J. HALEY.

Glass Presses.

No. 138,750. Patented May 13, 1873.

Fig. 1.

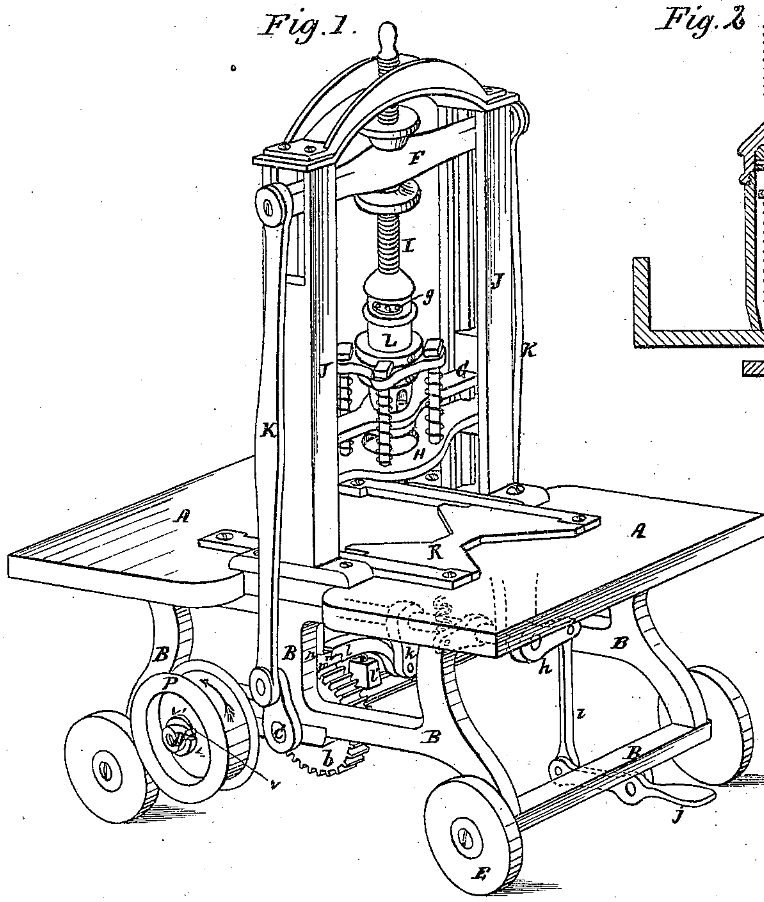


Fig. 2.

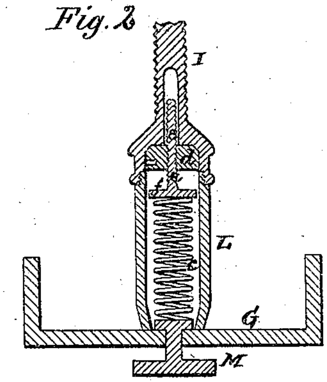


Fig. 3.

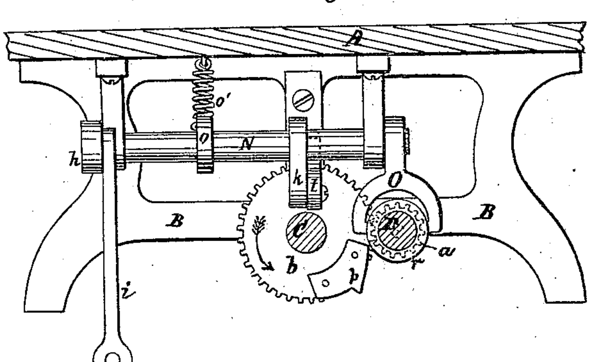
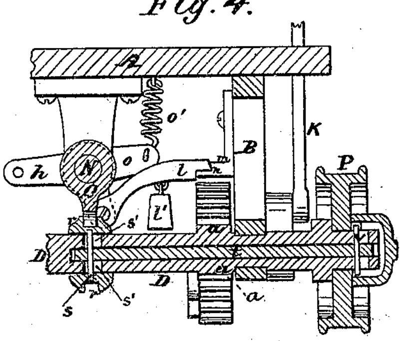


Fig. 4.



Witnesses.

John Buckley

[illegible]

Inventor.

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AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

JONATHAN HALEY, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN GLASS-PRESSES.

Specification forming part of Letters Patent No. **138,750**, dated May 13, 1873; application filed April 24, 1873.

To all whom it may concern:

Be it known that I, JONATHAN HALEY, of Pittsburg, Allegheny county, Pennsylvania, have invented certain new and useful Improvements in Presses for Molding Glass-Ware, of which the following is a specification:

This invention is designed with special reference to the production of a power-press, although some of the improvements herein comprised are applicable to presses worked by hand, as well as by steam or other power.

My invention may in general be stated to consist of the following features: First, a power-press for molding glassware, in which the cranks are driven by a rotary shaft carried by and in the frame of the press, and arranged to connect with and derive motion from the prime mover, substantially as hereinafter described; secondly, the employment, in a press for molding glassware, of a reciprocating plunger capable of yielding so as to exert an elastic or yielding pressure upon the material in the mold, in order to adapt itself automatically to variations in the quantity of glass put into the mold; thirdly, the combination, with the bed-plate of the press, of sliding mold-guides, arranged to be shifted at will from one side of the bed-plate to the other, under the plunger, whereby the press is made a double press, admitting of one, two, or more workmen working at one press at the same time; fourthly, combining with the crank-shaft and driving-shaft, a mechanism or devices substantially such as hereinafter described, whereby the movement of the plunger may be automatically arrested at any given point desired by the operator.

The above are the more important features of my invention. Other features will be developed in the course of the description, which I shall now proceed to give, of the manner in which my invention is or may be carried into effect.

Figure 1 is a perspective view of a glass-press made in accordance with my invention. Fig. 2 is a transverse section of a detached portion of the press, comprising the cross-head and the elastic or self-adapting plungers. Fig. 3 is a longitudinal vertical central section of the bed-plate and parts below the same. Fig. 4 is a transverse vertical section of a portion of the bed-plate in the plane of the axis of the driving-shaft.

A is the bed-plate, supported on a frame or legs, B, which serve as hangers for the crank-shaft C and driving-shaft D, as well as to support the press, the same being mounted in the usual way, on rollers or wheels E, to permit of the convenient transfer of the press from one locality to another. F is the yoke, G the cross-head, H the spring-plate, and I the plunger-rod, said parts being arranged together in the usual way, except in the particulars hereinafter stated. The yoke, cross-head, and spring-plate slide in pillars or posts J, and to the projecting ends of the yoke are jointed rods K, jointed at their lower ends to cranks on shaft C. I prefer to connect the rods K to their cranks, and to construct the pillars J, and the parts which move up and down between and in contact with them, in the manner described in Letters Patent granted to me July 30, 1872, No. 130,039.

Motion is communicated to the reciprocating parts which move up and down between the pillars J from the crank-shaft C, through the medium of connecting-rods K. Heretofore this shaft has been operated by hand, by means of a lever-handle, and has had a rocking motion on its axis. This movement I dispense with, and in lieu thereof I rotate the shaft continuously in one direction, indicated by the arrow in Fig. 3. The shaft is driven by shaft D, hung in the legs B, and provided at one end with a driving-pulley, which receives a belt from a main driving-shaft in the works. A pinion, *a*, on the shaft D, engages with a larger gear, *b*, on shaft C, and so causes the rotation of the latter shaft. This mode of actuating the reciprocating plunger of a glass-press by means of a rotating crank-shaft I believe to be new with me. In order, however, to render the rotary crank-shaft fully available, it becomes necessary to provide means whereby the plunger may adapt itself automatically to variations in the quantity of glass in the mold. This is not necessary where the crank-shaft has only a rocking motion and is moved by hand, in which case the reciprocating plunger can be depressed more or less, according to circumstances. But where the shaft revolves there must always be the same length of stroke to the connect-

ing-rods and yoke, and it therefore becomes necessary to devise means whereby the plunger, or the part which acts directly upon the mold, may at all times adapt itself to the quantity of glass in the mold. To this end I make the plunger capable of yielding so as to automatically adjust itself to the varying conditions above named. One mode of effecting this result is shown in the drawing. The plunger-rod terminates at its lower end in a box or case, L, Fig. 2, fastened to the cross-head G. Within this box is a spring, *c*, which, at its lower end, bears against the part M, which is the plunger or the plate to which the plunger is attached. I shall, however, distinguish this part as the plunger. It has a head within the box, upon which the spring presses, a stem passing through the cross-head, and of such length as to be capable of a certain play up and down therein, and terminates at its lower end in a plate or base of suitable formation, as shown in Fig. 2. The spring presses the head of the plunger down with a yielding pressure on the cross-head, so that when the cross-head descends and the plunger enters the mold, the said plunger, while exerting all needful pressure, can at the same time yield or give back a little, if necessary, at any time, thus being rendered self-adapting to variations in the quantity of glass in the mold. The pressure of the spring can be adjusted and regulated at pleasure by means of a nut, *d*, on the screw-stem *e* of a presser-plate, *f*, within the spring-box, which bears on the upper end of the spring. The nut rests against the top of the box, and by rotating it the presser-plate can be forced down to compress the spring, or be permitted to rise to allow the spring to expand. Access is had to the nut, for this purpose, through an opening, *g*, Fig. 1, in the side of the spring-box, through which a rod can be inserted into one of a series of holes formed in the periphery of the nut, and the latter, by means of the rod which serves as a lever or handle, can thus be turned. The presser-plate and its screw-stem is prevented from turning with the nut by means of one or more splines on the periphery of the plate fitting in a corresponding groove or grooves in the interior of the box.

I have represented one means, to wit, a metallic spiral spring, whereby the plunger is made self-adjusting, as above explained. It is obvious, however, that springs of other form and other material may be used, or indeed any suitable elastic intermediary, by means of which the plunger, while held down to its work, may at the same time be capable of adjusting itself to the varying conditions attending its use.

It is also of great advantage, if not indispensable, in a power-press operating in the manner above stated, that there should be means provided whereby the movement of the plunger may be automatically stopped at any given point, as required by the size of the molds operated on, or by other conditions. A mechanism for this purpose is shown in the drawing, and will now be described.

In suitable bearings attached to the under side of the bed-plate (see Figs. 3 and 4) is hung a short horizontal counter-shaft N, arranged above and at right angles to the shaft C D. This shaft is, at one end, (see Fig. 1,) provided with a crank-arm, *h*, connected, by a pitman, *i*, with a treadle, *j*, pivoted to the frame B. At a point on the shaft about opposite the large gear *b* on shaft C is another crank-arm, *k*, to which is pivoted a latch or catch, *l*, resting on a shelf or ledge, *m*, fixed to the inner side of frame B over gear *b*. The latch is preferably provided with a small weight, *l'*, to hold it down on the shelf. The shelf is provided with a notch or offset, *n*, the upright face of which is slightly beveled, so that its top may slightly overhang its base. The outer end of the latch is correspondingly beveled to fit against the face. On shaft N there is another crank-arm, *o*, to which is attached one end of a spiral spring, *o'*, the other end of which is fastened to the under side of the bed-plate. This spring tends to draw or rotate the shaft N in a direction opposite to that in which the latter would be moved by depressing the treadle. An inclined lug, *p*, designed to strike and lift latch *l* at the proper time, is fixed to the inner face of gear *b* so as to project some little distance beyond the periphery of the same. To the inner end of the shaft N (see Fig. 3) is fixed a shipping-fork, O, the two arms of which straddle a flanged disk, *r*, on shaft D. This disk is capable of sliding on the shaft, the extent of its movement being limited by a cross-pin, *s*, extending through slots *s'* in the shaft, and also through a sliding rod, *t*, arranged centrally within the shaft, as shown in Fig. 4, and extending out through the shaft on the side where the driving-pulley P is located, being provided at that end with a semi-clutch, *v*, to engage with a stationary semi-clutch, *v'*, on the hub of pulley P. The pulley is mounted loosely on the shaft D, so that it will only impart movement to the same when the two parts of the clutch engage.

The above is a description of the various parts of the locking and releasing mechanism. The operation of the same is as follows: Supposing pulley P to be revolving in the direction of the arrow in Fig. 1, the parts *v v'* of the clutch engaged, and the latch *l* held down in its notch on ledge *m*. The parts will continue in this position until, by the revolution of gear *b*, lug *p* strikes against the under side of the latch and disengages the latter from its notch. Spring *o'* will now be free to act, and will consequently rotate the shaft N to such an extent as to throw the end of the latch up on shelf *m* above and beyond the notch, and, through the medium of shipper O, to push out the sliding rod *t* far enough to disengage the two parts of the clutch. Shaft D will now remain at rest, pulley P will revolve loosely on the shaft, and all movement

of the crank-shaft and parts connected with it will cease. To again start the press, the pedal *j* is depressed. This rotates the shaft N in a direction opposite to that in which it is drawn by spring *o'*. The pedal is depressed until the end of the latch falls into notch *n*, at which time the two parts of the clutch *v v'* will have become re-engaged, and the press is once more in motion. When the foot is taken off the pedal the spring *o'*, tending to draw the shaft in the other direction, will jam the beveled end of the latch (held down by weight *l'*) against the beveled upright face of the notch *n*, and the latch will be thus engaged and held down in place until the lug *p*, by the rotation of the shaft C, is again caused to raise it, as above explained. The lug *p* can be fixed and adjusted upon any part of the gear *b*, so as to arrest the movement of the plunger at any given point in its ascent or descent, and two, three, or more of these stops or lugs may be employed, as required, by the exigencies of the work. Upon the bed-plate A is a sliding double guide, R, which moves in or between ways on the bed-plate, and can be shifted from end to end of the plate, so as to be used from either end of the bed-plate. By this simple arrangement the press is made in reality a double press, and can be used by two, three, or more operators working from opposite sides of the press.

Under the arrangement hereinbefore described of the stopping and starting mechanism, the automatically self-adjusting plunger, and the rotating crank-shaft, it will be noticed that provision is made for all exigencies of the work.

The press can be operated by power, while it is perfectly under the control of the workman. The movement of the plunger can be arrested at any given point during its descent as well as its ascent; and when its descending movement ceases at such given point any further irregularity or inequality, whether due to variations in the quantity of glass or to other causes, is compensated for by the yielding of the plunger.

The driving mechanism is so arranged that while carried by the press it is under the bed-plate and out of the way. If occasion requires the press to be transferred from one furnace or locality to another, the belting on the driving-pulley is removed, and after the shifting of the press has taken place another belt, from a suitable driving-pulley provided at the proper point on the main line of shafting in the works, is carried over pulley P.

Having now described my invention, and the manner in which the same is or may be carried into effect, I wish it to be understood that I do not confine myself to the precise details herein shown and described in illustration of my invention; but

What I claim, and desire to secure by Letters Patent, is—

1. A power-press for molding glassware, in which the reciprocating parts that operate on the mold are actuated from or by a crank-shaft having a continuous rotary movement in one direction during the operation or working of the press, substantially as and for the purpose herein shown and set forth.

2. In a press for molding glassware, a reciprocating plunger, arranged to act on the material in the mold with a yielding pressure, which admits of its automatically adapting itself to variations in the quantity of glass in the mold, substantially as shown and set forth.

3. The combination, in a glass-press, of a crank-shaft, continuously rotating in one direction during the working of the press, and a reciprocating plunger connected with and deriving its movement from said crank-shaft, and automatically self-adjustable to variations in quantity of glass in the molds upon which it acts, substantially as and for the purposes described.

4. In a power-press for molding glassware, the combination, with the rotary crank or driving-shaft which actuates the reciprocating plunger, of a stopping and starting mechanism, arranged and operating substantially as herein shown and described, whereby the movement of said crank-shaft may automatically be arrested in order to stop the movement of the plunger at any given point or points in its ascent or descent, as and for the purposes set forth.

5. The combination, in a glass-press, of the following elements, namely: A rotary crank or driving shaft, a reciprocating plunger deriving its movement from said shaft, and automatically self-adjusting to variations in quantity of glass in the molds, and a stopping and starting mechanism, whereby the movement of said shaft, and consequently of the plunger, may be arrested automatically at any given point or points, substantially as herein shown and set forth.

6. The combination of the plunger-rod, spring-box, cross-head, plunger, and spring or elastic cushion within said box, the same being arranged together for joint operation, substantially as shown and set forth.

7. The combination, with the spring-box, its inclosed spring, and the plunger, of the presser-plate, adjustable to regulate the compression of said spring, and its consequent pressure upon the plunger, substantially as and for the purposes shown and set forth.

8. In combination with the reciprocating plunger and the bed-plate, the sliding mold guide-plate, moving in guides or ways on the bed-plate, and arranged with relation to the plunger, substantially as shown and set forth.

9. The herein-described stopping and starting mechanism, constructed and organized as set forth, in combination with the crank-shaft and the driving-shaft, under the arrangement and for operation, substantially as shown and specified.

Witnesses: JONATHAN HALEY.

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WESLEY BENNETT.