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Aluminum.

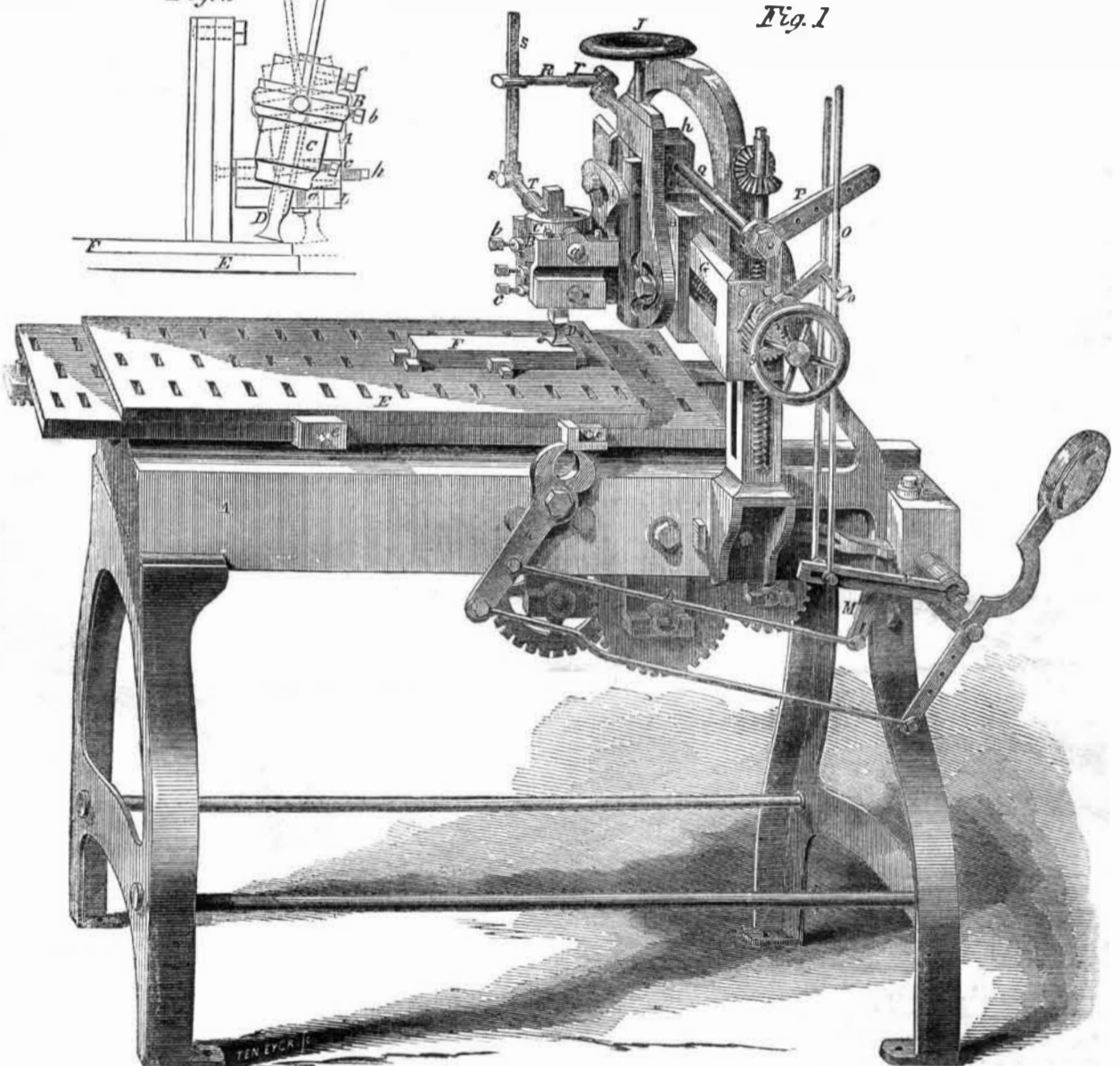
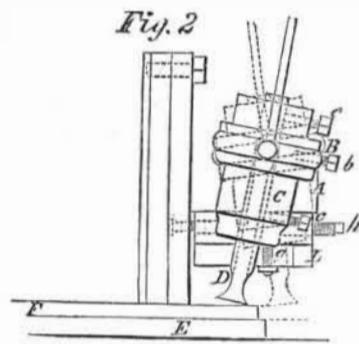
M. St. Claire Deville lately delivered a lecture before the Society for the Encouragement of National Industry at Paris, on aluminum, in which he gave some interesting facts in relation to its properties, and the progress made toward its general introduction. Under the skillful hand of this celebrated manipulator, it has been reduced to a beautiful white metal, with a slight bluish tinge, easily worked, more easily melted than silver, remarkably well adapted for gilding, and, in short, capable of being applied to many manufacturing household purposes. It has taken its place, in fact, among metallic substances as much as iron, brass or any other metal. The extraction of this new element of beauty and utility from the common clay is only another evidence of the scientific knowledge derived by the world from the noiseless operations in the chemical laboratory. The processes by which the object is attained are complicated as yet, it is true, but they are becoming less so in the same manner that all the now well established manufactures have. Three foundries have commenced the fabrication of this metal in France, and M. Deville now disposes of many hundred weight per annum. The price at present is 300 francs per kilogramme, or about \$27 per pound; but even under the present system of production, it might easily be reduced to 200 francs, were it manufactured on a large scale. The distinguished discoverer of this metal looks forward to the period when it will supersede the more precious metal in the fabrication of numberless articles of adornment and use.

Recorded Register for Gas Meters.

At present no uniform method is observed by the consumers of gas for keeping a check upon the inspectors who examine the meters monthly, and take down, for the accounts of the gas companies, the amounts consumed. The monthly inspectors may make false entries, and the consumers of gas thereby suffer. To afford a check against such a result, Mr. A. N. Brewer, of this city, has designed a tabulated index to hang up beside each meter for the inspector to enter the amount registered on the index of the meter, and the quantity consumed during the month. These entries will enable the consumer to examine the meter for himself, and to keep a check upon the inspector and the bills of the gas company. It is a very useful improvement, and it is surprising that something of the kind has not come into general use long before this.

The Senate has passed a bill giving \$20,000 to Edward N. Kent, in full compensation for the use in the United States Mints of his apparatus to separate gold and silver, and other precious metals. It was illustrated on page 81, Vol. XI., SCIENTIFIC AMERICAN.

MASON'S CUTTER STOCK FOR PLANERS.



There is a great waste of time in the ordinary metal planing machines which will only cut in the one direction, and hitherto there has been some practical difficulty attending the machines which cut both in the back and forward movements of the bed. The machine illustrated in our engravings, (and the cutter stock of which is the invention of Joshua Mason, of Paterson, N. J., and was patented by him July 22, 1856,) is, we think, the best produced for its purpose. One tool does the cutting, and it is not turned or rotated, but is provided with a double edge, and is so mounted in a movable cutter stock that, whichever way the metal to be cut is moving, a cutting edge is presented to it at exactly the right angle to take off a shaving the same thickness as the preceding one.

Fig. 1 is a perspective view of a planing machine with this cutter stock and operating parts attached, and Fig. 2 is a view of the same separate, showing the cutter in the two positions, one in line and the other dotted.

A is the frame of the planing machine, carrying a bed, E, to which is secured the piece of metal, F, to be planed or cut even by the tool, D. This tool is of peculiar form, having two cutting edges, seen better in Fig. 2, each of which can be ground independent of the other, or exactly alike, and by regulating the feed motion it can be made to go with one

edge in one direction over the stuff, taking off a shaving, and at the return stroke or motion of the bed, it can take, with its other edge, a finer shaving off the same surface, thus finishing each cut as made, or it can cut at each motion a shaving in advance of the last, and dress after. The tool is mounted in a cutter stock, C, by means of set screws, b c, and the stock can move in a frame, I, by being supported by the pins, a, projecting from the belt, B, and moving in journals in I.

The manner in which it is moved is as follows:—On E are two movable stops, e, that can be put and secured in the proper positions by set screws, which, when the bed has got to the end of its traverse in one direction, throw the clutch, K; over, and so by a system of levers, connecting rods, and wheels, as in ordinary planers, reverses the motion of the bed. To this clutch, K, there is also attached another connecting rod, L, that is attached and gives motion to the bell crank, M N, to which are connected by a screw the rods, O; to one rod, O, is secured a toothed piece, i, by a screw, o, and this working on a ratchet wheel moves a screw that propels the frame, H, along the slide, G; this can also be done by the hand wheel, g, at the commencement, to bring the tool over the piece to be cut. To the other of the rods, O, at or near its top, is attached a lever, P, which moves a shaft or

bar, Q, and this has a piece, R, jointed to it at r, the other end of which passes over (by a slot in it) the piece, S, hinged to the axle, T, of the cutter box, C. It will be seen from this arrangement of levers and rods, that as the clutch, K, is thrown over, and the motion of the bed reversed, at the same time the cutter is changed from the angle at which it has been cutting with one edge to the same angle with the other edge, and has also been advanced one shaving or not, as desired; the frame, I, which supports the cutter stock, is raised or lowered on H by the wheel, I, and Q passes completely through the box, h, that helps to support H on G.

This arrangement can be attached to any planer, and will prove a great saving of time wherever it is used. Any information that may be desired can be obtained by addressing the inventor as above.

An Orthodox Subscriber.

One of our subscribers, who is an attorney-at-law in a thrifty village in Pennsylvania, writes to us in the following sensible manner:

"I am strictly orthodox, and I would as soon think of raising my family without the Bible in the house, as doing business without your paper in my office. I have been a regular subscriber to the SCIENTIFIC AMERICAN for a number of years."



Issued from the United States Patent Office
FOR THE WEEK ENDING APRIL 20, 1868.

[Reported officially for the Scientific American.]

HORSE HAY RAKES—N. E. Allen, of Trenton, Wis.: I am aware that rakes have been held until released by the operator, but heretofore the rake teeth, or their equivalents, must be in contact with the ground, so that contact rotated them, and even then the rotation was not positively certain. I lay no claim to any such contrivance.

But I claim so connecting a lever, H, which actuates the dog, C, with a clutch that gears with the driving wheel, D, as that one operation throws out the dog and throws in the clutch, and vice versa, which makes a positive and compulsory rotation of the rake by the means set forth and described.

GEARING FOR HORSE POWERS—Cyrus Avery, of Tunkhannock, Pa.: I claim, first, forming the main wheel with a wide periphery east whole or in sections, so that any desired number of series of intermediate wheels may work within it, one series above another, and each series to gear into the main wheel, thus enabling me, by slipping on or shipping off one or more series of intermediate wheels, to produce a very low, very high, or medium velocity.

Second, I claim the method by which the main wheel is kept in position, viz., by means of a thimble attached to the center of the bed plate in connection with the flanges upon the lower intermediate wheels, and by the flange upon the outside of the main wheel in connection with the circle around and above it, and by the pivot at the top of the main shaft.

Third, I claim the method by which any desired velocity is obtained, namely, by removing or adding one or more series of intermediate wheels, as described.

LIFE BOAT—Leverett Ball, of Auburn, N. Y.: I claim the combination of the described doors with the life boat, for the purpose of preserving the lives of shipwrecked passengers, substantially as set forth.

DRESSING SAWS—Job Batchelor, of Camden, N. Y.: I claim the horizontal disk file, A, for the purposes described, and its connection and combination with the movable parts of the machine by which the same is operated as described, the whole being combined, arranged and operating substantially in the manner set forth.

SEWING MACHINES—Chas. F. Bosworth, of Petersham, Mass.: I claim the jointed rocking feed hand constructed and arranged as described, so as to play freely between and upon two fulcrum when operating from beneath the sewing table, in combination with the pressure pad above said table, in the manner and for the purpose specified.

I also claim regulating the angle of vibration of the feed hand constructed, arranged, and operating as herein described, by means of two stops, one of which is so adjustable as to allow the fulcrum upon which the said feed hand moves to be raised or lowered, thereby diminishing or increasing the feed at pleasure, substantially as set forth.

RUNNERS OF SLEDS—Silas Bullard, of Hartland, Mich.: I do not claim giving a movement to sleigh runners independent of the load that is above them.

Nor do I claim giving the runner on one side a movement independent of that of the other.

Nor do I claim the use of the link joint for connecting sleigh runners to the frame-work of a sleigh.

But I claim constructing the rear runners of sleighs in separate frames, each frame being hung by link joints to the cross-bar, H, so as to admit of a fore and aft rising and pitching movement in each runner which shall be independent of the movement of the opposite runner as set forth.

I also claim the construction of the tie beam, H, so contrived as to hold these separate forward runner frames at the proper distance apart by the fastening bolts, B, h, near its ends, and at the same time to allow the independent rising and pitching movement in each runner by making the mortise holes in H, so large as to admit the bars, E' K', to play loosely therein, so as to allow of a slight rolling motion on the axis of H, whenever the runners rise or pitch from the irregularities of the ground.

AIR PUMP AND GASOMETER—Samuel Chichester, of Poughkeepsie, N. Y.: I claim a machine composed of a reservoir and two pumps, whose pistons having their weight proportioned as described, are combined with a shaft, K, or its equivalent, to which the power of a spring or weight, or other constant first mover is applied by means of a cord or chain, F, connecting them with a loose pulley on the said shaft, a wheel, M, fast upon the said shaft, a stop for acting on the said wheel to stop the shaft, and a proper contrivance for engaging the loose pulley with, and disengaging it from the shaft, the whole operating substantially as described, for the purpose set forth.

[See a description in another portion of this paper.]

SHARPENING DEVICE FOR ROTARY CUTTERS—Edward Conroy, of Boston, Mass.: I do not claim broadly the idea of rendering revolving cutters self-sharpening by bringing their edges into contact with a sharpening instrument.

But I claim the sharpening device, H, when arranged and employed, substantially in the manner shown and described.

[A notice of this invention will be found on another page.]

CROSS-CUT SAWING MACHINE—Richard M. Cosby, of Indianapolis, Ind.: I claim no gain of power by leverage, nor any of the parts described, when taken separately, as new.

But I claim the combination of the rocking lever, K, spring, C, and weight, J, with the saw frame as described and shown.

COOLING AND DRYING MEAL—John Deuchfield, of Oswego, N. Y.: I do not claim forcing a current of air between a pair of mill-stones, while the same are in operation, for the purpose of keeping the stones in a cool state and preventing the heating of the grain, for such means, although not very efficient, have been previously used.

But I am not aware that parts arranged as herein shown, so as to allow the meal to be subjected to the blast during its entire, or nearly entire passage from the stones to the bolts, and insure the perfect cooling and drying of the meal, have been previously used.

I claim, therefore, the arrangement and combination of the chests, D, J, shafts, F, K, elevators, F', fan, G, and spout, I, substantially as and for the purpose shown and described.

[A description will be found on another page.]

PORTABLE INVALID BEDSTEPS—Zebulon C. Favor, of Chicago, Ill.: I claim the arrangement in an invalid cot bedstead embracing the following several features, to wit: two slotted straps, G, G', two stop pins, J, J', two loops, K, turning thimble eyes, D, D', punctured strips, e, beveled rails, A, A', obliquely set pivoted legs, B, and turning thimble stop catches, C, in the manner specified, and for the purpose of producing an improved new article of manufacture of the character set forth.

[See another page for a description of this improvement.]

PLATFORM SCALES—Chas. H. Earle, of Green Bay, Wis.: I claim, first, supporting the platform by plates, I, G, arranged as shown, and connecting the platform with the beam, Q, by means of the bent lever, O, rod, N, and arm, M, or an equivalent device, for the purpose specified.

Second, The auxiliary weight formed of the chain, U, in connection with the cup, T, arranged as shown, or in any equivalent way to operate as and for the purpose set forth.

[This invention consists in a peculiar arrangement of means employed for connecting the scale beam with the platform, whereby the construction of the platform scales is simplified; the parts made less liable to get out of repair, and the operation more perfect than usual.]

DRIVING WHEELS OF LOCOMOTIVE ENGINES—John F. Elliott, of New Haven, Conn.: I claim the combination with the legs, E, E', operated as described, of the feet, D, D', jointed to the said legs, and connected together by chains, to operate substantially as set forth.

[A description of this invention will be found on another page.]

BURNISHER—Chas. Frampton, of Brooklyn, N. Y.: I claim a burnisher for spinning screws, whose operative extremity is formed substantially in the manner described.

LIFE-PRESERVING BUCKET-RAFT—Chas. French, of Jersey City, N. J.: I do not claim the construction of buckets with air chambers in them to make them serve as floats or life-preservers.

But I claim furnishing buckets with encircling gaskets or grummetts, d, d', or their equivalents, applied substantially as described, so that two or more of such buckets may be combined to constitute a float or raft, as set forth.

[These buckets are provided with a gasket or grummet around their lower part, so that when a number of these buckets are pushed one into the other, they form a raft or life-preserver, on account of the air inclosed in the air-tight space between each bucket. They are excessively convenient, and are ready for instant use, not being at all in the way, and taking very few moments to put them together so as to form a raft of large dimensions and great buoyant power.]

FIELD FENCE—Benedict Gabriel, of Elmira, N. Y.: I claim constructing the post halves, A, A', with points, f, f', having their inner edges wedging, so as to force said points further apart in the act, driving the post into the ground, arranged in combination with the step, B, B', substantially in the manner and for the purpose specified.

TREATMENT OF SULPHURETTED ORES—Isaac Gattman, of Philadelphia, Pa.: I am aware that caustic, carbonate, and sulphate of potash or soda have been used before in the working of the native metallic sulphurets, and I therefore do not claim their use as such exclusively.

But I claim the use of sulphuric acid in connection with the hydrate, carbonate, or sulphate of potash or soda, or with an compound thereof, in the mode of working the native metallic sulphurets, substantially in the manner set forth, and for the purpose specified.

RAILS FOR STREET RAILROADS—John B. Henck, of Boston, Mass.: I claim in a cast-iron rail the combination of the supporting lap and dove-tailed dowel, the said dove-tail being cast on the said lap as set forth, whereby the rails are rigidly locked and prevented from rising or falling, or moving in either lateral direction.

CLENCHING HORSE-SHOE NAILS—James Houck, of Green Castle, Ind.: I claim the use of the post, A, when constructed with the cap, C, and band, B, in the manner and for the purposes described in my specification.

RUNNERS OF SLEDS—John Hoyt, of Fishkill, N. Y.: I claim, first, the combination of the T-headed noddle pin, P, with the dog joints, D, D', and the front bob, A, as described, and for the purposes set forth.

Second, The combination of the noddle pin, P, with the jointed reach, R, constructed and operated as and for the purpose described.

Third, The attachment of the rear bob, X, to the double cranked axle, F, and to the body of the sleigh, in the manner and for the purposes set forth.

STEAM GOVERNOR—Rowell D. Jacobus, of Newark, N. J.: I claim using a distinct motive power from the main engine with the motive power of the main engine to operate a governor in combination with machinery constructed in the same or similar manner, and for the purposes specified.

CENTER-BOARDS OF NAVIGABLE VESSELS—Benjamin Joiner, of Westfield, N. Y.: I do not claim broadly suspending a center board within its trunk by chains or ropes, for this has been previously done.

But I claim suspending the front end of the center board, C, within its trunk, A, by means of the bridle, D, in combination with the bolt, e, and slot, d, or their equivalents, to serve as a guide, the parts being arranged to operate substantially as and for the purpose set forth.

OPERATING BLACKSMITHS HAMMER—James W. Kerr, of Rochester, N. Y.: I do not claim the various parts of my automatic blacksmith separately considered.

But I claim the combination and arrangement of the eccentric, H, with the slotted reciprocating gate, I, and bellows, K, whereby the required motions for successfully operating the bellows are obtained by the revolutions of the balance wheel, G, in the manner and for the purpose herein set forth.

I also claim the combined operation of the wheel, G, with cam or cams, o, lever bar, M, hammer lever, f, hammer, J, and spring, d, whereby the power may be reciprocatingly employed between the actions of the bellows and trip hammer, so that the power released from one is expended on the other, and vice versa, substantially in the manner and for the purpose described.

UMBRELLAS—Henry Kurth, of Brooklyn, N. Y.: I claim making the rib by coiling the wire into loops, which serve, like ordinary holes in the rib, for the joints, and attaching the stretcher to the middle loop without the interposition of intermediate links, substantially in the manner and for the purpose as described.

HARVESTERS—Henry Marcellus, of Amsterdam, N. Y.: I do not claim the pole plank, E, with castor wheel, G, attached for relieving the draft pole of the weight of the front end of the machine when the sickle is raised, for that has been previously used.

Nor do I claim attaching the draft pole to the pole plank, irrespective of the particular arrangement, or the point where the pole is attached, as shown and described.

But I claim connecting the draft bars, a, a', of the draft pole to the pole plank, E, at point intermediate between its castor wheel, G, at the front end of the pole plank and the point of connection of the pole plank with the machine, substantially as shown and described for the purpose set forth.

[This invention relates to an improvement in that class of harvesters in which a pole plank is employed to serve as a rest for a lever by which the cutting device is raised and lowered. The invention consists in attaching the draft pole to the pole plank at a point intermediate between the castor wheel at the outer end of the pole plank and the point where the pole plank is connected with the machine, whereby many advantages are obtained.]

COMBINED COAL SCUTTLE AND ASH SIFTER—Archibald McNeill, of Washington, D. C.: I do not claim any of the parts described, separately.

But I claim a coal scuttle, A, provided with the extended scoop-shaped piece, D, slide, C, screen, E, and cover, G, all arranged and operating substantially as and for the purpose as set forth and described.

POTATO PLANTER—F. S. McWhorter, of Smyrna, Del.: I claim the employment of a transverse hopper, I, having an inclined bottom, and arranged on one side of the endless chain conveyor, C, in combination with a longitudinal guide and retaining box, G, H, which has its rear portion inclined and its front portion horizontal, and a brush, K, which brushes off any surplus pieces of potatoes which may collect in the cells or chambers of the endless conveyor, substantially as and for the purposes set forth.

[This machine consists of an endless chain of conveyors which continuously receive the pieces of potato from a side hopper, and carry them to a planting tube which conducts them into the ground. This is a simple arrangement and has been found in practice to be very well adapted for the purpose above named.]

DOMESTIC MANGLE—Samuel Nowlan, of New York City: I do not confine myself to the application of mangles conducted and arranged as described, to bureaus only, as substantially the same principle of construction can be applied to any kind of furniture, such as ward-ropes, tables, desks, &c.

I claim the mechanism of a mangle constructed and arranged in relation to and in combination with parts of any suitable articles of furniture in the manner and for the purposes specified.

CORN SHELLERS—Elmon Parker, of Baltimore, Md.: I claim the combination of the cylinder, A, the spring back, d, and rollers, e, when they are constructed and arranged with respect to each other, as set forth for the purpose specified.

SECURING TIRES TO RAILROAD CAR WHEELS—Lea Pusey, of Philadelphia, Pa.: I do not claim constructing locomotive and car wheels with plates or rings riveted to centers and tires, as these have been previously used.

But I claim the slotted ring, b, forming a series of openings to admit corresponding parts of the tire, c, passing through said openings for the purpose specified and set forth.

PORTABLE FIELD FENCE—L. S. Robison, of Gypsum, N. Y.: I claim any method of constructing a fence which will be portable and easily put up by means of the panels constructed substantially as described, with the cross bars, B, and the blocks, e, e, on the end of the projecting horizontal bars.

OPERATING SEWING MACHINES—P. J. Steer, of Washington, D. C.: I disclaim the employment of a pawl and ratchet for the purpose of revolving a shaft continuously in one direction, as this is not new.

But I claim the arrangement of the devices for starting sewing machines always in a right direction, and to prevent backward motion with the knee and foot of the operator, and without using the hand for that purpose, as set forth and described.

RAILROAD RAILS—E. W. Stephens and Richard Jenkins, of Covington, Ky.: We claim constructing a tubular T rail when the walls, B, B', are welded, forced or pressed together from C to C, or from the base of the rail up, as represented and before described, (or so near together, that when the weight is placed on the rail in using it, the walls will force together), combined, with the walls made concaving on their outside at d, d', from near the top of the rail down, a short distance below where they are made to meet for the purpose of making the walls brace inwards, with which combined structure and form of rail we can make a stronger one with the same quantity of metal as mentioned and described in the specification.

CATCH LATCH FOR FARM GATES—Joseph Summers of Raleigh, Va.: I claim the peculiar formed spring plate, K, G, in combination with the spring bolt, D, as an attachment for farm gates, arranged and operating in the manner set forth, for the purpose of accomplishing the result specified.

[With this arrangement the end of the spring latch is prevented from projecting out beyond the closing face of the front batten of the gate, when the gate is opened, and thus the annoyance of having the reins, gearing or garments catching upon the same in passing through the gate is completely avoided. Those who have been subjected to this inconvenience will readily appreciate the utility of this simple and neat contrivance.]

HOLLOW CAST IRON COOKING UTENSILS—A. V. Van Hovenberg, of Southside, N. Y.: I claim as a new and improved article of manufacture, to wit, hollow cast iron cooking utensils, kettles, griddles, &c., having the interior surface which comes in contact with the cooking material polished by any of the usual processes for polishing metals.

BIT-HOLDER—David H. Whittemore, of Worcester, Mass.: I claim the holder, C, E, with its cam, when applied in the manner and for the purpose set forth.

METALLIC SHOES FOR THE BRACES OF TRUSS GIRDERS—T. B. White, of New Brighton, Pa.: I do not claim the double shoes irrespective of the mode of construction, and combining the same with truss bracing.

But I claim the combination with the diagonal braces, C, C', in a truss girder of the peculiarly constructed metal male and female shoes, b, c, and wedges, d, d', substantially as specified, for the purposes of setting up the braces to give camber to, or to raise the girder as set forth.

[With this simple arrangement in truss girders for bridges, the diagonal braces can be set up so as to give the girder any amount of camber, or to raise it in case of settling too low, by the introduction of wedges between the male and female shoes without danger of crushing the ends of the braces, and without liability of their getting out of place or having a chance to play laterally or longitudinally. This is an important improvement in truss bridges.]

QUARTZ MILLS—L. W. Williams, of Nevada City, Cal.: I do not claim the circular battery, that being by no means new.

But I claim constructing the inside bottom of circular batteries (in which quartz is to be crushed) of a series of inclined planes or curved surfaces commencing at any desired base, and produced to any required height over and in contact with which stampers or wheels are made to revolve and by their revolution over such inclines are alternately raised and let fall, substantially in the manner and for the purpose described.

CURTAIN FIXTURES—T. R. Work, of Hartford, Conn.: I do not claim, broadly, the application of friction rollers to the shade roller, nor do I claim any of the parts separately.

But I claim, first, The specified arrangement consisting of rollers, h, h', bar, c, pin, e, yoke, c, case, A, endless band, F, roller, D, for the purpose set forth.

Second, I claim, in combination with the above, the plates, A, A', constructed with projecting ears, a, as shown, so that the plates may be attached either to the front side of the window casing as may be desired.

[This invention consists in a novel application of friction rollers to a semi-circular yoke, the rollers and yoke being fitted within or to a case, and the whole arranged so that the shade or curtain may be retained at any desired point by friction produced by the pressure of the friction rollers on the shade roller, and the shade roller relieved of the friction whenever it is turned by the band; the friction rollers causing the band to encircle the roller to an extent fully sufficient to ensure the rotation of the same, and the case which contains the friction rollers and yoke being so constructed that they may be applied at either side of the window, and either at the front or side of the window casing as may be desirable.]

SEED PLANTING HOES—Samuel Woodruff, of Sparta, N. J.: I am aware that seed distributing devices have been attached to hoes, and arranged in various ways, in order that the seed may be distributed, the hoes made to receive it, and the seed covered at one operation, and I therefore do not claim separately any of the parts shown and described.

But I claim the box, B, provided with the valve, C, and plunger, D, attached to the hoe, and used in connection with the sack or receptacle, G, placed on the operator, and communicating with the box, B, by means of the flexible tube, E, the whole being arranged substantially as and for the purpose set forth.

[This invention consists in the employment of a small box attached to the back of the hoe, provided with a valve and plunger, and used in connection with a seed receptacle or sack which is slung around the shoulder of the operator, and made to communicate with the distributing device by means of a flexible tube. The device may be readily applied to any ordinary hoe, and used by the operator with the greatest facility, the seed being planted and covered by the implement equally as quick as the ordinary process of covering alone by means of the hoe.]

LIME KILNS—Bernard Zwart, of Keokuk, Iowa: I claim the construction of a division wall, B, in combination with the two adjoining fire-places, E, and walls, g', to secure the oven burning of both sides when desired.

I claim the combination of the solid spherical triangle I, in connection with the form of the canals from R down to K, for the uses and purposes as above more fully described.

I claim the particular construction of the hot air conductors, X, in combination with the division wall, B, and in combination with the draught flues, y, to produce the horizontal draft of hot air, and make the same serviceable, so as to act direct on the limestone in the manner and for the uses as fully described.

MACHINE FOR MAKING WOODEN DOWEL PINS—A. H. Boyd (assignor to S. F. Chase), of Saco, Me.: I claim, first, The slotted clamp carriage or bed-piece, in combination with a gang of two or more circular saws for splitting or cutting off wood, substantially as specified.

Second, The arrangement and adaptation of said circular cutters, in combination with said clamp carriages and circular saws, substantially as specified for the purpose specified.

REAPING MACHINES—J. W. Brokaw (assignor to W. Brokaw and child), of Springfield, O.: I claim the combination of an auxiliary platform, H, with the platform for the reception of the grain as it is cut, when arranged, constructed and operated in a space between the latter and the driving wheel, in the manner substantially as and for the purposes set forth.

SMOOTHING AND POLISHING IRON—F. A. Cannon (assignor to John Phillips), of Brooklyn, N. Y.: I claim the application and arrangement of rollers or cylinders to smoothing and polishing irons as described, by which a high degree of polish is imparted to iron and other fabrics with the least expenditure of muscular power.

MEAT CUTTERS—P. Demeure, of Brooklyn, N. Y.: I do not claim the original invention of S. Millet.

But what I claim as an improvement on the said patent of S. Millet, of May 24, 1853, is, first, The opening, l, in the cover, e, placed near the front part of said cover for the purposes and as specified.

Second, I claim the arrangement of the hinged cover, e, and latches, b, b', in connection with the removable basin, d', for the purposes and as specified.

Third, I claim the arrangement of the cutters, i, i', acting through slots in the cover, e, in opposite directions on the meat, &c., to be cut as the same is presented by the revolving basin, substantially as and for the purposes specified.

MANUFACTURE OF LEATHER, PASTEBOARD, AND PAPER—A. N. Mathieu, of Paris, France, assignor to M. J. A. Guet, of New York City. Patented in France, April 13, 1856: I do not claim the employment of leather in making pasteboard, &c., when the same is made to pass through a process of maceration with lime, or like substances, or when leather scraps are mixed with resinous or glutinous compounds to cause it to adhere, for all such modes are too expensive for practical use.

But I claim manufacturing pasteboard or paper of leather shavings by simply washing and grinding and mixing the same with vegetable fibers, without the addition of other manipulation or material, by which I make a cheap and merchantable article when heretofore the process was too expensive for its profitable use.

METHOD OF VENTILATING RAILROAD CARS—Calvin Pepper (assignor to N. R. Scovell), of Albany, N. Y.: I claim the manner specified of purifying the air as it enters the car, by passing the same through the pneu-mometer composed of the tubes, b and c, in the water chamber, C, for the purposes and substantially as specified.

CASTING CAR WHEELS—Robert Poole (assignor to himself and G. H. Hunt), of Baltimore, Md.: I claim the base, A, of the flask made in sections, so that the center one may be removed without disturbing the remaining one, for the purpose set forth.

I also claim the sectional cope, C, so made that either section may be removed without disturbing the other one, for the purposes set forth.

I also claim, in combination with the sectional base and cope, the central member, B, of the flask, with a lining of some non-conducting material, substantially in the manner and for the purpose described.

HORSE SHOE MACHINE—Elwin Shaw, of Providence, R. I., and Calvin Carpenter, Jr., of Pawtucket, Mass., assignors to themselves, and G. B. Justram, of said Providence: We claim varying the point at which the pressure for narrowing and thickening the heel commences, by moving the mold, K, in or out in the manner substantially as described.

CORN PLANTERS—George Taylor, of Richmond, Ind., assignor to himself and J. W. Free, of Laporte, Ind.: Now I do not claim any particular method for the distribution of the grain; but I disclaim the method shown, and all other methods of distribution, for I hold that what is strictly my invention is applicable to many or most methods or devices for distribution now in use.

Neither do I claim the devices shown for operating the distributing apparatus by means of inclined planes, J, J', held in contact with cam, j, by means of a spring, S, as this contrivance is already before the public.

Nor yet do I broadly claim the use of either springs or weights for operating the marking contrivance.

But I claim, first, The combination of parts, j' j', shaft, L, and wheel, K, with slide, G, for the purpose of correcting the machine, and making it plant in line with work already done.

Second, I claim the weighted spring arms, D, p, operated as shown, in combination with the devices shown for correcting the machine, when said spring arms are so situated as to mark midway between the rows of planting.

CHURN—James Macnish, of Berlin, Wis.: I claim the combination of a central spiral flanged or winged agitating shaft, C, with a series of encircling expressing rollers, A, A', a portion of which have a direct motion in one direction, while the others have an indirect motion in an opposite direction.

EE-1868.

POWER PRINTING PRESS—Isaac Adams, of Boston, Mass. Patented Oct. 4, 1830—extended for seven years from Oct. 4, 1844—extended by Congress from Aug. 16, 1856, to March 2, 1864—re-issue April 20, 1868: I claim, first, The method described, or any other substantially the same, for giving the bed its proper periods of motion and rest, and producing impressions by means of the combination consisting of the crank, D, the pitman, D', the declension lever, I, I', and the toggle joints, e, e'.

Second, I also claim the described method or any

equivalent mechanism for giving the proper periods of motion and rest to the frisket carriage, and each and all the parts attached to it by means of the combination consisting of the arm, o 4, the rocking bar, o 3, the incline plane by which said bar is disengaged, the shaft, O, and the crank, n, 13.

Third, I also claim the combination of one or more feed frames, with the frisket or friskets or mechanism for receiving the sheets to be printed, the same being substantially as set forth.

Fourth, I also claim the described mode or any other essentially the same of securing against the platen the sheet to be printed, whereby it is not only kept steady and prevented from bagging, but it is also, after the production of an impression upon it separated from the types in a proper and safe manner.

Fifth, I also claim constructing the pitman as described, or in any manner substantially the same, the bearing surface, i 1, the shoulder, i 2, and the joint, h 5, constituting its essential characteristics, so as to allow said pitman to be operated and to produce effects in the manner substantially as specified.

Sixth, I also claim, in combination with the described mechanism for producing the impressions, the treadle, K 4, or its equivalent, to prevent impressions being taken or produced while other parts of the press are in motion whenever such prevention may be desirable.

Seventh, I also claim the combination of the double frisket carriage, the bed, platen, and the rollers for inking the type with two sets of inking mechanism, the whole being made to operate together substantially as explained, and the several parts being constructed and connected substantially as set forth.

Eighth, I also claim the combination consisting of the platen (when constructed substantially as stated), the bed and distribution cylinders.

Ninth, I also claim the combination of a crank with the carriage, n 6, for the purpose of carrying the inking rollers over the form, and for giving the friskets, n', their proper motions and periods of rest.

Tenth, I also claim the mode of constructing the winter, E, or bottom bar, as shown in Figs. 3 and 34, or any equivalent device, by which inconvenient high in the machine is avoided, said winter being made with a ledge or shoulder near its lower part upon which the toggle joints are sustained, substantially as described.

Eleventh, I also claim the combination of the fountain with one or more distribution cylinders, and a traveler, L, the same being for the supply and distribution of the ink, substantially as described.

Twelfth, I also claim placing the apparatus for the supply and distribution of ink, so that the distribution cylinders rest over or nearly over the fountain, the roller which takes the ink from the fountain roller being placed between the fountain and the cylinders, K 6, K 5, in the manner substantially as shown.

Thirteenth, I also claim the mode described of laying the ink upon the types by passing the rollers, K 5, K 6, between the bed and platen, said rollers being brought to a stand in their horizontal movement for the purpose of receiving their supply of ink from a cylinder or cylinders substantially as stated.

Fourteenth, I also claim the described mode by which the nuts, g' g', which sustain the impression are brought to their proper positions and secured there, that is, by the hoops, g 2, set screws, g 3, and pins, g 5, substantially as specified.

Fifteenth, I also claim the mode of producing the impressions by means of toggle joints applied to the under or reverse side of the bed, substantially as described.

Sixteenth, I also claim the combination of the rocker shaft, d 2, and the levers, d', with the bed, the same being for the purpose of keeping the bed level, substantially as described.

EXTENSION.

MACHINES FOR SPLITTING LEATHER.—Alpha Richardson, of Boston, Mass., patented April 15, 1844—extended April 16, 1858: I claim the arrangement specified of the gage and feed rollers of a leather splitting machine, so that the bilge of the lower side, or the axis of the former shall be directly over or in the same vertical plane with the edge of the knife, while the axis of the latter is a little distance out of said vertical plane, and its upper bilge is a little above the level of the edge of the knife for the purposes recited in the specification.

The Horse Power of Locomotives.

MESSRS. EDITORS—"What is the horse power of a locomotive under the following circumstances, namely, cylinders fifteen inches in diameter; stroke, twenty inches; driving wheels, five feet diameter; speed, forty miles per hour, with a working pressure of steam in the cylinder of one hundred pounds per inch, full stroke?"

I have worked out the question for myself, and have made the power of each cylinder 393 horse, nearly, or 787 total. An apprentice in a machine shop in this place recently asked me the above question, and when I gave him the foregoing answer, all the engineers in the shop laughed at me. I then asked quite a number of mechanics what was the power of such a locomotive, and they said from forty to eighty horse. An engineer of a locomotive of about the capacity given, told me that his engine was eighty horse power. There is either a very mistaken notion among mechanics generally concerning the power of locomotives, or else the rules laid down in books for estimating their horse power are not correct. Your opinion will throw light on the subject. G. B. F.

Canton, N. Y., April, 1858.

[Our correspondent is nearly right in the conclusions deducible from the question according to the data he has furnished. The nominal horse power of a locomotive of the dimensions given and performing, as described, is eight hundred. This is estimated by multiplying the pressure of the steam per inch on the area of piston into the velocity of the latter in feet per minute, and dividing the product by 33,000. The unit of a horse power is 33,000 pounds, lifted one foot per minute. In the above case, therefore, we have—

$$15^2 \times 7854 = 176.715 \text{ inches area of piston.}$$

$$5 \times 3.1416 = 15.708 \text{ feet circumference driver wheel.}$$

$$5280 \div 15.708 = 336 \text{ revolutions of wheel per mile.}$$

$$336 \times 40 \div 60 = 224 \text{ revolutions driven per minute.}$$

$$224 \times 3\frac{1}{2} = 747 \text{ feet (nearly) velocity of piston per minute.}$$

$$\text{Therefore, } 176.715 \times 100 \times 747 \div 33,000 = 400 \times 2 \text{ (cylinders)} = 800 \text{ horse power.}$$

$$\text{A like result is obtained as follows:—} \\ (15^2 \times 20 \times 40 \times 100) \div (5 \times 4500) = 800.$$

This latter rule embraces the multiplying of the speed in miles per hour by the square of the diameter of the piston in inches, by the stroke in inches, by the effective mean pressure on the piston in pounds per inch, and dividing the product by the diameter of the driving wheel in feet, and by 4,500.

The nominal and the efficient horse power of a locomotive are two very different questions, and the engineer to whom our correspondent refers may have given a correct answer so far as it related to the efficiency of his locomotive. In working out the above question no allowance is made for back pressure, which in locomotives sometimes amounts to one-seventh of the direct pressure. There is also a great difference between the pressure in the boiler and that in the cylinders, especially when running at high speeds and working expansively; this difference of pressure is from 20 to 40 per cent in speeds of from twenty to sixty miles per hour, and is even greater when the cylinders are not protected.

The question, "What is the horse power of a locomotive?" is one of a complex character, and in some respects very different in its nature from that of a stationary steam engine. The efficient horse power of a locomotive may be very small, while its nominal horse power may be very large, and the very best locomotives expend a vast amount of power in proportion to their amount of efficiency. Redtenbacher, a German author of scientific attainments and a practical engineer, has published the results of quite a number of experiments on this head, and his conclusions are that the efficient horse power of a locomotive performing under the best possible conditions, according to his experiments, is only as 230 to 505—not fifty per cent of the power expended. Six wheeled drivers connected together, he found far more efficient than engines having either two or four driver wheels. He also found that the important element, *adhesion*, varied greatly with the character of the engine. Thus a locomotive of eleven tons weight with two wheel drivers, possessed only 5.5 adhesion, whereas one of twenty-five tons weight with six wheel drivers possessed 22.5 of adhesion; the former only half the adhesion of its tunnage; the latter nearly the whole of it. There are quite a number of elements which necessarily enter into the computation of "the efficiency of locomotives."—[Eds.]

Appreciation of the Scientific American.

The Iowa Farmer, published at Des Moines, Iowa, speaking of the SCIENTIFIC AMERICAN, says:—

"This is one of the most valuable publications in the country. To the mechanic and inventor it is invaluable. In it may be found a notice or description, and frequently an engraved illustration, of the most important and useful discoveries of the day in all the arts, both in Europe and the United States. It is highly and deservedly prized by every intelligent workman in the mechanic arts, and receives from them a generous support. It is as necessary and useful to them as any of the tools of their trade, for in its beautifully printed pages they find a record of the result of the toils of years of the greatest minds of the world. A friend who stopped a few days in Chicago on his way West informed us that at a lecture which he attended there one evening, a large portion of the audience were mechanics, and he thinks he saw not less than fifty of them with this paper in their hands reading it, which they no doubt had just received from the Post Office. It gave him an exalted opinion of the intelligence of the workmen of Chicago."

The Egyptian Steamship *Voyageur de la Mer*.

This fine steamship, built at Boston for the Pasha of Egypt, has been lying idle at her wharf, for several months, in consequence of difficulties connected with the working of her engines. We are informed that a contract has just been closed between the agent of the Pasha and the Corliss Steam Engine Company, of Providence, by which the latter are to remodel her engines by the introduction of Mr. Corliss' improvements. The work will probably be completed in two or three months, and by the 1st of July it may be presumed that this splendid ship (which our readers will probably recollect is constructed with a double hull of iron and wood) will be in a condition to reflect the full credit due to her designers and constructors. She is the largest iron vessel ever built in this country, and is the first, we think, in which an inner casing of wood has been provided in this manner to contribute to the strength and efficiency of the structure.

Fans for Ventilating Mines.

On page 235, this volume, SCIENTIFIC AMERICAN, we published a brief description of the success resulting from the employment of a steam fan in ventilating the coal mine at Abercarn colliery, England. In answer to this, we have received a communication from Stephen Cox, of Bridgeton, N. J., claiming priority of invention, and he has furnished us with some testimony to prove his title. He made a rotary fan, and put it to work in a mine at Reading, Pa., in September, 1854, and another for the same company in November following. Since then, it has been successfully at work, embracing a period of three years and seven months. The mine in which it is placed is three hundred feet deep, and the workings are a considerable distance from the shaft. The fan is three feet in diameter, has four blades, and runs at the rate of twelve hundred revolutions per minute. A branch pipe from each inlet of the fan case connects with a main pipe, which is carried down the shaft and into the rooms where the miners are working. Through this pipe the foul air is sucked up, thus causing a current of fresh air to rush down the shaft and through the mine to supply the place of that which is exhausted. This fan is driven by the usual mine engine, and is not set in a separate ventilating shaft like the one in England. As it appears to be competent to fulfill the offices for which it was constructed and arranged, it is an important fact for miners, inasmuch as it presents a very simple method of mine ventilation. In regard to its utility, Thomas Robarts, mine agent for Reeves, Buck & Co., of Phoenixville, Pa., states that the mine to which it has been applied, was previously almost impossible to work on account of foul air, but this was removed within an hour after the fan was set in motion, and the mine thoroughly ventilated. This is pretty high testimony to its efficiency. "Honor to whom honor is due."

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims:—

COMPRESSING AIR.—Samuel Chichester, of Poughkeepsie, N. Y., has invented a machine, the object of which is to obtain from a spring or other prime mover exerting an unmovable or but little varying force, a supply of air for any purpose at a pressure above that of the atmosphere that shall be perfectly uniform, notwithstanding any degree of variation in the quantity used. The machine is especially intended for supplying the necessary quantity of air for passing through and taking up the vapors from the hydro-carbon liquids for illuminating purposes, particularly the liquid invented by Levi L. Hill, and it consists in a combination of a spring with a reservoir and pistons.

MACHINE FOR CUTTING CORK.—The great difficulty in cork-cutting machines has been in keeping the cutters sharp, and at the same time not interfering with the operation of the

machine. In this machine this difficulty is overcome, for the cutters and saw teeth are kept sharp by an automatic or self-acting sharpener. The cork is fed to the machine, and cut, and the shaving is conveyed away by the saw teeth, and the necessary parts sharpened by the rotation of a wheel or handle. Edward Conroy, of Boston, Mass., is the inventor.

MODE OF COOLING MEAL.—This invention consists in the peculiar arrangement of a suction fan, conveyors, and elevators, so that the meal during its passage from the grinding stones to the bolts, is thereby cooled and dried within a limited space, the whole being a simple and economical device. It is the invention of John Deuchfield, of Oswego, N. Y.

DRIVING WHEELS FOR LOCOMOTIVES, PLOWS, &c.—John F. Elliott, of New Haven, Conn., has invented a novel arrangement of legs and feet applied to the driving wheels of locomotives for running upon common roads or for agricultural purposes, such as plowing and otherwise tilling land, or reaping and mowing by steam power, and operated by a cam, or its equivalents, to cause the propulsion of the machine or engine by the rotary motion of the wheels.

PORTABLE CHAIR LOUNGE AND BEDSTEAD.

—This invention contains in one simple article the above useful comforts. It consists in a sort of chair frame, so arranged that by shifting a couple of straps it may be converted into an easy chair, or if desirable into a sort of sofa lounge; or, by another change of the straps, it may be horizontally extended into a comfortable bed. The legs are hinged, and the whole folds up into a small pack. To take up one's bed and walk, with this contrivance, would be a very easy matter. We have had one of these chairs in practical use for some time past, and therefore speak from experience when we say that it is an excellent improvement. For camp use it is just the thing, and our government ought to give it a trial among the soldiers. The inventor is Z. C. Favor. The assignees of the patent, who may be addressed for further information, are Messrs. Brown & Hilliard, Chicago, Ill.

The following inventions were patented last week:—

CARRIAGE WHEEL.—With this arrangement, after the spokes are inserted and the wheel put together, the wheel can be tightened by simply inserting the taper axle-box, expanding an annular packing ring which is placed within the eye of the hub, and causing the same to bear against the ends of the spokes, and force them outward until the wheel is tightened up; and again, in case of shrinkage, after the wheel has been in use, by simply withdrawing the taper box and inserting a duplicate packing ring and again driving in the taper axle box, all the spokes can be moved radially outward, and the wheel thereby tightened up. We regard this as a good attachment to wheels. It is the invention of B. A. Rogers, of Shubuta, Clark county, Miss.

COAL HOISTER.—With this machine, the coal car loaded can be hoisted from the railway of the mine or pit, to a convenient or proper position relatively to a dumping chute, and then automatically dumped and allowed to re-adjust itself and descend to its original position ready for receiving another load, without any other attention other than the turning of a windlass shaft to the right and left. It is the invention of George Martz, of Pottsville, Penn.

FILTER.—This invention is designed for purifying the water used in steam boilers, and thus prevent incrustations of lime and sediment over the inner surface of the same. The arrangement adopted is very simple and perfectly automatic in its operation, the weight of the discharging filtered water being made available at intervals for opening certain valves, so as to effect the discharge of all sediment which may have accumulated in the bottom of the filtering vessel. It is the invention of Dr. A. Jaminet, of St. Louis, Mo.