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Improvement in Screw Machine.

The annexed engravings represent a machine for cutting screws, which has been used with great success for three years in some of the large shops in the West. The shaft of the head stock is hollow, to allow the insertion of bolts of any desired length, and in all its equipments it is equal to any of the screw-cutting engines in common use, while by the peculiarity to be described it admits of a very nice adjustment of the screw produced, cuts the thread complete, at one operation and in a very superior manner, and affords extraordinary facilities for inserting and removing the bolt.

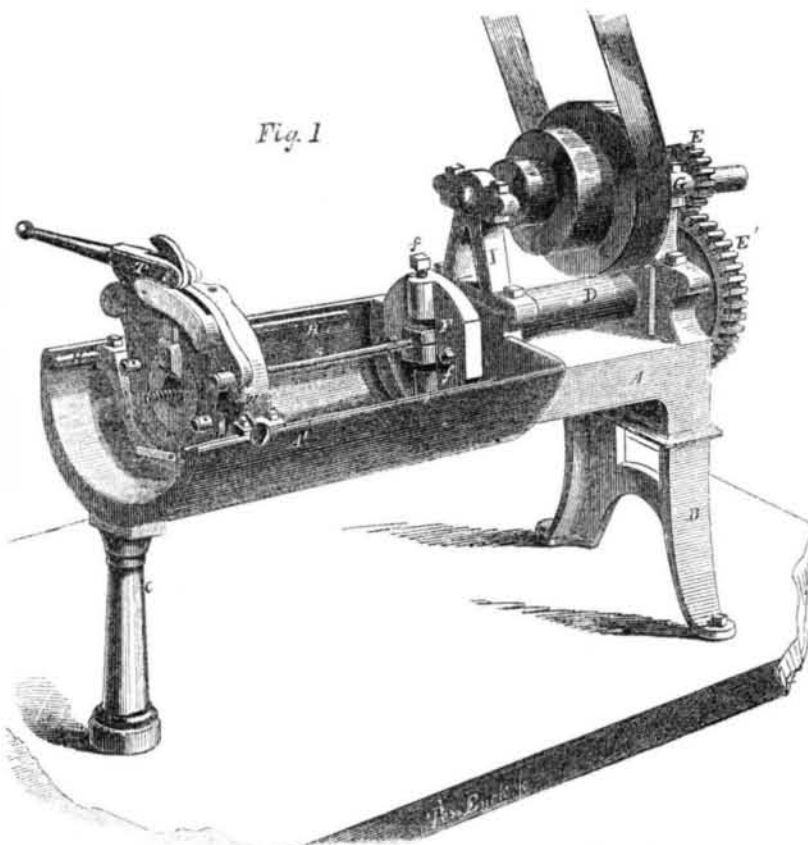
The novelty lies in the arrangement and mode of operating the cutters and dies. Fig. 1 represents the machine complete, fig. 2 an enlarged view of the cutting portion alone, fig. 3 a piece fitted to the face of fig. 2, and fig. 4 a portion of the form produced. The threads are in no instance raised on the bolt by crushing the metal, but in every case the crease is cut out clean by the dies, the forward edges of which act as cutters, like the tool of a lathe, and remove the metal in thin shavings. No backing motion is ever required, and consequently one belt and one pulley for reverse motion is dispensed with, and the dies are never liable to nip and heat.

The bed-piece, A, the legs or standard, B, and the front pillar, C, explain themselves; so also do the standards or carriers, I I, which support the journals of the hollow mandrel, D, with the cone pulleys, gearing, etc., to give motion thereto. On the front end of D is fixed the ordinary chuck, F, which contains the pair of ordinary holding dies, J. The bolt to be operated on is represented by S, which is held in the dies, J, and consequently receives the same rotary motion as D.

On the interior surface of the bed-piece are cast straight horizontal slides or guides, H H, to which is fitted the sliding carriage W, as represented, and in this is supported the die chuck with its attachments. The principal portion of the die chuck consists of a circular metal box, J, of which fig. 2 is a front or interior view. It is provided with journals, j j, by which it is supported in a ring, (not represented) so that it is free to oscillate in a horizontal plane, and this ring is in its turn mounted on journals located horizontally to allow of oscillation in a vertical place, the effect of the whole being to suspend the box, J, by a kind of gymbal ring or what is equivalent to a universal joint, so that it is free to accommodate itself to any position of the sliding carriage, W.

The interior of the box, J, contains three radial grooves, into which the cutting dies, K, are fitted to slide freely. The dies are connected by links, N, to pins, k, on another ring, M, which latter is fitted loosely to the front of J, so that it may be partially rotated by the aid of the arm, P', and thus draw together or separate the cutting dies, K, at pleasure. The plate, M, has an opening in its center large enough for the largest sized bolt to pass freely through, and the projecting rim or lip, z, fits accurately against the faces of the dies, K, so as to confine them in their grooves without

MOORE'S SCREW MACHINE.

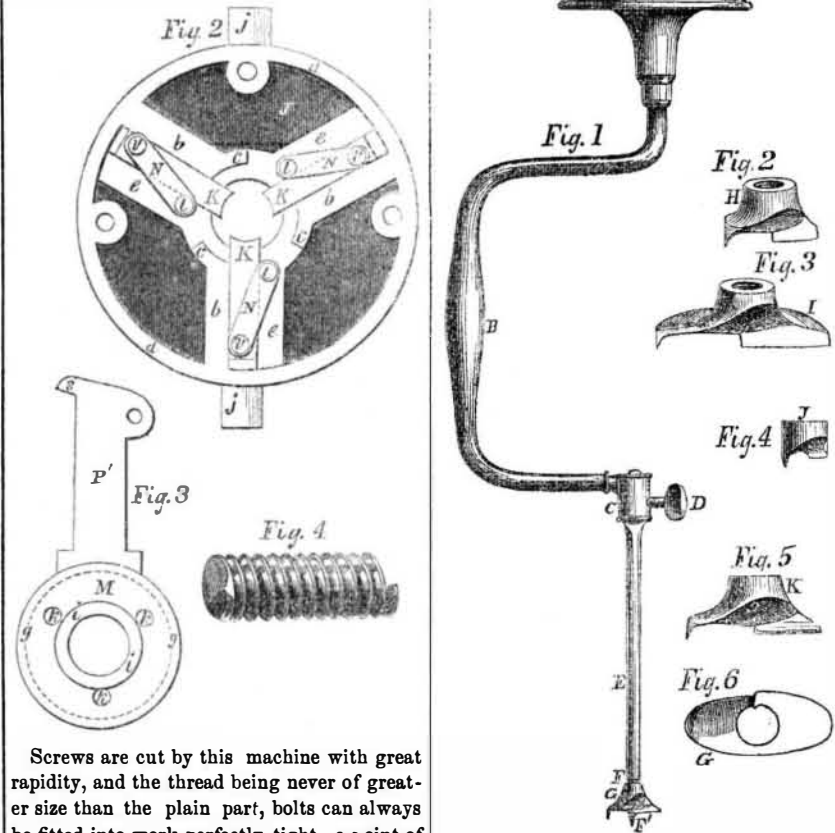


preventing their proper and easy motion. All the parts are so rebated and confined as to make a strong and durable job.

The ultimate means for controlling the position of the ring, M, and of graduating the sizes of the screws cut now remains to be explained. The handle or lever, T, is jointed to the arm P', at its extremity, and must be drawn forward, to bring the dies, K, into action. When drawn sufficiently forward, a hook or catch drops over the end of a curved stop, as indicated in fig. 1, and confines it until released by the attendant. The position of this curved stop may be adjusted at pleasure, and thus the whole machine is made readily adjustable to all the conditions required.

claimed that valve rods, or other nicely fitting parts of machinery, first turned in a lathe and then cut in this machine, will be found perfectly straight, however unequal may be the hardness of the different parts of the metal.

This machine was patented by Mr. John Moore, of Madison, Ind., in October last. One of the machines is now on exhibition at Lovejoy's Hotel, this city. Any further information may be obtained by addressing Joseph Garratt, Sen., & Charles Almond, care of John M. Slaney, Baltimore, Md., or George Almond, Madison, Ind.



Screws are cut by this machine with great rapidity, and the thread being never of greater size than the plain part, bolts can always be fitted into work perfectly tight, a point of great importance in car or agricultural machine making, bridge building, etc. It is also

vention of Mr. Charles H. Barnes, of this city.

The peculiar properties of these adjustable bits are boring a smooth hole, cutting very easy, capable of being used in a brace or handle at the pleasure of the operator, will pack in less space, and are cheaper than any other bits and gimlets boring the same sizes.

As will be seen by the cuts, a different cutter, G H I J K, etc., is provided for each size of hole to be bored, and in each instance the sharp screw point, F', of the spindle, E, projects through the cutter at its center, thereby fastening the cutter to the spindle, while the screw of the spindle projecting beyond, acts as a feed screw, like the center of an auger bit.

A set consists of 12 cutters, 2 spindles, 1 handle, wrench and screw-driver, cutting 12 sizes, from 1-4 to 1 inch inclusive. Eight of the cutters, viz., from 1-2 inch upwards, increased by sixteenths, are formed to fit on a larger and longer spindle. The remaining four cutters (1-4, 5-16, 3-8, and 7-16) are similarly adjusted on the small spindle.—Either spindle can be quickly fastened to the handle, when either of the above cutters, from 1-4 to 1 inch, can be used easily in the form of a gimlet, and by turning one screw the handle is disengaged, when all may be used in a brace.

Any further information concerning this invention may be obtained of Mr. D. B. Logan No. 11 Gold st., this city. A patent has been applied for.

Migration of Plants.

"Plants are seldom motionless. The wind wafts the seed of the dandelion. The waves bear the nut of the cocoa palm. Man has carried the apple and pear, the apricot and the peach, from the highlands of Asia to the Far West. The cerealia have spread over all the world, and have become so cosmopolite that the land of their birth is unknown. Some plants would almost seem to attach themselves to particular races. The common plantain is called by the North American Indians the White Man's Footstep.' Currents of air carry seeds and the eggs of insects and infusoria. To settle this formerly disputed question, a German philosopher, Unger, placed several plates of glass, carefully cleaned, between the almost air-tight double sashes with which he protected his study against the rigors of a fierce northern climate. Six months later he took them out, and examined the dust that had fallen on them, through imperceptible cracks and crevices, with a microscope. The result was that he discovered in the apparently inorganic dust the pollen of eight distinct plants, the seeds of eleven varieties of fungus, the eggs of four higher infusoria, and living individuals of at least one genus."

Observations like this go far to disprove the evidences of new created life which are often discovered both in natural and artificial compositions. It seems sometimes almost impossible to imagine how eggs or seeds could have either found admittance or retained vitality under circumstances where life appears, and it has not been deemed inconsistent with revelation to suppose the work of creation still going on. But such instances as above recorded induce a great reluctance to believe in newly originated life, and to induce a belief that the varieties of animals and plants which appear at intervals are but modifications generated from pre-existing species.

Paddle Wheel Experiments.

One of the large towboats plying about our harbor has wheels with pointed paddles, or rather with paddles so arranged as to produce the same effects, and covered by wheel-houses of such form as would only allow of paddles so arranged. It has been claimed that her performance is decidedly better than with the old wheels.

The accompanying cuts represent a new tool for boring holes of various sizes, the in-



[Reported officially for the Scientific American.]
LIST OF PATENT CLAIMS
 Issued from the United States Patent Office
 FOR THE WEEK ENDING MARCH 3, 1857.

FRICTION ROLLERS IN SHIP'S BLOCKS—John Allen, of New London, Conn.: I claim the pieces, F, F', placed behind the rollers, in combination with the flanges, or their equivalents, to hold the rollers in position end-wise, substantially as described, and permit them to revolve, thereby dispensing with the pivots and rings heretofore used for that purpose.

PLATES FOR ARTIFICIAL TEETH—A. A. Blandy, of Baltimore, Md.: I claim molding the plates of artificial teeth in such manner as to obtain a perfect fit to the gums, and a correct articulation of the teeth upon casting as set forth.

SHUTTLE DRIVERS—Saml. Boorn, of Lowell, Mass.: I claim the described composition, to be used in the manufacture of the striker of a shuttle driver, as described.

SEWING MACHINES—C. D. Belcher, of Charleston, S. C.: I claim the improvement on the patents of A. B. Wilson, described, consisting in the application of an unyielding brake, to hold the loop upon the revolving hook, and imparting a positive movement thereto, in such a manner as to separate it from and bring it to the periphery of the hook at the proper moment, substantially as specified.

PEN AND PENCIL HOLDER—G. H. Byron, of Governor's Island, N. Y.: I do not claim the diagonal frames nor the holders.

I claim the attachment of the handles of the holders to a diagonal expanding frame and the general arrangement.

I also claim the handle, A, and the arms, d, working by pins in slots, in the attached holders, and secured by thumb screws to the handle, A.

Neither do I limit myself to any number of holders, which may consist of any required number.

I also claim its application by attaching pens, known as "music pens," instead of the ordinary writing pens for ruling several staves of music at one operation.

HAND STAMP—Leonard Bailey, of Winchester, Mass.: I claim arranging an ink fountain and its discharging roller at the foot of the slider and between the same and the type or printing plate, and so as to be movable therewith, substantially as set forth.

I also claim arranging the forked lever, L, of the inking roller, with respect to the slider, C, substantially as described, so that while the palm of a person's hand is placed on the top of the slider or more of the fingers can operate said lever, or the upper arm thereof, in a manner to move the inking roller backward against the type, and into a position to come in contact with the fountain roller, when the slider is next depressed.

SEWING MACHINES—Joseph W. Burnham, of Hartford, Conn.: I claim the employment on sewing machines of the mechanism herein before described, so as to cut or clip the thread on the under side of the work.

TRIP HAMMERS—Henry Bushnell, of New Haven, Conn.: I claim the use of the male and female, V, wheels, having as specified a portion of the surface of either one of them removed, so as to permit the hammer to drop freely when arranged, substantially in the manner and for the purposes set forth.

WASHING MACHINES—Richd. Collins, of Chicopee, Mass.: I claim combining with and arranging in the vibratory dasher, as described, one or more soap receptacles or chambers, each provided with an aperture of discharge and a stop cock or faucet, or the equivalent thereof, disposed substantially in manner, and so as to operate as specified.

LUBRICATING FIRE ARMS—Samuel Colt, of Hartford, Conn.: I claim the method of applying oil or other lubricating matter to the outer surface of the ball, or as the equivalent, to the bore in close proximity with the ball, after the ball has been inserted by means of an instrument having a reservoir of liquid lubricating matter in combination with a valve or other equivalent means for discharging the required quantity of lubricating matter, substantially as described and for the purpose set forth.

CHURNS—E. P. Cowles and J. A. Cowles, of Oakfield, N. Y.: We distinctly disclaim the invention of two dashers, moving in contrary directions and operated by geared wheels and an intermediate pinion. Examples of such an arrangement are seen in Brown and Bigelow's patent, 1832, and in Mansfield and Moore's rejected application, 1833; but in neither of these examples, nor in any other churn which we are acquainted, is our feature seen, of having the arms of the dashers so curved as to draw the cream from the center of the churn, and force it against the sides of the machine for the purposes set forth.

We disclaim the use of curved arms, except when thus employed and operating.

Having the connecting pinion, F, adjustable, in the manner and for the purposes described, is also a new and highly valuable feature in this description of churn. Without this adjustability it would be almost impossible to collect the butter.

The employment of springs, g, and, i, saves the necessity of stuffing boxes to prevent leakage. These features are also new in churns to the best of our knowledge and belief.

We disclaim every part and feature of our device which is seen in any other churn or analogous machine, but we claim and desire to secure by letters patent the shafts, B, C, with collars, f, h, and wheels, D and H, thereon, in combination with springs, i, and g, arranged and operating in the manner and for the purposes set forth.

[If report be true this churn will bring the butter in a wonderfully short time, and also extract more of it from a given quantity of cream. Double dashers are employed whose arms are of peculiar shape, whereby the cream receives an unusually thorough beating. After the butter has "come," it is easily collected by disengaging a pinion, and allowing both dashers to turn in the same direction.]

HAND PRINTING PRESS—N. L. Chamberlin, of West Roxbury, Mass.: I claim, first, the method described, of hanging and balancing the impression roll, for the purpose set forth.

Second, the method substantially as set forth, of adjusting the impression roll to increase or diminish the pressure given and adapt it to the size of the form and the height of the type or block.

CUTTING PASTEBOARD FOR BOXES—E. E. Clarke, of New Haven, Conn.: I claim the method of attaching and adjusting the cutters in combination with the main cylinder, when the whole is constructed, arranged, and made to operate substantially as described.

Second, the combination of the spring clamp, M, with the main cylinder and cutters, when constructed and made to operate substantially as described.

SHEEP SHEARS—E. G. Chambers, of Bucyrus, O.: I claim the fixed plate stock, C, as described, combined with the bifurcated handle of the vibrating cutters, substantially as and for the purposes specified.

HARVESTERS—S. A. Clemens, of Rockford, Ill.: I claim the method of operating the sickles of harvesters by means of a catch wheel, a spring, and a recoil cushion connected, combined and attached substantially as described.

POTATO DIGGERS—Paul Dennis, of Stillwater, N. Y.: I claim, in combination with the digger, A, in the manner described and shown, constructing the separator, so as to form an irregular undulating surface for the potatoes to fall upon, for the purpose set forth.

[The stops or elevations of the separator are arranged out of line with each other, so that the irregular undulating surface may effectually break up the dirt surrounding the potatoes, and prevent its passing off readily from the separator. The latter runs directly upon the ground behind the digger, and by turning upon a shaft at the forward end, adjusts itself to the different depths to which the digger may be caused to enter the soil, or to rise in passing over obstacles. After the potatoes come upon the separator they roll some distance along a plane portion where the dirt is stripped off and left adhering to the ground beneath, and by the time the potatoes are carried over the irregular stops, and a terminal plane portion, they are pretty thoroughly cleaned.]

SUSPENDING WIND WHEELS—Joseph de Sendzimir, of South Oyster Bay, N. Y.: I do not claim the regulation of the sails by weights, levers, and cranks. Nor the use of brakes for stopping the wind wheel. Nor communicating power by pulleys, bands, cones, &c. Neither do I claim any part or feature of the machine described, which is seen in any other windmill.

But to the best of my knowledge it is new to suspend the wind wheel within a revolving frame, in the manner and for the purposes already described.

I claim suspending the wind wheel, A, within a revolving frame, b, c, in the manner and for the purposes substantially as set forth.

[The wind wheel in the above improvement is of the ordinary vertical kind; but it is placed within a frame which is pivoted at the top and bottom. The arrangements for supporting the frame are cheap and simple. The wheel is placed in the center of its shaft; it there runs easier than when placed at the extreme end, as in common windmills. The sails are rendered self adjusting, and the wheel may be so set as to run at a given speed, although the wind may fluctuate considerably. The general construction of this wheel is such that it can be made by any farmer or an ordinary mechanic. No castings are required. It is a good invention.]

MAKING TIRE FOR CAR WHEELS—John Evans, of Portsmouth, O.: I claim the use of the rings, A, in connection with the segments of iron as herein described, the same being cut and piled and prepared for forging in the manner set forth, for making tire for railroad car wheels, locomotives and other purposes.

CIRCULAR SAWING MILL—Phlander Eggleston, of Mobile, Ala.: I do not claim separately the means employed for feeding the log to the saws and gibbing back, for that is a well known device and in common use.

But I claim, first, suspending the log, P, to the carriages, F, F', by means of the bars, n, and, x, arranged substantially as shown with the screw rods, z, q, and shafts, u, whereby the log may be firmly lodged or secured in proper position, and also adjusted or elevated or depressed to the desired position or height.

Second, I claim suspending the log, P, from the carriages, F, F', as shown in any proper manner, in combination with the two saws, B, E, arranged as shown, and the feed movement composed of the shafts, J, L, with their respective pulleys and belts, and the clutch operating as described.

[This invention provides for the employment of two circular saws, the arbors of which are mounted in sliding frames, so that the saws may be set to the log instead of the log to the saws, and that the saws may work on opposite sides of the log. By having the carriage placed at the upper part of the framing, and the log firmly and conveniently suspended therefrom, a free space is left on the flooring for the attendants, and a less number of consequently required.]

MACHINES FOR HARVESTING CORN—J. H. Frampton, of Hopewell, O.: I claim the body, H, so arranged that it may be operated to discharge the stalks, as described, in combination with the rods, O, O, placed in said body and provided with curved ends or gripping arms, p, p, as shown for the purpose specified.

CHRONOMETER ESCAPEMENTS—James Fulton, of Louisville, Ky.: I claim the combination of two levers in such a way that one spring may perform the offices above described by acting on both of them.

BRIDGE TRUSSES—Albert Pink, of Parkersburg, Va.: I do not confine myself to the particular form of the shoe casting, d, or the mode of connecting the suspension rod with the same. This may be varied according to circumstances to carry out the object in view, viz., the support of either the upper or lower chord of truss.

I do not claim the general arrangement of the parts, b, b, c, c, a, a, or any of the details of their connection with each other; but what I do claim is the use of an auxiliary truss which is to consist of the lower part, c, c, of the counterbrace, c, c, and of a piece, a, placed between the two main braces, b, b, independent of these braces substantially as herein set forth.

HARVESTERS—Lewis W. Harris, of Waterville, N. Y.: Having thus fully described the nature of my invention, I would state that I am aware two rock shafts with segmental wheels and pellets have been worked from a crown wheel, and to one of which shafts the pitman was connected to vibrate the cutters, this I do not claim; but what I do claim is, first, in combination with the alternating projecting lugs, a, b, the rocking shafts, L, L, with their toe-pieces, cranks and connecting rod, N, for the purpose of operating the cutters, as set forth.

I also claim hanging the shafts, L, L, in the hinge pieces, K, K, when said hinge pieces are put within the control of the conductor, by means of the rods, h, h, and treadle, or their equivalents, so that he may from his seat throw the cutters into and out of gear, as herein set forth and explained.

HAND STAMP—Horace Holt, of Winchester, Mass.: I do not claim operating the platen or stem and the inking roll by a simple operation of the hand; but I claim the combination of a detached lever, with its toe-pieces for inking and taking the impression, when said inking and impressing devices are returned to their places by springs as set forth.

[This invention works the platen by a cam, which may be worked in any ordinary manner so as to serve as a hand stamp or a foot press, or may be worked by power, as preferred. As a power press, it is designed principally for card printing. It appears a simple and very effective device.]

SCREW WRENCH—B. F. Joslyn, of Worcester, Mass.: I claim a hammer-shank, with a thread on both edges, fitting into a nut, when combined with the other parts of the wrench, arranged as shown and described.

[The shank of the lower and stationary jaw is made hollow, so as to receive the bar of the sliding jaw, and also to receive a screw which is fitted within the hollow shank, by the side of the bar of the sliding jaw, and passes through a projection on the side of the same, so as to protect the threads from dust or injury.]

WEAVER'S SHUTTLES—Lucius J. Knowles, of Warren, Mass.: I am aware that a stop-motion or mechanism has been applied to a shuttle and race beam of the loom, and as to operate in such manner as to prevent the breakage of the filling thread of the bobbin of the shuttle as to stop the motion of the shuttle or arrest it in the race beam before it could enter the shuttle box next to that part of the said stop-motion which was affixed to the race beam. In this kind of stop-motion the shuttle in being arrested in its motion across the race is liable to be driven by the reel close into the crossing of the warps. In case such should take place, injury to the warps or loom may ensue. My stop-motion is of an entirely different kind, as it allows the shuttle to enter each shuttle box, and when once in either box, the loom will be stopped in case the filling thread may have been broken during the passage of the shuttle across the race beam, and into such box.

I claim the combination of the tilting lever, F, the inclined wires, G, G, or the equivalent of the latter, and a spring cam, C, or means essentially the same as said spring cam, whereby, in case of breakage of the thread from the shuttle while the latter is in motion across the race beam of the loom, the cam or contrivance to operate the protector may be caused to act with or against such protector, as is equivalent, that it shall be made to produce stoppage of loom, as stated.

RAKER FOR REAPING MACHINES—Caleb Lee, of Knox Township, O.: I claim the two spring latches, l, l, working upon the arm, k, in combination with the pointed lever, g, the latches being notched to receive the same, and both the lever and latches being arranged so as to be acted upon alternately by pins, p, p, to raise or lower the rake and hold it in either position as required, all in the manner and for the purpose set forth.

BASE COCK—Robert Leitch, of Baltimore, Md.: I claim the arrangement of the loose stop piece, c, connected with a male screw thread on the periphery, and the means for operating it vertically without turning, by the fixed square, F, on the stem, A, and a corresponding female screw thread, or its equivalent, in the rotating globe of the cock, B, substantially as and for the purpose set forth.

CORN HUSKER—Wm. Lewis, of Seneca Falls, N. Y.: I would remark that the connection of the hammer, G, to the rod, F, to the plate or spring, b, is not strictly essential. In practice, or in an operating machine, the hammer may be rigidly attached to the rod, F, but probably the elastic spring connection is preferable. I do not confine myself, however, to either mode of attachment.

I claim the bar, D, knife, B, bar or hammer, G, and stop, E, in combination with the clearing rod, Q, when the whole are arranged to operate conjointly as shown, for the purpose specified.

[A stationary knife with a concave edge is employed to cut off the nubbin or buttof of the ear, a bar presses down on the same, and the ear is then discharged from the husks by the action of the hammer. The clearing rod rides the knife of the nubbin, should it incline to adhere, and the action of the whole is exceedingly rapid, and not liable to choke, like many huskers.]

PHOTOGRAPHIC PLATE HOLDER—Wm. and Wm. H. Lewis, of New York City: We do not claim a sliding jaw in itself; neither do we claim adapting said sliding jaw to different sizes of glasses or holders by stops or notches taking said moving jaw.

Neither do we claim retaining articles between the jaws by power derived from a spring.

Neither do we claim turning the vice or holder upon its base into any desired position, as this has before been accomplished by a screw connecting the base and vice.

But we claim, first, constructing the hollow base, a, and hub, c, of the cap plate, b, in such a manner as to regulate the friction spring, d, screw, f, and cap, e, for regulating the power with which said plates are clamped together, substantially as and for the purpose specified.

Second, we claim regulating the force with which the spring, p, tends to clamp any glass or holder between the jaws, l and n, by means of the set screw, o, acting substantially as and for the purpose specified.

Third, we claim the beveled adjustable bars, m, on the jaws, l and n, to support the glasses, plates, or holders with their upper surface at the desired height above the upper edges of the said jaws, substantially as and for the purpose specified.

MASTIC ROOFING COMPOUNDS—C. R. Mills, of Detroit, Mich.: I am aware that most, if not all, of the articles named have been used in like compositions; and I am also aware that in some roof compositions heat has been applied to the articles separately, just before they have been put upon the roof.

I claim the composition for roofing made up of the ingredients, in the proportions and in the manner set forth.

HUSKING CORN—John Massey, of Buffalo, N. Y.: I do not wish to limit myself to the particular proportions set forth, but desire to include only such forms and proportions as substantially embrace the principle of my invention.

I claim the tapering tubular burr, B, for the purpose of removing the husks from the corn, when arranged and operating substantially as set forth.

CURTAIN ROLLERS—Purches Miles, of Hartford, Conn.: I do not claim as new the toothed flanged pulley, nor the endless eyelet band, nor the friction spring, nor the roller curtain by themselves, nor any two or three of these in combination.

But I claim the combination of the toothed flanged pulley, A, the endless eyelet band, B, and the friction spring, C, with the roller curtain, in the manner and for the purpose substantially as set forth and described.

SHINGLE MACHINE—H. D. McGeorge, of Morgantown, Va.: I claim in combination with the saw and carriage the rocking bed, F, for determining and adjusting the bolt to the thickness and taper of the shingle to be sawed, substantially as set forth.

COMPOSING TYPES—Wm. H. Mitchell, of Brooklyn, N. Y.: I claim the manner of dropping one type at a time from the lines of types in the conductor, g, by the combined operation of the pushers, 52, 53, 55, and fingers, 56, substantially as and for the purposes specified.

I also claim inclining the composing wheel, when used in connection with the inclined chute or conductor, 59, and fence, 60, on the lower side only of the inclined composing wheel, for the purposes and substantially as specified.

I also claim the compositor's grab, 65, formed in the curved shape, and used in the manner and for the purposes specified.

[NOTE.—The above includes only about half the claims of patents issued; but the late hour of their reception, due, probably, to the confusion attending the ceremonies and festivities of the Inauguration, compels the postponement of the remainder until our next issue.]

Superheated Steam.

The advantages of using steam extra heated after its separation from the water have been much discussed, and although the general opinion of philosophers and savans is adverse to its employment in any form, it is notorious that the Wethered system tried in this city on the steamer *Joseph Johnson*, and to a small extent on the *Arctic*—although the pipes could not be made to endure well—was very economical in the use of the steam, or what is the same thing, the amount of power obtained from the consumption of a given amount of fuel was very considerably increased.

Wethered's system consists in taking the steam from the boiler through two pipes instead of one, and while one pipe partly throttled is led direct to the engine, the other is led in bends through the flues or through the furnace so that its contents become very highly heated. The steam admitted to the cylinder is consequently a mixture of common steam, with superheated steam, and although it is difficult to see how this mixture differs from steam only slightly superheated, the economic effect of the system proved so much superior to that of common steam that Mr. Collins was induced to expend some thousands of dollars in minor experiments, and subsequently to apply it on the mammoth *Arctic*.

The experiment failed, but not from want of merit in the fundamental principle, and it is therefore important to understand, if possible, exactly how far and how superheating is advantageous, if at all, as the practical difficulties may possibly be surmounted by patience and ingenuity, if there be sufficient inducement.

Thomas Howard, a recent writer on the subject avers a quite sensible gain in effect from superheating steam to a moderate degree, and expresses in the following very clear manner what is probably the correct theory thereof. He enunciates it as new, which is not the fact, but he has expressed it better than any previous author:—

"Since the time of Mr. Watt's champion improvement in the steam engine, by condensation in a vessel separate from the cylinder, it has been assumed that nothing more remained to be examined or developed in this regard. Let us see if there may not be one hidden agency that perchance has escaped even the lynx eye of that scrutinizing artisan, and the apprehension of other experimentalists and engineers. Let us go the cylinder and condenser as left by him, and in practical operation. On the plenum side of the piston we have water-saturated steam pressing forward from the boiler at a temperature due only to its density, and bringing with it a quantity of uncombined water also, every smallest diminution of temperature causing an immediate deposit of water within the cylinder. When the stroke of the piston has been made, and a free passage is opened to the condenser, this water boils rapidly off imbibing the great latent heat due to a rare vapor under the existing vacuum, kept up too by the large exhaust pump; and if a new supply of steam did not presently follow, the cylinder and adjuncts would rapidly fall to about 80° Fahr. But by continued action, a compromise is brought about, under which the steam is always acting in the cylinder causing a very great deterioration of effect and loss of heat. But by giving to the steam a sufficient surcharge of caloric to enable it to maintain its elastic or vaporous condition, throughout the stroke without the deposit of water, such effect cannot, of course, take place, but only a refrigeration that would arise by the discharge of so much heated air. The same holds, but greatly moderated, in high pressure engines.

Important Improvement in Printing Presses.

We had the pleasure, last week, of witnessing a preliminary experiment, with a full-sized model, of an apparatus for turning the sheet and printing it upon the second side before it leaves the press. The apparatus, which is simple and clearly practicable, is attached to one of Hoe's celebrated "Lightning Printing Presses," used in *The Sun* establishment. It is the invention of Moses S. Beach, Esq., the Editor and Proprietor of *The Sun*, by whom it has been patented in Europe, as well as in this country.

In its operation there is no checking or reversing the ordinary movements of the press. A double or twin set of fingers, which shut against each other, are so arranged as to grasp the back or tail end of the sheet before it leaves the printing cylinder, and after the first impression is taken. The sheet, thus held fast while the cylinder continues to revolve, is drawn in again for the second impression, and thus the feeding the sheet by hand the second time, or fifty per cent. of the labor now required is saved, and, practically, the sheet is printed on both sides at once—two forms instead of one being placed upon the press.

Nor, it seems to us, does the improvement end here. The difficulty of feeding the sheets in the first place, by machinery, is not insurmountable. It can be done by cutting them from a roll, if in no other way, and then the feeding would necessarily be more accurate than it can be by hand. Spoiled sheets from irregular feeding, as well as "packets," would be almost unknown; the full speed which the press is capable of could be maintained, and uniform "register" and uniform work would be the rule. Thus, too, folding and counting machines, which are now comparatively useless, might be brought into service.

Unless we are greatly mistaken, this invention will make a stir among the newspaper folks. We regard it as a most important and valuable improvement, and congratulate our editorial brother upon its production, while, at the same time, we welcome him to the ranks of American Inventors.