure the reverse form of that upon their periphery. Knurls are generally made with about three forms of face—straight, hollow, and rounding—and these forms are cut with straight or beveled teeth, or designs of different degrees of coarseness.

If at any time the mechanic has one of these forms, a hollow for instance, which is suitable for beading a swell, and he wishes to produce the opposite of this, or a round faced knurl, he can turn up a steel blank of the required form and hold the hollow knurl against it until the form of its teeth is fully impressed in the surface of the blank. This then can be hardened and tempered ready to be used for the production of its reverse. In this way a sharp knurl may be used to produce a great number of others, or when they become dull by usage they can be restored by it to their original excellence.

But as it is often desired by the mechanic to make a knurl the teeth of which are required to be coarser or finer than any he possesses or can purchase, he can readily do it by first turning a blank to the form required, and then cutting a small screw with the same pitch of thread that the knurl is wanted to be, then cut grooves across it the same as a hob is made for cutting screw-chasers. Temper this screw and fit it to revolve in the lathe. Attach the blank knurl to a shank, the same as it is used in actual work, and hold it in a vertical position so that it will revolve by the action of the screw as it is held against it. The rotation of the screw will cause the blank to revolve, and a serrated surface will be formed upon it at the same time. While doing this it will be necessary to support the shank that carries the blank upon a T-rest.

If the blank knurl be made with a hollow face, the screw to cut it must of a necessity be of a size proportionate to the hollow; but if the blank be made with a flat or rounding form then it must be moved in such a manner that the screw will cut every portion of the face evenly and alike, and this can be done by moving the handle that carries the shank, as it lays upon the rest up and down, and by so doing presenting the blank correspondingly to the cutting surface of the screw.

If ornamental knurls are wanted, the services of the die-sinker must be brought into requisition, who will produce a reverse of the ornament needed, and then reverses of this can be made in the manner mentioned, or they may be so made that they can be used upon the work without the necessity of using them as patterns to form working tools.

HOW TO MAKE METAL TUBES.

Tubes of metal are used for a variety of purposes, and in all large cities and towns are easily obtained of almost any size; but there are times when the mechanic finds it an impossibility to obtain what he wants of this kind of material, and he must manufacture a tube for himself. If the tube is required to be of two inches diameter inside, a narrow strip of metal is cut off and bent close about a mandrel or spindle of that size, until the ends just meet; this slip when straightened out gives the breadth of the piece which is to form the tube. Cut a piece of this breadth from the metal, taking care that the edges are exactly straight and the breadth uniform; brighten the surface for about a quarter of an inch by filing it at the opposite edges on the same side. Then place the piece of metal upon a spindle and with a mallet bend it round it until the edges come in contact and lie very close and even together, the brightened parts coming together on the inside and presenting a clean surface for the reception of the solder.

If the tube be exposed to the fire for soldering in this state, especially if the metal be thin, the heat would cause the suture to open, and it would be impossible to solder it; to prevent this, place loops of small wire, at an interval of about an inch or so apart, around the entire length of the tube, and twist them so as to bring the edge of the metal in close contact.

The tube so prepared is ready for soldering, and borax and spelter must be used for that purpose. The borax being previously burned or made to swell into a friable mass by exposure to heat upon an iron plate, is triturated with water to the consistency of cream, in which state it is rubbed along the inside of the tube upon the seam; upon the borax a portion of spelter solder must be laid. Place the tube over a good charcoal fire with the suture downward, until it becomes slightly red hot; at a cherry-red heat the borax will melt, and presently the solder will fuse, and as this fusion proceeds draw the tube along so as to expose every part of the line or joint to the action of the heat.

When finished remove the wires, and put it in a pickle of sulphuric acid diluted with water; after half an hour remove it, wash and scour it clean, and it is ready to be wrought as may be desired.

GRINDING CYLINDRICAL SURFACES.

The turning of long and slender rods in the lathe, so as to have them of a true cylindrical form, is quite difficult even when a back-rest is used; irregularities which are unobservable by the eye are easily detected by passing the rod between the fingers. Even short and thick rods, that are too rigid to spring under the action of the turning tool, are found to have slight irregularities, which may be accounted for by imperfections of the lathe or by the wearing of the tool, or from hard or soft places in the metal. It will be observed, then, that to produce a perfect cylindrical surface in the lathe is a matter of some difficulty, and the only method seems to to be to turn the work as true as possible, and then complete it by grinding with some abrasive substance, as powdered emery, moistened with water or oil, which is the material generally employed.

The application of emery as an abrasive means for producing cylindrical surfaces is quite simple, as it is evident that the cylinder must be confined between surfaces the counterpart of those to be produced, and then well supplied with the abrading material; it is quickly revolved and operated upon until the requisite surface is produced. If a block of metal, as iron, steel, or brass, be bored with a hole of the size to which the rod is to be reduced, and one end of the rod made to enter this hole, both rod and aperture being supplied with oil and emery, it is evident that by moving the block in which the rod is inserted over the length of the work, it will be reduced so that it will correspond to the diameter of the hole. A block of lead or tin may be cast around the rod and supplied with emery and oil and operated as mentioned. This perhaps is the readiest way of forming a block, as it is easier to melt and recast the soft metal than it is to prepare and accurately drill the iron or steel block. The latter is useless unless of the proper size, but the former can be often remelted and used as as first.

For the use of the amateur an adjustable tool which may be recommended, consists of two cast iron or brass shells, cylindrical in form, and of a length sufficient to keep them steady upon the work. These shells have ears upon each side, and screws pass through these ears and confine the two parts or halves together. Two middle ears may be made with set screws to prevent the shells being closed beyond a certain point. To each of these shells handles are attached, so as to enable the operator to hold the tool and also to enable him to traverse it over the rod to be ground. The interior circles of the shells are made so that when the tool is placed around the rod it is much larger than its circumference, and this space is filled with molten tin, lead, or babbit-metal. If a difficulty should present of the soft metal not retaining its place, several small holes may be drilled a little distance in the shells, and the metal filling these holes when cast will form a sufficient hold to retain it. By slacking the

set screws and tightening the binding screws, the size may be varied, to suit small variations of diameter in rods.

For the purpose of casting the lead or tin within the shells, the set screws are withdrawn and the binding screws are slackened so as to leave an opening of about a quarter of an inch between the flat faces of the shells. They are then placed edgewise upon a block or some level support, and a short cylinder or core of the same diameter as the cylinder to be ground is placed centrally in the aperture of the shells, and two slips of wood are placed so that they form a continuation of the circle where this circle is broken by the separation, and then the parts are firmly pinched together by the binding screws, the melted metal poured in, so that it fills the cavity and encloses the core. The slips of wood serve to keep the shells at the required distance apart, and also serve to retain the metal, which otherwise would flow out at those places. It is almost unnecessary to repeat that the aperture of the shells should be much larger than the work to be ground, and the slips of wood taken out when the tool is to be used.

To keep the core centrally in the aperture of the shells, while the metal is being poured, it may have a portion of its length inserted in a hole in the block or board on which it is placed. If it be desired to cast the metal round the work itself, it may be so fixed and the metal poured. To prevent the flowing out and waste of the metal, all such points as would be likely to afford such escape are luted with clay, or even common putty such as is used by glaziers to fasten in windows may be used.

In using a tool of this character after the rod to be ground is put in rapid rotation, the tool is grasped with the hands and transversed backward and forward over the rod, and as the parts presented to its action are reduced the set screws are loosened and the binding screws are correspondingly tightened in order to decrease the circle and enable it to clasp the work with the requisite pressure. Adjust the tool and pass it over the rod until it continues to slide smoothly and with uniform resistance from one end to the other; oil and emery are to be applied during the entire operation.

It is advisable to make the grinding surface as near a counterpart of the cylinder as possible, and if a very perfect surface be desired, it would be well to reduce the inequalities with the application of one set of soft-metal castings, and then remove them and cast a fresh set with which to complete the operation.

Another application of this method is to fix the grinding tool in the tool-post of the lathe, and let it traverse the work from end to end, as it is rotated, keeping it supplied with oil and emery and advancing it to the work as it is reduced. In this case it is not necessary to encircle the cylinder or rod with a metal block, as an encircling of one third or one half the circumference is sufficient.

In some kinds of machinery it is necessary to accurately grind large rolls so that they may be perfectly true, and after these rolls are turned in the lathe as true as possible, they are mounted on their own bearings in a frame similar to that in which they are to be employed, and made capable of a slow rotation. A wooden cylinder supplied with a coating of emery is revolved with great velocity just in contact with the roll, which as it slowly turns is reduced by the quick-running emery wheel. The roll must revolve in a direction opposite to that of the emery wheel.

The same application may be made in the lathe, by slowly revolving the work and fixing the emery wheel in the tool post of the lathe and letting it traverse the work, the necessary speed being communicated to the grinding wheel from any convenient pulley.

This method is used for trueing the hardened plugs of templets for gaging the caliber of rifle barrels, a wheel of corundum being employed instead of the emery wheel.—*Mechanic's Tool Book.*

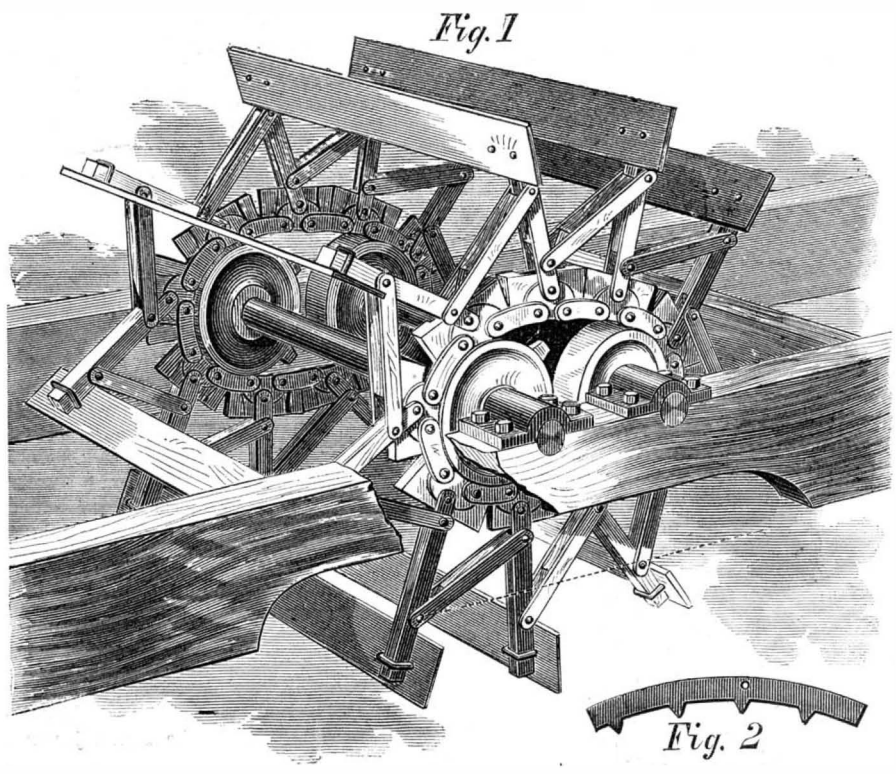
The Latest Novelty in Printing.

The foreign journals report that an American has taken out a patent in France for a style of printing which may be read in absolute darkness. We have not seen an account of the details of this invention, but have no doubt that the process is similar to that of certain photographs, which we described, Vol. XVIII., page 407, under the title of the "Latest Novelty in Photography." Nothing is easier than to print with an ink made of powdered phosphorescent substance mixed with some gum or varnish, as described on the page mentioned. Such a print may be either visible or entirely invisible by daylight, according as the color of the ink differs from or resembles the color of the paper upon which the print is made; but in order to render it visible in the dark, all that is required is simply to expose it for a few seconds to the sun, strong daylight, or to electric, calcium, or magnesium light; and, when after some time it becomes invisible, a renewed exposure to light will make it again visible. In this respect it has a great advantage over the luminous photographs which cannot be exposed to daylight except under the glass positive, as the whole surface of the paper is covered with the phosphorescent substance, and must therefore be preserved in the dark. The printing here described, however, improves and becomes more luminous the more it is exposed to light, as only the letters consist of the strongly phosphorescent substance, and the rest of the paper is in its natural condition, that is, it requires a very strong light to make it feebly phosphorescent.

SO-CALLED SODA WATER.—Most of the beverage sold as soda water has not a particle of soda in it, but is simply water with carbonic acid forced into it by using mechanical pressure, as that of a condensing syringe or a powerful force pump. Carbonic acid water is an agreeable and healthful drink, especially in hot weather, when taken in moderate quantities.

Improvement in Steamboat Wheels.

Many attempts have been made to produce a more uniform action of the buckets of a steamboat wheel on the water, to overcome the loss of power in lifting the water and to preserve the paddles in an upright position while immersed. For this, automatic and eccentric wheels have been contrived, and various devices have been experimented with to ensure a more continuous action on the water by the buckets. The engravings illustrate an attempt in this direction, which has been tested on tow boats and found by experienced boatmen to give very excellent results, one of them stating that the gain in effective power over other boats of equal capacity, but



GRANGER'S EXTENSION CHAIN PADDLE WHEEL.

with the common wheel, to be fifty per cent. The improved wheel has a longitudinal or horizontal diameter of more than double that of a true or circular wheel, of the same general diameter as the short diameter of the chain wheel.

Instead of a central axis to a round wheel, this has two axes, the rim or paddles forming an oval. Each of the shafts has guiding wheels for the chain which supports the arms on which the buckets are secured. The wheels on the driving shaft are furnished with projections, like those of any chain wheel, to fit into the interspaces between the side links and rivets, and insure the action of the chain. Each pair of links is connected to the adjoining pair by a piece that may be called a bridge, designed to support the chain with its buckets in preserving a segment of the arch forming the oval. To the center of these bridges are pivoted upright arms, on each side sustaining between them the buckets, and connected one to the other by diagonal bars, also pivoted, as seen in the large engraving.

This arrangement insures a perfect connection and uniform action between the parts, and gives a much longer contact between the paddle blades and the water than is possible by the ordinary circular wheel. To insure keeping the chains in place on the wheels, and to prevent sagging where the two shafts are at considerable distance apart, the bridge or connection shown in Fig. 2, is contrived. It is curved to suit itself to the radius of the wheel, and has projections on its inner side to engage with the spaces in the chains. The ends of these bridges are squared at such an angle that as they pass over the top they form a rigid arch, preventing all trembling, jar, or sagging, and working as smoothly as a belt over pulleys.

The principal device was patented through the Scientific American Patent Agency, some time ago, and an application is pending on other improvements by James Granger, whom address at Zanesville, Ohio.

The Suez Canal.

The financial descent of the Suez Canal to the level of the great Hamburgh State distribution, etc., is a step from the sublime to the ridiculous, which we must regret, but which, taking all the circumstances into consideration, we can scarcely reprehend. A grand undertaking, commenced in the halcyon days of speculation, is found, as many others have been, to be impossible of completion with the amount of capital at first subscribed. In the meantime, such has been the flagrant abuse of the confidence reposed by both the English and French public, in most classes of financial operators, that money is no longer forthcoming, even for what may be considered as eminently safe investments, which, with all its merits, the Suez Canal is not. It is, however, an undertaking of that class, and has already progressed to that stage which gives it a kind of prescriptive right to capital, if capital can, by any fair means, be collected for it; and in the present proposition we recognize a more open and fair mode of procedure than that which failed last year to obtain more than a third of the £4,000,000 now said to be necessary for the completion of the canal. The *modus operandi* then was the very ordinary and exceedingly specious one of placing a nominal value on the self constituted property of the company and proposing a species of mortgage on landed estates, consisting mainly of sandbanks situated either below or above water. In the report which we published recently we find that the directors, who, like many other mortals, gain wisdom by experience, almost abstain from referring to this class of security for the advance which they ask from the public, and the spirit of their present appeal is one to the candor of which we can take no exception. They say that, from the extraordinary state of European financial affairs, even more than from the peculiar nature of their undertaking, special inducements must be put forward to obtain the capital which is absolutely necessary for the completion of the enterprise. That inducement they provide in the glorious uncertainty of the lottery, and to our mind not a few of the undertakings of modern days would have been much more fairly dealt with if direct and open recourse to gambling, with all its sins, had been made, rather than the money drawn from a too credulous public by representations having very slender foundations in fact. It is curious that just at the moment when the directors themselves have, under the coercion of the times, practically thrown overboard the question of the ultimate remunerativeness of the undertaking, a rather more serious discussion than usual should have arisen on that very subject which is still quite as unfit for discussion with a view to absolute solution as it has ever been. The letters of Mr. Daniel A. Lange in the *Times* though evidently written in good faith, and containing a fair popular idea of the views of the directors on the future of the canal, is almost of necessity without any practical basis for the calculation of the future receipts and expenditure of the canal, assuming it to be ready for traffic in 1869; in fact, the only matters of certainty which he puts forward are the facts that the interest and sinking funds for the present "loan" will amount to £360,000 a year, and that a margin of £800,000, when obtained, will pay 10 per cent on the original capital. When he computes the maintenance of the canal he makes a guess which may or may not prove to be correct, and a guess the truth of which no man living can affirm or deny, for the simple reason that the world has as yet no experience as to the cost of maintaining a canal through a sandy desert, nor any adequate experience in the maintenance of colossal ports amid coral reefs and shifting shallow banks. The probable revenue of the canal, though depending to a certain extent on the realization of the estimates of gross tunnage to and from India, depends far more on one condition of the carrying of that tunnage to which Mr. Lange has not alluded, viz., the proportion of it now carried, or which will hereafter be carried, by steam or in sailing vessels. That almost every merchant steamer trading to the East will pass through the canal when opened there is no reason to doubt, but the Eastern tunnage carried by steamers at present is a mere fraction of the aggregate of over 6,000,000 tuns assumed as the total trade; and for sailing vessels, especially for that greater portion of the fleet which comes from the Indian Peninsula, the canal offers scarcely any advantages; in fact, they could not possibly avail themselves of it if a most extensive system of towage both in the Red Sea and the Indian Ocean be not organized for their assistance. The Red Sea, from the reefs with which it abounds, is perhaps the most dangerous navigation in the world, even for steamers, and sailing vessels have been known to take longer from Aden to Suez than the average voyage of an English clipper from Shanghai to the Thames. Now the tolls for passage through the canal, set down at 8s. per tun, will form no serious obstacle to the transit through it of any class of eastern goods, whether in steam or sailing ships, but steam towage is a very different matter, and will scarcely come to be counted in shillings a tun if sailing vessels are to be brought from Suez to points in the Indian Ocean where steady winds can be relied on. We think, therefore, that the future prosperity of the canal, assuming that it can be maintained at a reasonable cost, depends far more on the increasing employment of steamers for the conveyance of all classes of merchandise than upon any other condition that can now be foreseen. At present our experience of the working of unsubsidized steamers for long voyages is decidedly unfavorable. The case of the Indian trade will, however, be exceptional when the canal is opened, and the question of the shorter steam route competing with the longer sailing voyage will be one of great interest to solve.

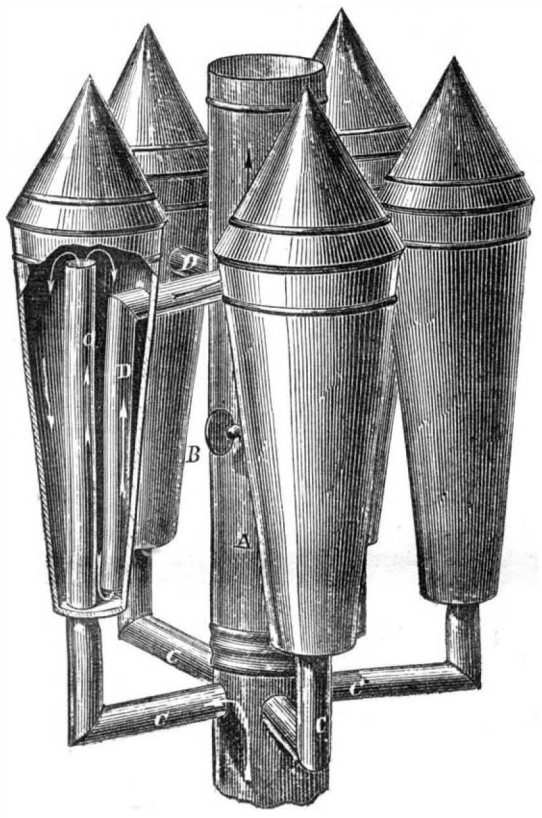
The steady progress of the works since the commencement of Messrs. Borel, Lavally & Co.'s contract is a matter on which we cordially congratulate the company. They have promised even less than they seem to be capable of performing, and the great enterprise to which M. Lesseps has devoted a life of energy was never more lucky than in its forced recourse to mechanical excavation, and in the fortunate circumstance that its machinery has been introduced and wielded by such able hands. The engineering world will be indebted to him whatever the commercial value of the canal.—*Engineer.*

LAKIN'S PATENT HEAT RADIATOR.

For the purposes of radiating heat, ordinary stoves, furnaces, and heaters present too small an area of the outer surface to properly warm the surrounding atmosphere, the heated gases being confined and compelled to climb the chimney, instead of loitering by the way and giving out their superabundant heat. Appliances for delivering this wasted carbon can be made useful and at the same time ornamental. Such is that seen in the accompanying engraving. A series of upright inverted cones of sheet metal, capped with cones, are arranged around the draft pipe and connected to it by tubes.

A is the central pipe, with an ordinary damper, B, which, when open, permits the gases of combustion to pass unimpeded to the chimney flue. Branch pipes, C, extend in angles or curves from the central draft pipe up into the inverted cones to near their tops. The heated air, being light, passes through these tubes and impinges upon the cone-like caps, from which it is deflected down and passes out through the tubes, D, open at the bottom, to pass into the central draft tube to the chimney, through apertures above the damper. The arrows show the direction of the heat currents. The heat gases impinge upon every side of the cone, and thus greatly enlarge the heating surfaces. If no additional heat beyond that of the usual direct draft is required, the damper, B, may be opened, when the course of the gases will be as in an ordinary stove pipe without any appliances, and the draft will be direct.

For base burning and slow combustion stoves, for offices,



stores, and for upper floors in private dwellings, and, in short, for all circumstances where the utilization of heat is a desideratum, this device is intended. It is constructed on scientific principles, and calculated for saving fuel and trouble. It was patented June 11, 1868, by J. A. Lakin, who may be addressed for state rights or for additional information at Thompsonville, Conn.

BRIODAY'S IMPROVED ARTIFICIAL LEG.

The results of the late war have made unusual demands on the resources of surgical art in providing substitutes for natural limbs, and mechanical talent has been largely employed in manufacturing and improving these appliances. Yet with the best mechanical skill, we fall short of providing a perfect substitute for the natural limb. Every improvement, however, in these necessary aids to mutilated humanity should be welcomed and encouraged. That shown in the accompanying engravings claims to be superior to others now manufactured for the same purpose. It is the invention of B. Brioday of Detroit, Mich., to whom patents were granted, May 19th and 27th, 1868.

The device is intended as a substitute for the human foot and leg below the knee, and is believed to be simpler in construction, less in cost, and easier in operation than others in use. Fig. 1, is a sectional elevation, and Fig. 2, a plan view, of the foot with the leg portion removed at the ankle joint, and the foot partially broken away to show the mechanism of the toe joint. The pintle or centre of the joint is secured to the foot by means of two bolts, A, the nuts of which are seated in a recess, and with washers bear against rubber glands or flanges, B, or washers of some other yielding substance. From the same centre or pintle, rods, C, extend upward through the solid part of the leg, and are secured by nut, washer, and yielding cushion as are the bolts, A. Between the lower end of the leg and the bottom of the receiving recess in the foot are thick rubber springs, D, on either side of the hinge joint.

The part representing the toes is joined to the foot in a similar manner, except that the rubber spring or buffer, E, is placed above the joint. The nature of the connections is plainly shown in the engravings. The contiguous parts of the joints are curved to permit free movement. The bottom of the foot may be covered with canvas, leather, or any other tough elastic substance, and the opening of the toe joint may be similarly defended, the coating serving to prevent the ingress of dirt and the too free action of the joint, which might throw the toe of the foot beyond the horizontal line, as it is raised from the ground in the act of walking. The rubber springs between the leg and foot are arranged to hold the two parts together at about right angles, but to yield in

Fig. 1

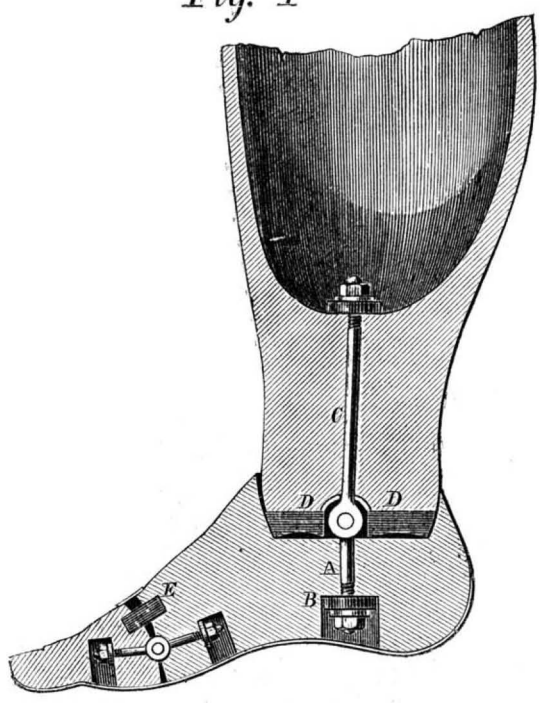
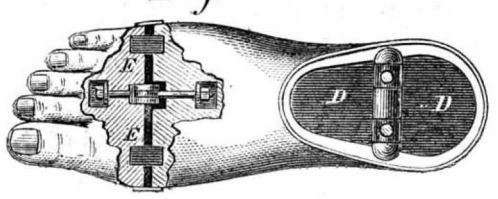


Fig. 2



either direction in the act of walking. A semicircular steel spring is interposed between the ankle joint and the lower end of the ankle, the ends of which bear upon the upper faces of the rubber to overcome and compensate for any wear or looseness in the joints of the straps or bolts, so that when the foot is taken up or set down no shock shall be felt, the spring pressing the parts away from each other when raised, and yielding when the foot comes in contact with the ground. The yielding washers or packings of rubber allow a slight lateral motion when walking over rough ground.

The whole patent, or State rights, may be obtained by addressing the patentee, B. Brioday, at Detroit, Mich.

Correspondence.

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

The Diamond Point Tool.

MESSRS. EDITORS:—No apology is deemed necessary for offering an article on this important tool. When properly made there is no tool more satisfactory, but in practice it is quite exceptional to find a good one. Hence it is to be inferred that the principles of its action are not completely understood by all turners and tool dressers.

To begin at the beginning, the tool should have the proper inclination forward for the lathe, and the work on which it is to be used, a tool for a light lathe and for small work requiring more inclination than one for a heavy lathe and large work, and a plainer tool but little inclination. These points, however, are commonly observed.

The next thing is to put the cutting side in its proper angular position. Fig. 1, is a horizontal section near the point of a good tool in cutting position, and Fig. 2, likewise of a bad one. The tools are supposed to be for feeding to the left, in the ordinary way. The corner 1, is the leading corner; 2, is the cutting corner; 3, the following corner; and 4, the back corner. 1, 2, is the cutting side.

Fig. 1

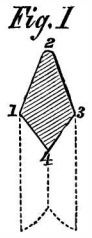
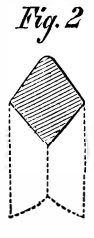


Fig. 2



Now in forging the tool the cutting side should be made to stand at a small angle with a horizontal line in the direction of the crossfeed, as in Fig. 1, not a large one as in Fig. 2. In other words, its position must be a little removed from that of the edge of a straight side tool, but there must be some angle, otherwise the tool ceases to be a diamond point, and becomes a half diamond, and must be inclined to the left to give it clearance. A true diamond point should not be so inclined, but only forward. Thus, it appears, that the cross section of the part drawn out to form the tool, should be a rhombus or diamond, and not a rectangle or square, in order that the cutting side may not form too great an angle with the tranverse line.

The reason why a small instead of a great angle is required, becomes obvious thus: In setting the tool, the point must be elevated to such a height as will give it the proper clearance. The clearance of the pointed and the clearance of the cutting side are two things, and the tool must be so formed that the cutting side will have its proper clearance when the point is elevated to the right height.

The shape must be such that the clearance of side and point will coincide in one position. When the angle of the cutting side is too great, the elevation of the tool affects too much the clearance of the cutting side. If it was made with no angle, but straight like a side tool, it is plain the elevation would not affect the clearance of the side at all, but only that of the point. The final adjustment is made by turning the tool in the tool-post to the right or left from a straight position.

The tool being forged it must be properly ground. The diamond point is a wedge for separating two portions of metal. Of course a thin wedge operates easier than a thick or blunt one. There is less disturbance of the molecules of the metal removed in the chip, consequently less heat, and the tool is not thereby burned away. It is not uncommon for a good tool to stand a whole day in turning wrought iron with a heavy chip and fast speed, without sharpening, except with an oil stone, in position, and making continuous spiral chips to the last.

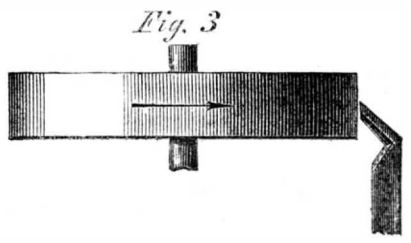
As this wedge is a powerful one, there a tendency of the tool to move forward in the direction of the feed, which is performed with little power, so that the tool is liable, with improper management, to spring into the work and break. This is what frightens many workmen from using thin tools, but if properly made and handled, there is no danger in using very thin tools. Some men in attempting to grind a tool thin, grind the back corner low, but this does not make a tool thin, at least, not thin to any useful purpose. It makes the point slender and weak, so that it breaks off; then they are disgusted.

It is the following corner (marked 3 in the cut) which must be ground low to make a good thin tool.

In a planer tool, the back corner and necessarily the leading corner, should be left high compared with the cutting corner, to prevent the tool springing down into the work, and also to strengthen the point. In a lathe tool the leading and back corners may be ground somewhat lower. If left sufficiently high, the tool will make left hand spiral chips. It is best to grind these corners low enough to make straight or right hand spiral chips. In all cases the following corner should be ground low.

To grind a diamond point properly and easily, it is well to know the best place on the grind stone to apply it. The place recommended for grinding a tool according to these principles is shown by the cut. This is for a right hand tool, or one to feed to the left. The tool is to be held in nearly a horizontal position. To grind the back corner higher, of course the back end of the tool is held more to the right I think any one who tries it will agree that this part of the grindstone peculiarly facilitates giving the form to the tool which has been recommended. The ugliest ground tool is here speedily brought into comely form.

Fig. 3



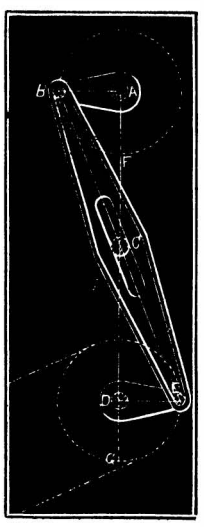
H. W. P.

Newark, N. J.

Connecting Shafts by Pitmans.

MESSRS. EDITORS:—The learned Mr. Caxton, upon returning to his home and finding that his wife had given the name of Pisistratus to his son, exclaimed in tones of horror, "Good heavens, madam, you have made me a father of an anachronism!" Your correspondent from Delaware City, Del., whose communication appears on page 20, current volume, will probably find himself struck with similar horror when he finds himself the father of an absurdity.

To say that he succeeded in making a device work which could not by any possibility work, certainly entitles him to the credit of doing more than lies within the power of ordinary mortals. His device involves the absurdity that the hypothenuse of a right-angled triangle is equal to the altitude. To prove this I subjoin his drawing, having placed thereon the figure, A B C D E F G. The distance from A to D is equal to the distance from G to F. When the cranks have made a quarter revolution they would stand at the points, G and F, the pitman would then be on the line, A G, and its length, measuring from the centers of the crank pins, would be equal to G F. Its half, B C, would then be equal to the half of G F, which is equal to A C. Hence, to suppose rotation possible in such a contrivance is to suppose the absurdity that the hypothenuse, B C, of the right-angled triangle, A B C, is equal to its altitude, A C. All the motion that such a contrivance could possess would be the play consequent upon imperfect fitting.



ABERDEEN.

Providence, R. I.

The Planchette.

MESSRS. EDITORS:—In your article on this interesting little instrument, it is stated that "makers claim that the wood

used in their manufacture is peculiar;" and "in the center of the board we have occasionally seen a disk, having the appearance of German silver, but whether for use or ornament we are not informed." Some experiments I witnessed on the 4th will show that no peculiarity of wood is required, and that the disk of metal was, as you conjectured, for ornament.

The Planchette was made by my brother, of fine wood, the board of heart shape, and in size about 7x7 inches by ¼ inch thick. The supports were a piece of lead pencil and two round, fine legs, about the diameter of a pencil, and 2½ inches long, rounded and smooth at the base. Such a one can be easily made by any one who can handle a jack-knife. And as they are so easily made, it might be well to know whether it is patented.

One surprising feature in its operations is the smoothness with which it moves. There is no perceptible jerking or tremor about it, while a person compelling it to make figures finds it difficult to make circles or curves without having them full of angles.

From the time the hands were first applied it was about fifteen minutes before it moved, after which I noticed that at times all hands were withdrawn for a second, but when two hands (it would not move with but one hand) were applied, it would again instantly move off, as though it were charged with a power which only required certain connections to put it in motion.

Another fact which seems to indicate that the will has but little control over its operations was, that when all desired it to write it persisted in wild scribbling. It must, however, be acknowledged a good writer when it does attempt it.

H. Anderson.

Peekskill, N. Y., July 6, 1868.

Origin of Planchette.

Messrs. Editors:—I observe an article in your paper entitled "What is Planchette?" It will cost you very little trouble to ascertain the birthplace and origin of Planchette, and you may even put your finger on the author of its being. I would send you the documents and the exact dates if I had access at present to my library; but you can easily verify my statements. The fact is, Planchette was originally a purely imaginary affair and a mere literary creation, made entirely, wood, wheels, and pencil, by the author's own pen (not his hands), out of his own head. In one of the back numbers of *Every Saturday* you will find an article, copied from an English magazine, written after the manner of Swift's Gulliver or De Foe's Robinson Crusoe, giving the very first true and original account of Planchette. The author of that article created Planchette, and baptised her, and invented all her remarkable qualities. He begins his essay with a pretended dialogue, in which an American gentleman asks his English friend to come and see Planchette, which he explains to be a little instrument in extensive use, as a sort of oracle, in New York, Philadelphia, and elsewhere in the United States. Then follows a description of the instrument and a drawing, with an elaborate account of the wonders it performed. Remember, Messrs. Editors, that when this article was written no such thing as Planchette, neither the name nor the instrument, had ever been used or heard of anywhere in America. This is a key to the article which was merely intended as an imaginative essay, or, to say the worst, a hoax on the English public. I am certain the writer would be indignant if any one should accuse him of having intended to state facts, when he was so obviously producing an ingenious work of fiction. I said, at the time the article appeared here, that some simple-minded people, especially those whose native simplicity took a spiritual turn, would not see the point of the hoax, and we should soon have Planchettes in abundance. A few months afterward, an enterprising gentleman in New York—a stationer, I think—advertised the first Planchettes ever seen in America. The literary gentleman who, with the view of writing a sensation magazine article, imagined Planchette and all her wonders, must be surprised to find her in actual existence, for sale at all stationers' in England and America, for he never dreamed that we, who could detect at once the fallacy of his opening statement, could possibly be taken in and hoaxed on this side of the water. He had placed the birthplace of Planchette in America, where it had never been heard of, merely to gull the English public. Here you have the beginning of Planchette—a mere hoax or literary invention; and it may help you to prophesy the end, or at least to guess "What is Planchette?" and who are her "reliable" disciples.

M. W.

The Mysteries of Planchette.

Messrs. Editors:—Your article entitled "Planchette" has attracted my attention by its candor and evident fairness of intention—qualities rarely exhibited by the press when referring to this or cognate subjects.

Wonderful as are the phenomena termed spirit manifestations, no one, nor all of them, have seemed to me so strange as does the course of our scientific and religious people in relation to this matter. If they do occur, as claimed, they are outside of, and beyond the present known laws of nature, and, I think, demand the most careful scrutiny of that class which claim preëminence in knowledge. If they do not occur---if thousands upon thousands of otherwise intelligent people are the dupes of cunning imposters or the victims of wild hallucinations, it surely is the imperative duty of those to whom the religious culture of the people is confided to seek to discover the source of this delusion, and thus rescue these misguided ones from the effects of their folly.

Neither ridicule on the one hand nor denunciation on the other has checked the manifestations nor lessened the number of believers in their spiritual origin. Is it not time, then, that fanaticism and bigotry were laid aside and common sense employed in the consideration of this subject?

If Planchette does move without voluntary action by the persons whose hands may be upon it; if, in thus moving, it writes words or sentences which are appropriate answers to *mental* questions; if questions resting in the minds of a spectator, *unspoken*, are correctly responded to through the instrumentality of this little toy; if, as recently occurred in Baltimore, the sudden death of a gentleman in a distant city is announced through Planchette in the evening and confirmed by telegraph next morning, then no question can be raised of guess-work or the law of chances; but at once the reflective mind asks, Whence comes the intelligence controlling Planchette?

If intelligence floated loosely about through the atmosphere, we might fairly suppose, in accordance with the theories of some of our scientific friends, that electricity would, occasionally, catch up a word that would be *apropos*, and transmit it to the wonder-seeking admirers of this little instrument; but even our most profound scientists have not yet claimed to have discovered that property of the mind known as intelligence in a state of independent detachment. It is always the emanation of some organized form. The only question that remains is, whether the intelligence thus manifested comes from some mind clothed in the physical form or from some disembodied spirit. Some man or woman who, having passed from the external world, still lives in the interior or invisible spheres, and has discovered the action of a law of nature, through which he or she can control the nervous or muscular system of the operator and write through Planchette.

If man does live in a world unseen by mortal eyes, after his pilgrimage on earth is ended, is it not rational to suppose that he preserves his identity; that he is, indeed, the same man, minus his external covering of flesh; that he possesses the same intellectual faculties and the same desire to exercise them that he did when in the physical form? Would Benjamin Franklin, for instance, be content in any description of heaven where his great powers of thought were repressed; where he could no longer make research into the laws and agencies by which God manifests himself in nature? Would Franklin be satisfied with an eternity of any form of praise to the Almighty which would preclude him from following up that initial experiment when the kite and the key were the only instruments he required to bring God's lightnings from the heavens? If Franklin is now living in the interior, or world of causes, is it rational to suppose that he has been surpassed in electrical science by his pupils who still dwell in the world of effects? Can we doubt, while Morse has been teaching men to make the electric fluid eloquent with messages of love and wisdom, as it traverses the material wires of our earth, that Franklin also has been experimenting with those subtler and more etherial forms of matter pertaining to the invisible spheres? If Morse has taught men to play upon the telegraphic machine, and thus communicate with his fellow-man on the other side of the globe, is it irrational to suppose that Franklin, Morse's gifted master, with his superior advantages, has been able to teach the spirits of men to seize the electric currents and play upon that more delicate instrument, the human brain?

If the physically embodied or mortal man is compelled to throw his thought upon the fibers of the brain to be transmitted thence along the nervous chords to the organs of speech before it can find oral expression, or to the extremities of his fingers in order that it may be transcribed upon paper, is it unreasonable to suppose that disembodied men, or spirits, should seek to acquire knowledge of the law by which thought is thus transmitted, and take pleasure in its exercise?

I have been unable to perceive what there is in such an hypothesis to excite ridicule or justify denunciation. If it is correct, what a glorious field of discovery does it not open to the progressive human mind? If it is erroneous, still is it not worthy of the careful consideration of the most exalted intellect?

I had intended referring, in this article, to one or two incidents which have occurred in my presence, demonstrating the theory here presented, but fear to become too much extended for your columns.

Wash. A. Danskin.

Baltimore, Md.

Editorial Summary.

A Race Anterior to our Own—The late Sir David Brewster, in his very interesting work entitled "More Worlds than One," in discussing the geological condition of the earth, inquires, "But who can tell what sleeps beyond? If we have followed the omnipotent arm into the infinity of space, may we not trace it under our feet in remoter times, and in deeper cemeteries? Another creation may lie beneath the earth's granite pavements—more glorious creatures may be entombed there. The mortal coils of beings more lovely, more pure, more divine, than man, may yet read to us the humbling lesson that we have not been the first, and may not be the last of an intellectual race."

The Underground Railroad in London is set down as a success. The cost of construction, including the purchase of property, amounted to $2,500,000 per mile. First and second class cars are run every four minutes. The locomotives consume their own smoke, and it is estimated that 200,000 people pass daily through the line. The work is being extended, and before many months tunnels will be completed under the Thames, so as to connect the two sections of the city. It is reported that the frequent passing of heavy trains jars the buildings, and fears are being entertained for their safety. This is very likely. The promoters of the proposed underground railroad of New York must necessarily show a good deal of pluck and endurance before they can complete their work.

Small-arms Factory, Enfield.—The accounts for the financial year 1866-67 show that there were fabricated that year at Enfield, and sent into store, 17,996 cavalry carbines, Richards' patent breech-loading; 8,160 muskets, smooth bore, with bayonets; 2,480 fusils ditto; 85,033 musket rifles, pattern 53, converted to breech-loaders on Snider's system; 10,012 short rifles, also converted, and 4,998 naval rifles ditto. The value or cost of the small arms and implements for small arms sent into store from Enfield in the year is estimated according to several modes of computation; by the lowest it is £187,921, and by the highest £206,420.

Norton's Stamp Eraser.—The Troy *Times* denies the story that Marcus P. Norton, of that city, has been awarded the sum of $250,000 for the use of his Post Office stamp. It says that not a single dollar has been voted by Congress for that purpose, and that it is not probable any appropriation ever will be made for it. We thought the story was false, and so stated in our last number.

Poth's Patent Wheel Hub.—In the description of this device on page 40, current volume, we omitted to state that the threads on the two, different portions of the sleeve are of different pitch, making what is known among mechanics as the "differential screw," an application of which may be found on page 2, Vol. XV., Scientific American. The device is one of the strongest grips between two opposing surfaces yet discovered in mechanics.

It is stated that on the morning of July 15, at 2 o'clock, Prof. Retus, of Litchfield Observatory, Hamilton College, Clinton, N. Y., discovered another asteroid, which makes 100 now discovered. It had the appearance of a star of the 11th magnitude, and its position was 21 hours, 9 minutes, and 10 seconds in the right ascension of 16 deg. and 4 min. south declination, with retrograde southern daily motion of about 36 seconds of time and 6 minutes in arc respectively.

We regret to announce the sudden death of Joseph T. Bodley, of the well-known firm of Lane & Bodley, iron founders and engine builders, Cincinnati, Ohio.

THE VALUE OF A CAVEAT.

The following decision of Judge Fisher will be read with interest, as showing that a properly prepared caveat may at any time be adduced as evidence of priority of invention:

Supreme Court of the District of Columbia. Before Justice George P. Fisher. In the matter of the interference between the applications of A. Barbarin and of Scharit, Lyman, and Hudson for patent for improved mode of lighting gas. On appeal of Scharit *et al.* from the decision of the Commissioner of Patents.

On the 16th day of January, A. D. 1868, Barbarin filed in the Patent Office a caveat setting forth the design and purpose of his improvement in lighting gas, and its principal and distinguishing characteristics, agreeably to the provisions of section 12 of the act of Congress approved July 4, 1836, and praying protection of his rights till he might mature his invention. This caveat described the same invention for which a patent was prayed by Scharit & Co. in their application filed in the Patent Office on the 31st day of March, 1866; and under the provisions of the section above mentioned, notice thereof was given to Barbarin on the 10th of July, and action on the application of Scharit & Co. was suspended. Barbarin did not file his description, specifications, drawings, and model within the time prescribed in said twelfth section, to enable him to "avail himself of the benefit of his caveat" that is to say, in time to save him as the discoverer of the invention from the operation of the rule of law which awards to the inventor who first adapts his invention to practical use, the right to the grant of a patent, which is the chief office of a caveat; but he did file his application, with description, specifications, etc., on the 14th day of November, pending the consideration of the application of Scharit & Co.

On the coming in of Barbarin's application, the Commissioner of Patents declared an interference, as he would have had the right to do, and as, indeed, it would have been his duty to do even if no caveat had been filed by Barbarin, and even if, also, a patent had been issued to Scharit & Co. There is no objection on their part, and could be none as to the propriety of the declaration of interference. Ten days before the day first set for the hearing of the case upon the interference, viz., on the 27th of April, 1867, Barbarin notified Scharit & Co. that the caveat which he had filed had had the vail of secrecy lifted from it, and was open to their inspection, and that the same would be produced in evidence to support the claim of Barbarin as prior inventor; and the receipt of notice was acknowledged by Scharit & Co.

Mr. Scharit was present at the hearing, and objected to this evidence—that it had not been put in at the proper time—but the Examiners held to the contrary, that it was within the time limited by the rules of the Office, and decided that it was conclusive and satisfactory evidence, showing Barbarin to have been the prior inventor. An appeal was taken by Scharit and others to the Commissioner of Patents, who affirmed the decision of the Board of Examiners.

From that decision an appeal is taken to me. The reasons of appeal are as follows:

1st, That said Commissioner of Patents held that the caveat filed by Arthur Barbarin could be received and considered as evidence of invention at the time of its filing, without other proof: whereas the said caveator having failed to perfect his invention and file his application within the time limited by law, after receiving notice pursuant to the statute to do so, had lost and forfeited his right to use said caveat as evidence of invention, and he must, as other parties in interference, rely upon evidence *aliunde* for proving priority of invention.

2d, Because priority of invention was awarded to said Barbarin contrary to law and the proofs.

These reasons of appeal raise two questions for my consideration, viz.:

1st, Was the caveat admissible in evidence for the purpose of proving Barbarin to have been the prior inventor.

2d, Was it overbalanced by countervailing testimony admitting it to be proper evidence of priority.

It is argued as an objection to the admissibility of the caveat itself, that the rules of the patent Office require that when a "party relies upon a caveat to establish the date of his invention, a certified copy thereof must be filed in evidence, with due notice to the opposite party, as no notice will be taken by the Office of a caveat filed in its secret archives." Now the object of this rule is expressed on the face of it. It means to say that because a caveat is in the secret archives, where the law requires it to be "preserved in secrecy," and the Commissioner cannot, of his own motion, remove the vail of secrecy so as to acquaint the adverse party of that which is within its seals, therefore, if the caveator when placed in interference shall desire to use what is shown as evidence for his claim, he shall himself break open the seal and let his opponents know what he relies upon within it. This may be as well, if not better accomplished, by opening the original and filing it as evidence in the case. The object of the rule is simply to give the other side an opportunity to inspect the evidence, and to prevent his being taken by surprise by having it suddenly sprung upon him, as he is supposed to know nothing of its contents. Until its secrecy was invaded it was a confidential record of the Office; but as soon as its seal was broken by the caveator, it became a public record which the appellants were entitled to inspect, and they could not be surprised by its production in evidence any more than if they had been served with a copy. The rule is substantially complied with, whether the caveat be opened and filed as a public record or a mere copy of it be filed. The rule does not require the copy to be served on the adverse party or his attorney, but simply that it "be filed in evidence, and notice thereof given to the opposite party," and "because no notice can be taken by the Office of a caveat filed in its secret archives." But when it is transferred from the secret archives to the public record or public files, and notice is given to the opposite party, the reason of the rule is ended and the maxim, "*cessante ratione cessat lex*" is applicable.

I apprehend no well informed judge or court would think of holding that a copy of one of its own records was evidence of a better character than the original record itself. I have therefore no hesitation in deciding that the original caveat was properly admitted in evidence.

As to the second question, as I find no testimony in the papers forwarded from the Patent Office except the caveat, I assume it to be true as stated by the Examiners in their decision, that the caveat was the only testimony in the case. Of course, therefore, it was conclusive of the issue joined between the parties. The decision of the Commissioner is therefore affirmed, and it is ordered that the patent issue to A. Barbarin.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

THE *San Francisco Bulletin* says:—One of the prominent executive officers of the Central Pacific Railroad has declared within the last ten days that this road will be finished to Salt Lake, and passengers will be transported over its entire length by the 4th of July, 1869. It is pretty certain, now, that there will be very little difference of time in the completion of the two roads. The prediction amounts to this in effect: That on the 4th of July, 1869, passengers will be able to travel by continuous rail across the continent, from San Francisco to New York. Strange as the proposition seems, we are not prepared to controvert it. The two great companies have surmounted the greatest obstacles which are to be encountered on their respective lines. Each has passed the summit of the highest intervening mountain ranges, and are now on the "home-stretch." The coming winter weather will not interfere, as heretofore, with the progress of the work. Only a limited force could be used in the deep mountain cuts; but upon the plains and more open country, gangs of men can be distributed at various points. Bringham Young, it appears, has not only contracted to build a section of the road from Salt Lake eastward, but is likely to undertake quite as large a job for the Central Pacific Railroad, west of Salt Lake. President Stanford was in the latter point some days ago, and there is little doubt that arrangements will be closed with Young for such available held as he can furnish. A large shipment of railway iron, said to amount to 5,000 tuns, is to be sent accross the Isthmus, and a dozen ships are under charter to bring rails by way of Cape Horn.

IT is announced in Southern papers that new and important discoveries in the manufacture of steel, the results of which are of such magnitude as almost to stagger belief, will be shortly made public. The steel is said to be made directly from brown hematite ore. The process is said to be endorsed by distinguished engineers.

AN Exchange says:—More than four thousand gallons of coal tar, which had floated through a sewer from the condenser at the Manchester gas works, has been pumped from a small creek east of the work. A similar deposit, estimated to reach 200,000 barrels, has recently been found in Charles River, near Boston.

IT is rumored that a sixty-four gun man of war is now on the stocks of a private yard in New York, being built for the Spanish Government, to be used in a war against Peru and Chili.

AN examination of the United States statistics of manufactures, shows a clear increase in wages in 1866, of upwards of 60 per cent as compared with the wages paid in 1860.

CHICAGO has 34 breweries, 29 planing mills, 12 grain elevators, 18 iron foundries, and 54 packing houses.

Recent American and Foreign Patents.

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

APPLE PARING AND CORING MACHINE.—Isaac Rogers, West Chehalem, Oregon.—This invention has for its object to furnish an improved machine so constructed that apples may be pared, cored, and quartered, or cut into pieces with once handling, and which shall, at the same time, be simple in construction, not liable to get out of order, and will do its work fast and well.

TIRE FRAME ATTACHMENT.—N. H. Mead, Waterport, N. Y.—This invention has for its object to improve the construction of tire frames so as to make them more convenient and effective in operation, and which will enable the wheel to be detached and turned, when required, before the tire can get cold.

FIRE KINDLING.—J. Granier, Ch. Gagdin, and Z. Granier, San Francisco, Cal.—This invention has for its object to furnish a simple, convenient, effective, and reliable means for starting or kindling fires in stoves, ranges, furnaces, and other places.

HAME FASTENER.—A. B. Woodard, Allred Center, N. Y., and Samuel A. Woodard, Harnellsville, N. Y.—This invention has for its object to furnish an improved hame fastener, simple in construction and effective in operation, drawing the hames closer together during the operation of locking, and holding them securely when locked.

HYDROSTATIC PUMP.—W. P. Callahan, Dayton, Ohio.—This invention relates to an arrangement whereby a forcing pump, which is used to operate hydrostatic presses in the process of manufacturing linseed oil and other similar operations where hydrostatic presses are used, is made and arranged so as to operate upon a number of presses, thereby saving much valuable time, and greatly facilitating and expediting the operation.

PUMP.—R. W. Cronse, Westminster, Mo.—This invention relates to the class of double-acting cylinder pumps, and consists in a new and improved arrangement of the valves by which power is economized, while the machine is rendered less complicated and less liable to get out of order.

CULTIVATOR.—A. P. Routt, Liberty Mills, Va.—This invention is an improvement upon the one patented by me April 30, 1867, and consists in an instrument which I attach to the standards that support the plows, and employ for the purpose of cutting and destroying the weeds and grass between rows of standing corn and other growing vegetables.

APPARATUS FOR FEEDING FUEL TO FURNACES.—J. G. McCormick, Louisville, Ky.—This invention is an apparatus for carrying fuel, coal, saw dust etc., from a bunker to the furnace, and feeding it regularly, uniformly, and evenly over the length and breadth of the fire grate, under any number of steam boilers, at the same time. The machine is worked by the engine, and requires no care except in keeping the bunkers supplied with fuel to be used.

CALCULATING BALANCE.—Benj. W. Ogburn, Whittles' Mills, Va.—The object of this invention is to provide a simple, cheap, and easily operated balance, which will indicate either the weight of an article or its gross price.

MACHINE FOR STUFFING HORSE COLLARS.—S. B. McCorkle, Greenville, Tenn.—The object of this invention is to construct a machine which will place the straw in the collar in such a position that its elasticity will be preserved and utilized, thereby producing a better collar than any heretofore made, whether by hand or machinery.

CHURN MOTION.—David Morris, Bartlett, Ohio.—This invention consists in the use, in connection with a device for imparting two strokes of the dasher to one revolution of a crank, of a supporting frame consisting of an upright having a foot which is provided at its extremity and underside or bottom with a screw-threaded tubular stem, which serves the double purpose of a guide for the dasher shaft and means of attachment of the frame to the lid of the churn vessel.

GANG PLOW.—J. F. Porter and A. Norton, Tidioute, Pa.—In this gang plow, each plow has a hinged colter which severs the weeds, roots, etc., and by which the plow is drawn forward; the heel of each plow is hinged to its standards, and a new supporting frame, and new means of attaching and adjusting the plows upon it, are employed, by means of all which improvements a lighter, neater, stronger, and more completely adjustable gang plow is produced, than has ever heretofore been brought into use.

GUNPOWDER.—Paul A. Oliver, New York city.—This invention relates to a new and improved gunpowder, the advantages of which are, that it can be made much more rapidly, with perfect safety, cheaper and stronger than the ordinary gunpowder now manufactured.

SELF-ACTING VARIABLE CUT-OFF.—Samuel Stanton, Newburg, N. Y.—This invention relates to an application of a governor to the slide valves of a steam engine, whereby a more equitable motion than usual is obtained, and the steam admitted into the cylinder at all times when the ports are fully open, whereby the "wire-drawing" of the steam occasioned by the latter passing through a partially-opened port is avoided, and the steam within the cylinder allowed to work under a pressure equal to that which it has in the boiler.

HORSE HAY FORK.—C. E. Murray, Sugar Valley, Pa.—This invention relates to a horse hay fork, for unloading hay and mowing it away in barns or forming stacks. The invention consists in a peculiar construction of the fork, whereby a large amount of hay may be lifted or unloaded in a given time.

TRUSS.—Thomas S. Lindley, Medora, Ind.—This invention relates to a truss of simple construction, which may be manufactured at a trifling cost, and be applied in such a manner that the wearer may attend to any active business without any difficulty whatever.

DRESSING GRIND STONES.—Philip Leonard, Sharon, Pa.—This invention relates to a machine for dressing grind stones and wheels or cylinders of any mineral composition for grinding, polishing, etc.

CHAFING ROLLER FOR WAGONS.—James M. Mayhew, Providence, R. I.—This invention relates to a device for protecting the sides of wagons or other vehicles from chafing or wearing when the front wheel may be turned, and it consists in a hollow concave iron roller, secured to a holding frame, as hereinafter described,

BREAST STRAPS.—A. L, Hill, Decatur, Ill.—This invention relates to an improvement in breast straps, whereby several advantages are obtained over those in present use, to wit, much greater strength and durability, the avoidance of wear by the friction of the rings of the neck yoke on the straps, and a more ready means of detaching them from the hames and neck yoke.

BURGLAR FIRE ALARM.—William J. Biggar and John C. Blood, Conneaut, Ohio.—This invention relates to a circuit breaker for a fire alarm, designed to be connected with the apparatus of a magnetic burglar alarm, for which letters patent have been applied for by Wm. J. Biggar, John C. Blood, and D. M. Griswold, in connection with a device for breaking the electro-magnetic circuit by the entrance of a burglar through a door or window. This device for a circuit breaker is operated on by the heat of a fire that may occur in a room where it is placed, and thus give timely alarm through the agency of the magnetic signals.

HORIZONTAL RECIPROCATING STEAM ENGINE AND WATER.—Thomas Reese, St. Louis, Mo.—This invention relates to an improvement in horizontal steam water or pumping engines, whereby economy in both space and power is obtained, and it consists in an arrangement for supporting the cross head and pitman, and producing a parallel motion without the use of the ordinary guides or ways.

COFFEE POT.—Benjamin Boardman, Malden, Mass.—This invention relates to an improvement in coffee pots, by the employment of certain means whereby the steam and aroma which arises from the coffee during the process of boiling is condensed and saved or not allowed to escape.

GANG PLOW.—George Wharton, Jerseyville, Ill.—This invention relates to a gang plow, and it consists in a peculiar construction of the same, whereby the plows may be operated (raised and lowered), by the device with the greatest facility, and also made to conform to the uneven surface of the ground, so as to operate or turn a furrow slice in a perfect manner, whether the ground be level, undulating, or more or less inclined.

IMPROVEMENT IN LANTERNS.—Andrew Whelden, South Dennis, Wis.—This invention relates to an improvement in lanterns, which are provided with lamps, more especially designed for burning petroleum and similar hydrocarbons, the flame of which is not very persistent, and is liable to be extinguished by a sudden upward and downward movement of the lantern.

LAMP BURNER.—Frank H. Fuller, South Boston, Mass.—This invention relates to improvements in lamp burners for burning kerosene or other oils.

CULTIVATOR.—G. W. Cook, Macon, Ill.—This invention relates to a cultivator, and it consists in a peculiar construction and arrangement of certain parts whereby the driver may either walk or ride, as he may desire, and be capable in either case of operating equally the shares and shovels and managing the team.

SECURING HEADS IN BARRELS.—Peter Rink and Jas. Docherty, Wertsville, N. J.—This invention consists in securing heads in barrels in such a manner that the heads may be secured in barrels and removed therefrom without disturbing the hoops, and, in case of shrinkage, the heads rendered capable of being expanded in order to insure a tight adjustment of them in the barrels at all times.

CLOTHES MANGLE AND IRONING MACHINE.—Joseph Seamans, Chicago, Ill.—This invention relates to an improved clothes mangle, and consists of a device for actuating the lower roller upward against the top roller, by means of a pair of levers and a weight.

WELDING FLUX.—J. R. Tryon, La Crosse, Wis.—The object of this invention is to provide a superior welding flux or compound for steel or iron, which operates to refine and toughen the metal at the welded surface, thereby securing a perfect junction.

HUB BAND FITTER.—Charles E. Stone, Amesbury, and Alfred Herbert, Salisbury, Mass.—The object of this invention is to fit the outer bands of carriage hubs in an expeditious and easy manner. It consists of a tool with which a continuous shaving is pared from the hub by simply turning the wheel on its axle and holding the tool in proper position upon the hub.

COMBINED DIE AND PLUNGER.—H. G. Williams, Providence, R. I.—This invention relates to a method of forming tin or metallic boxes and covers for the same.

SPECTACLES.—Erastus S. Clapp, Montague, Mass.—This invention has for its object to provide spectacles for those who use them, which shall not require to be removed from the nose when the glasses are not needed, whereby much trouble and inconvenience are avoided.

HARVESTER SHARPENER.—Edwin L. Bushnell, Poughkeepsie, N. Y.—The object of this invention is to provide an instrument for sharpening the cutters reaping and mowing machines.

FURNACES FOR SMELTING ORES.—J. W. Shaeffer, Red Wing, Minn.—This invention relates to improvements in furnaces for smelting and reducing gold, silver, copper, and other ores, whereby many of the objections to the ordinary methods of reducing those ores are overcome.

PRINTERS' GALLEY.—Charles H. Lawrence, New York city.—The object of this invention is to construct a galley in such a manner that it will not be affected by shrinking. The frame is made of wood with its corners halved and mitered so as to make a good stiff joint, and is cut down its center along the inner side a depth of about two thirds its width, so as to receive a metal tongue, which is soldered to the lining. The lining is secured to the frame by screws which pass through the tongue into the frame, thus leaving the lining perfectly smooth and free from the heads of screws.

MAGNETIC BURGLAR ALARM.—Wm. J. Biggar, J. C. Blood, and M. Griswold, Conneaut, Ohio.—This invention relates to improvements in the construction and arrangement of an instrument for giving an alarm on the entrance of a burglar into a house, by means of a magnetic circuit, and consists in connecting copper wires with a battery to run through the house, and having circuit connections attached to the doors and windows, so that when a window or door is opened by a burglar the break of the circut shall release window from the magnet and thus act upon an alarm by striking a bell and lighting a fluid lamp or candle in the room where the instrument is placed.

VAPOR OR MEDICATED BATH.—Wm. Kent and Chas. Winterburn, Cincinnati, Ohio.—The nature of this invention consists in a box of peculiar construction, in which may be used medicated vapor baths, etc. It also consists in the combination of medicated baths with the vacuum produced in the aforesaid box. It further consists in the combination of electro-magnetism with a vacuum; also in the combination of vapor or medicated vapor baths with electro-magnetism produced in the said box.

LETTER BOX.—D. P. Jordan, 115 Randolph street, Chicago, Ill.—This invention relates to a new and improved letter box, and provides for the safe and convenient deposit of letters, papers, and other mail matter, separate receptacles being furnished for each, with hooks at the bottom to attach a mail bag into which the contents of the box are conveniently discharged through a trap door. The door is provided with a suitable lock, and the entire apparatus covered by a lid, to protect the contents from the weather. Patented July 7, 1868.

BROILING STEAK BY GAS.—H. Y. Lazear, New York city,—This invention relates to an apparatus for broiling meats or steaks by gas, or over a gas stove.

MANUFACTURING RAILS.—Wm. Haywood, and John Lees, Danville, Pa.—This invention relates to the manufacture of rails for railroads, of iron or steel, or iron and steel combined.

ANILINE DYE.—Benoit Bloch, Soultz, France, now temporarily New York city.—This invention relates to a gray dye, prepared from aniline oil.

SPUR AUGER BITS.—James Swan, Seymour, Conn.—This invention relates to an improvement in the manufacture of spur auger bits, and is designed to accomplish by means of dies what has hitherto been done by hand with skilled labor.

SOLES FOR BOOTS AND SHOES.—Baker Van Ansdall, Keokuk, Iowa.—The present invention consists in making the outside or wearing sole of a boot or shoe, of wood and a series of sectures or parts from the ball of the foot to the back of the heel, whereby a flexible sole is obtained.

SPIRAL OR WINDING STAIRS.—Wm. J. Keim, New York city.—This invention consists in so constructing winding stairs that by one set of steps two or more separate stairways can be produced The steps are made in in shape of straight bars, and secured around a central foot, that fits through the central hole, so that each end of the bar forms a separate step for a separate staircase, opposite to another step and staircase formed at the opposite side of the central post. In the same manner can treble and quadruple stairs be made, by using steps in which three or four arms radiate from the post.

MACHINE FOR WASHING PAPER STOCK.—J. E. Andrews, Coeyman's Hollow, N. Y.—This invention consists of a water tank provided with an agitating wheel and a hopper adjacent to the same into which the stock to be washed is placed and so exposed to the action of the floats on the wheel that it will be drawn down into the water thereby, where it is, after being sufficiently agitated, delivered to an elevating apparatus whereby it is raised out of the water and carried to any desired hight and delivered from the same. The said tank is also provided with a means of supplying fresh water and discharging the foul water without carrying off any of the stock, and also with a screen for separating the kennels of grain that may be in the straw or small pieces of gravel or other similar matter.

SHIP WHEEL BRACKET—Isaac N. Bunker, Hillsburg, Nova Scotia.—This invention relates to a new manner of locking ships' steering wheels when the same are to be retained in certain position, and consists in the use of a bracket which is hinged to the deck of the vessel or to any other suitable stationary apparatus, and which is provided with a notch, which, when the bracket is thrown against the wheel, will fit around one of the spokes or handles of the wheel and thereby lock it and prevent it from turning.

PORTABLE CHAMBER CLOSET.—W. J. Lyman, East Hampton, Mass.—This invention consists in arranging an additional seat-lid, besides the ordinary perforated seat, the lid being hinged to the back of the apparatus, so that it can be folded up or down at will. The hole through the lid is smaller than that through the seat, so that when the lid is folded down upon the seat, the apparatus can be used by children, while it is otherwise fitted for adults.

STEAM PUMPS.—Wm. R. Thomas, Catasanqua, Pa.—This invention consists in an arrangement whereby the steam is made to actuate the valves without the intervention of valve gear, in constructing the cylinder with extensions from each head to serve for the pump cylinders, in the arrangement of projections from the piston to serve the purpose of the plungers for the pumps, and in an improved means of packing the pistons of the pumps.

EMBROIDERING MACHINE—Jacob Einhorn, New York city.—This invention relates to a machine for embroidering on gauze or other fabric, and consists principally in fitting, the devices by means of which the stitches are made, in a swinging frame, and in stretching the fabric to be embroidered on a sliding carriage so that by these means the stitches can be made to follow any desired pattern that may have to be embroidered. It also consists in the arrangement of the needle and hook by which the stitches are made and in the devices for operating and adjusting the same, and for throwing them in or out of gear.

Business and Personal.

The charge for insertion under this head is one dollar a line.

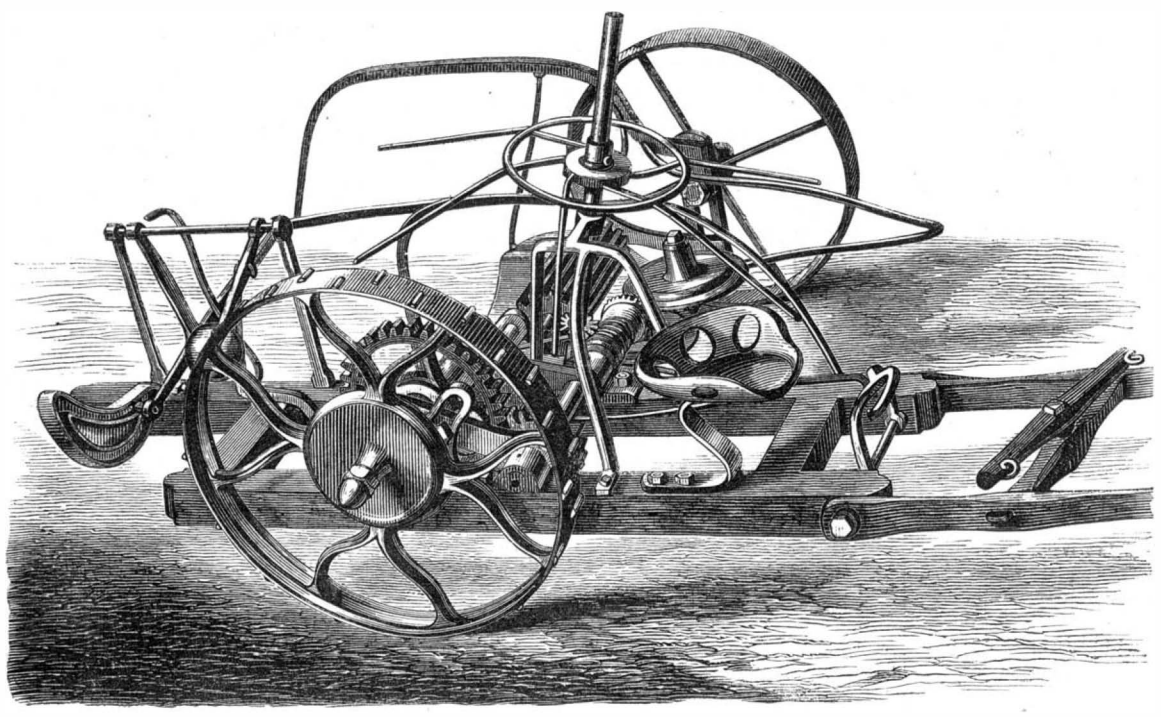
EXTENSION NOTICES.

Isaac R. Trimble, of Long Green, Md., having petitioned for the extension of a patent granted to him, the 10th day of April, 1855, and antedated October, 1854, for an improvement in wooden splice piece for railways, for seven years from the expiration of said patent, which takes place on the 10th day of October, 1868, it is ordered that the said petition be heard at the Patent Office Monday, the 28th day of September next.

Eben N. Horsford, of Cambridge, Mass., having petitioned for the extension of a patent granted to him the 10th day of October, 1854, for an improvement in compounds for neutralizing chlorine, for seven years from the expiration of said patent, which takes place on the 10th day of October, 1868, it is ordered that the said petition be heard at the Patent Office on Monday the 28th day of September next.

Improvement in Machines for Harvesting Cane or Corn.

This corn cutter is a simple rectangular frame, on which are mounted the working parts of the machine. The whole is supported by two wheels, one a large driving wheel seen in front with the usual projections on its periphery, and the other a small wheel turning on a stud in the cutter bar. The cutting mechanism consists of two rotary knives, one driven by beveled gears on the shaft just in front of the driver shaft, the other turning free, and both being mounted on the cutter bar between the outer small supporting wheel and the frame. Between these cutters and the frame is a reel, on a nearly upright shaft which is driven by a worm on the forward shaft by means of a worm pinion, intended for bringing the stalks up to the action of the cutters. A corrugated roller driven by a belt from the front shaft serves to guide the stalks to a platform in its rear which receives the butt ends of the stalks as they are cut, the top ends of the stalks being received on an arm connected to a rock shaft on the rear portion of the machine. This rod with the platform sustains and collects the stalks until a sufficient number are collected to make a bundle, when the pressure of the driver's foot on the lever in front depresses the receiver and allows the rear ends of the stalks to drop to the ground when they are discharged ready for binding or carrying away in bundles. A weighted lever attached to the rock shaft brings the supporting rod back to position as soon as the pressure of the foot is withdrawn and the apparatus is ready for the reception of another bundle of stalks.



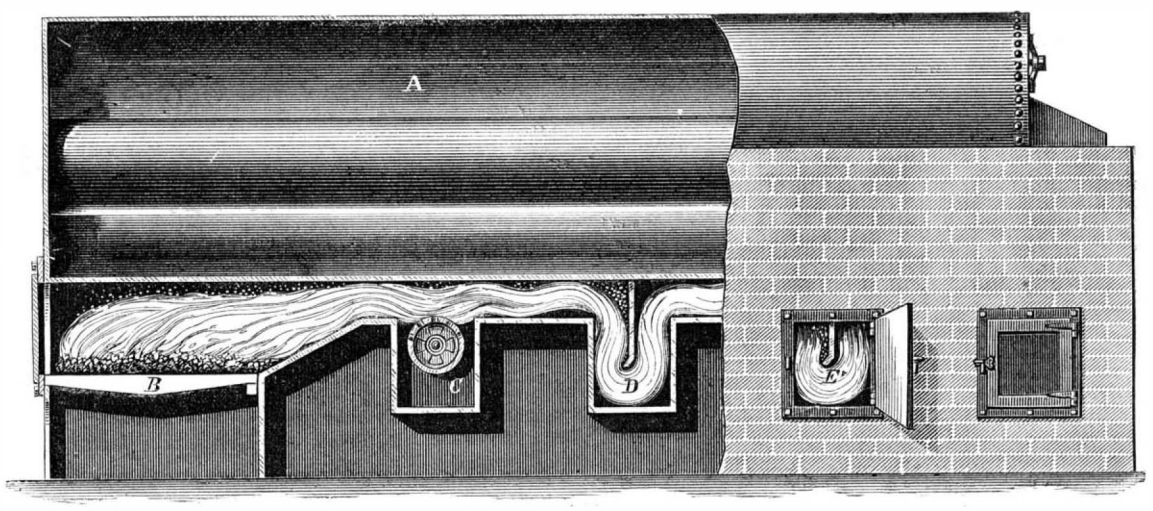
WINCHELL'S PATENTED CORN HARVESTING MACHINE.

The inventor says: "Experience has demonstrated that in corn harvesters, as heretofore constructed, the point of the supporting arm, as it was thrown back into position for receiving the stalks, would become entangled with them and throw them into the gearing of the machine. To obviate this difficulty I extend the rear end of the support over the inside bar of the frame where it engages, by means of a stud and friction roller with a fixed grooved cam, attached to the bar, having at the upper end a rubber spring which permits the friction roller to pass it, but will not allow it to return by the upper track, but forces it down the lower track, by which means the point of the supporting arm is made to incline downward when discharging and is raised up and over the bundle upon its return to its first position." The inclination forward of the shaft carrying the reel and the downward inclination of the arms tend to bring the stalks to the action of the cutters and to raise the stalks if bent. The machine took the first premium at the Ohio State Fair in 1867.

Patented Oct. 9, 1866, and May 5, 1868 by J. F. Winchell, who has assigned his interest to the Champion Corn and Cane Harvesting Company. Address for further particulars either J. F. Winchell, Pres't, Geo. C. Steele, Treas., or Levi A. Simons, Sec'y., Box 425, Springfield Ohio.

Device for Preventing the Escape of Sparks.

Where other fuel than anthracite is used, more or less of the debris of combustion—the unconsumed portions—is carried off with the smoke, and appears at the top of the chimney, fouling the surrounding atmosphere with dense clouds of dark vapor, or, as lively sparks, endangering all combustible materials around. The attachment of wire gauze to the top of the chimney is not always effectual, and it has been long desired that furnaces, burning light fuel, could be so contrived as to prevent these dangerous eruptions of ignited substances, and not only diminish chances of fire from this source, but conserve the fuel thus wasted. These objects are attempted in the device seen in the accompanying engraving.



CARPENTER'S IMPROVEMENT IN STEAM BOILERS.

Under the boiler, A,—an ordinary return flue, horizontal boiler—is the grate, B, there being, just beyond the first bridge wall, a pipe, C, extending across the boiler and furnished with a register at either end to govern the admission of atmospheric air. The pipe is perforated on its top, and partially around its upper side by small holes for the emission of the air to mingle its oxygen with the gases, ready to be inflamed. One or more wells, D and E, are sunk inside the brick work, forming the under flue or space, just back of the well that contains the atmospheric pipe, into which are suspended plates or pendant partitions, slightly curved forward at their lower ends for the purpose of arresting the solid components of combustion and depositing the heavier or less volatile particles. These pendant partitions may be made either of plate iron or of fire brick, as may be desired. One or more may be used, but, from experience, it has been found that one is enough on ordinary stationary engines. More may be required on steamboats and steamships, and on locomotives; to all of which this device is believed to be well adapted.

The products of combustion, in their passage from the fire-box to the chimney, come in collision with the drop partitions, impinging against the plates, the lighter portions being carried off by the current of the draft, and the heavier particles falling to the bottom of the well, from which they may be removed by the doors opening on the side of the wells. The inventor says, that after a trial of fifteen months he found but little debris in the bottom of the well, most of the fuel—the volatile portions—being consumed, and no show of sparks from the chimney, although the fuel used was mostly cottonwood, pitch pine, willow, and cotton seed and "motes," all light and imflammable fuel.

Patented through the Scientific American Patent Agency, June 2, 1868, by N. L. Carpenter, Natchez, Miss., who may be addressed for State or Teritorial Rights, or any other information desired.

WATERING STREETS AND SIDEWALKS.

We have long been convinced that the practice of deluging uncleaned streets and sidewalks, not merely sprinkling them, is deleterious to the public health, and we are gratified that the matter has been brought to the attention of our Board of Health. A few days ago Dr. Stephen Smith called the attention of this body to the practice, stating that the rapid evaporation of the moisture carried with it into the atmosphere a large amount of poisonous organic matter calculated to breed desease. He suggested the use in the street-sprinklers of suitable disinfectants. Street-filth is far less deleterious when dry than when moist during the extreme heat of the summer months. Sprinkling furnishes one of the two conditions that are absolutely necessary before decomposition can take place, namely, moisture.

We would go a little further and suggest the rigid enforcement of the ordinance against the deposition of garbage, or decaying vegetable or animal matter in the street. It is the practice on all streets inhabited by people who have any knowledge of the effects of decaying organic matter when exposed to the sun's rays, to carefully sweep the walks in front of their premises, and the street to nearly its centre every morning; the rest, that of collecting and removing the sweepings, are considered the business of the city authorities. The street being cleaned, a light sprinkling once or twice a day would effectually keep down the dust, and insure comfort and health; but cleanliness, not moisture, is what is needed and can be secured by the city authorities seconding the united individual exertions of residents on the streets. If they keep their back-yards, front areas, gutters, and a cross section of the street clean in front of their premises, the public authorities should see to the restand give the people clean and cool streets. Even, however, if not watered, cleanly swept streets will prevent noxious exhalations and contribute to the comfort while they secure the health of the residents. A slight sprinkling of carbolic acid or of chloride of lime on the streets would aid in the work of disinfection.

Earthquake Waves.

An earthquake wave which followed the recent eruption in the Sandwich Islands, was transmitted to the Pacific coast and recorded on the government self-registering tide gauges at San Francisco and Astoria, in about five hours. On the 23d of December, 1854, a similar wave was transmitted from the coast of Japan to the Golden Gate in twelve hours and thirty-eight minutes. It will be recollected that this earthquake wave caused the wreck of the Russian frigate *Diana* in the port of Simoda, and great loss of life

These facts, which are derived from the best authority, convey a very impressive idea of the tremendous power required to disturb the whole body of an ocean, for a distance of from three to five thousand miles, by a movement distinct from its ordinary tidal swing. It will be seen that the revulsion of the great tidal wave at Hawaii reached this coast, distant over two thousand miles, in five hours, and was observed along a stretch of shore over thirteen geographical degrees in length.

These earthquake waves appear to have moved with a velocity of about 400 miles an hour; a speed which suggests the possibility of a more rapid means of transit over the waves than mankind possesses. Here is an opportunity for inventors. On land we move along almost equal with the bird; but the fishes sport under the prows of our fleetest vessels and laugh at our efforts to overtake them.

SHOULD A FARMER BE MORE THAN A FARMER?

We think he should. He should be a mechanic as well; should know something more than

To plow and to sow,
To reap and to mow.

He needs the ability to repair his tools; to understand how to keep his implements in proper condition without being entirely dependent on the blacksmith or machinist, to be able to do carpentering work, to patch and mend harnesses, to mend his tin ware, and do many other jobs which the denizens of towns and cities find it more convenient to turn over to those who make these repairs a specialty. He should have a room fitted for a workshop, with foot lathe and small forge, and all the appliances, on a small scale, of a combined machinist and carpenter shop. Working with these tools is a pleasant employment on stormy days when out-door labor is interdicted, and in evenings.

Trial of Mowing Machines.

A large gathering of farmers assembled on the 12th of June, at Winchester, to witness a trial of English and American mowing machines, instituted by the Hampshire Agricultural Society. Seven machines, each drawn by a pair of horses, competed for the prizes. Mr. Wood, jun., who was over from America, and Mr. Cranstone, represented the machine of Walter A. Wood. The American Clipper mower was exhibited by the Reading Iron Works Company. Mr. Phillips, from Grantham, had charge of Messrs. Hornsby's Paragon mower. The partner of Mr. Samuelson, of Banbury, managed the Eclipse machine. Mr. Kearsley, of Ripon, was also a competitor. Mr. James Howard, of Bedford, entered the list for the first time with Messrs. Howard's new British mower. After the machines had gone a few rounds, it was evident to the spectators that the first prize would fall either to Wood's American or Howard's British mower. At the completion of the plots the judges selected the two latter as the best, and ordered a second trial between them. The work of both was so perfect that the judge had great difficulty in coming to a dicision. However, as the Americans finished the work in a few minutes less time, they placed Wood's first, and Howard's second, giving Messrs. Burgess and Key the third prize.—*London Artisan.*

STEEL RAILS.—A portion of the Philadelphia, Wilmington, and Baltimore Railroad is now being relaid with steel rails.

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SEASONABLE HINTS---HOW TO KEEP COOL.

The intensely hot weather, succeeding weeks of chilling rains, comes with unusual severity. People drop stricken with death in the streets, they sink senseless as they sit at their desks or tables, and are found dead in their beds. A few suggestions for preserving life and health in such a season may not be amiss.

First, the external condition of the body. It should be kept scrupulously clean. Nightly bathing is almost a necessity. If a bath tub is not convenient, a sponge or bit of linen or cotton cloth, with a quart of tepid water, is sufficient. The water should not be cold spring, well, or aqueduct water just drawn, but that which has stood for twelve hours of daylight to absorb oxygen from the atmosphere. Better, perhaps, is a bath of warm water, as the reaction, after toweling, produces coolness and invigorates the body. Better take the bath after supper, before retiring, rather than in the morning before eating, as it will induce a pleasant sleep, and a bath when the stomach is empty is anything but healthful, empirics to the contrary notwithstanding.

Still air is perceptibly warmer than air in motion, although the thermometer may register the same degree of temperature in both cases. The reason is that the currents of air bear away the effects of perspiration, inducing a more rapid evaporation from the surface. For this reason the use of fans for producing an artificial breeze has common sense as well as custom to recommend it. A rapidly evaporating liquid applied to the exposed portions of the body induces a local and temporary coolness. Aqua ammonia (hartshorn) is excellent for this purpose. A little of this solution occasionally used on the hands and face will, from its rapid evaporation, carry off the perspiration and leave the skin cool. As sold at the druggists it is too strong; it should be diluted with four volumes of water. For clothing, wear some absorbent next the skin, thin or gauze flannel: eschew linen or bleached cotton; outside, these will do well enough. In the hat wear a wisp of green grass, cabbage leaf, or damp towel, when going out to brave the darts of fiery Sol. In the writer's experience as a campaigner in Virginia he found this to be an excellent preventive of *coup de soleil* when on the march, and compelled the practice by the men under his command.

Eating and drinking should be regulated in hot weather. In the winter one may eat and drink almost everything he pleases: he can digest almost anything. But when the system is enervated by excessive heat it is a necessity to attend carefully to the quality and quantity of food and drink. Fat meats, solid farinaceous food, as puddings and bread of indian meal or wheat flour should be shunned. Fish, lobsters, clams, and oysters are not desirable food. Fresh vegetables and fruits, salted fish, meats, and smoked hams are healthy. Pure ice water is excellent: not, however, in large quantities, but taken a swallow at a time. The stomach does not need a load of ice-cold water, only the mouth and throat need lubricating. Drink slowly of ice water. Cold coffee and tea are no better than cold water, and iced milk is dangerous, as it is in any form highly heating. After all, however, any radical change of habit in eating or drinking will prove to be worse than useless. A very good substitute for stimulants is a cool drink made of Brown's extract of ginger with iced water sweetened. It is both cooling and stimulating.

Keep your house cool by shutting out during the day the external atmosphere. Close the blinds and keep the doors shut. Open every aperture to your chimneys and the scuttle on the roof. Thus you will have ventilation and at the same time diminish the nuisance of flies. Sunlight is a great health invigorator, but we can do without it for the short heated period.

Above all, do not get excited, indulge in no controversies, preserve a calm exterior and a quiet mind. Have a clear conscience and a courteous manner, and the "sun shall not smite thee by day, neither the moon by night."

HEATING AND VENTILATION.

A correspondent sends us a drawing and a description of a steam heating apparatus, with a request for our opinion as to its merits. In an article published in the first number of the current volume, we discussed the subject of the supply of cold air to furnaces employed for warming buildings. The request of our correspondent has suggested some general remarks upon the relative merits of steam and hot air for heating purposes, from which he may sufficiently infer our views of the apparatus submitted.

There is a radical difference in the principles of heating by steam and hot air which cannot be overlooked in forming a true estimate of this subject. The heat supplied by steam apparatus is for the most part radiated heat, and that supplied by hot air is conveyed by moving particles, and imparted to the surfaces of bodies by contact. Persons in a room heated by hot air solely are, to use the words of Prof. Silliman, "immersed in a hot air bath, and require, consequently, several degrees more heat by the thermometer, for comfort, than when radiant heat forms a part of the means of an artificial temperature."

There is a prevalent notion that air parts with a portion of its oxygen in passing over the heated plates of iron in furnaces. The surfaces of these plates, however, absorb very little oxygen, after they have become in a measure protected by the coating of oxide which always forms upon them. This objection, therefore, only has force in regard to new furnaces. The air is, however, vitiated by the products of combustion, not not only of the organic particles which are always floating in it, but also of the fuel, the gases of which are generally imperfectly retained within their proper channels.

A prevalent error in regard to the use of steam pipes, etc., for heating, may be also noticed. It is thought by some that —to use a common phrase—"the heat is not so dry" as that obtained from furnaces. The phrase, properly speaking is a scientific absurdity. Heat is not a thing like a sponge to to soak up moisture. But if it is construed to mean that the air is more moist when heated to the same degree by steam than when heated by hot air furnaces, an error is committed, unless as in some cases special provision is made for keeping the air saturated with moisture by small steam jets or their equivalent.

The capacity of air for moisture increases with its temperature, and if the amount necessary to completely saturate it, is not artificially supplied, it will seize upon and appropriate moisture from all objects with which it comes in contact. The skin and the lungs are called upon to pay tribute, and chapped hands and faces, bronchial irritation, and increased sensibility of these organs must inevitably follow. A higher degree of heat is generally imparted to the air passing through the flues of furnaces than is effected by most kinds of steam apparatus. From this cause, and also from the fact that the organic particles are not burned by them, the air is more wholesome in rooms heated by steam than in rooms heated by hot air.

An entirely different plan for ventilation ought to be adopted when the fresh air admitted to rooms is cold, than when it is heated, as is the case with furnaces. In the latter case the pure air being heated, rises at once to the top of an apartment, and the air containing impurities settles to the bottom. An open grate with a fire reheats it and passes it through the chimney to the outside of the building without creating dangerous drafts of air, and is the best means of ventilating apartments. When cold air is admitted the impure air must be drawn off at the top of the room, but unless it is passed through heated flues the ventilation will be very imperfect. The admission of cold air is liable to create injurious drafts, and is therefore not to be recommended.

The plan of heating rooms by steam, and ventilating by means of grates and flues with an apparatus for supplying fresh pure and warm air to take the place of the air drawn off, and jets to keep it properly saturated with moisture, is probably open to fewer objections than any other.

EMPLOYER AND EMPLOYED.

Much of the disaffection between the employer and employed which leads often to acrimonious and unpleasant disputes, might be avoided by a more generous interpretation of the terms of the contract specified or implied between them. In many cases the employer makes his concern a disciplinary school the pupils of which are to be drilled to become as mere machines as the insensate machanism they oversee or attend. A certain set of iron-bound rules, immutable and unchangeable as those of the Medes and Persians, is made to govern and control the help, with no opportunity for variation or adaptation to circumstance or person. The honest, conscientious workman finds himself, under this system, ranked with the careless, unjust, and selfish man who would feel a pride in "getting ahead" of his boss.

All this is wrong. Certain rules must, of course, be made and observed in order to insure a uniformity of work and a proper division of duties; but the rule that is necessary for him who, having no standard of right in himself, bows only to the law of force, is not the rule for the conscientious workman anxious mainly to protect and insure the interests of his employers. In the contriving of rules for the governing of mechanical establishments, the character of the men employed should be considered. No man should have his sense of manliness crushed or injured by being subjected to rules fitted only for the inmates of a penal institution. It not only injures him morally, but it deprives his employer of his best efforts, as he cannot and will not work *con amore* when he knows he is under espionage or suspicion. Let employers treat their men as men and they will find it to be to their pecuniary advantage. Circumstances alone generally give them an advantage over their fellows.

OBITUARY--DEATH OF AN INVENTOR.

Dr. Wm. Thomas Green Morton, a native of Massachusetts, whose investigations in regard to the anæsthetic effects of ether upon the human system, and whose perseverance in its introduction against opposition and persecution has resulted in incalculable benefit to mankind, died suddenly in this city on July 15th in the forty-ninth year of his age. His name will stand inscribed upon the records of those whom the world never forgets, and it is to be greatly regretted that during a life devoted to the amelioration of suffering humanity he did not reap any substantial pecuniary benefit from his discovery. On the contrary, the injustice and personal abuse, which he suffered from those who desired not only to rob him of the honor to which he was entitled, but also of the pecuniary rewards of his discovery, were perhaps never exceeded, although they have too often been exemplified in the history of others to whose memory the world now pays willing homage.

A few months after his discovery he obtained a patent for it, which immediately called forth the denunciations of the medical profession, as being contrary to professional usage. The patent was also generally and persistently infringed, and notwithstanding the astonishing perseverance, and undaunted resolution with which he met his persecutors, he died without seeing his cause righted, although he had the satisfaction of knowing that his claims were recognized by most scientific men throughout the world.

He sacrificed a promising and lucrative business to his zeal in bringing his discovery before the public; and failing to secure any solid benefit from his patent, he applied in 1846 to Congress for relief. In 1849 he renewed his application, and although the Government had infringed his right without stint, and a committee composed exclusively of physicians reported strongly in his favor; no further action was taken at that time. In 1852 a bill was reported appropriating $100,000 to him on condition that he should surrender his patent, which was defeated. In 1853, another bill for his relief met with the same fate, and still another in the following year failed to pass. Undeterred by failures, Dr. Morton applied himself to other measures for establishing the validity of his patent, and securing to himself his just rights, but in 1860 his patent expired and he failed to obtain a renewal. Such are the rewards which an ungrateful country pays to genius. His subsequent efforts during the war, when the merits of his discovery were daily and hourly demonstrated in thousands of cases on the field and in the hospital, failed in securing any appropriation for his benefit, and he died unrequited, save in the consciousness of the great good he had bestowed upon his fellow men.

SWINDLING PATENT AGENTS.

In a recent number we called attention to the fact that an obscure Patent Agency firm, in Washington, were using the frank of the Hon. John A. Logan, to circulate, free of postage, their business pamphlets. Since that date we have had other complaints of this abuse of a privilege that ought to be sacred, but which is perverted in many instances, thus defrauding the Post Office Department of its just revenues. We cannot believe that the Hon. Mr. Logan is knowingly a party to this fraud. We are more inclined to the opinion, judging from the pamphlet before us, that the Patent Agency in question is a swindling concern that has either forged the signature of Mr. Logan, or by surreptitious means has obtained possession of envelopes bearing his frank. Under any circumstances it is a fraud, and we trust that Mr. Logan, whose name is thus compromised, will look sharp after the parties who are using it to defraud the Post Office Department of its revenues. There is a class of professed Patent Agents hovering about the Patent Office, with empty hands and empty pockets, who are ready to extend to inventors advice and assistance for the merest pittance. Destitute alike of professional skill and honesty, they are Micawbers, always "waiting for something to turn up," but woe to him who chances to fall into their hands.

Inventors and patentees who receive business cards and circulars under the frank of a Member of Congress, may safely conclude that there is some cheating in the game.

BUSINESS AND SCIENTIFIC MEN.

Business men are apt to feel something like contempt for men of letters and science. It is not to be denied that they are often visionary, impracticable, and unskilled in business details. On the contrary, men devoted to science are apt to entertain a similar feeling toward business men, and to look upon them as sordid in their motives and superficial in their views. In some cases there may be grounds for such an opinion. There are many things in the very nature of successful business which are incongruous to a man whose life is among books. Accustomed to deliberate upon all subjects, he fails appreciate the rapidity with which a man of business considers practical questions, and the sharp, decisive answers, and the blunt, out-and-out way in which he expresses opinions, seem therefore, inconsiderate and hasty. Nothing could be further from the truth. A good business man's opinions are always well considered, and his answers are short because he has not time for words. Decisive they must be, for vacillation is fatal to success in any business. Neither is it true, that, because a

man has devoted himself to scientific pursuits, he is unfitted to judge of the merits of practical questions. The misfortune of these mutual misconceptions is, that studious men are apt to transfer their contempt to money as the cause of what they think the faults of business men, and the latter look upon abstract science as the parent of business incompetency. That this is an extreme view is often demonstrated by the correct estimate of general affairs shown in the opinions of bookish men. Great executive ability, the power to systematize and organize large business operations, the tact to control men, and properly dispose the talents of employés so as to develop the highest degree of efficiency, cannot be obtained by the study of books. Such ability is rare, and is the mark of a superior mind, whether it is accompanied by adjuncts of high scholarship or otherwise.

Either to rely solely upon wealth, or to despise it, is an extreme and narrow view of its true worth. It alone will be found a false resource in years when business must, perforce, be laid aside, and the mind is left to feed upon nothing but the retrospections of a selfish life. Neither can the resources of science blunt the keen edge of poverty,nor compensate for the lack of that personal ease and dignity which accompany pecuniary independence. The illustrious Franklin was an example of a man, who, by a proper estimation of the true value of both learning and wealth, and a life wisely adjusted in accordance with it, secured himself against bodily want, and the restlessness of mental inanity. How few there are who, like him, can practice economy without avarice, or pursue learning without assuming pedantic arrogance.

THE WORCESTER COUNTY FREE INSTITUTE OF INDUSTRIAL SCIENCE.

We understand that this novel experiment in education is about to commence its career under the most favorable auspices. It owes its existence primarily to the beneficence of Mr. John Boynton of Templeton, Mass.,who placed $100,000, in the hands of his friend David Whitcomb of Worcester, for the purpose of founding a school of industrial science. The design of this school was specially to provide an institution for the proper education of those intending to become mechanics, farmers, manufacturers, merchants, and public school, teachers.

Among the studies to be pursued were enumerated mathematics, surveying, leveling, physics, and mechanics; mechanical engineering, civil engineering including drawing, designing and modelling; architecture, applied chemistry, metallurgy, geology applied to mining and agriculture, bookeeping, French, and the science of teaching. In connection with these studies it was provided that there should be lectures with experiments, the practical application and use of tools and instruments, and the working of machinery. The school was to be for the youth of Worcester county and was to be free; but only persons between the ages of fourteen and twenty-one years who should pass a satisfactory exmination were to admitted as pupils. In special and urgent cases however this rule might be relaxed so far as to admit a person over twenty-one years of age. Scholars not belonging to Worcester county might also be admitted upon the payment of a moderate sum for tuition. The privileges of the school were to be confined to males only if such should appear to be the more advantageous course.

The munificent gift of Mr. Boynton, was suplemented by the gift from Mr. Stephen Salisbury, of a lot upon which to erect the proposed buildings, and a building fund of $50,000 contributed by the citizens of Worcester and vicinity, Mr. Ichabod Washburn, who from the first took a deep interest in the success of the enterprise, bestowed upon it a large machine shop and equipment, built specially for this purpose, endowed it with a working cash capital of $5,000, for the first year to which is to be added the interest of $50,000 annually during his life, and at his death the principal is to become a permanent fund secured to the institute. Mr. Salisbury not content with having furnished a site for the buildings and having contributed $22,000 to the building fund and $10,000 as a fund for books and apparatus, added a crowning gift of $50,000.

A handsome granite building has been erected, and the machine shop of brick stands adjacent. The school is to be opened in November next, and we wish it and its liberal founders, long life and prosperity.

THE GLACIERS OF SWITZERLAND.

To the traveler in Switzerland, apart from the grandeur of the mountain scenery nothing is more interesting than the gigantic glaciers which form in the elevated gorges between the snow-clad mountains. It is scarcely possible to estimate the extent of the Swiss glaciers, but they are supposed to cover upwards of 1,500 square miles, and vary from 80 to 600 feet in thickness. When viewed from an elevation, the general appearance of a glacier is that of a torrent tumbling through its sinuous bed, to precipitate itself into the valley below, but which has been suddenly stopped by some mysterious agency.

The glacier terminates at the lower extremity in a promontory of ice, thrusting itself into cultivated valleys, and from its base issues a stream of water through natural arches formed in the ice. The Rhine and the Rhone, and many other smaller rivers, derive an everlasting supply from these wasting and ever forming glaciers; and it is a singular fact that these frozen masses have a regular motion. They advance noiselessly and imperceptibly in the direction of the declivity, carrying forward rocks and other substances on the surface, which can be traced from year to year and almost from day to day, all depending upon the mildness or severity of the weather.

Glaciers are not peculiar to the Alps, but have been observed in the Andes. During the summer months tourists through the Alps watch with deep interest the fall of avalanches of snow from the sides of the Jung Frau and Mont Blanc, the reports of which resemble the sound of distant artillery.

Hay Making.

Alas for the poetry of farming! All the songs of milkmaids must be listened for in the old English poets. The whetting of the mower's scythe is almost over—quite over—on my farm! Instead of that one hears the sharp rattle of the mower, and sees the driving man quite at his ease riding round and round the meadow, for all the world as if he were out airing! Whereas, heretofore, two acres would be counted a large day's work; now, ten and twelve are easily accomplished.

Nor is the contrast less remarkable in all the after work. When I was a boy I was placed in line, with all the men that could be mustered, to shake out the hay with forks; and after a few hours all hands were called to go over the ground and turn it. To do this rapidly, and yet so the bottom side shall really come to the top was no small knack. Now, a *tedder*, with one man riding, will literally do the work of ten men and do it far better than the most expert can. Have you ever seen a *tedder?* I have got now a perfect one. The grass rolls up behind it and foams, I was going to say, like water behind the wheels of a steamer. The grass leaps up and whirls as if it were amazingly tickled with such dealings.

The result is, that unless the grass is very heavy, and the weather very bad, you may cut your hay in the morning and get it into your barn before night, in far better condition than it used to be when it required never less than two, and generally a part of three days to cure it.

But I have forgotten the *Horse Rake*. Instead of the old-fashioned, long handled rake, and the five or six men, pulling and hauling to get the grass into windows, that same fellow, with that same horse, rides his luxurious rake, and in a fifth part of the time formerly required, puts it into equally good shape. Indeed, haying if it has lost its poetry, has also lost its drudgery. A man can now manage a hundred acres of grass easier than he formerly could twenty. The only thing that remains to be made easy is pitching on and off the load. It is true that horse forks have been invented, but I have never seen any that did their work well; and in my barn at any rate the old work of pitching and mowing remains; and if you wish to know what fun is, get on the mow, under the slate roof of my barn, on a hot day, and let Tim pitch off hay, as he will if I give him the wink. You will have to step lively, and even then, you will often be seen emerging from heaps of hay thrown over you, like a rat from a bunch of oakum. And then it is so pleasant, when a man is all a-sweat, to have his shirt filled with hay seed, each particular particle of which makes believe it is a flea, and wiggles and tickles upon every square inch of your skin, untill you are half desperate!

It is the 2d of July, and my grass is all cut, and the last load is rolling into the barn while I write. How sweet it smells! How jolly the children are that have been mounted on top of the load; and their little scarlet jackets peep out from their nests while Tim stands guard and nurse. A child that has not ridden up from the meadow to the barn on a load of hay, has yet to learn one of the luxuries of exultant childhood! What care they for jolts, when the whole load is a vast and multiplex spring? The more the wagon *jounces* the better they like it! Then come the bars, leading into the lane with maple trees on each side. The limbs reach over, and the green leaves kiss the children over and over again. So would I, if I were a green leaf, and not consider myself so green after all! And so the load rolls slowly up the hill. There is no such a thing as momentum in an ox. He is always at a dead pull and at the very hardest. But the children like it! The slower, the longer is the ride! Let them take all the comfort they can. By and by they will be grown, and own fine carriages, and roll in style through the streets. But there is many a fair face that rides in a silk lined coach, with a sad heart, and would go back if she could, oh how gladly, to her joyous ride on a load of hay!—H. W. Beecher, *N. Y. Ledger*.

A New Sensation--The Elephant Beetle.

A Nevada paper is responsible for the following beetle story, which goes ahead of anything we have yet read in the fish or snake line. It appears that, in addition to the plague of a plurality of wives, Utah is also afflicted with a visitation of the elephant beetle. A person who returned from the neighborhood of Salt Lake last week, saw myriads of them covering the earth with their shining brownish-black bodies, and destroying everything which they met in their path. Even small animals, he was informed by the ill-fated residents, did not escape the voracity of these hordes; their bodies were crowded upon and worried and wounded cruelly with the powerful antennæ until they fell down exhausted by their struggles and loss of blood, when they were fastened upon by thousands and devoured. The entire carcass of a sheep was eaten and the bones picked clean in two minutes and a quarter; and it is said that a dead ox would be gobbled up by them in a quarter of an hour. So ferocious are these giant beetles that mothers are afraid to let their little children go out of the house unattended by a grown person. In their frequent bloody contests the wounded are devoured on the instant. Our informant says they are about four inches long, with legs three inches long; their antennæ are stiff, sharp, and fully four inches long; they have a short tail, armed with a powerful horn, and their shells are so hard that the weight of a man will scarcely crush them. They are very frisky at times, and jump with the agility of fleas. No other species of the beetle possesses their faculty of uttering a loud sound, which, made by thousands of them at once, resembles the braying of a band of jackasses. Their noise terrified the horses of our informant and his companion, which could not be kept upon the plain, so great was their fright. On one occasion, while they were riding in a valley that was black, with beetles, and crushing them under their horses' hoofs, when their hard cases would crack with a report like a rifle, the fierce insects showed a disposition to attack the horses, and fairly drove them out of the field. We were informed that a scientific man in Salt Lake City was collecting specimens of this formidable elephant beetle for transmission to the various learned institutions of the country.

It is very likely also that the elephant beetle may soon be exhibited on Broadway, immediately after the excitement about the "headless rooster" passes off. We want enough of them at least to imitate the bray of one jackass.

The Conmissionership of Patents.

"Senator Trumbull has engrafted the following amendment upon the third section of the bill to authorize the temporary supply of vacancies in the Executive Departments: 'That in case of the death, resignation, absence or sickness of the Commissioner of Patents, the duties of said Commissioner, until a successor be appointed, shall devolve upon one of the Examiners-in-Chief in said office, to be designated by the President.' The object of this is to legislate the incumbent Chief Clerk of the Patent Office, who is acting as Commissioner, out of office, and to give the President a chance to appoint Mr. Foote, Senator Henderson's father-in-law, now one of the chief examiners in the Patent Office, Commissioner of Patents. Senator Henderson has been for some time urging the President to make the appointment, but Mr. Johnson has failed to comply because he has understood that Mr. Foote could not secure confirmation from the Senate. Mr. Trumbull's arrangement, however, obviates the difficulty, and it is understood that the President will appoint Mr. Foote Commissioner of Patents should the bill pass. As there are some disagreeing votes between the two Houses, the bill will probably go to a Committee of Conference, and as several members of the House are fully aware of Mr. Trumbull's object, the amendment it is thought will be defeated."

We find the above piece of information in the telegraphic summary of the *Daily Tribune*. We do not perceive any necessity for arranging a legal trap in order to catch the Senate in advance of a nomination. If the President desires to appoint Judge Foote, to the vacant Commissionership, let him do so boldly and without any reference to Senator Henderson or anybody else. Judge Foote would make an excellent Commissioner, and we do not see any reason for his rejection, even though his daughter may have espoused Senator Henderson. We learn the bill has been defeated in the House.

Gen. Stout Acting Commissioner is filling the office acceptable to both Inventors and Solicitors.

The duties of the office he thoroughly understands and we hope no further effort will be made to appoint a comissioner until the President and both Houses of Congress can agree upon some person well qualified for the office.

PAPER MATERIAL.—Notwithstanding the multifarious efforts made to find materials for paper, the manufacturers of this article in the east of France are in such want of materials that they have combined to offer as a prize a model of the value of £160 to any person who produces and applies any economical filamentous matter, which, in the form of pulp, may serve for the manufacture of paper, and which, when mixed with three fourths of rags, shall make a paper of as fine a quality as if made of rags alone. Medals of considerable value will also be given for the best processes for docolorizing and bleaching rags; for the best size for paper; for the best process for neutralizing the electricity developed in the paper while it is in the machine; and for a complete and exhaustive statistical work on paper manufacturing industry in the principal countries of Europe and America. Probably the okra plant, mentioned on page 36, current volume, would fulfill the conditions required.

"If one would appreciate the inventive genius of Americans, they should read weekly the SCIENTIFIC AMERICAN, which is largely devoted to descriptions of the various useful and curious inventions and discoveries of the day. Take the last number, for illustration: There will be found some fifty or more recent discoveries and inventions noticed—from a blast furnace to a mop: from a carriage wheel to a horse collar; from a heliometer to a vegetable masher; including new and curious electric machines, watch manufactures, pliable glass, gage punching machines, and scores of other interesting and important matters. Let no reader suppose that this is a mere puff for the SCIENTIFIC AMERICAN, for it is no such thing. We pay for the copy which we read, and owe the editors and publishers nothing but good will."

[We copy the above friendly hit from the *Evening Traveler*, published in Boston. We thank our cotemporary for the notice, and shall endeavor to pay up in full hereafter.—EDS.

THE hands in the gas works at Philadelphia are on a strike, and the city is in danger of being left in darkness. The hands demand an increase of 25 per cent on former wages. The utmost economy in the use of gas will not insure its lasting for more than three days, when, if the matter is not adjusted, there will be a dark state of things.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JULY 14, 1868.

Reported Officially for the Scientific American.

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. Residents of Canada and Nova Scotia pay $500 on application.

☞ *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.*

79,800.—FASTENING FOR BOOT.—A. A. Abbot, Boston, Mass.

I claim the within described fastening, consisting of the spring bottom, C, in combination with an eyelet, B, or its equivalent, substantially as described

79,801.—SELF-LOCKING BOLT FOR METER SAFE.—Alonzo W. Adams, New York city.

I claim, 1st, The bolt, A, and the devices attached thereto, or equivalents, as shown and described.

2d, The safe or guard-casing, with its devices thereto attached, or equivalents as shown and described.

3d, The combination of the bolt, A, with the safe or guard-casing, as represented in the specifications and in fig. 4 of the drawings, or any equivalent for the same.

79,802. — MACHINE FOR SEPARATING LIGHT FROM HEAVY PARTICLES OF LITHARGE, PAINT, ETC.—W. Atwood, Cape Elizabeth, Me.

I claim 1st, The combination of the fan wheel, f, tube, g, and rotating drum, b, as and for the specified purposes.

2d, The combination of the spout, a, with the rotating drum, b, as and for the purposes set forth.

3d, In combination with the fan wheel f, tube, g, and drum, b, all operating as described, the deposit-chamber, h, for the purposes described.

4th, Separating the finer from the coarser particles of litharge, etc., by means of a current of air forced through a rotating drum, etc., and carrying the said finer particles into a deposit chamber, substantially as described.

79,803.—ROTARY STEAM ENGINE.—J. S. Barden, Providence, R. I. assignor to himself and D. N. Pickering, Boston, Mass.

I claim as my invention, the combination consisting of the two sectoral chambers, c c, the oscillating pistons, C D, the shaft, B, the cylinder, d, the reciprocating valve piston, G, its cylinder, F, and tapped or stemmed valves, b1 b1, arranged and provided with steam passages or induction and eduction the whole being substantially as and so as to operate as described.

Also, the arrangement of the steam-passages, f g with the pistons, C D, the cylinder, D, and the shaft, B,

Also, the arrangement and combination of the faucet, E, and its branch passages, k k, with the steam chambers, c c.

Also, the arrangement of the valves, b1, the rods, c1, thereof, and their passages, a3 b3, so as to effect "cushioning" of the valve-piston, G, by the steam, under circumstances as set forth.

Also, the valve-piston, G, constructed of the shell, r, and body part, q, made and arranged together as set forth.

79,804.—SCROLL FOR WATER-WHEEL.—J. L. Beers, McAlisterville, Pa.

I claim the arrangement of the gate, D, and bar, C, with the adjustable tongue, B, and the throat, A, as and for the purpose specified.

79,805.—CAR BRAKE.—Wm. P. Blades, Baltimore, Md.

I claim the brake block, B, constructed with the slotted cavity, in combination with the supporting bolt, D, made with a neck or bolt to pass through brake car, and when pivoted to the block by the same link which supports the whole, substantially as described

79,806.—REVENUE STAMP.—G. W. Bowlsby, Monroe, Mich.

I claim, 1st, A blank stamp, having no fixed value while in the hands of the Government, until the inspector has estimated the tax, through the proper means, and has entered the amount upon the face of the stamp for a specific package, the value of the stamp depending mostly upon said estimate, and partly upon the class name of the stamp.

2d, A stamp made, and the value fixed by the Government, for a particular individual package, as shown in figs. 2 3 4 5.

3d, A stamp made in separate and independent sections, mechanically, substantially as described, for the purposes named, or for other similar purposes

4th, A stamp, the mechanically independent sections of which are of different colors, for the purposes named.

5th, Making the different sections or portions, as described, of the same stamp vehicles for the necessary entries of inspection and reinspection, and continuing and carrying a history on their face of the movements, ownership, duty, proof, weight, measure, and, or other matters of record pertaining to the article taxed, as an ever present means of detection, an auxiliary in reinspection, and also a partial cancellation,

6th, A stamp whose sections have duplicate and corresponding entries upon their faces, to be separated, substantially as and for the purposes described.

7th, The numbering of the different stamps, and also the sections of the same stamp, by various series, for further means of detection, reference, cancellation, record, and identification.

8th The entry of official countersignatures upon the face of the stamp and its sections in successive series, or by intermediate steps, for the purposes named.

9th, The continuous cancellation of the stamp by the process described.

10th, The final resumption of the stamp coupons, and then of the stamps proper, by the Government.

11th. A stamp whose face history is connected with an official book record at the home office, and also with the inspectors or assessors' book, for the purposes specified

79,807.—HOT WATER TANK ON COOKING STOVE.—Albert Brown, Troy, N. Y.

I claim a hot water reservoir, having a descending or driving flue therein substantially as and for the purpose herein specified

Also the projecting horizontal flue, E, for forming a connection between the stove and reservoir flues and exit pipe thereof, substantially as set forth.

Also, the suspension of the reservoir by the stove-pipe projection or thimble, substantially as described and as represented in fig. 1.

Also, the boiler hole or holes g, over the flue space, E, in combination with the hot water reservoir, substantially as set forth.

79,808.—FIRE PROOF SAFE.—H. H. Bryant, Boston, Mass.

I claim, 1st, The combination of one or more vessels, adapted for containing a liquid suitable for generating steam, with a safe which has its chamber of deposit made steam tight against the steam which is generated from the water in said vessels, substantially as and for the purpose herein described.

2d, The arrangement of water or fluid vessels with steam valves, applied either within the door of the safe, or immediately around the receptacle, E, or both within the door and around said receptacle, substantially as and for the purpose described.

3d, Providing the water vessels with air valves, substantially in the manner and for the purpose described.

4th, The combination of both air and steam valves with the water vessels applied to a safe, substantially as and for the purpose described.

5th, The arrangement of the valves in or on the water vessels or chambers in such a manner that some of the valves will operate, in whatever position the safe may assume during a fire, substantially as described.

6th, The combination of water or other fluid with a solid absorbent substance, as a filling for a vessel or a chamber used in a safe or other similar fire proof structure, substantially as and for the purpose described.

79,809.—FIRE-PROOF STRUCTURE.—H. H. Bryant, Boston, Mass.

I claim in combination with a safe or other structure of a similar nature, the use of one or more vessels or chambers, used as steam or vapor generators that are provided with a suitable number of pipes, a, arranged substantially as and for the purpose set forth.

79,810.—MACHINE FOR ATTACHING SPANGLES TO HOOPS OF SKIRTS.—Albert Carter, Forrestville, Conn.

I claim the swinging gate, c, with its end inclined upwards, in combination with the inclined assorting plate, a, opening, e, and fence, b, substantially as and for the purposes specified.

79,811.—MUSTARD PLASTER.—B. I. Crew, Philadelphia, Pa.

I claim a plaster, composed of mustard deprived of its fixed oils, and mixed with a solution of India-rubber, or other material insoluble in water as set forth.

79,812.—RAILROAD SWITCH.—James Dampman, Lebanon, Pa.

I claim 1st, The bent switch-rail, C1 C2, and straight rail, C, in combination when the former has the tapering section, N, applied to it by means of rods, f f, and springs, e e, and the latter has the frog, P', and pointed rail-extension P, applied to it, all substantially in the manner and for the purpose described.

2d, The frog, P', and pointed rail extension, P, constructed and adapted to serve the purposes substantially as described.

3d, The switch rod, b, constructed with removable shoulders, j j, and with removable griping jaws, j', and screw threads and retaining nuts, substantially as described and shown.

79,813.—GRAIN SEPARATOR.—L. H. Davis (assignor to Casho and Company), Newark, Del.

I claim 1st, The longitudinally vibrating stair shaped screen, F, provided with rectangular perforations, f, in the riser of the stair, as and for the purpose set forth.

2d, The combination as set forth, of the longitudinally vibrating stair shaped, rectangularly perforated screen, with the ratchet ribs, c, whereby the straw escapes backward and the grain forward.

3d, The combination, substantially as set forth, of the stair shaped perforated screen, with reciprocating rakes G, which return the grain to the front of the machine after passing through the screen.

4th, The combination substantially as set forth, of the threshing cylinder, longitudinally vibrating, rising and falling stair shaped perforated screen, and reciprocating rakes, with the fan and second longitudinally vibrating shaking shoe, for the purposes specified.

5th, The combination as described, with the fan, of the shoe, H, troughs, k1 k2, and adjustable back board, K, for the purposes set forth.

79,814.—CORN PLANTER.—Geo. Dickerson, Harveysburg, Ohio.

I claim, 1st, The general arrangement of the bracing and adjusting bolts, P e e' and S, sheath, B, tube, K, coverers, D D, and roller, E, all constructed and employed as described.

2d In combination with the above parts, the relative arrangement of the horizontal trigger, L, retracting spring, N, and cam wheel, H h h', when constructed as specified.

79,815.—PICK AND PICK-AXE.—E. P. Dickie, Morristown, N. J.

I claim the twist-pointed pick or pick-axe, herein described.

79,816.—CLOSING VULCANIZING FLASKS.—Horace M. Edson, Mount Vernon, Ohio.

I claim the screw of brass or other suitable metal, which, screwed down through a nut in the top of a vulcanizer, will close the flasks inside of the vulcanizer, as above described, and the steam tight packing box around the screw, to prevent the steam from escaping from the vulcanizer during the process of vulcanizing.

79,817.—STOVE PIPE DAMPER.—L. S. Enos, Almond, N. Y.

I claim the serrated latch, C, as constructed and arranged, in combination with the oval plate damper, B, substantially as and for the purposes herein set forth.

79,818.—TOOL SHARPENER.—Samuel Farrenburg, Taylorsville, Ind.

I claim, 1st, The arrangement of the wheel, E, cranks, F F, pitmen, G G, stones, H H, slides, I I, rests, L L, and binders, M M, upon the table, A, and operating as set forth.

2d, The adjustable rest, L, and binder, M, for supporting the tool to be sharpened, substantially as and for the purposes above set forth.

3d, The rest, N, against which the person working the machine may lean substantially as and for the purposes above set forth.

79,819.—ELECTRIC MACHINE.—A. L Fleury, New York city.

I claim, 1st, The above described electric machine, composed of the non-conductor casing, A, isolated plates, C and D, and battery of plates, f f f, etc., arranged substantially in the manner set forth.

2d, The battery of plates, f f f, with perforations and exciting points, g g g g, connected together, or any other perforated plates, wire cloth, or equivalent, when arranged together and operating in the manner and for the purposes specified.

79,820.—CHIMNEY COWL.—J. W. Foard, San Francisco, Cal.

I claim the ventilator, composed essentially of the pipe, A, and cowl, C, united by the connection-pipe, B, the cowl having the expanded end, c, to receive the air to create the current and the elongated cylindrical or parallelopipedon discharge end, c', for the purpose described, all the said parts being constructed and arranged to operate together, substantially in the manner specified.

79,821.—CHURN.—J. C. Gilbert, Galesburg, Ill.

I claim the revolving-box, B, with perforated dashers, H H K, and small lid, F, on the main lid, when the several parts are constructed, arranged, and used to operate substantially as shown and described.

79,822.—ATTACHING PAD HOOKS TO PADS.—Geo. D. Gillett, Meriden, N. Y.

I claim in combination with the pad hook, B, the hook, c, and shoubder, b', with or without the shoulders, b b, as herein shown, and for the purpose described.

79,823.—LAMP CHIMNEY ATTACHMENT.—F. N. Gisborne, and Herbert Allman, London, England

We claim, 1st, Our improved apparatus for regulating the supply of air to the flame of a lamp or burner, when constructed and arranged substantially as herein described and set forth.

2d, The combination of a disk or button, F, with an opening valve placed above it, substantially as described and herein set forth.

3d, The combination of the compound bar, d, the hinged valve, c, and perforated rim, a, the whole used in connection with a lamp or gas chimney, substantially as herein described, and for the purposes specified.

79,824.—DISH COVER.—H. S. Goff, and F. M. Goff, Middletown, Conn.

We claim, 1st, The arrangement of the cover, B, of the dish, upon one or more vertical pieces, A, so that it slides up or down, and can be fastened up or down upon the dish at pleasure, substantially in the manner described and shown.

2d, The arrangement of the figure hinged at the top of the cover, and operated by the spring, G, so as to form a lock, suostantially as shown.

79,825.—BIT STOCK.—A. D. Goodell, Florence North Hampton, Mass. Antedated July 3, 1868.

I claim 1st, A bit-brace in which the clamp is formed of the two pieces, D and D', operated by a collar, B, arranged and constructed substantially as shown.

2d, The adjustable socket C, operated by the collar, A, substantially as shown,

3d, The device for attaching the head consisting of the split screw, E, set around a neck formed in the journal, and screwing into the head, substantially as shown.

79,826.—STEAM HEATING APPARATUS.—Chas. C. Hall, Portland, Me.

I claim 1st. The open boiler, b, constructed and operating as herein set forth and for the purposes described.

2d, Combining the air and steam heat within the boiler, by the means of the pipe, n, as and for the purposes herein set forth.

3d, The minute perforations, i, in the tops of the radiators, as and for the purposes described.

4th, The arrangement of the radiators, e, and connecting tubes, f, for the purpose of distributing the steam therein, as described.

5th, The steam heating apparatus, as herein described, in which the liability to accident or explosion is obviated, by the prevention of steam pressure as herein described.

6th The steam heating apparatus, as herein described, which is automatic, that is, when the supply of water and the pressure of steam are regulated by the apparatus itself, without the necessity of any care, as herein described, by means of outlet, h, regulator, p, pipe, c, and waste pipe, m.

79,827.—FRUIT GATHERER.—O. Court Hamilton, and Harvey McKinney, Turtle Creek, Pa.

We claim 1st, The combination, substantially as set forth, with a partly open box, of jaws, hinged near the edges of the opening, which jaws when closed, complete the box, and thus prevent the spilling of the fruit.

2d, The combination, substantially as set forth, with the receptacle and jaws, of the rounded internal strips, to prevent the crushing of the fruit or the clogging of the jaws.

79,828.—ROTARY STEAM ENGINE.—Caleb Harrison, Milwaukee, Wis. Antedated June 27, 1868.

I claim an engine consisting of the serrated disk, B, mounted in a case provided with the two steam passages, L L, and valve, H, and having the shaft, D, provided with the endless screw, P, engaging in the wheel, F, all constructed and arranged to operate as shown and described.

79,829. — HARROW.—Anthony Hochstein, Williamsville, N. Y.

I claim the combination of the adjustable teeth-supporting beams, B, independent of each other, and set screws, b' b', substantially as and for the purpose described.

79,830.—WORKING THE PEDALS OF PIANO-FORTES, ETC.—R. H. Hooper, West Roxbury, Mass.

I claim, 1st, The pedal levers and treadles, when constructed substantially as shown, and used with the pedals of a piano or other similar musical instrument, all substantially as and for the purpose described.

2d, The pedal levers and treadles in comoination with the fixed foot stool, A, all constructed and used substantially as described.

3d, The pedal levers and treadles in combination with the stool bar, B, when constructed and used substantially as described.

79,831.—MANURE FORK.—Jacob W. Horst, Annville, Pa.

I claim, 1st, The fork D G E, pivoted to runners, A A, and provided with latching bar, C, substantially as described.

2d, The use of sled runners, A A, constructed substantially as described, and adapted for sustaining a fork, and also a latching bar, C, which passes through the handle of the fork, substantially as set forth.

79,832. — MACHINE FOR WASHING LEATHER.— Adolphus Howard, Wellsville, N. Y., and George F. Howard, Chicago, Ill., assignors to Geo. F. Howard.

We claim, 1st, In a machine for washing leather, the application and use of split brooms, substantially as and for the purposes herein described.

2d, In a machine for washing leather, the clamps, D D', or its equivalent, in combination with the radial arms or disks, C, upon the shaft, G, for the purpose and substantially as described.

79,833.—MACHINE FOR SIZING HAT BODIES.—Wm. H. Hoyt (assignor to himself and Nathan Seeley), Bethel, Conn.

I claim, 1st, The combination of the vibrating or swinging segment, D, and the correspondingly formed bed, a a, hinged or pivoted at N, it being elastically supported by the spring, O, substantially as herein described and for the purpose set forth.

2d, The handle, R, shaft, E, springs, S S, and swinging segment, D, when arranged as described and for the purpose specified.

79,834.—PLOW.—Abram C. Jacques, Leavenworth, Kansas.

I claim, 1st, The adjustable frame, F, and roller, G, to determine and guide the width of the furrow, substantially as herein described.

2d, The projecting horizontal blade, E, and the vertical spur cutter, d, on the plow point, as and for the purposes herein set forth.

79,835.—WINDOW SASH STOP.—James G. Jewell, Washington, D. C.

I claim the combination of the metallic socket nail, g, with the tooth, F, the socket nail to be made with a sharp point where it penetrates the wood, so that it may be driven into its proper place, like a nail or tack, having an angular groove in its head, in which the tooth, F, rests when the window is locked down.

Also the corrugated groove, i, in the disk or wheel, A, in combination with the rubber ring or band, B, so as to prevent the rubber from slipping when in use.

79,836.—STOVEPIPE DAMPER.—John Johnson, Atkinson, Ill.

I claim a stove damper consisting of one center plate, A, made of a circular rim, a, and fine wire sieve, with arms, c c, and two outside perforated plates, B and C, of oval shape, arranged and secured together as described, substantially as and for the purposes herein set forth.

79,837.—CAR SEAT.—C. P. Kimball, Portland, Me.

I claim, 1st, Locking or securing the seats of cars so that they cannot be turned or reversed, either separately or all together, without operating the lever or brake, c, in the manner and by the means substantially as set forth.

2d, Operating or reversing in horizontal planes the seats of cars by means of a rack and lever or brake and gears, substantially as and for the purposes herein set forth.

3d, Reversing all the seats on one side of a car simultaneously by one lever or brake, as and for the purposes set forth.

4th, Arranging the seats of cars so that each one of the separate chairs or seats will turn independent of the other, substantially as and for the purposes herein set forth.

79,838.—MACHINE FOR DRESSING STONES.—Francis L. King, Worcester, Mass.

I claim, 1st, The arrangements of the grinder blocks, U U, so as to leave a hollow space in the center, and the conveyance of sand and water to the hollow space left by this arrangement of the stone in the grinder boxes by means of the upright hollow shafts, D D, and their hoppers, M M, or their equivalent.

2d, The collars, O O, or their equivalent.

3d, The slots in the shafts, D D, with the set screws in the gears, C C, or their equivalent, when combined with the shafts, D D, gears, C C, self-adjusting frame, L, rotary grinder boxes, N N, and reciprocating carriage, I.

4th, The sectional grinder boxes, N N, the inner frames, g g', the knobs, d d', the set screw, c', or its equivalent, arranged and operating substantially as and for the purpose described.

5th, The cutters, e e', combined with the rotary grinder boxes, N N, and the carriage, I, arranged and operating substantially as and for the purpose specified.

6th, The self-adjusting frame, I, the shafting, R R, the gears, S S, and T T, racks, P P, the side bearings, b b', arranged and operating substantially as and for the purpose described.

7th, The hoisting chains, X X, pulleys, shaft, Y, ratchet wheel, W, intermediate gears, p p', pawl, r, arranged and operating substantially as described, when combined with the grinder boxes, N N, self adjusting frame, L, collars, O O, and shafts, D D.

8th, The chains, P P', pulleys, k' k', weights, m' m', used for the purpose described, when combined with the self-adjusting frame, L, grinder boxes, N N, collars, O O, and shafts, D D.

9th, The scroll grinder, with its hollow cone in the center, as represented in figs. 6, 7, and 9, made and operating substantially as described.

79,839.—SPRING BED BOTTOM.—B. F. Kingman and M. V. B. Shepard, Chicago, Ill.

We claim a bed spring fastening consisting of the metal strap, C, and loop, D, the former having a nib, E, for holding the spring in place, and a slot, H, through which said loop passes, and the latter having projecting flanges F' G, fastened to the end of the strap, C, and bearing against the inside of the same, substantially as and for the purpose herein specified.

79,840.—SUPPOSITORY MACHINE.—A. M. Knowlson, Troy, N. Y.

I claim, 1st, The mode or manner herein contained, described, and set forth, for the manufacture or formation of suppositories from the medicated material, while in a cold or solid state or condition, substantially as herein described and set forth.

2d, The combination of the plunger, B, with the suppository molds, a and G', each being arranged with the supply tube or cylinder, A, in the manner and for the purposes substantially as herein described and set forth.

3d, The employment of the frame, H, having combined therewith the mold or die, G', the supply channel, c, and the cap, I containing the vent, e, each being arranged in the manner and for the purposes substantially as herein described and set forth.

4th, The arrangement and combination of the die or mold, a, with the cap, E, in the manner and for the purposes substantially as herein described and set forth.

79,841.—RADIATOR.—J. A. Lakin, Thompsonville, Conn.

I claim the peculiarly shaped radiators herein shown, open at the lower ends, and connected in pairs by means of the pipes, B and B', substantially in the manner and for the purpose herein shown.

79,842.—CAST IRON CAR WHEEL.—George G. Lobdell, Wilmington, Del.

I claim a cast iron car wheel having a hollow rim, with transverse strengthened ribs, a, where the flanged side of the said hollow rim is made straight, and at right angles, or nearly so, to the said internal ribs, as set forth, for the purpose specified.

79,843.—FRUIT JAR.—Wm. A. Loder, Rochester, N. Y.

I claim a sealing ring for fruit jars formed from a strip or strips of paper or other flexible material, coated on the inside with gum or wax, for covering the joint between the cover and jar, as herein set forth.

79,844.—HOT AIR FLUES IN STOVES.—C. K. Marshall, New Orleans, La. Antedated July 4, 1868.

I claim, 1st, Constructing the pipe, D, of fire clay, soapstone, or other like material, with a tapering flue, substantially as described, and for the purpose specified.

2d, Constructing the stove, A, with openings, a b, in combination with the pipe, having elbows, d and d', when the same are constructed of fire clay soapstone, or other like material, and arranged so as to operate substantially as described and for the purpose specified.

79,845.—COAL GRATE AND STOVE.—C. K. Marshall, New Orleans, La. Antedated June 27, 1868.

I claim, 1st, The tile, C, with its internal grooves, c c, in combination with the pipes, E and F, or their equivalents, and the grate, B, when the same are constructed and arranged substantially as described and for the purpose set forth.

2d, The tile, C, with its internal grooves, c c, in combination with the pipes E and F, and damper, G, when the same are constructed and arranged substantially as described and for the purpose set forth.

3d, Arranging in the bottom of an open fire grate, a hollow triangular tile, D, when the same is connected with openings in the side of the grate, substantially as described.

79,846.—STAIR RODS, ETC.—Wm. M. Marshall, Philadelphia, Pa., assignor to himself and J. B. Alexander, Washington, D. C.

I claim, 1st, The use of glass tubing, when supported by metal or other casing, mountings in relief, of metal or other material, or the rabbeted supports, of metal or other material, substantially as described and for the purpose set forth.

2d, The filling of silvered or gilded glass tubes with plaster, cement, or their equivalents, combined with wood or metal rods, substantially as described and for the purpose set forth

79,847.—EYE CUP.—Benj. K. Maltby (assignor to Charles R. Fosdick), Cincinnati, Ohio.

I claim the use of tubes that serve as receivers for exhausting the air around the eye, in combination with spectacles, with or without magnifying power, designed to elongate the eye, and by proper use to prevent and also to cure long-sightedness.

79,848 —REFINING AND SMELTING ORES.—James P. McLean, New York city. Antedated July 3, 1868.

I claim, 1st, the dry gas or gases prepared and applied to smelting or refining ores, substantially as above set forth, or otherwise prepared, to suit the exigencies of the time and place.

2d, I claim the retort, B, cleanser, C, dryer, D, gas chamber, E, neck, V, with pipes, G G' G'', and cocks, m n o P u and X, prepared and arranged in the manner and for the purpose set forth and shown in the drawings, or otherwise arranged, substantially as described.

79,849.—MACHINE FOR SEPARATING IRON FROM SUGAR.—John Meyer, Portland, Me.

I claim as an improvement in the process of filtering sirup in manufacturing sugar, the improved filtrator herein shown and described, having the metallic sieve, for the purpose of eliminating the particles of iron which have become mixed with the charcoal in the process of preparing the same.

79,850.—INSTRUMENT FOR STRETCHING BOOTS AND SHOES.—George Munro, Philadelphia, Pa,

I claim, 1st, The combination of the sections, A B, block, C, screw spindle, D', nut, G, bevel wheels, h and h', and spindle, D, the whole being arranged and operating substantially as and for the purpose herein set forth.

2d, The block, C, consisting of two parts, e and e', secured together by screws, f f, and arranged for the reception of the bevel wheels, h and h', and spindles, D and D', as described.

79,851.—DITCHING MACHINE.—Patrick O'Conner and Morris Collins, Decatur, Ill.

We claim in combination with the beam, A, and the plow, C, the mold boards, D, knives, K and L, screw, G, and guides, I, so that the whole may be moved and adjusted by said screw, substantially as specified and for the purpose set forth.

79,852.—HORSE POWER.—George Oerllein, Utica, Minn.

I claim, 1st, A horse power arranged on wheels substantially as described.

2d, Master wheel, C, supporting frame, Q, step, R, arms, S, center shaft, T, and draft levers, U, in combination substantially as described.

3d, Draft levers, U, chains, V, toothed wheels, shafts, and dogs, W, in combination with master wheel, C, substantially as described.

4th Tumbling rod shafts, O M and K, arranged and combined substantially as described.

5th, Wheels, D and G, and master wheel, C, with their connections, arranged and combined, substantially as described.

6th, Braces, X and Y, in combination with frame, A, substantially as and for the purpose described.

79,853.—PAINTERS' HOOK.—John W. Pattee (assignor to himself and Ephraim Elliott), Thornton, N. H.

I claim the combination and arrangement of the arms, c and d, with their projections, e and f, eye hook, g, or its equivalent, and main hook, i, with or without the projection or barbs, when arranged substantially as described and for the purposes fully set forth.

79,854.—WIRE AND PICKET FENCE.—Elias C. Patterson, Rochester, N. Y.

I claim a wire and picket fence in which each picket is provided with two or more pairs of oblique slots or notches for wires, at different hights, the notches of each pair in the same picket being also at different hights on opposite sides, and inclined, the one upward and the other downward, the pickets being so arranged that each wire of a pair shall alternate from a high to a low notch, and vice versa, in the successive pickets, and the two wires of each pair being tightened by being seized together at their crosslugs, substantially as described.

79,855.—WAGON BRAKE.—David Philips, Cordova, Ill.

I claim the brake consisting of the roller bar, B, having the blocks, d, pivoted thereon, with the lever, D, supports, C, and chains, F, when said parts are constructed and arranged to operate substantially as described.

79,856.—SEWING MACHINE.—Hiram Plummer, Brooklyn, N. Y., assignor to himself and Wm. E. Doubleday & Co., New York city

I claim, 1st, The combination a reciprocating perforating needle with the folder, o, constructed and operating substantially as described, and shutter, r, or its equivalent, for the purposes and as set forth.

2d, A feeding mechanism acting in the direction of the needle's length, in combination with a folder and reciprocating perforating needle, substantially as specified.

3d, A perforating needle, reciprocating in a plane parallel to that on which the fabric to be sewing is placed, in combination with a shuttle moved in a raceway in the bed, and with mechanism for presenting the material to the needle in a folded condition, substantially as set forth.

4th, The swinging plate, l, carrying the folder, o, in combination with the feeding point, s, and mechanism, substantially as specified, for giving motion to the parts.

79,857.—GATE.—Jerome Potter, Pierceton, Ind.

I claim a sliding gate having a long stile, I, and a short stile, J, in combination with a stationary bar, D, and movable bar, E, the whole being constructed and arranged substantially as and for the purpose set forth.

79,858.—MACHINE FOR MAKING WOODEN BOXES.—Reuben Ramsdell, Rindge, N. H.

I claim in combination with the former block or its equivalent, the groove or grooves, d, for turning the nail points, substantially as set forth.

Also in combination with the block, c, the jaw block, e, with its clamping or griping jaw, g, and the spring, h, substantially as set forth.

Also combining with the jaw, e, and the block, c, the adjusting screw, k, substantially as and for the purpose set forth.

79,859.—PADLOCK.—David F. Randall, Chicopee, Mass.

I claim, 1st, The arrangement of the detent, O, in the curved depression beneath the heel of the shackle, so that the detent cannot be removed without detaching the shackle from the body of the padlock, as set forth.

2d, The combination of the padlock body, formed as described, slotted and serrated bolt, B, spring, H, detent, O, and shackle, C, with the elongated and rigid key shank, T, the whole constructed and operating substantially as described.

79,860.—TEA KETTLE.—Ezra Ripley, Troy, N. Y., assignor to himself and W. C. Davis & Co., Cincinnati, Ohio.

I claim, 1st, A tea kettle or other culinary vessel having a hinged bail and an edgewise swinging cover, so hinged or pivoted, and made flat, or so shaped on top that the cover forms a convenient shelf for supporting and warming other culinary vessels of larger diameter than the cover.

2d, In combination with a cover formed and hinged as specified in the preceding clause, so constructing and applying the bail or lifting handle and the rear bail lug, that when the bail is turned down it will permit the cover to swing over it, as described.

3d, In connection with a flat topped swinging cover, the lug or handle, G, projecting horizontally, in such a manner as to offer no obstruction to placing a vessel upon said cover.

79,861.—DETACHABLE MUZZLE FOR SHOT GUNS.—S. H. Roper, Roxbury, assignor to the Roper Repeating Rifle Company, Amherst, Mass.

I claim a contracted ring or ferrule, substantially as described, attachable to and detachable from the muzzle of a shot gun by means of a screw joint, for the purpose of diminishing or increasing the scatter of the shot, substantially as shown and described.

79,862.—DOOR STRAIGHTENER.—O. C. Ross, Penfield, N. Y.

I claim the device for straightening doors consisting of sections, D D, connecting intermediately at b, and engaging at the extremities with lugs, C C, by means of angles, f g, and ribs and slots, h i, substantially as herein set forth.

79,863.—STEAM ENGINE.—W. G. Savage, Knoxville, Iowa.

I claim, 1st, The arrangement of the lever, S, and spring, x, with the shaft, F, and wheel G, by which means the motion of the engine is reversed, substantially as set forth.

2d, The combination of the valve, C, with the head, A, having a hub, b, and the cylinder, D, with its steam press, B a, constructed and operating substantially as specified.

79,864.—GUDGEON FOR BOOM.—Charles Sayward, Gloucester, Mass.

I claim the arrangement of the swivel, hinge, yoke, and bolt, the swivel intervening between the boom and the hinge, substantially as and for the purpose specified.

79,865.—GRINDING PLATE FOR GRIST-MILL.—Henry Shaw and William D. Leavitt, New Orleans, La.

We claim the combination and arrangement of the cast iron grinding plate, B, having diamond shaped projections, A, the unyielding, non-conducting paper packing, C, and back plate D, all constructed and secured together in the manner and for the purpose herein described.

79,866.—FURNACE FOR MELTING METALS.—William Shea and L. D. Harvey, Harvey, Mich.

We claim the putting of pipes into cast iron plates, substantially as and for the purposes above set forth.

79,867.—JOURNAL BOX.—William Sherburne, Charlstown, Mass.

I claim, 1st, The bolt, E, constructed as and for the purposes above described.

2d, The bolt, E, in combination with the jaw, m, and oil box, B, substantially and for the purpose above specified.

79,868.—TYPE WRITING MACHINE.—C. Latham Sholes, Carlos Glidden and Samuel W. Soulé, Milwaukee, Wis.

We claim, 1st, A circular annular disk, C, with radial grooves and slots, or grooves alone, to receive and guide the type bars or hammers, so that they inevitably and necessarily will strike the the central point with perfect accuracy, when made and operated for the purpose, and as described.

2d, The combination of a circular, annular, radially slotted or grooved disk, with type bars fitted therein, and pivoted thereto, when made operated for the purpo e, and as described.

3d, The combination of a ratchet, or regular and equidistant teeth or cogs, with rods and levers to the keys, so that the paper carriage will be moved a certain and exact distance every time a key is struck, when made and operated for the purpose, and as described.

4th, The clamp or rod, u, in combination with the hinges, h, and the catches or buttons, m, for holding the paper securely down on the carriage, when made and operated for the purpose, and as described.

79,869.—BRIDGE BLOCK.—J. R. Smith, Springfield, Mass.

I claim, in combination with the wrought iron locks, D D, connecting the heads, a a, of the chords, the cast iron block, filling in closely around the joints, substantially as and for the purpose herein described.

79,870.—WATER WHEEL REGULATOR.—Hervey D. Snow, Bennington, Vt.

I claim the adjustable stops, g g', in combination with the pawls, r s, satchel wheel, f, and flange, t, moved by a connection to the governor, substantially as set forth.

79,871.—HARVESTER.—Welcome Sprague, Farnham, N. Y., assignor to himself and Bernard H. Meuhle. Antedated June 30, 1868.

I claim so constructing a reaping machine that the grain, after it is cut by the knives or cutters will be collected and formed into a rope, or equivalent, and in that shape be left, in the rear of the machine upon the ground.

79,872.—CARD CYLINDER.—Joseph M. Stone, (assignor to himself, George L. Davis, and John A. Wiley), North Andover Mass.

I claim a card cylinder, formed of a thin shell, with three or more spiders or sets of arms in the same, all cast in one piece, substantially as described, as a new manufacture.

79,873.—HOISTING GATE.—George Stowe, Braceville, Ohio.

I claim, 1st, The supporting bars, B and C, constructed with a slot, and operating substantially as described and specified.

2d, The grooves, D and E, in the ends of the fire box, constructed and operating as herein described.

3d, The bottom grate, H, provided with a nib or guide, or its equivalent, for the purpose of guiding the grate, and constructed and so arranged as to be hoisted and dumped, substantially as shown and described.

79,874.—HARNESS BUCKLE.—W. H. Taylor, Baldwinsville, N. Y.

I claim the combination of buckle and loop, substantially as and for the purpose specified.

79,875.—OIL, TOBACCO, AND OTHER PRESSES.—Enoch Thomas, Craigsville, Va.

I claim, 1st, The combination and arrangement of the double acting toggle levers, E E' and F F' with the follower frame, D, and the reciprocating frame, I, substantially in the manner herein described, and for the purpose specified.

2d, The combination and arrangement of the sectors, J J and J' J', rocking shafts, H H', shaft, K, and eccentric wheels, L L, in relation to each other and to the reciprocating frame, I, toggle levers, E E' and F F', substantially as herein described, and for the purpose specified.

79,876.—WEATHER STRIP.—James H. Thomas, Lynn, Mass.

I claim the combination of the flexible elastic roll, D, with the short cylinder, K' K' K', &c., and the spindle, H, arranged substantially as described, and for the purpose set forth.

79,877.—LATHE REST.—William Thompson, Worcester, Mass.

I claim connecting the nut, E, to the poppet block, C, by means of a screw passing through a slot in the side of the rest B, in the manner herein described.

79,878.—FILE CUTTING MACHINE—Thomas E. Thurston (assignor to himself and James Kearney) Newark, N. J.

I claim, plate, A, having the part, e, cast or forged therewith, in combination with parts, a b, and B and E, all combined and arranged in the manner and for the purpose set forth.

Also the improved adjustable stem, D, the improved parts, E and F, the improved part G, and the adjustable roller, u, when arranged and used in a file cutting machine, which has thereon the improved part, e, all constructed substantially as hereinabove set forth.

79,879.—LOCK BOLT.—George Washburn, New York city. Antedated June 27, 1868.

I claim, 1st, The combination and arrangement of the slide bolt, C, provided with the rack, E, the case, G, pinion, F, and shaft, H, provided with the bolt, t, and collar, e, all operating as described, for the purpose specified.

2d, The key, J, provided with the thumb lever, I, having the pin, g, attached, in combination with the shaft or arbor, H, of the pinion, F, said shaft having the hole, f, substantially as and for the purpose specified.

79,880.—GANG PLOW.—Jas. T. Watkins, Santa Clara, Cal.

I claim, 1st, The plows, H H, in combination with the blocks, E E', the holding screws, I I, by which the plows are adjusted, and the wedges, a a, constructed and arranged substantially as described.

2d, The blocks, E E', mounted upon the axles, C C', and the bent arms, J J', with the set screws K K', for regulating the depth of the furrows, substantially as described.

3d, The bent arm, N, and connecting rod, O, with the handle, M, and the catch, P, for disengaging the plows, substantially as described.

4th, The bent axle, R, with the nut, R', and the screw, S, for raising and depressing the furrow wheel, substantially as described.

79,881.—HARVESTER RAKE.—Cyrenus Wheeler, Jr., Auburn, N. Y.

I claim, 1st, The construction and arrangement of the chain sheave or pulley, whereby it is adapted to serve as the rotating head to which the rake and reel arms are pivoted.

2d, The arrangement of the endless chain and the driving and guide pulleys, for driving the rake, arranged on one side of the drive wheel, from a pulley or sheave on the opposite side of said wheel, substantially as described.

3d, The rake cam or track made in one piece with the base plate or yoke, and attached to the rake stand, substantially as described.

4th, Mounting the friction rollers that traverse the guiding cam in detachable boxes or stands, located in recesses or chambers formed in the rake and reel arms.

5th, Linking the rake and reel arms together in pairs, in such manner that the angle of relation of said arms may be varied by adjusting the point of connection of the links therewith at either end.

6th, The rake and reel arms provided with lugs or ears, having set screws for adjusting the hight of said arms in passing over the platform.

7th, The guiding sheave or pulleys in front of the drive wheel, around which the rake driving chain passes, made adjustable for the purpose set forth.

8th, The main frame, or arm, A', thereof, extended in rear of the drive wheel, and affording a point of support for the seat bar, substantially as described.

79,882.—WASHING COMPOUND.—H. K. White, Conneaut township, Pa.

I claim the above described composition for washing and cleansing clothing and other goods, compounded in about the proportions specified.

79,883.—APPARATUS FOR MOVING HEAVY BODIES.—Charles Whittaker, Milwaukee, Wis.

I claim the portable hoisting apparatus consisting of a frame, A, mounted on wheels, with a series of vertical screws, E, with the bars, F, and stirrups, G, arranged to be operated by bevel gear attached to the horizontal shafts, H, all substantially as described.

79,884.—PORTABLE FENCE.—Henry Willard, Ripon, Wis.

I claim the adjustable braces, C C, the mortised posts, A, the hook, D, and the pin, B, the whole arranged and combined with the fence in the manner substantially as and for the purposes shown and described.

79,885.—WINDLASS.—Geo. L. Woods, Newburyport, Mass.

I claim the arrangement of the capstan, c, shaft, d, gears, f f', and the bevel gears, g h h', in connection with the windlass, r, when constructed and operated as and for the purpose set forth.

79,886.—FEED RACK.—Morgan Workman, Washington township, Ohio.

I claim in the construction of a feed rack, the arrangement of the removable troughs, B, and hinged covers, b, substantially in the manner and for the purpose as herein shown and described.

79,887.—LAMP.—Ferdinand Adt (assignor to himself and Elisha Turner), Wolcottville, Conn.

I claim a reflector placed between two or more deflectors, and within the chimney, so as to reflect the light from the flames in the manner specified; and in combination with such deflectors and reflectors, the air tube, f, for the purposes set forth.

79,888.—INKING APPARATUS FOR COLOR PRINTING.—Thos. L. Baylies, Richmond, Ind, assignor by mesne assignment to the American Patent Chromatic Printing Press Company.

I claim, 1st, The combination of the central hub, B, a series of adjustable inking bars, D E, and a clamp for securing the bars at the ends without the interventica of any intermediate lateral supports, substantially as set forth.

2d, Interposing rubber or other yielding material, between the inner surface of the hooks of bars, D and E, and their point of contact with cylinder, B, and longitudinal bars, e and e', for purpose set forth.

3d, The cams, b and b', in combination with bars, I and I', and rollers, C and C', substantially as described and for the purpose set forth.

79,889.—FRUIT CAN.—Charles Becker, John A. Ross, and Jacob Steuernagel, Allegheny City, Pa.

We claim the arrangement of the corrugated lip, D, shoulder, o, flange, i, and recess, s, constructed, arranged, and operating as herein described and for the purpose set forth.

79,890.—MANUFACTURE OF FRUIT CANS.—Charles Becker, John A. Ross, and Jacob Steuernagel, Allegheny city, Pa.

We claim the method herein described for forming and providing fruit cans with an inner flange, for the purpose set forth.

79,891.—THILL-COUPLING.—Henry M. Beecher (assignor to H. D. Smith & Co.), Plantsville, Conn.

I claim the improved shaft connection, as made with the lips, a a, to its base, and in other respects substantially as described and represented.

79,892.—MANUFACTURE OF GLASS.—Leon Bemelmans and Laurent De Give, Atlanta, Ga.

We claim, 1st, The process, broadly, of manufacturing window and mirror-glasses, of whatever thickness and size, by pressing the melted glass between two parallel and polished plates, whatever may be the mode of pressing employed.

2d The machine to carry said process in operation, called window and mirror-glass-manufacturing machine, heretofore described, or any other substantially the same, and which will produce the intended effect.

79,893.—MANUFACTURE OF GLASS.—Leon Bemelmans and Laurent De Give, Atlanta, Ga.

We claim a machine, called window and mirror-glasses-molding machine, heretofore described, or any other substantially the same, and which will produce the intended effect.

79,894.—CIRCUIT CLOSER.—William J. Biggar and John C. Blood, Conneaut, Ohio.

We claim the combination of the board, A, the brass and iron strips m n, the sliding bolt, e, the spring lever, c, and the posts, b b', with the insulated wires, a a', arranged and operating substantially as and for the purpose herein described.

79,895.—ELECTRO-MAGNETIC BURGLAR ALARM.—William J. Biggar, John C. Blood, and Del M. Griswold, Conneaut, Ohio.

We claim the combination and arrangement of the magnets, B B, armature, C, pivoted frame, D, wheel, E, provided with pins, d, and catch, r, hinged lever catch, b, bell, K, hammer, H, handle, m, spiral springs, s e, catch, p, swinging holder, N, rubber, O, stand, M, lamp, L, weight, F, cord, j, shaft, G, wires, g, and circuit connections and breakers, all substantially as and for the purpose herein shown and described.

79,896.—APPARATUS FOR INSULATING TELEGRAPH WIRES.—Samuel C. Bishop and William W. Marks, New York city.

We claim the combination of the dies, B C, with the feed orifice, a, when the back or male die, B, is perforated for the passage, in a separated manner, of duplicated wires, and so arranged, relatively to the feed of the insulating material through the orifice, a, as that the wires, in their passage to and through the front die, C, are caused to travel in a plane which is transvere or at right angles to the feed orifice, a, substantially as and for the purpose herein set forth.

79,897.—KNITTING MACHINE.—Charles W. Blakeslee, Watertown, Ebenezer D. Beecher, Westville, and Anthony G. Davis, Watertown, Conn.

We claim the combination, with the needle-actuating cam, of an endless belt or chain for driving it, substantially as set forth.

Also, the combination, with an endless chain or belt, of an arm, which, whether revolving continuously or reversing its movements around the machine, substantially as set forth, will impart a reciprocating motion to the thread guide.

Also, the combination of the traveling needle-operating cam with the guide bars, M M, with which it engages and disengages, substantially as set forth.

Also, the narrowing and widening stops, constructed with cam surfaces, as described, for insuring the connection of the thread guide with its driver, and its disconnection therefrom, substantially as set forth.

Also, the combination of the thread guide, spool, and stops with the removable bar which supports them, constructed substantially as and for the purpose set forth.

Also, the combination, with a knitting machine, of a detachable automatic traveler for narrowing and widening, actuated by a traversing finger or projection, substantially as described.

Also, a narrowing and widening device, constructed and operating substantially as set forth.

79,898.—SPECTACLES.—Erastus S. Clapp, (assignor to himself and Isaac Chenery), Montague, Mass.

I claim, in combination with a spectacle frame, the rod, D, with glass rings and glasses attached thereto, and made adjustable, substantially as and for the purpose herein shown and described.

79,899.—MACHINE FOR MAKING ROVING.—Nathan F. Clark, (assignor to himself and George H. Cook), Lawrence, Mass.

I claim the combination and arrangement of the tube, F, and bobbin rest, D, constructed as described, with the bolster A, the tube, F, having the oil passages, b and c, for conveying the oil to the surface of the spindle and to the interior of the bolster, substantially as and for the purpose set forth.

79,900.—JOURNAL BOX.—Richard Colborn and George W. Gould, Norwich Conn.

We claim, 1st, The combination with the bottom, A, the top, B, of the box, of the end grooves, C C, longitudinal grooves, b g, cross grooves, c c, and the wicks, m n, with or without grooves, 4 4, substantially as and for the purposes set forth.

2d, The combination, with the parts, A and B, of the end grooves, C C' longitudinal groove, b, cross groove, c c', and wick, m, substantially as and for the purposes herein set forth.

3d, The combination, with the metal part, e, and groove, b, of the box, of the groove covering and Babbit supporting plate, 1, substantially as and for the purposes set forth.

79,901.—EMBROIDERING MACHINE.—Jacob Einhorn, (assignor to himself and Jacob Eugster), New York city.

I claim, 1st, The arrangement of embroidering mechanism, substantially as described, in a jointed, swinging horizontal frame, D E, so that ornamental designs may be produced without moving the fabric after each stitch, substantially as herein shown and described.

2d, The longitudinally adjustable frame, B, in which the fabric is held, in combination with the jointed swinging needle frame, D E, made as set forth.

3d, The rotating cam, M, rod, k, and lever, l, and hook, L, in combination with the tube, J, and with a spring on or within the same, all made and operating substantially as herein shown and described.

4th, The oscillating lever, n o, in combination with the crank shaft, I, and reciprocating holder, N, all made and operating substantially as here in shown and described, for the purpose of operating the needle in the manner specified.

5th, The longitudinally adjustable oscillating lever, n, in combination with the levers, P P, and the spring catch, Q, or its equivalent, all made and operating so as to allow the needle to be easily thrown in or out of gear.

6th, The application of the hook, L, and needle, O, operated by the mechanism described for working a chain stitch, for the purpose specified.

79,902.—MEAT CUTTER.—C. A. Foster, Fitchburg, Mass., assignor to himself and Harlan P. Derby.

I claim, 1st, The combination of the chopping knife, its slotted arm, H, and sliding blocks, 4, with the grooved wheel, in which said blocks move, and the pin, upon which the said arm is hung, substantially as and for the purposes shown and set forth.

2d, The combination of the chopping knife, its vibratory arm, and the grooved or slotted wheel for actuating the same, with their supporting frame arranged to overhang or extend across the revolving meat tub, substantially in the manner and for the purposes shown and described.

3d, The combination, with the cross piece, C, and stands, B, B', and F, of shaft, E, wheel, G, stand, D, stud, c, and arm, H, substantially as and for the purposes set forth.

79,903.—FIRE KINDLING.—Charles Gaudin, Zoe Granier, and Jules Granier, San Francisco, Cal.

We claim forming a fire kindling ball upon the end of an inflammable wick for the purpose of ready ignition, as herein shown and described.

79,904.—FAGOT OR PILE FOR MANUFACTURING RAILROAD RAILS.—William Hayward and John Lees, Danville, Pa.

We claim the "pile," as represented in the drawing, either with or without the part, A, substantially as shown, and for the purposes set forth.

79,905.—MACHINERY FOR MAKING WIRE HEDDLES.—Emil T. Hertle and Richard Thompson, New York city.

We claim, 1st, Arranging the head stocks b' b' which support the inner or adjacent ends of the cylinders, a a1, in the manner described and for the purpose set forth.

2d, The combination of the movable cylinders, a a1, the rods, i i', bars, h h', and cam pieces, g g', substantially as described and for the purpose set forth.

79,906.—FRUIT PICKER.—Leander Hotchkiss, Torrington, assignor to Elisha Turner, Wolcotville, Conn.

I claim a fruit gatherer formed of a jointed segmental ring, that closes upon the fruit in the act of pulling or cutting the same off, substantially as set forth.

79,907.—MILK CAN.—George A. Huggins (assignor to himself and H. W. Shepard, Mannsville, N. Y.

I claim the sheet metal body, A, and cast or malleable bottom, B, when the latter is groved so as to form a seat for the former, and at the same time furnish an outer rim for the protection of its lower edge, when the same are combined and attached, substantially as described as and for the purpose specified.

79,908.—LOOM.—John P. Humaston (assignor to himself and Hamilton E. Towle), New York city.

I claim, 1st, The combination of the lay and the pivoted and vibratory shuttle carriers with connecting rods and levers, receiving and imparting their movement from a single revolving cam shaft directly to said lay and shuttle carriers, substantially as herein shown and described.

2d, The construction of the two shuttle carriers, vibrating on an axis common to both, when the same are provided with shoulders or jogs, acting in the manner and for the purpose set forth.

79,909.—WAGON SEAT.—Almon Hunt and C. C. Chapman, Macomb, Ill.

We claim the springs, B B1, cross pieces, b c, hooks, b1, pins, d, and seat, C, the whole being combined and arranged as described.

79,910.—INKING APPARATUS FOR COLOR PRINTING.—Joshua Hunt, Richmond, Ind., assignor, by mesne assignments, to The American, Patent Chromatic Printing Press Company.

I claim the combination of the type bed, B, the two forms, and the type inking rollers, E' G', and the adjustable cam tracks, I I', when so constructed and arranged in relation to the ink distributing rollers, that different colored inks, first disposed in bands on the type inking roller, or on part thereof, shall be transferred simultaneously to the lines of type, and a single color be also transferred to the other form, so that by two impressions, the sheet or the form being reversed, two completed jobs may be printed in which the letter press is printed in more than two colors, and the border in one color, substantially as set forth.

79,911.—PASSENGER REGISTER.—Thomas S. Huntington and A. Fulton, Bellefontaine, Ohio.

We claim, 1st, The hinged or pivoted levers or arms, D, when used for operating a register or indicator, in connection with the rotating disk, C, and cams, d' d', substantially in the manner and for the purpose herein set forth.

2d, The combination of the revolving disk, C, the fixed cam, F, and the levers or arms, D, substantially in the manner and for the purposes set forth.

3d, The combination of the cap, E, and the fixed cam, F, for the purpose of operating the arms, D, in the manner and for the purpose set forth.

4th, The combination of the cams, d, and the disk, C, for the purpose set forth.

5th, The combination of the levers, J K L, the spring, M, and the register, substantially in the manner and for the purposes set forth.

6th, The register ring, g, with its cylinder, k, and slot, l, when constructed in the manner and for the purpose specified.

7th, The combination of the register rings, the slot, l, and the pawls, g' h' i', in the manner and for the purpose specified.

8th, The arms, D, when constructed and operated by means of the fixed cam, F, on the cylinder, E, in the manner and for the purpose specified.

9th, The register rings, so constructed that, on their outer surfaces, figures, letters, etc., may be placed, and on their inside a ratchet and flange, as and for the purpose herein described.

10th, In combination with the rotating rings, the reciprocating shaft, I, and pawls, g' h' i', when constructed and operated substantially as described.

79,912.—MACHINE FOR PUNCHING AND SHEARING.—Michael A. Lanagan, Brooklyn, N. Y., assignor to himself, John Dailey, Robert Russell, and Andrew Mercein.

I claim, 1st, In combination with the punch, C, the plate carrying bed, A, arranged to slide crosswise of the punch, and provided with racks or teeth, i j, on opposite edges of it, reverse pawls, g h, connected by arms, g1 h1, with a vibrating shaft, H, slotted levers, g2 h2, in connection with said pawls, and beam lever, g3, for throwing either pawl in gear with the bed, or disconnecting both therefrom, to reverse or stop the motion of the bed without changing or arresting the movement of the punch, essentially as specified.

2d, The combination, with the punch, C, of the intermittently fed bed, A, and shears, M N, arranged, as described, for operation together automatically to punch the plate in a regular or uniform manner, and to trim or dress its edge as it is passed through the machine, substantially as herein set forth.

3d, The combination, with the shears, M N, and intermittently fed bed, A, of the double pawl, m3, and accompanying mechanism for giving a reverse action to the bed, or arresting its motion without changing or stopping the shears, essentially as specified.

79,913.—SNOW PLOW.—Samuel Lewis (assignor to William H. Cammeyer), Brooklyn, N. Y. Antedated July 6, 1868.

I claim the combination of the lever, 9, axle, 10, gearing, 7 8, chains, 11, 12, 13, pulleys, 6 6 6 6 6, legs, 14 14 15, and guides, 17 18 19, as set forth, to the body of a "snow plow," as ordinarily constructed, all as explained and specified.

79,914.—APPARATUS FOR FEEDING FUEL TO FURNACES.—John McCormick, Louisville, Ky., assignor to himself and M. W. Ferguson. Antedated July 3, 1868.

I claim, 1st, The arrangement of the double acting screw, c'', within cylinder, C', when constructed and used substantially as and for the purpose specified.

2d, The arrangement of the concaves, e' e', and wheels, e e, within the spout, E, through which fuel is fed to a furnace, substantially as and for the purposes indicated.

3d, The arrangement of the bifurcated spouts, E E, astride of the boilers, A A, substantially as and for the purposes described.

4th, The instrument, I, when used in a feeding spout for the purpose of directing the fuel to its proper destination, and constructed and operated as above described.

5th, The vibrating plates, m m, substantially as and for the purpose specified.

6th, The arrangement of the vibrating grate, G, with the horizontal boilers A A A, in such a position that it vibrates back and forth traversely under them, for the purpose of leveling the fuel beneath them, substantially as described.

79,915.—RAILROAD TELEGRAPH ALARM.—G. Natcher, Sidney, Ohio, assignor to himself and I. Marks & Co.

I claim, 1st, A telegraphic alarm for railroads, which is capable of indicating at each station the progress of the train along the track, and also of giving a suitable alarm along the entire track, both in front and rear of said train, by means of the signal boxes, F, gongs, G, hammers, H, levers, J, tappets, K K', and rods, O, or their mechanical equivalents, the whole being arranged and operating substantially as herein described, and for the purpose set forth.

2d, In combination with the elements, F, G, H, J, K, K', and O, of the preceding clause, the spring guard, L, for the object set forth.

3d, In combination with the elements, F, G, H, J, K, K', and O, of the first clause, the indicator, P, for the purpose herein described.

79,916.—AXLE BOX.—Benjamin M. Pearne and Leroy Coville, Oxford, N. Y.

We claim the combination of the metallic box, B, and bands, C C, with the axle, A, when said box has a central depression, and is enlarged at each end for the bands, as set forth.

79,917.—GANG PLOW.—John F. Porter and Alonzo Norton, Tidioute, Pa,

We claim, 1st, The hinged coulter, I, attached to the plow, and operating as described.

2d, A plow, so constructed and operating that the draft is mainly or wholly upon the point, as herein set forth.

3d, The combination of the hinged standards, K K', with the plow, D, substantially as described.

4th, The combination of the rack, n, socket, S, cam, o, lever, p, standard, K, and plow, D, substantially as described, and for the purpose set forth.

79,918.—BUCKLE FOR SUSPENDER.—Augustus Pototsky (assignor to Fisk, Clark & Flagg), New York city.

I claim the combination, in a buckle, of the two members thereof with a spring stud upon one member, and with the slotted stop plate upon the other member thereof, substantially as before set forth

Also, the combination of the stock of the buckle, constructed with a toothed slot, with a turning bar clamp, substantially as before set forth.

79,919.—ADJUSTABLE BARREL HEAD.—Peter Rink and James Docherty, Wertsville, N. J.

We claim the bevel d edge, C, grooved upon each side to receive the edges of the parts, a x b, of the barrel head, the short beveled wedge, D, rebated upon its under side to fit between the said parts, and rest upon their upper sides, both wedges secured together and tightened in the head by means of the beveled wedge, E, all constructed, arranged, and operating as herein described, for the purpose specified.

79,920.—RAILROAD CAR STOVE.—John K. Sax and George W. Kear, Kingston, Pa.

We claim, 1st, The door, M, provided with the eccentric spring latch, O, and sunk in from the surface to protect it from breaking in time of accident, substantially as and for the purposes above set forth.

2d, The combination of the base, A, pan, B, and its valve, revolving grate, F, and its cog gearing, and perforated cylinder, C, and its perforated dome, N, and the door, M, all constructed and forming a cylindrical stove for railroad cars, and operating as specified

79,921.—COFFIN.—Bernard Smith (assignor to "American Burial Case Company," Cincinnati, Ohio.

I claim constructing a burial case substantially in the manner herein described, with the outer edge of the flange, D, flush, or nearly so, with the sides, B B', of a body, A, whose upper portion is set in, as and for the objects designated.

79,922.—SCOOP AND SIFTER.—E. J. Smith & F. B. Perkins, Chicago, Ill., assignors to E. J. Smith.

We claim the combination of the sifter, J, rod, E, coil spring, H, and curved rod, G, substantially as and for the purpose herein set forth.

79,923.—LOOM FOR WEAVING PALM LEAF.—John C. Smith, Chicopee, assignor to himself and L. D. Hills, Amherst, Mass.

I claim 1st, In combination with a reciprocating weft carrier, the feed trough and oscillating box, constructed substantially as and for the purpose set forth.

2d, In combination with the feed trough and oscillating box, the sliding weights, D, substantially as and for the purpose described.

3d, In combination with the feed trough, and weft carrier, the hooks, e e, operating substantially as and for the purpose specified.

4th, In combination with the feed trough weft carrier, and hooks, e e, or their equivalents, the sliding bar, v, substantially as and for the purpose set forth.

5th, The mechanism, substantially as described, for causing the cloth beam and harness to stop when the pincers fail to make a successful pick.

6th, The slotted arm, y, attached to the lay, to receive the strip of palm leaf, and to prevent it from turning or twisting, substantially as described.

7th, The lever, N, so arranged that it will bear against the lower side of the

strip of woof while the same is being drawn into the shed, and thereby tend to prevent it from twisting or turning.

79,924.—LAMP.—David M. Smith, Orange, N. J., assignor to Benjamin F. Small, New York City.

I claim the safety lamp body, formed of a tube, and constructed substantially as hereinbefore set forth.

79,925.—TOOL FOR FITTING BANDS ON HUBS.—Charles E. Stone, Amesbury, and Alfred Herbert, Salisbury, Mass.

We claim the handle, B, curved at, c c c, and adjustably pivoted to the extension, C, of the handle, A, by means of the set screw, a, fitted into either one of a series of holes, b b b formed in said arm, C, substantially as and for the purposes herein shown and described.

79,926.—APPARATUS FOR THE MANUFACTURE OF WHISKEY.—Hiram Vaughn, Thomas Chadwell, E. H. Childress, and G. A. Webber, Nashville, Tenn. Antedated July 2, 1868.

We claim 1st, The process hereinbefore described of manufacturing whiskey, or any kind of spirit whatever, by the employment of pipes, pums, hydrometers, gages, padlocks, substantially as described.

2d, The manner herein described of employing pipes, pumps, hydrometers, gages, padlocks, as set forth.

3d, The method of working said pumps, pipes, hydrometers, either by steam or other power whatever, and using them in combination with gages and padlocks, in the manner and for the purposes set forth.

79,927.—PAPER RULING MACHINE.—Charles F. West, Boston, assignor to J. F. Tapley & Co., Springfield, Mass.

I claim, 1, Combining, with a ruling mechanism, the wheel, o, provided with lifter surfaces or pieces, for effecting the rise of the pens at the proper times, when the wheel is arranged in relation to the ruling cylinder substantially as described.

2d, Making the lifter pieces, w, adjustable within the circular grooves, v, when held in position, substantially as set forth.

3d, Arranging the wheel, o, with its axis at right angles to that of the ruling cylinder or bed so as to be driven by frictional contact therewith, substantially as set forth.

4th, Combining, with the wheel, o, and cylinder, b, arranged in relation to each other, substantially as described mechanism for arresting the rotation of the wheel, and for effecting its release, substantially as and for the purpose specified.

79,928.—CLINCHING NIPPER.—John B. Wilder, (assignor to himself, W. H. Shepard, and George A. Huggins) Mannsville, N. Y.

I claim, 1st, The cutters, b and b1, when the same are so applied to a pair of clinching nippers that they can be operated substantially as described, as and for the purpose specified.

2d, The cutters, b and b1, jaws, a and a', and shoulder, e, when the same are arranged substantially as described, as and for the purpose specified.

79,929.—ELECTRICAL BATH.—Charles Winterburn and William Kent, Cincinnati, Ohio.

We claim the application of electricity to the human body while the latter is *in vacuo*.

79,930 —HAMES FASTENER.—A. B. Wood ward, Alfred Centre, and Samuel A. Woodware, Hornellsville, assignors to themselves and Orson Mosher, Hornellsville, N. Y.

We claim an improved hame fastener, formed by the combination of the strap, A, strap, B, lever catch, D, lever catch, C, and spring, E, or equivalent, with each other, said parts being constructed and arranged substantially in the manner herein shown and described.

79,931 —BEER COOLER.—John Agate, Pittsford, N. Y.

I claim box, b, divided into several compartments H, in combination with the tanks, C, and connecting pipes, t, operating conjointly, substantially as and for the purposes shown and described.

79,932 —CHECK AND DRIVING LINE.—C. M. Alexander, Washington D C.

I claim the check lines, A A', made continuous, and connected to or orming a part of the driving line, B, and operating upon the mouth of the animal with one or two bits, substantially as specified.

79,933.—INFLATED RUBBER GOODS.—George M. Allenton, New York city.

I claim the separate covering of cloth, felt, or similar material, in combination with the enclosed india-rubber article, as and for the purposes set forth.

79,934.—LIFE PRESERVER.—George M. Allenton, New York city.

I claim an annular inflatable elastic rubber life preserver, substantially as specified.

79,935—MACHINE FOR WASHING PAPER STOCK.—J. E. Andrews, Coeyman's Hollow, N. Y.

I claim 1st, The combination with the tank, A, of the wheel C, provided with the floats, C1, screen, C2, and hub, a, substantially as and for the purpose described.

2d, The combination with the tank, A, of the chute, E, cylinders, D and D', and endless chains, provided with the rakes, substantially as and for the purpose described.

3d, The combination, with the endless chains, provided with rakes, of the guides or ways, F, substantially as and for the purpose described.

4th, The combination, with the water tank, A, chute, E, and rakes, b, of the screen, G, substantially as and for the purpose described.

79,936.—ROSE FOR DOOR KNOBS.—William H. Andrews, New Haven, Conn.

I claim the combination of the plate, d, constructed with the flange, a, with the plate, A, formed from tin or similar hard metal, as described, and when the flange, a, extends up through the central perforation of the plate, A, substantially as and for the purpose set forth.

79,937.—PROPELLING VESSELS.—B. T. Babbitt, New York city.

I claim the combination of the tubes, c b, open at both ends, with the jet-tubes, d, arranged to project within the former intermediately of their length, and with their jet orifices facing either open end of said larger tubes, substantially as shown and described.

79,938. GAS EXPLOSIVE ENGINE FOR CONDENSING AIR.—B. T. Babbitt, New York city.

I claim 1st, A mover or power generator, operating to compress or force air or gas by the reciprocating action in an automatic manner, of a weighty and independent piston or projectile, free from constant connection with outside working parts, the same being started or set in motion by any suitable explosive force or expansion of gas or vapor under heavy pressure, within a tube or cylinder provided with suitable openings for producing the necessary explosion or starring impetus to the piston, and for reception and discharge of the fluid which it serves to compress, substantially as specified.

2d, The combination of intermittently revolving or other equivalently operating many chamber magazines at opposite ends of the tube or cylinder, A, suitable powder feeding vessels or chambers thereto, and wires or conductors, s s', for operation in connection with the wire or wires from a battery to explode the charges at opposite ends of the cylinder alternately, essentially as and for the purpose or purposes herein set forth.

3d, The combination, with the loose or independent piston, E, operating as described, of rods, I I, or their equivalents, and suitable mechanism for giving in an automatic manner, or by the action of said piston, the necessary impetus to the latter at starting, by gaseous expansion or explosion, substantially as specified.

79,939.—GAS EXPLOSIVE ENGINE FOR CONDENSING AIR.—B. T Babbitt, New York city.

I claim, 1st, A motor or power generator, operating to compress air by gas by the rotary travel or action, within a cylinder or annular chamber, provided with one or more abutments and suitable inlet and outlet passages of a loose or detached and independent piston, having imparted to it at intervals power to establish and continue its momentum by any suitable explosive force or expansion of gas or vapor, substantially as specified.

2d, The combination of a loose or independent piston operating within a cylinder or annular chamber, substantially as described, with a sliding abutment or abutments in such manner, and said parts or devices being so constructed as that the piston in its rotation is caused to open and operate the abutment or abutments by contact with the same, essentially as and for the purpose or purposes herein set forth.

79,940.—SWITCH FOR STREET RAILROADS.—Gilbert L. Bailey, Portland, Mo.

I claim the construction and arrangement of the spring, S, levers, 7 and 8, friction rollers, 5 and 6, and treadle, 11, all substantially as and for the purposes described,

79,941.—BOOT AND SHOE SHANK.—August Bertram, New Albany, Ind.

I claim the right and left shoe shanks, A B, of the form shown, when the same are made entirely of wood, and are inserted between the upper and lower surface of the sole, so as to be imbedded in the leather, substantially as herein described, and for the purpose specified.

79,942.—ANILINE DYE.—Benoit Bloch, Soultz, France.

I claim a dye, composed of the ingredients herein named, and treated in the manner substantially as set forth.

79,943.—COFFEE POT.—Benjamin Boardman, Malden, Mass.

I claim the cup or condensing chamber, D, constructed and applied to an ordinary coffee pot, A, in the manner substantially as and for the purpose herein set forth.

79,944.—SNAP HOOK.—William H. Bouser, Paris, Ill.

I claim a snap hook for harness, having hook, A, spring, B, shield, D, and thumb piece, E, constructed, combined, arranged, and operating substantially as specified.

79,945.—GLUE POT.—James Bragdon, Boston, Mass.

I claim, in combination with the glue pan or vessel, d, the water-containing vessel, c, made with the conical bottom, i, and the steam chamber, j, and having beneath it the inclined flue, l, for escape of the smoke from the lamp, all substantially as shown and described.

Also, in combination with the conical bottom, i, and flue, l, the vertical flue, m, substantially as shown and described.

Also, in combination with the conical bottom, i, and flue, l, the lamp, b, having a packed tube, g, substantially as described.

79,946.—HAND LOOM.—James L. Branson, Cincinnati, Ohio.

I claim, 1st, The swinging dog, E, in combination with the ratchet wheel and chips, substantially as and for the purpose described.

2d, The rigid connecting wire, S, combined with the strap, O, and picker block, I, substantially as and for the purpose described.

79,947.—STEERING WHEEL STOP.—Isaac N. Bunker, Weymouth, Mass.

I claim, 1st, Arranging a notched hinged bracket, D, in combination with the steering wheel, A, substantially as and for the purpose herein shown and described.

2d, Providing the bracket, D, when the same is made and operating as described, with springs, c c, substantially as and for the purpose herein shown and described.

3d, The bracket, D, when provided with a lip, d, substantially as and for the purpose herein shown and described.

79,948.—HARVESTER CUTTER SHARPENER.—Edwin L. Bushnell, Poughkeepsie, N. Y.

I claim, as a new and improved article of manufacture, the rhomboidal shaped cutter sharpener, substantially as described, and for the purposes set forth.

79,949.—FORCE PUMP FOR HYDRAULIC PRESS.—W. P. Callahan, Dayton, Ohio.

I claim, 1st, The combination of the pumps, as shown, with check blocks and valves, arranged to operate in connection with hydraulic presses, substantially in the manner set forth.

2d, The pump, F, in combination with the pumps, D and E, the stop valve, J, and the check valves, P P', substantially as and for the purposes described.

79,950.—DOUBLE ACTING HINGE.—James H. Carkeet, Montgomery, Ala.

I claim the pivoted arm, h, provided with two clutches, J J, so arranged that either one side or the other of the hinge may be clasped, while the opposite side is free to operate, thus allowing the door or shutter to swing in or out as may be desired, substantially as described.

79,951.—INSULATOR.—A. H. Castle, Ann Arbor, Mich.

I claim the insulated bracket, A, with a core, E, formed solidly with said bracket, and the angular traverse notch, B, by which the hook is covered by the projections, C D, in the manner as and for the purpose specified.

79,952.—ELEVATED RAILWAY.—Robert A. Chesebrough, New York city.

I claim an elevated railway, composed of inclined planes or sections, arranged substantially as described, in combination with elevating platforms at the junctions of the sections, and operated by stationary motive power to establish continuity of the sections, as herein set forth.

79,953.—LUGGAGE SUPPORTER FOR SADDLES.—William Cline, Boston, Mass.

I claim, in combination with a saddle, an adjustable supporting arm, substantially as and for the purpose set forth.

79,954.—ORE CRUSHER, GRINDER, AND AMALGAMATOR.—John A. Collins, Virginia City, Nevada.

I claim, 1st, The combination and arrangement of the cylinders, C, crushing wheels, D, axle, E, and central plate, F, with arms projecting downward, and supporting said axle, substantially as described.

2d, The combination and arrangement of the driving plate, G, on the shaft, H, the friction rollers, N on the arms of the revolving plate, L, and the stationary plate, K, above it, substantially as described.

3d, The combination and arrangement of larger rollers, S, with smaller, S', within the cylinders, C, the former rolling upon the latter and upon the cylinder, but the latter or smaller rubbing and grinding against the cylinder, as described.

79,955. —BLEACHING APPARATUS. —Elizabeth A. Combs, Monroe, Wis.

I claim the fire pot or furnace, D, in combination with the box described, all constructed substantially as and for the purposes specified.

79,956.—CULTIVATOR.—George W. Cook, Macon, Ill.

I claim the connecting of the standards, F F, of the plow beams, E E, by cross bars, c c, as shown, in combination with the crank shafts, I I, chains, d, pulleys, f, and treadles, H H, all arranged and applied to mounted frame, A, substantially as and for the purpose set forth.

79,957.—TOOTHED WHEEL.—John Cowell, Ansonia, Conn.

I claim, 1st, The combination of a detachable tooth with the corresponding mortises in the rim of the wheel, when constructed with a recesses in one face of the tooth, so as to lock on to the corresponding face of the mortise, and secured by the key, d, substantially as set forth.

2d, The combination of the plate, C, and its set screw, f, with the key or keys, d, so as to secure the keys, substantially in the manner herein set forth.

79,958.—LAMP CHIMNEY—Robert R. Crossby, Boston, Mass.

I claim the abrupt or nearly right angled enlargement of the chimney, as represented in fig. 3, arranged in relation to the lamp burner, substantially as and for the purpose herein specified.

79,959.—PUMP.—Rufus W. Crouse, Westminster, Md.

I claim the combination and arrangement of the cylinder, A, plunger, D, induction, I, and eduction, E, when connected by the apartments, C C1 C2 C3, and the passages, F F', provided with the valves, c c' c'' c''', all the said parts being constructed, arranged, and operating together, substantially in the manner and for the purposes set forth.

79,960.—FIRE PLUG.—James P. Cummings, Newport, Ky.

I claim, 1st, The stuffing box, guide, and stop, k, in combination with the block, n, and rod, g, substantially as described.

2d, The stop, d, and waste hole, e, formed in one of the legs of the valve in the manner explained, and arranged relatively to the waste opening, f, in the stock, and the valve seat, b, to operate in the manner and for the purpose specified.

3d, The stuffing box, guide and stop, k, and block, n as arranged in relation to the valve, c, substantially as described.

79,961.—CORN SHELLER.—Milton Day, Baltimore, Md.

I claim the combination, in a corn sheller, of two palms, B B, each having three or more fingers or tines, b b, to embrace the cob, with the springs, C C, and shanks, d d, when the latter are permanently secured to the rim, all constructed and arranged substantially as described, and for the purpose specified.

79,962.—CORN SHELLER.—Milton Day, Baltimore, Md.

I claim a corn-sheller, having a series of palms, B B, each having feeding threads, f2 f2, on their inside, when the same are so arranged that they afford protecting tines, b b, to receive the cob, and are in combination with the fingers and springs, C, and the whole are made to operate substantially as described.

79,963 —POCKET SIGNAL DEVICE.—J. J. Detwiller, Greenville, N. J

I claim 1st A metallic signal cup, A1, grooved spirally for attachment to a staff or supension cup as and for the purpose set forth

2d, The combination of two or more cups, A1 A2 A3, tapered and grooved as herein described, to make them relatively interchangeable, for the purpose specified.

3d, The spiral socket, C', constructed and adapted to receive and hold the cups A1, as and for the purposes described.

79,964.—SAW-SET.—Isaac Estell, St. Lewis, Mich.

I claim the arrangement of the slotted bottom plate, A, arm, H, screws, I and G, gage, D, and rod, e, constructed as described, and operating substantially as and for the purposes herein set forth.

79,965.—TAPE MEASURE.—A. J. Fellows, New Haven, Conn.

I claim the combination of the case, A, with the plate, b', click spring, d d' and the arm, e, and knob, f, when the whole is constructed, arranged and fitted for use, substantially as herein described.

79,966.—STEAK MASHER.—Richard Flynn, West Brookfield, Mass.

I claim the employment in a steak-mashing machine, of the rolls, A A, the teeth of which are arranged so as to form a continuous spiral from one end to the other of each roll, the said rolls being geared together so as to move in opposite directions, while their spirals run in the same direction, as shown and set forth.

79,967.—DISCHARGING APPARATUS FOR HARVESTER.—J. S. Fowler, Davenport, Iowa.

I claim 1st, The slatted gates, G G G, constructed and operating substantially as and for the purposes set forth.

2d, In combination with the slatted gates, G G G, the rack, H, sliding bar, K, and levers, F and I, constructed and operating substantially as specified.

79,968.—WATCH.—M. N. Frederick (assignor to himself and C. S. Mosely), Elgin, Ill.

I claim 1st, The stud or post, B, having a bearing through the plate, C, and box, D, thereby holding the drive-wheel, A, firm and steady, substantially as described.

2d, In combination with the stud or post, B, and drive wheel, A, the screw, T, constructed substantially as described.

3d, The double wheel, K, in combination with the wheels, A J, and the vibrating bar E, provided with spindles, b, arranged to operate substantially as specified and for the purposes set forth.

4th, The spur wheel, H, in combination with the box, D, and post plate, C, when arranged so that the bearing of the spur wheel is partly in the box and partly in the plate, substantially as set forth.

5th, The plate, R, in combination with the wheel, L, and, main-spring arbor when arranged substantially as specified.

79,969.—LAMP BURNER.—F. H. Fuller, South Boston, Mass.

I claim, 1st, The wick tube, D, made in two sections, when the upper section is fitted over the lower, as at, l, whereby the separation of the parts of the burner for cleaning is facilitated, as herein set forth

2d, The lamp burner, constructed as described, and consisting of the perforated conical ring, B, and cap, A, supported on stands, C, projecting from the upper section of the wick tube, and the concave perforated disk, F, rim, E, and part, G, attached to the lower section of the wick tube, all arranged as herein shown and described, for the purpose specified.

79,970.—APPARATUS FOR DECORTICATING AND CLEANING CEREALS.—William Walker Gibson, Edinburgh, North Britain.

I claim the employment of a revolving drum for decorticating cereals, upon the surface or periphery of which strips or blades of glass, porcelain, or like material are fixed and arranged, substantially in the manner shown and set forth.

79,971.—SCREW THREADING MACHINE.—Ezra Gould, Newark, N. J.

I claim, 1st, The arrangement, herein described, of the driving wheel, F, concentric spindles, G C, and projections, a b, for the purpose set forth.

2d, The combination of the lever, K, and slide, L, secured one to the other, by a pivot, h, which moves in a slot, l, with the lever jaw, m, frame, A, and head block, J, all constructed, arranged, and operating substantially as and for the purpose described.

79,972.—ELECTRO-MAGNETIC TEMPERATURE ALARM.—John H. Guest, Brooklyn, N. Y.

I claim, 1st, The spring axis, on which the armature swings, in combination with the hammer and bell, as and for the purposes set forth.

2d, The spring circuit breaker, i, and adjusting screw, a, provided with a head or button, in combination with the armature and spring axis, h, for the purposes and as set forth.

3d, The alarm thermometer, formed with the horizontal circuit closer and its adjusting arm, in combination with the case enclosing the adjustable parts as set forth.

79,973.—ELECTRO-MAGNETIC BURGLAR AND FIRE ALARM.—John H. Guest, Brooklyn, N. Y.

I claim, 1st, A pair of magnets and armatures, arranged and acting in the manner specified, in combination with a hammer and bell, the former being attached to the lever of the armature, for the purposes and as set forth.

2d, An expansive corrugated disk and hinged arm, forming a thermal circuit closer, substantially as set forth.

3d, The adjusting screw, 7, in combination with the thermal circuit closer, as and for the purposes set forth.

4th, The pendulum and spring, in combination with the circuit wires and notched sash or slide to close the circuit as specified.

5th, The two springs, 13 14, connected with the circuit wires, in combination with the pusher, q, for the purposes and as set forth.

6th, The plate, r, screw studs, s, and nuts, t, constructed substantially as specified, in combination with the circuit wires, to form a designating or disconnecting apparatus in a fire or burglar alarm, substantially as set forth.

79,974.—TOOL HOLDER.—Jacob W. Haskell, Boston, Mass.

I claim the combination of the tube, e, bearing the mortise headed bolt, d, with half boxes, h i, when the tube and boxes are connected with a feather and a spline, and are otherwise arranged, substantially as and for the purposes set forth.

79,975.—FEATHER RENOVATOR.—Charles E. Hendrick, Chicopee, Mass.

I claim, 1st, Three or more valves, D D D D, rod, E, nut, N, in combination with the receiver, C, the whole arranged and operated substantially in the manner herein shown and described for the purpose set forth.

2d, The swinging valve, D, with the spiral spring, t, substantially as described, and for the purpose set forth.

79,976.—MACHINE FOR SHAVING RATTAN.—Levi Heywood, Gardner, Mass.

I claim the arrangement of the knife, M, constructed and operated substantially as described.

Also, the arrangement of the knives, d, in combination with the presser rolls, I I', and operating screws, h, all constructed and operating substantially as set forth and for the purpose stated.

79,977.—BREAST STRAP.—A. L. Hill, Decatur, Ill.

I claim, 1st, The breast strap, constructed as described, and consisting of the strap, C, to which the plate, D, having ribs, d, is rigidly secured, when said strap is provided at each end with a hook, B b all arranged and operating as and for the purpose described.

2d, The ribs, d, on the exterior surface of the bar, D, when used in combination with and applied to the strap or straps, C, for the purpose substantially as set forth.

79,978 —TRACE BUCKLE.—Henry Hise, Chicago, Ill.

I claim, 1st, The combination of the plate, B, provided with one or more inclines, a, with a clasp, C, arranged and operating substantially as set forth, and for the purposes specified.

2d, A plate, B, when constructed so as to be secured upon a trace, and provided with one or more inclines, a, in the manner described.

79,979.—SAW HANDLE.—Charles W. Hubbard, Pittsburg, Pa.

I claim a new article of manufacture, to wit, a saw handle, consisting of the part, J, provided with a recess, f, for the nut of the bolt, B, and with a groove adapted to the end of the saw blade, said handle and its part, J, being made substantially in the form herein described and represented.

79,980.—MACHINE FOR GRINDING SAWS.—Charles W. Hubbard, Pittsburg, Pa.

I claim, 1st, Providing a saw grinding machine with an unjointed thin metallic belt or endless apron, substantially as herein described and for the purpose set forth.

2d, Pivoting the bearing roller, A', so that it can be deflected to correspond to the desired taper of the saw blade, substantially as herein described and for the purpose set forth.

3d, Providing the shaft of a grindstone with a flange provided with a socket joint, substantially as herein described and for the purpose set forth.

79,981.—CATCH FOR MONEY DRAWERS.—Saunders Hubbell, Jr., West Salem, Ohio.

I claim the combination and arrangement of the levers, A and B, the fulcrum support, C, and spring, m, or its equivalent, in the manner substantially as described, and for the purpose specified.

79,982.—CAR COUPLING.—Frederick A. Hull, Belvidere, Ill.

I claim the combination and arrangement of the tubular draught iron, B, the bars, D E, the spring S, and the link, l, and pin, b, arranged and operating substantially as specified and shown.

79,983 —NEEDLE FOR SEWING MACHINE.—George M. Isbell, Farrington, Conn. Antedated July 3, 1868.

I claim a sewing machine needle, formed as specified, with the flattened body, the circular edge to the hook, the lengthened opening in the hook, and the curvature or swell at the back of the hook, as and for the purposes set forth.

79,984.—ATTACHMENT FOR BALANCING POLISHING WHEELS.—Horace K. Jones, Kensington, Conn.

I claim the combination of the ring, A, and weights, a, constructed and arranged as herein described, with a polishing wheel, for the purpose of balancing it, substantially as specified.

79,985.—SPIRAL OR WINDING STAIRS.—William J. Keim, New York city.

I claim an arrangement of winding steps, constructed in such a manner as to give two or more flights within the same space, substantially as described.

79,986.—BELT SHIPPER FOR LOOMS —L. J. Knowles, Warren, Mass.

I claim, 1st, The combination, with the shipping lever, D, applied to one end of the shipping rod, C, of the inclined guide rod, c, substantially as and for the purposes set forth.

2d, The combination, with the shipping lever, and slotted and notched guide piece in which it moves, of the dog and ears for actuating said lever, and the rotating and longitudinally sliding rod upon which the same are mounted, together with the spring, f, and lever, D, the said parts being arranged for joint operation, as herein specified, so that the movement of the lever, D, shall cause the shipping lever to be drawn in either direction, as required.

79,987.—ANIMAL AND BIRD TRAP.—A. T. Latta, Camden, S. C.

I claim, 1st, The weighted and pivoted door, c, cord, d, pulley, e, platform, a, and catch, f, all constructed as described, and combined and operated in the manner set forth.

2d, In combination with the above, barrel, g, arm, h, bent lever and catch, f, the whole being operated in the manner and for the purpose set forth.

79,988.—PRINTERS' GALLEY.—Charles H. Lawrence, New York, assignor to himself and N. P. Tyler, Barrytown, N. Y.

I claim the lining, c, having the metal tongue, b, in combination with the frame, a, bottom, d, and screw, e, applied in the manner and for the purpose substantially as herein shown and described.

79,989.—GAS HEATER.—H. Y. Lazear, New York city.

I claim, 1st, The V-shaped trough, E, and the filling, E', by which the flame is divided, and the grease protected from burning, and smoke thereby prevented, substantially as described, in combination with a gas steak broiler.

2d, The annual space, B and the orifices, h and i, substantially as and for the purposes set forth.

3d, An apparatus for broiling steak by gas, whereby the steak is broiled or cooked simultaneously on both sides, or where the sides are equally exposed to the flame and heat, substantially as shown and described.

79,990. —MACHINE FOR DRESSING GRINDSTONES, MINERALS, ETC.—Philip Leonard, Sharon, Pa.

I claim the adjustable frame, B, fitted in a frame, A, as shown, in combination with the sliding frame, C, provided with the tool stock, C', arranged for a lateral movement, substantially as and for the purpose set forth.

79,991.—TRUSS PAD.—Thomas J. Lindley, Medora, Ind.

I claim the wooden pressure pad, B, having an inserted lead centre, C, and attached to the strap, A, all arranged substantially as and for the purpose set forth.

79,992.—STOVE PIPE.—James C. Loup, Galveston, Ind.

I claim the sliding pipe, B, for making connection of stove pipes to the flue and shutter, H, for closing the aperture in the rest, when the pipe is not in use below the rest, as described.

79,993.—GRAIN SEPARATOR.—Elijah Lucas, Winslow, Ind.

I claim, 1st, The polygonal shaped wire sieve, B, provided with shafts, d d, metal strips, e e, and wires, i i, constructed and operating substantially as and for the purposes herein set forth.

2d, The reversible chute, F, in combination with the rod, f, and the lever, G, substantially as and for the purposes herein set forth.

79,994.—PORTABLE CHAMBER CLOSET.—William J. Lyman, East Hampton, Mass.

I claim the arrangement and combination, with each other, of the box, A, cover, B, seat, C, platform, E, vessel, F, additional seat, H, and receptacles, I, all made and operating substantially as herein shown and described.

79,995.—CHAFING ROLLER FOR WAGON.—James M. Mayhew, Providence R. I.

I claim the construction of the chafing roller, C, upon the longitudinal rod, a, having its bearings in the ends, C', of the side pieces, A, which are recessed to receive the elastic cushions, c c, bearing against the ends of said roller, all operating as described for the purpose specified.

79,996.—SHACKLE BEARER.—John W. Mayhew, San Francisco, Cal.

I claim the manner of supporting and bracing the bearer ring, A, by means of the back brace, C, formed and shaped as herein described, and secured to the tread of the shoe in the manner set forth, in combination with the side braces, D, of the particular shape and construction described, having fork shaped ends.

79,997.—HORSE COLLAR STUFFING MACHINE.—S. B. McCorkle, Greenville, Tenn.

I claim, 1st, A machine for stuffing horse collars, so constructed and operating that as the plunger enters the collars, its forks, a, will have its prongs in a horizontal plane, for the purpose described.

2d, A machine for stuffing horse collars, so constructed and operating that the plunger partially rotates as it moves back and forth, in order that its prongs, a, may lie in a vertical plane as it catches the straw, and in a horizontal plane as it delivers the straw into the collars, substantially as described.

3d, The combination of the plunger, A, having the fork, a, with the arm, e, and bent guide rod, H, when the several parts are constructed to operate in the manner described.

79,998.—DOUBLE CORN PLANTER.—William McLucas, Reinersville, Ohio.

I claim, 1st, The tube, H, when the same is constructed with angular openings and supplied with a plug, h, in such manner that the same can be actuated by the driving wheel, D', or controlled by the upright lever or needle, h'.

2d, The foot lever, G', when in combination with suitable mechanism, and the universal casters, f' f' when the same is so constructed and arranged substantially as described and for the purpose specified.

79,999.—TIRE FRAME ATTACHMENT.—N. H. Mead, Waterport, N. Y.

I claim the combination of the pivoted lever, C, adjustable toothed bar, E, slotted cap plate, F, and toothed bar, G, with each other and with the frame, A, substantially as herein shown and described, and for the purpose set forth.

80,000.—WASHING MACHINE.—Cyrus Miller, Des Moines, Iowa.

I claim the box, A, cylinder, D, and adjustable board, E, when said cylinder is provided with a series of corrugated staves and brushes, as described, and the board, E, with corresponding brushes, to operate substantially as set forth.

80,001.—CHURN MOTION.—David Morris, Bartlett, Ohio.

I claim the frame, consisting of the upright, A, foot, B, and screw threaded stem, a, the latter serving the double purpose of a guide for the dasher shaft and means of attachment of the frame to the lid of the churn vessel, in combination with the grooved wheel, G, slides, g g', pitman, F, and dasher shaft, D, the whole arranged and operating in the manner and for the purpose specified.

80,002.—HORSE HAY FORK.—C. E. Murray, Sugar Valley, Pa.

I claim the frame, composed of the diverging prongs, a a, and head,

combination with the pivoted or jointed teeth, e e, rods, f f, and eccentric, h, all arranged for joint operation, substantially in the manner as and for the purpose set forth.

80,003.—CALCULATING BALANCE.—Benjamin W. Ogburn, Whittle's Mills, Va.

I claim the combination of the sliding fulcrum, M, and pea, L, when working upon a graduated beam, I, in connection with a balance frame, B, the parts being constructed and arranged as described, so as to operate together in the manner and for the purpose set forth.

80,004.—POWDER FOR BLASTING AND OTHER PURPOSES.—Paul A. Oliver, New York city.

I claim the use of peat in the manufacture of gun and blasting powder, substantially as set forth,

Also, as an improved article of manufacture, the powder made substantially as herein described.

80,005.—RAILROAD STATION INDICATOR.—Thomas Payne, Detroit, Mich.

I claim, 1st, The arms, N N, arranged as described, on the roof of a car, and provided with ears, r r, to guide them along the circular rods, s s, in combination with the spiral springs, h h, on said rods, to prevent any wabbling or lost motion, substantially as and for the purposes herein set forth.

2d, The slotted bars, E E, forming a frame, and placed on the shaft, a, on each side of the circular disk, B, in combination with the shoes, b b, and levers, F F, for the purpose of turning the shaft in either direction, substantially as and for the purposes herein set forth.

3d, The arms, I I, pivoted at one end, one having a weight or spring, L, attached to the other end, and the other attached to a bell or alarm, M, by means of a spring, c, and both provided with adjustable corrugated clamps, K K, in combination with the cog wheels, c c, when arranged and operating substantially as and for the purposes herein set forth,

4th, The slotted stays, H and T, when arranged so as to regulate the movement of the cog wheels, c c, substantially as and for the purposes herein set forth.

5th, A drum, constructed as described, for the purpose of indicating names, figures, or characters, suspended in a car, and operating substantially as set forth.

6th, The cylinder, d, and roller, o, in combination with the spring, p, and ribbon, e, when arranged as described, so that when said cylinder is revolving in one direction, the spring winds up the ribbon on the roller, and when revolving in the opposite direction the ribbon unwinds from the roller and winds up the spring, substantially as and for the purposes herein set forth.

7th, The arms, S S, when attached to the posts, R R, in the manner described, with spring, n n, to soften or lessen the blow, and used for the purpose of making the station indicator self-operating from any station or direction, substantially as herein set forth.

8th, The arrangement of the circular disk, B, and its cog wheel, C, the bars, I D, lever, F, bars, E E, and shoes, b b, when constructed and operating substantially as set forth.

9th, The arrangement of the arms, N N, and their springs, when operated by the arms, S S, upon the posts, R R, substantially as specified.

80,006. APPARATUS FOR CONDENSATION OF VAPORS IN LARD BOILING, etc.—C. C. Peirson and Geo. F. Peirson, Philadelphia, Pa.

We claim 1st, The shower pipes, R and S, constructed and operating substantially as and for the purposes specified.

2d A condensing and deodorizing apparatus, having cover, B, condensing boxes, D and E, shower pipes, R and S, and chimney, K, and conduit pipes, as described, constructed, arranged and operating substantially as described,

80,007.—BASE BURNING STOVE.—Samuel Pierce, Boston, Mass.

I claim, 1st, In base burning stoves, making the walls, which divide the coal receptacle from the ignition chamber, double, and inclosing water, said water serving to preserve the said walls, and also for heating purposes.

2d The combination of the radiating drum, C, with the receptacle, D, arranged and operating as described.

88,008.—CLAY MILL.—Nath. F. Potter, Providence, R. I.

I claim, 1st, Combining the rack and pinion mechanism, k b (for giving a radical movement on its axle to the tempering wheel), with its driving gear, L, by means of the adjusting screw, c, or equivalent device, for breaking the connection between the two at pleasure, substantially as herein described.

2d, Combining the driving shaft, D', of a tempering mill, with the driving gearing, by means of the friction strap, P, applied and operating in the manner substantially as shown and described.

80,009.—TABLE FORK.—L. A. Powers, Meriden, Conn.

I claim making the socket for the guard of a carving fork solid with the bolster, or with a portion of said bolster, and independent of the tang or body of the fork, substantially as and for the purpose set forth.

80,010.—APPLE CORER AND SLICER.—David R. Reed, Tekonsha, Mich.

I claim the arrangement and combination of the flange coring tube, C, presser, P, hand lever, D, arm, E, with the receiving box, A, substantially in the manner and for the purpose specified.

80,011.—STEAM ENGINE.—Thomas Reese, St. Louis, Mo.

I claim the cross head, G, suspended by links, J, from a rock shaft, I, mounted in pivoted standards, K said standards being so connected with the reciprocating cross heads as to receive an oscillating motion therefrom, in the manner and by the means substantially as herein described, for the purpose specified.

80,012.—DEVICE FOR STRAWBERRY CULTURE.—Henry Seymour Robbins, Newton Falls, Ohio.

I claim a plate for strawberry culture, constructed in the form herein shown and described, and having apertures, B and C, and projections, D, combined and arranged substantially as specified.

80,013.—MACHINE FOR DRESSING FFLLOES.—Wm. H. Rodeheaver, Miamisburg, Ohio.

I claim the convex and flanged rest or bed, V, adjustable in height in the manner described, in combination with the cutter head, D, and adjustable feed and pressure rollers, P, or their mechanical equivalents, the whole being arranged and adapted to operate substantially as set forth.

80,014.—APPLE CORER AND SLICER.—Isaac Rogers, West Chehalem, Oregon.

I claim, 1st, The combination of the slide bars, F, cross bar, H, tube, M, knives N, and rim, O, with each other and with the guides or slides, G, and parer fork, Q, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the adjustable guide, P, with the rim, O, and slide bars, F, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the cross or foot bar, J, and levers, I, with the bottom board, A, and cross bar, H, of the sliding bars, F, substantially as herein shown and described, and for the purpose set forth.

80,015.—CULTIVATOR.—A. P. Routt, Liberty Mills, Va.

I claim, 1st, The instrument, consisting essentially of the standard M, loop, s, point, m, and blades, n n, having sharp front cutting edges, when the several parts thereof are constructed and arranged as above described and for the purpose set forth.

2d, The combination of said instrument with the plow standard, B B, and wedge, W, substantially as described.

80,016.—BASE BURNING STOVE.—A. K. Sanders, Brooklyn, N. Y.

I claim, 1st, The descending smoke flue between the casing, m, opening into the base of the heater, in combination with the air flues, 3 5 and 6, arranged and acting substantially as specified, so that the air to be heated comes in contact with one side of the flue plates or tubes, and the products of combustion on the other side, as set forth.

2d, The magazine, g, supported by cylinder, f', top plate, f, in combination with the fire pot, a, and combustion chamber formed between the said magazine, g, and the casing, e, in which chamber are the air-heating pipes, 5, as and for the purposes set forth.

3d, The doors, 8, between the plates, d and n, and at the end of the air flue, 5, for the purposes and substantially as set forth.

4th, The doors, 9, between the cylinder, f', top plate, f, and grate or mantel frame, t, and opening into the hot-air inclosure, for the purposes and as set forth.

5th, The descending flue, m, conveying the products of combustion from the fire chamber to the base of the heater in combination with the air flue, 3 5, that exposes the air to be heated to the wall of the ash pit, the fire pot, and said descending flue, m, substantially as specified.

6th, A fireplace heater, in which the magazine for the fuel extends to the top of the heater, and is provided with an opening in front of the mantel frame for the introduction of fuel, substantially as set forth.

80,017.—RENOVATING AND DRESSING FEATHERS.—A. C. Sanford, Plymouth, Conn.

I claim the combination and arrangement of the outer tube, D, with the inner tube, E, and respective openings, f and g, provided with the valve, d, and having tubes, a, leading from the inner tube into the cylinder, and constructed so as to operate in the manner and for the purpose herein specified.

80,018.—MACHINE FOR STRETCHING AND SOFTENING SKINS. Christian Schmitz, Philadelphia, Pa.

I claim, 1st, An instrument having a set of parallel, or nearly parallel, stationary blades or supports, and a set of parallel rollers, operated by a lever or otherwise, for the purpose of stretching leather, as set forth.

2d, The arrangement of the blades, D D D, upon the supporting head C, so as to adapt them for adjustment by means of the set screws, c, substantially as set forth.

80,019.—MANGLE AND IRONING MACHINE.—Joseph Seaman, Chicago, Ill.

I claim the combination of the rollers, A A', levers, D, eccentric disk, E, pillow block wheels, F, and weight, W, or their equivalent devices, substantially as shown and described for the purpose specified.

80,020.—FURNACE FOR ROASTING AND SMELTING GOLD AND OTHER ORES.—J. W. Shaeffer, Red Wing, Minn.

I claim a furnace for smelting and reducing gold, silver, copper, and other ores, constructed substantially as herein shown and described.

80,021.—CHURN.—E. F. Shaw, Wyoming, Mich.

I claim the oscillating vessel, D, provided with the cross bar, E and dasher, F, in combination with the gear wheels, K M O, and their shafts and pinions, and the spool, I, cord, G, and weight, W, all arranged and operating substantially in the manner specified.

80,022.—MANUFACTURING SCREWS.—G. V. Sheffield, Worcester, Mass.

I claim the combination, with the reciprocating rods, H H, the frame marked J and K, of the shafts, L L, and wheels, 5 and 6, pins, 8 8, and arms, M, for operating the same, as and for the purposes stated.

2d, The combination, with the reciprocating frame, I J K, and shafts, L, of the sliding boxes of the wheels, 5 and 6, hinged connections, f, arms, M, and pins 8, substantially as and for the purposes set forth.

3d, The combination, with the stationary frame, A, tubular shaft, B, spindle, F, and jaws, b, of the reciprocating frame, the rods, H, cross piece, G, wheels 5 6, connections, f, arms, M, and pins, 8, the said parts being arranged for joint operation, as and for the purposes set forth.

80,023.—MODE OF OPERATING SHUTTERS.—T. J. Sloan, New York city.

I claim, 1st, The bevel gears, K H, in combination with the spring shaft, F, retaining button, I, and rim, m, when the said shaft is arranged to drive the gear, K, and slide longitudinally through it, as and for the purpose set forth.

2d, The employment, in connection with a mechanism for opening and closing blinds from the inside of the window, of a positive lock mechanism composed of the locking shaft, O r, and spring-retaining mechanism, q R s t, all as specified.

80,024.—FRICTION CLUTCH PULLEY.—H. K. Smith, Norwich, Conn.

I claim, 1st, The pin, E, and nut, J, in connection with the levers, D.

2d, The friction pulley, constructed and arranged substantially as described and for the purpose specified.

80,025.—CUT-OFF VALVE GEAR.—Samuel Stanton, Newburg, N. Y.

I claim, 1st, The combination of the bent levers, H H, rollers upon the pins j, and the cams, g g', for opening and closing the valves, as herein shown and described.

2d, The sleeve, G, wheel, F, flange, c, and ring, e, in connection with the governor and the valve levers, H H', all arranged to operate in the manner as and for the purpose set forth.

80,026.—CAR COUPLING.—D. M. Steward, Dayton Ohio.

I claim the pin, C, with handle, D, fastened by the eye bolts, a a, in combination with the slotted bar, B, which forms the coupling chamber, all structed and arranged substantially as described and for the purposes specified.

80,027.—MANUFACTURE OF AUGER BITS.—James Swan, Seymour, Conn.

I claim, 1st, As my improvement of the dies, B and C, the cavities, e e, for preserving the material for the spurs, c c, as described.

2d, As my improvement in auger blanks, the projecting portions, b c d', of metal, of which to form the lip and spur of the form, and arranged relative to the screw point and cutting bit, as described.

80,028.—MACHINE FOR FORMING SHEET METAL PANS.—W. H. Teal, Weyauwega, Wis.

I claim a machine for forming sheet metal pans, consisting of an upper die, H, hinged to a lower die, E, provided with formers g, so that both dies may be firmly locked together, and the whole operated simultaneously with the lever, B, and actuating guides, D C, substantially as herein described.

80,029.—COMPOUND FOR ROOFING.—H. M. Teasdale, Dansville, N. Y.

I claim the combination of the within-specified ingredients when compounded in or about the proportions described, for the purpose set forth.

80,030.—STEAM PUMP.—W. R. Thomas, Catasauqua, Pa.

I claim the arrangement of the ports, e e', with relation to the cylinder, A, the chambers, a a', valve, G, induction ports, b b, and the eduction ports, d d', all operating as described for the purpose specified.

80,031.—CUTTING NIPPER.—N. Thompson, Brooklyn, N. Y.

I claim constructing cutting nippers so that the cutting edges thereof shall be as close as possible to the knuckle which surrounds the pivot on which the jaws turn, or shall be even closer to the pivot, with the knuckle projecting between the divided edges, as described, and so, also, that there shall be a double connection between the jaws and the handles, one part of each connection being embraced by the parts of the other, in the manner substantially as herein described.

80,032.—DRESSING BARREL.—C. Titus, Union, Me.

I claim the arrangement and combination of the seperate levers or treadles r s, the collars, p q and bent levers, n n' with one another and the shaft, B, the cutter head, A, and the cutter carrier, E G, such head and carriers being provided cutting and a guide ring, D, as set forth.

80,033.—HORSESHOE.—J. S. Toan, King's Ferry, N. Y.

I claim, 1st, A horseshoe provided with a nail flange, D, and an india-rubber sole, substantially as described.

2d, The clamps, F F, for the purpose of readily securing and removing the india-rubber sole, E, substantially as described.

80,034.—LOCK NUT.—A. N. Towne, Chicago, Ill.

I claim the corrugated nut, D, and washer, E, constructed as described, when used in combination with an elastic packing or washer.

80,035.—LARD PRESS AND SAUSAGE STUFFER.—A. J. Truxell, Salem, Va.

I claim the combination of the removable cup, E, formed with a concaved bottom and spout, F, and provided with a perforated plate, G, with the bench A, lever, C, follower, D, and pivoted latch, H, all constructed and operating as set forth.

80,036.—COMPOUND FOR WELDING.—J. R. Tryon, La Crosse, Wis.

I claim the welding flux or compound, substantially as described.

80,037.—BOOT SOLE.—B. Van Ausdall, Keokuk, Iowa. Antedated July 6, 1868.

I claim as a new article of manufacture a flexible wooden boot sole and heel formed of independent sections of wood riveted to the leather inner sole as herein described for the purpose specified.

80,038.—OFFICE BED.—A. J. Vawter, Indianapolis, Ind. Antedated July 10, 1868.

I claim the case, A, having a front, B, which is hinged at the bottom in the manner specified, the inner face of said front being provided with a bed, C, which is supported either in a horizontal or vertical manner, by means of the legs, I I, the various parts being constructed and operating as specified.

80,039.—GANG PLOW.—Geo. Wharton, Jerseyville, Ill.

I claim, 1st, Constructing the axle of two parts, H 1, connected by a joint, c, in combination with the two levers, J J', all arranged and applied substantially in the manner as and for the purpose set forth.

2d, The foot lever, M, connected with one of the beams, A, and to the post, b, of the axle, as shown, in combination with the shaft, Lx, secured to the axle, and having the front ends of the beam, fitted loosely to it, all arranged to operate substantially as and for the purpose specified.

3d, The treadle platform, D, draft pole, E, and the lever, F, connected to the draft pole by chain, b, all combined and arranged substantially as and for the purpose set forth.

80,040.—LANTERN.—A. Whelden, South Dennis, Mass.

I claim the perforated base, B, and band, F, in connection with the jacket, D, provided with a perforated top, a, and the plate or deflector, E, all being constructed, arranged, and applied to a lantern, substantially as and for the purpose set forth.

80,041.—RAILWAY CAR SEAT.—Albert M. White, Thompsonville, Conn.

I claim the studs, a a', and grooves, f f and g g, in combination with a car seat, substantially as described and for the purposes herein set forth.

80,042.—DIE AND PLUNGER.—Henry G. Williams, Providence, R. I.

I claim the die, A, when its upper inside edge is fluted or serrated, as described, whereby the tin or other metal to be struck up is crimped evenly to prevent the uneven lapping, and consequent breaking, of the metal, as herein set forth.

80,043.—BREECH-LOADING FIRE-ARM.—Thos. Wilson, Birmingham, England.

I claim, 1st, The combination, with the breech shoe or shoe cap, of the breech plug, and a spring locking collar or handle, attached to but having a rotary movement independent of said plug, together with the self-engaging lugs, or their equivalents, for holding the collar to the breech shoe, in the manner specified, so that when the breech plug is pushed up to close the breech, the said collar shall be first partially rotated in one direction by the action of the said lugs in entering the openings or recesses in which they are held, and then by the action of its spring, rotated in the opposite direction, to effect the engagement of the lugs, and the consequent interlocking of the collar and breech shoe, substantially as set forth.

2d, The rotating locking collar, with its lugs and inclosed spring, constructed and combined with the breech plug, upon which it is mounted in the manner specified, and arranged to operate in connection with the rear of the breech shoe or shoe cap and the beveled openings and annular space formed in said shoe for the reception of the lugs, substantially as and for the purposes set forth.

3d, The combination, with the breech plug and sliding hammer, of a spring stop and guide, h2, for guiding the said plug and hammer and for holding and releasing said hammer, substantially as shown and set forth.

4th, The combination, with the slotted tubular breech plug and the spring stop and guide, h2, of the inclosed sliding hammer, and its jointed catch and sere, both the said stop and the catch or sere being arranged so as to lie partly within the slot in the tubular breech plug, substantially as herein shown and set forth.

5th, The safety slide or bolt, v, under the breech shoe or shoe cap, for preventing the accidental retraction of the detent or stop, h2, constructed and arranged to operate in connection with the locking handle or collar, in the manner shown and specified.

6th, The combination and arrangement, with the rotating locking handle or collar, of the locking check bolt for preventing the movement of the trigger until the collar and the breech-plug are securely fixed or locked in their places, substantially in the manner set forth.

7th, The combination of the trigger check bolt and the safety slide for locking the detent, with the sliding breech plug and its rotating locking handle or collar, under the arrangement and for operation as set forth.

80,044.—DEVICE FOR SHARPENING HORSESHOE CALKS.—Peter Winegard, Coldwater, Mich.

I claim the block, A, constructed substantially in the manner and for the purpose specified.

80,045.—FRICTION CLUTCH PULLEY.—C. Wright, Newark, N. J. Antedated July 10, 1868.

I claim the set screw, X, when employed in a friction clutch, substantially in the manner and for the purposes specified, the nut being in the stem of the block, C.

The sliding arm, E, link, w, and eccentric, D, in combination with the adjustable block, C, when constructed, combined, and arranged in the manner and for the purpose hereinabove set forth.

REISSUES.

19,908.—DREDGING MACHINE.—Dated April 13, 1858; reissue 3,028.—E. B. Bishop, New Orleans, La.

I claim a revolving excavator or dredging machine, constructed and operating substantially as and for the purposes set forth.

60,714.—STREET CAR HEATER.—Dated Jan. 1, 1867; reissue 3,029.—John Gibson, Jr., Albany, N. Y.

I claim, 1st, The stove or heater, C, and smoke pipe, e, incased or not in whole or in part, either without or connected with other suitable heating pipes, other than steam pipes, when arranged under the seat of any traveling conveyance, or in a room under a seat, for the purpose set forth and described.

2d, The protection piece, D, constructed and arranged as described, or its equivalent, for the purposes set forth as specified.

3d, The pinch screw, F, or its equivalent, in combination with the draft doors, m m, as and for the purposes specified.

73,807.—LAWN MOWER.—Dated Jan. 28, 1868; reissue 3,030. A. M. Hills, Hockanum, Conn.

I claim, 1st, The balanced frame on the roller, E, in combination with the bail, Q, to which the handle, S, is secured, all constructed and arranged substantially as and for the purpose set forth.

2d, The horizontal cutter, M, having the spiral cutters, c c, when hung in front of the cutter, D, in a frame, which is adjustable upon the shoes, N N, in the manner and for the purpose specified.

3d, The combination of the frame, roller, shoes, cutting device, and handle, all constructed and arranged to operate in the manner substantially as and for the purpose set forth.

61,431.—SEED PLANTER.—Dated Jan. 22, 1867; reissue 3,031. D. S. Holman, Conneautville, Pa.

I claim, 1st, The two seed slides, H H', placed one above the other, at the upper part of the tubes, G, and having springs, d, bearing against them, in combination with the wheels, I, and projections, e, having pins, f g, in their peripheries, all arranged to operate substantially in the manner as and for the purpose set forth.

2d, The regulating slides, J, in combination with the seed slides, H H, arranged substantially as and for the purpose specified.

3d, The combination of the metallic tubes, L, and covering shares, O, all arranged and applied so as to be capable of operating and being adjusted substantially as shown and described.

4th, The seed slides, H H', tubes, G, springs, d, wheels, I, projections, e, with the pins, f g, in combination with the slides, J, metallic tubes, L, and the covering shares, O, all arranged to operate in the manner substantially as and for the purpose specified.

11,729.—PLATFORM SCALE.—Dated Sept. 26, 1854; reissue 3,032.—J. F. Keeler, Pittsburgh, Pa.

I claim, 1st, The combination of the platform scale with a device acting independently of the weighing levers for the purpose of raising or lowering the platform simultaneously at all points when constructed and operating substantially as described.

2d, In combination with the weighing levers of a platform scale, the intermediate platform or frame, G constructed and operating in the manner and for the purpose substantially as set forth.

3d, The combination of a spring balance with the vibrating beam of a weighing scale, substantially as and for the purpose set forth.

8,724.—GRASS AND GRAIN CUTTING MACHINE.—Dated Feb. 10, 1852; reissue 259, dated Feb. 28, 1854; reissue 466, dated June 2, 1857; extended seven years; reissue 3,033.—Division A.—Louisa R. Ketchum, Buffalo, N. Y., executrix of the estate of Wm. F Ketchum, deceased.

I claim, 1st, Extending the shoe, H G, from the heel of the rack or finger bar upward and forward, and firmly connecting its continuation with the draft when the finger bar is located as set forth, so that the power by which the machine is drawn shall, through the shoe, be communicated to and draw forward the heel of the rack or finger bar, thus relieving the great strain which would otherwise come upon the lateral connections of the rack or finger bar with the wheel frame, while the heel is enabled to slide over obstacles or obstructions, substantially as shown.

2d, When the main wheel and inner end of the short finger bar or rack, D, are located relatively to the frame, substantially as described, projecting the hoe, H G, which supports the inner or heel end of said bar forward and upward from the said heel to a point in advance of the cutters, and above the plane thereof, sufficiently far to keep the grass down, and prevent its rising over the shoe, thus aiding the shoe to ride over the mown grass, or other obstructions, substantially as shown.

8,724.—GRASS AND GRAIN CUTTING MACHINE.—Dated Feb. 10, 1852; reissue 259, dated February 28, 1854; reissue 466, dated June 2, 1857; extended seven years; reissue 3,034.—Division B.—Louisa R. Ketchum, Buffalo, N. Y. executrix of the estate of William F. Ketchum, deceased.

I claim, when the main wheel and inner end of the finger bar or rack, D, are located relatively as described, supporting the heel of the rack or finger bar sufficiently near the ground, and at a convenient distance from the main wheel, by one or more arms or braces extending upward and backward therefrom, and connected with the frame or strong bars, firmly bolted across the frame, in rear of the said rack or finger bar, while the said frame or bars are elevated or arranged so as to pass over the cut grass, substantially as shown.

73,122.—GAS LAMP.—Dated Jan. 7, 1868; reissue 3,035.—Division No. 2.—Ripley & Company (assignees of Daniel C. Ripley, Pittsburgh, Pa.

We claim, 1st, The construction of the base, A, and the two handles, B B, of one piece, for receiving a blown glass or reservoir, C, substantially as described.

2d, A pressed base, A, produced with one or two handles upon it, and having a globe, C, blown upon and united to the base and handle, or handles, substantially as described.

3d, The construction of the base, A, and handle or handles, B, in one piece by casting, and with a concave seat, for supporting and having blown upon the same a bowl or oil reservoir, substantially as described.

14,257.—REFINING IRON.—Dated Feb. 12, 1856; reissue 1,686, dated May 31, 1864; reissue 2,118, dated Nov. 28, 1865; reissue 3,036.—Christian Shunk, Philadelphia, Pa.

I claim, 1st, The refining and decarbonizing of molten crude iron by the employment of an armospheric air blast, uniting the oxygen of the air with the carbon of the crude metal, and thereby decarbonizing, or partially decarbonizing, and refining the same, thus preparing it to be molded into ingots, or otherwise, of iron or steel, fit for the hammer or the rolls, or to be molded into castings, or to be reconverted into fine cast steel.

2d, Such alloying, when effected by the introduction of the oxide of manganese, as above described, by which the ore is not only reduced, but the metal is thoroughly fused and incorporated with iron through the instrumentality of the high heat produced by the air blast, in the manner above shown.

3d, The use of a compound, consisting of common salt and manganese as a flux and detergent in said process, as set forth.

66,268.—MANUFACTURE AND PRESERVATION OF LARD.—Dated July 2, 1867; reissue 3,037.—Division A.—Charles Lafayette Tucker Chicago, Ill.

I claim, 1st, The box herein described, when constructed without a lid or cover rim, and with straight, even sides, from top to bottom, substantially as and for the purposes specified.

2d, The application of gumarabic, or its equivalent, to lard packages, for the purpose of making them tight and non-absorbing, substantially as specified.

66,268.—MANUFACTURE OF LARD.—Dated July 2, 1867; reissue 3,038.—Division B.—C. L. Tucker, Chicago, Ill.

I claim, 1st, The application or use of a tin or lead foil, or foil-paper covering for lard packages, constructed of wood or paper, substantially as and for the purposes specified.

2d, The process of putting up lard in a light wood or paper casing or box, by drawing or pouring the lard therein in a fluid state, and closing up the casing or box by inserting the head so as to leave a small space between the lard and the head, to provide for expansion, substantially as specified.

3d, As a new article of manufacture, small measured or specific quantities of lard incased in a light wood or paper casing or box, substantially as and for the purposes specified.

66,268.—PROCESS OF PUTTING UP LARD FOR STORAGE AND TRANSPORTATION.—Dated July 2, 1867; reissue 3,039.—Division C.—C. L. Tucker, Chicago, Ill.

I claim the mode herein described of packing lard for transportation or storage, by first packing the lard in separate small packages of light wood or paper, and inclosing such small packages in an outer, close-fitting case, substantially as specified.

71,670.—CUTTER FOR WOOD MOLDING.—Dated Dec. 3, 1867; reissue 3,040.—John Whitworth and W. H. Hawkins, Cleveland, Ohio, assignees of John Whitworth.

We claim the herein-described hard or chilled cast iron rotary cutter for working wood, made in the manner as and for the purpose substantially as set forth, as a new article of manufacture.

DESIGNS.

3,095 and 3,096.—CENTER PIECE.—Henry Berger New York city. Two Patents.

3,097.—IMITATION BRAID FOR BONNETS.—S. A. Blake, Milford Conn.

3,098.—CLOCK CASE.—Paschal Converse, New Haven, Conn.

3,099.—PARLOR STOVE.—J. B. Geyser (assignor to Mitchell, Stevenson & Co.,) Pittsburgh, Pa.

3,100.—BOTTLE.—John Hart, Lancaster, Pa.

3,101.—FLOOR OILCLOTH PATTERN.—R. Hoskin, Brooklyn, assignor to E. C. Sampson, New York city.

3,102.—TRADE MARK.—D. D. Mallory, Baltimore, Md.

3,103.—ARMY AND NAVY EMBLEM.—John P. Reynolds, Salem, Mass.

3,104.—CARPET PATTERN.—R. R. Campbell (assignor to Lowell Manufacturing Company), Lowell, Mass.

3,105 to 3,107.—STOCKING FABRIC.—T. Dolan, Philadelphia, Pa. Three Patents.

3,108.—KNIFE HANDLE.—R. H. Fisher, Beaver Falls, Pa.

3,109.—FIGURE.—Carl Muller (assignor to Nicholas Muller), New York city.

3,110.—FORK OR SPOON HANDLE CALLED "BRIDAL."—Geo. Wilkinson (assignor to Gorham Manufacturing Company), Providence, R. I.

3,111.—KNIFE OR FORK HANDLE CALLED "IVY."—George Wilkinson (assignor to Gorham Manufacturing Company), Providence R. I.

3,112.—KNIFE OR FORK HANDLE CALLED "ELIZABETHIAN."—Geo. Wilkinson (assignor to Gorham Manufacturing Company), Providence, R. I.

Inventions Patented in England by Americans.

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

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,588.—APPARATUS FOR MARKING OR DIRECTING BOXES AND PARCELS.—Wm. W. Secombe, New York city. May 14, 1868.

1,898.—EMBROIDERING APPARATUS FOR SEWING MACHINES.—Singer Manufacturing Company, New York city. June 10, 1868.

1,912.—CEMENT.—Chas. D. Peasley, Biddeford, Me. June 11, 1868.

1,918.—GOVERNORS FOR STEAM AND OTHER ENGINES.—D. la Forest Chase, Boston, Mass.—June 12, 1868.

1,920.—TREATING QUARTZ AND SILICIOUS SUBSTANCES TO OBTAIN HYDATE OF SILICA, AND APPLYING THE SAME.—A. L. Henry, Boston, Mass. June 12, 1868.

1,928.—ANCHOR.—F. Wittram, San Francisco, Cal. June 12, 1868.

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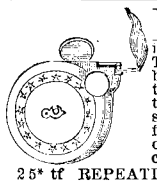

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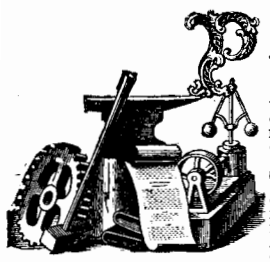

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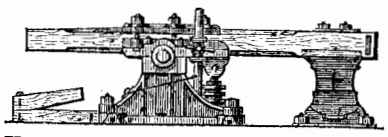

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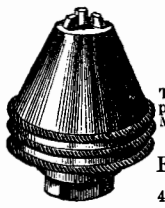

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