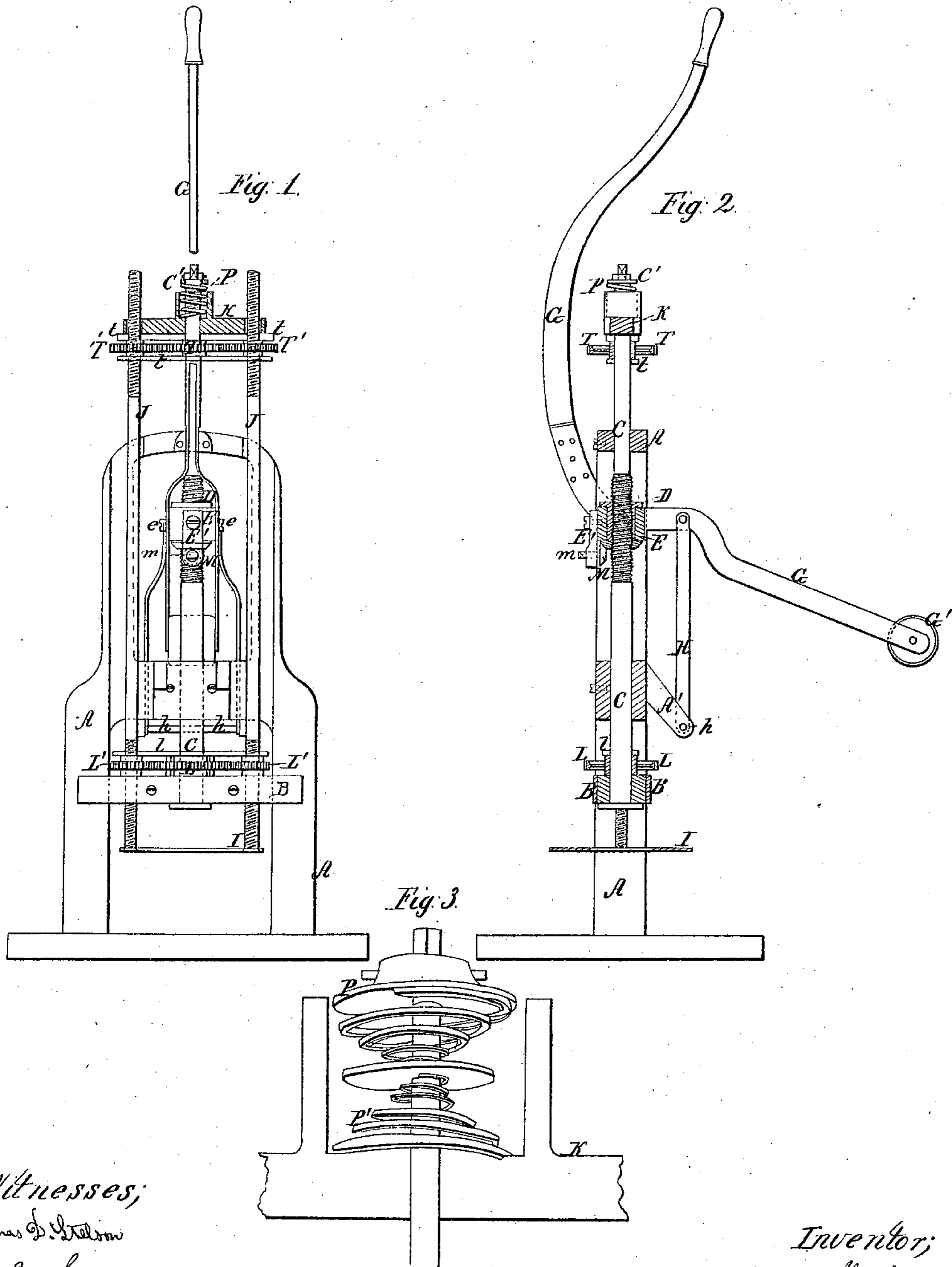


G. Mathewman,

Glass Press.

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IMPROVEMENT IN PRESSES.

Specification forming part of Letters Patent No. 52,584, dated February 13, 1866.

To all whom it may concern:

Be it known that I, GEORGE MATTHEWMAN, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Presses Adapted for Pressing Glassware and other Articles; and I do hereby declare that the following is a full and exact description thereof.

My invention consists, first, in an improved arrangement of the hand-lever and the connected parts; second, in a means for raising and lowering the spindle to adjust it for different dies or for goods of different thicknesses; third, in certain means for raising and lowering the clearer or edge-former; and, fourth, in an improved arrangement for operating the latter from the motion of the spindle, so as to better communicate the required motion and force.

My machine may be made of any approved material. I prefer that the main frame should be cast-iron and the greater portion of the mechanism be wrought-iron or steel; but this is not essential.

I will now proceed to describe what I consider the best mode of carrying out my invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a front view, partly in section, and Fig. 2 a vertical section, of my press without the dies, which latter may be of any approved character. Fig. 3 is an enlarged section of a portion.

Similar letters of reference indicate like parts in all the figures.

A is the frame-work, assumed to be of cast-iron, and B is a cross-head adapted to move vertically therein and preserve the spindle C from springing to one side or the other.

C is a spindle turning within the cross-head B and supported in the frame A, so that it is free to slide vertically.

D is what I term a "shell-nut" or "threaded tube," with flanges, as represented. It is fitted upon the spindle C, as represented, and inclosed within wrought-iron lugged shell E, which connects with the lever G, so as to be operated vertically thereby. This lever G is bent, as indicated, and carries a weight, G', at one extremity. A pair of rigid links, H, piv-

oted to an arm, A', on the frame-work A, support the lever G by aid of a cross-pin, h. The lever G is operated by pulling down the handle, and it gives a vertical motion to the spindle C and its connections, the links H H swinging or vibrating on their centers h to allow the motion, in the manner as will be obvious. The lever G is bent so that the upper ends of the links H H may come within the frame-work A or pass the center of the spindle. The weight G' tends to raise the handle of the lever G, and also to raise the spindle C and the connected parts.

E' is a bracket or hanger extending down from the wrought-iron shell E. This bracket E' supports a shaft, m, carrying a bevel-wheel, M. The lower end of the nut or tube D is beveled, as represented, and is toothed with bevel-gear corresponding to that of the bevel-wheel M. The collar on the upper end of the shell-nut D is capable of being removed at will by removing a key or the like, to allow the parts to be separated for repairs. The outer end of the shaft m is flattened or squared, and is adapted to receive a hand-crank (not represented) for turning it. By applying and turning such crank the bevel-wheel M may be operated in either direction at will, and consequently the nut or tube D will be revolved around so as to raise or lower the spindle C to any extent within reasonable limits. On completing the adjustment the hand-crank may be removed from the shaft m, and the parts M D, &c., may be kept in place either by friction or by any convenient catch and lock device. (Not represented.)

The plate I is adapted to carry any ordinary clearing device or edge-former, or other desired part of the mold or upper die, which is to be pressed down upon the material or on the top of the mold in advance of the main die. It is supported by two stout vertical rods, J J, which stand in holes in the cross-head B, and are adapted to slip vertically through corresponding holes in cross-head K, which is guided by the spindle C near its upper end. C' is a cap or nut secured on the upper end of the spindle C by a cross-pin or otherwise, so that it may be removed at pleasure. P P' are two flat scroll-springs made from tapering steel, which encircle the spindle C above the

cross-head K, and exert a force tending to press down the cross-head K and its connections. There are screw-threads produced on the lower portions of the vertical rods J J.

L is a geared wheel loosely surrounding the spindle C, and being guided or kept in place by pins or small rolls which may be mounted either on its exterior or on its interior. L' L' are corresponding geared wheels, so as to turn or move like nuts on the vertical rods J J, so as to regulate the depth or the distance at which the plate I shall be usually supported below the cross-head B. I usually employ a framework, l, to better connect the train of gearing L L' L'. When it is desired to raise or lower the plate I relatively to the spindle C and its connections the geared wheel L is seized by the hands or any suitable instrument and turned. This imparts a corresponding motion to both the geared wheels L' L' and rotates them uniformly in the same direction. This movement raises or lowers the rods J J, as will be obvious.

It will, of course, be understood by all familiar with the construction and operation of presses of this class that the variations in the character of the work require that the plate I shall in some cases stand at greater depths below the spindle C than in other cases. The adjustment above described provides for varying in this respect within any required limits; but unless some additional adjustments are provided every change in the elevation of the plate I relatively to the spindle C would involve a change in the tension of the springs P P', and consequently in the force with which the plate I would act as it comes down in advance of the spindle C, at a certain distance in advance thereof, until the plate I or its attachments presses firmly upon the work below. If it is then desired that the plate I and its attachments shall rest in that position while the spindle C continues its motion downward, the springs P P' allow this to be effected, and their peculiar construction in the form of scrolls, tapered as represented, allows them to be each pressed into a vertical space no greater than the thickness of the thickest part of the springs. They allow a wide range of motion with but a little vertical height. In order to obtain the same range of motion with ordinary spiral springs, the upper end of the spindle C would require to be prolonged very greatly, because a spiral spring, when pressed to the utmost, occupies a length equal to the thickness of its material multiplied by the number of coils. My spring is much better by reason of its requiring a lesser height. One and one-fourth inch serves for the minimum height for the spring for a large press. To allow the same range of motion with a spiral spring would require about six inches of minimum height. The traverse of both these supposed springs would be about two inches, and the tension of each, if the spring is rightly con-

structed, will be pretty nearly equal; but mine exerts a more uniform tension throughout the entire traverse, which is the character of spring desired for this purpose.

In practice the above figures hardly do justice to my spring, as in practice a spiral spring cannot be pressed solid together without danger of injuring, while mine can be pressed down solid with impunity.

In order to maintain a uniform condition for the spring as the plate I is raised and lowered in the adjustment above described, it is necessary to correspondingly adjust the position of the cross-head K on the rods J. I have provided mechanism which will accomplish this, and will also allow of adjustment independent of the adjustment at the bottom, so as to allow the force with which the plate I is depressed in advance of the spindle C to be graduated at will within any limits of which the spring P P' is capable. I have represented a train of gearing, T T' T', mounted within a frame, t t, and the wheels T' T' are threaded and their bosses are enlarged vertically, in like manner to the bosses of the wheels L' L', so as to form durable and substantial nuts which fit upon the threads on the vertical rods J. The cross-head K rests on the frame t t, or it may rest directly on the bosses of the wheels T T' T'. I prefer the latter construction, in which case the frame t t will perform the function simply of supporting the central wheel, T, and holding it and the geared wheels T' T' in their proper relative positions. The cross-head K being supported in such manner, directly or indirectly, upon the nuts or threaded wheels T' T', it follows that the turning of these wheels by the turning of the central wheel, T, in the one direction will raise the cross-head K relatively to the rods J and increase the tension of the spring P P', while the turning of the same in the opposite direction will lower the cross-head K and diminish the tension. The fact that these wheels L L' at the bottom are turned simultaneously insures that the plate I is always supported in a horizontal position. The fact that the wheels T T', near the top, are turned simultaneously insures that the cross-head K shall be always held in a horizontal position.

I can substitute for the central wheel, L, near the bottom, as also for the central wheel, T, near the top, a pitch-chain embracing the nuts or threaded wheels, and compel them to turn together by means of the said pitch-chain in lieu of the central wheels, L and T, or I can substitute for either or both of these wheels a worm-shaft extending in a horizontal position and operated by a hand-wheel or otherwise, the same being provided with worms adapted to operate simultaneously on the peripheries of the wheels on each of the vertical rods J, so as to compel the adjustment on each side to be simultaneous and equal. I consider this device an equivalent of the wheels L and T. They perform the functions simply of maintain-

ing a perfect mechanical connection and compelling uniform motion on each side of the machine. I can adopt one of these modifications at the top and another at the bottom, if desired. I square the free end of the spindle C at the top, as represented, so that in case of any derangement of the part M m, &c., I can raise and lower the spindle C by taking hold at the top and turning it, as usual.

To produce a glass goblet or other desired article, a suitable die is fixed on the lower end of the spindle C, and a suitable edge forming or clearing device is fitted to the plate I. The proper female die is now placed below, made in one or more parts, as is necessary, and moved in and out, as usual, during the period while the parts C and I remain elevated. The spindle C is raised or lowered by the working of the lever G, and the shaft m is turned so as to raise or lower the spindle C relatively to the hand-lever G, so that it shall be pressed down by the action of the lever to a proper extent without requiring the lever G to be thrown into any impossible or inconvenient position. The spindle C is now properly adjusted, care being taken, of course, to also so perfect the adjustment that the parts shall be in a proper position when elevated to the fullest extent that the lever G will allow them to rise. Next the part I and its attachments must be adjusted. This is effected by turning the wheel L in one direction or the other, correspondingly raising or lowering I, as above described. Next the wheels T T' are raised or lowered by turning the wheel T or its equivalent so as to give a proper tension to the spring P P' and induce a just sufficient pressure on the part I.

When all the parts are adjusted and melted glass or other material to be pressed is placed in the stationary female die the lever G is seized by the hand and brought down with force. The motion depresses the spindle C and its attachments and the plate I and its attachments simultaneously for a time until the plate I and its attachments rest fairly on the female die below. The further depression of the lever G now commences to compress the spring P P' and to carry the spindle C farther down until the entire movement is perfected, ready for the next operation.

The dies may, of course, be worked in a reverse position, with the male die on the bed and the female carried on the spindle C, if desired.

My press is simple, and all these adjustments may be produced with great rapidity and accuracy. The lever G, by being arranged to be operated in front of the machine and being

hung in the frame A at a low point, as represented, allows the same to be caught by the hand, on a large as well as on a small press, and drawn down with facility without the aid of a string or stepping up one or two feet from the floor, which is necessary to bring down a lever when mounted at a high point, and without the necessity for stepping around to the side or end of the machine, as is necessary where levers extend edgewise of the frame, so as to project sidewise instead of in front of the machine, and on large presses frequently requiring two men to operate the machine, evidently not doing it to as good advantage as one man can with my device.

The saving of time when one man is working alone is of vast importance in pressing glass. After the melted glass is placed in the mold or die it should be formed instantly, or it chills. My improved arrangement of the hand-lever gives this advantage by not requiring the operator to go from the front of the press to the side. It is necessary that he shall go to the front in order to shove the molders in and out of the press. My invention allows him to operate the lever instantly without moving therefrom.

Having now fully described my invention, what I claim as new in presses, and desire to secure by Letters Patent, is as follows:

1. The arrangement of the lever G, links H, and arms A', or their equivalents, the lever G being operated in front of the machine and at a low point, substantially in the manner and for the purposes herein set forth.

2. The shaft m, wheel M, and nut D, adapted to raise and lower the spindle C and its connections, substantially as and for the purposes herein set forth.

3. The within-described combination and arrangement of the connection L, or its equivalent, the gear-wheels L' L', and the frame l, or its equivalent, adapted to raise and lower the clearer I in the horizontal position, substantially in the manner and for the purposes herein set forth.

4. The within-described combination and arrangement of the springs P P', spindle C, and threaded wheels T' T', adapted to increase and diminish the force with which the plate I is pressed down in advance of the spindle C, substantially as and so as to realize the advantage of requiring little height for the entire mechanism, as herein set forth.

GEORGE MATTHEWMAN.

Witnesses:

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