2 Sheets—Sheet 1.

J. HALEY.

PRESSES FOR MOLDING GLASSWARE.

No. 181,434. Patented Aug. 22, 1876.

Fig. 1.

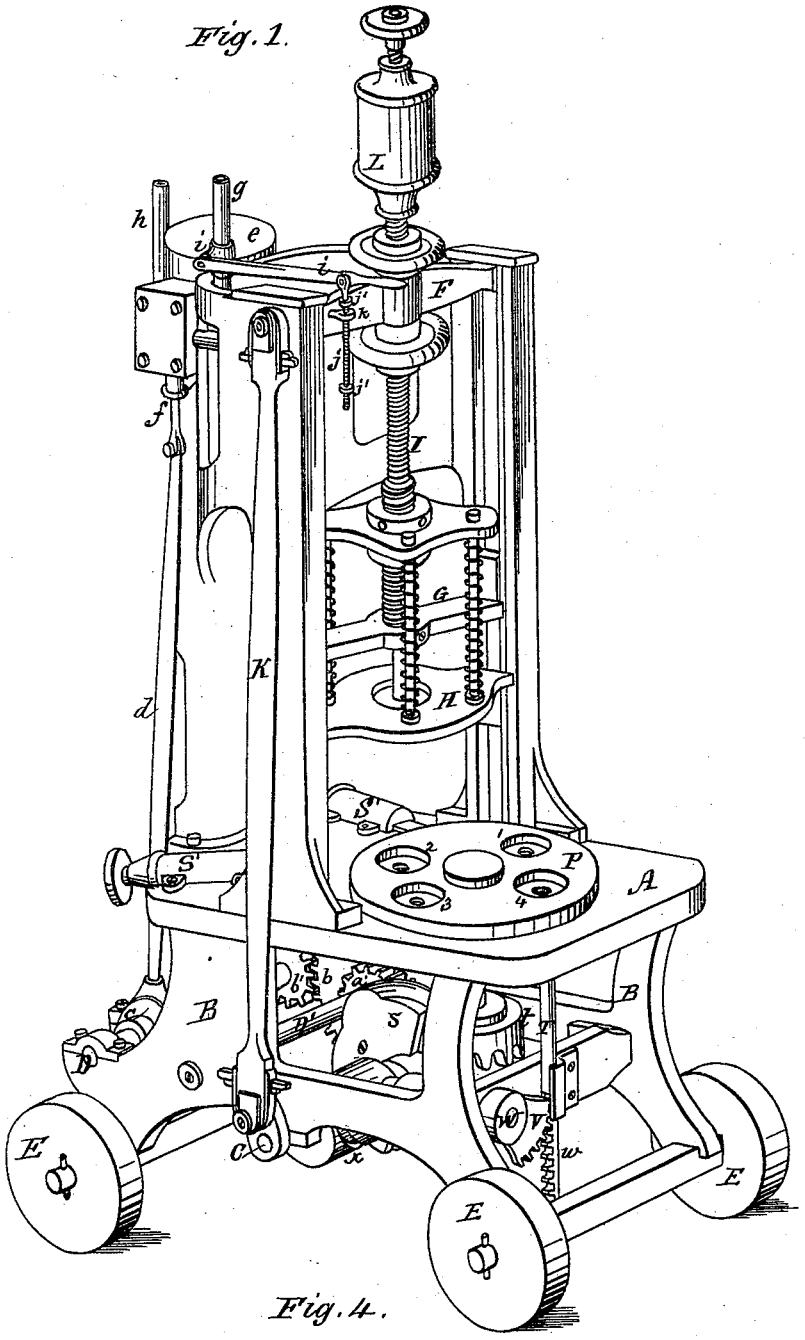
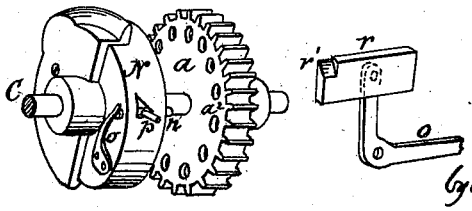


Fig. 4.



Attest:
Ewell & Dick
Henry R. Elliott

Inventor
Jonathan Haley
by Galtup Pollock & Daily

2 Sheets—Sheet 2.

J. HALEY.

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Fig 2.

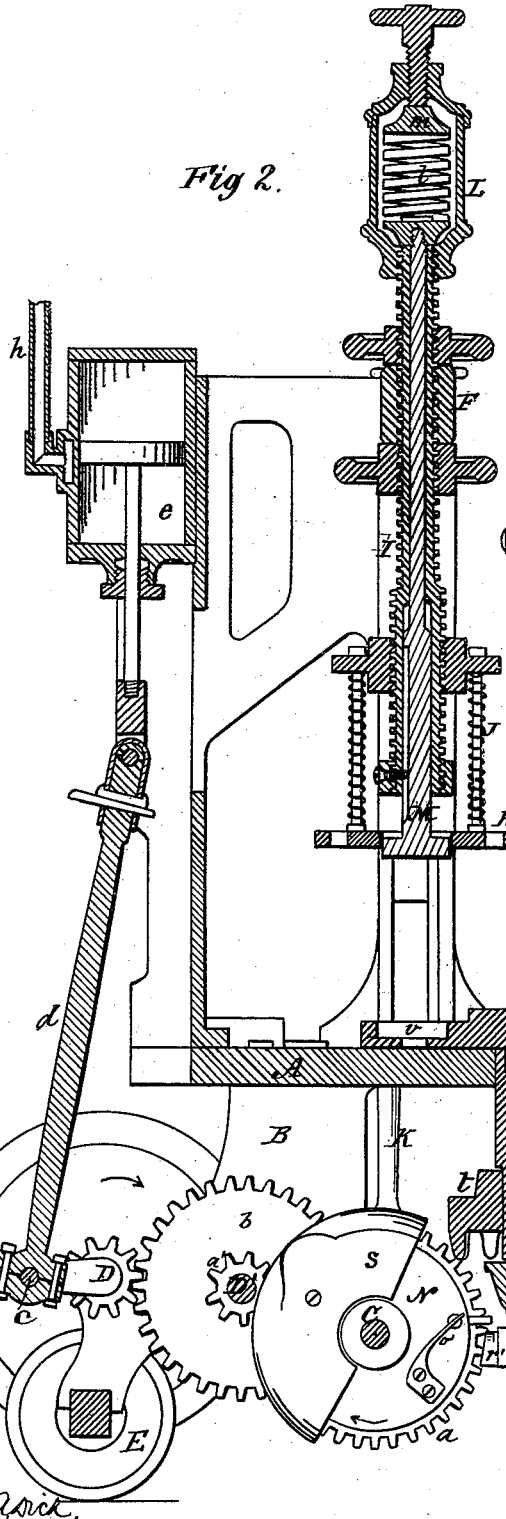
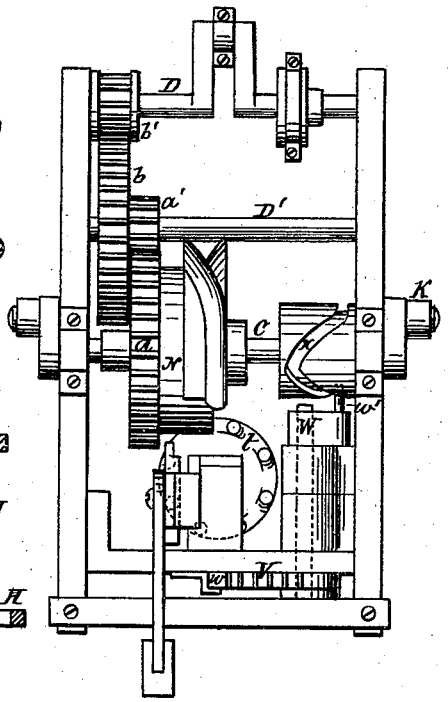


Fig. 3.



Attest:
Ewell Asick
Henry R. Elliott.

Inventor.
Jonathan Haley
by Wallis Pollock & Baily

UNITED STATES PATENT OFFICE.

JONATHAN HALEY, OF ROCHESTER, PENNSYLVANIA.

IMPROVEMENT IN PRESSES FOR MOLDING GLASSWARE.

Specification forming part of Letters Patent No. **181,434**, dated August 22, 1876; application filed July 21, 1876.

To all whom it may concern:

Be it known that I, JONATHAN HALEY, of Rochester, Beaver county, Pennsylvania, have invented certain new and useful Improvements in Presses for Molding Glassware, of which the following is a specification:

The improvements hereinafter described have special reference to power-presses for molding glass, but in some respects are applicable to hand-presses.

The particular machine I have had in view in making these improvements is that shown and described in my Letters Patent No. 138,750, dated May 13, 1873.

My present machine embodies, in principle, the more important features of the patented machine—*e. g.*, a reciprocating plunger, which automatically adapts itself to variations in the quantity of glass in the mold; a power-driven rotary crank-shaft for imparting movement to the reciprocating parts that operate on the mold; and a stopping and starting mechanism to automatically arrest the movement of the plunger at the proper point. I have, however, made many improvements conducing to the better working of the machine, as well as to simplifying its construction; and I have added features relating principally to the driving mechanism and to the mold-plate, which are not found at all in my patented machine.

These improvements can best be explained and understood by reference to the accompanying drawing, in which—

Figure 1 is a perspective view of a glass-press embodying my improvements. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a bottom view of the glass-press. Fig. 4 are details showing the clutching and unclutching mechanisms.

A is the bed-plate; B, the supporting frame or legs; C, the crank-shaft; D, the driving-shaft. These parts are arranged substantially as described in my Letters Patent No. 138,750, save that the crank-shaft C is geared down to move comparatively slowly, but with great power, by means of the intermediate shaft D′ and pinions and gears *a a′ b′ b*, as shown in Fig. 3. The machine is mounted, as usual, on wheels E. F is the yoke; G, the cross-head; H, the spring-plate; I, the plunger screw-rod; J, the pillars or posts; K, the rods connecting the yoke with the cranks on shaft C. These parts are preferably constructed and arranged together in the manner described in my aforesaid Letters Patent, except in the particulars hereinafter mentioned.

In my former machine I put the driving-shaft D in motion by belting leading from the main driving-shaft of the works. This, in practice, I have found defective on some accounts, principally because of failure to obtain sufficient power, and because of the slipping of the belting at times, as well as the giving out of the belting, due to the heat from the furnaces. To remedy this I now drive the shaft D by providing it with a crank, *c*, to which is jointed a pitman or connecting-rod, *d*, jointed at the other end to the sliding cross-head of the piston-rod of a steam-cylinder, *e*, supplied with steam from any suitable source, by ordinary or suitable valve-gear *f*, operated from shaft D, in the usual way. The cylinder is placed vertically in a suitable frame, as shown, making part of the frame of the machine. In other words, I arrange a steam-engine on the press, and connect it directly with the driving-shaft D. Steam is supplied to the valve-chest through pipe *g* from any suitable source. The connections with the source of steam-supply are preferably flexible, to permit the press to be moved at will. The exhaust-pipe is marked *h*.

Inasmuch as the press, except when actually operating on the molds, can be run without any great expenditure of power, I provide means whereby the supply of steam to the cylinder can be regulated to accord with the requirements of work. To this end I provide the steam-pipe *g* with a throttle-valve, *i*, connected with a suitable governor, operated by some moving part of the press, to increase the steam-supply while the plunger is delivering its pressure, and to diminish the supply as soon as this operation is finished. One simple way in which this can be done is by providing the throttle-valve with a long lever or handle, *i*, to which is jointed, at a point thereon about in line with the front of yoke F, a vertical governor-rod, *j*, which passes through an eye, *k*, on the yoke, and is provided, above and below that eye, with a stop or nut, *j′*, the two nuts being so placed

that when the yoke descends the eye *k* will bear on the lower stop *j'* at the proper time to pull down the lever *i*, and thus open the throttle and obtain increase of steam-pressure at the time the glass is being pressed. When, on the other hand, the yoke rises, the eye *k* will at the proper time come in contact with the upper nut *j'*, and thus decrease the steam-supply. This latter action of course takes place when the yoke is near the end of its up movement. When it completes this movement it stops, as hereinafter described, while the engine still keeps in motion.

In practice, I make the nuts *j'* adjustable on the governor-rod, so as to increase and diminish the steam-supply at any desired time during the movement of the pressing mechanism.

In order both to obtain an elongated bearing for the plunger, and to so arrange the parts that a more sensitive and a better yielding cushion can be had for the plunger, I now make the screw-rod I hollow through its length. Up through this tubular screw-rod extends the plunger-spindle M, for which the screw-rod constitutes an elongated tubular bearing, the internal and external diameter of which is increased at the lower part to receive the enlarged lower end of the spindle, this enlargement being for the purpose of giving the spindle additional strength at the point where it is particularly subjected to strain. On top of the screw-rod I fix a case, L, containing the spring *l*, which bears against the upper projecting end of the spindle M. The pressure of the spring is adjusted by a screw-presser, *m*. The spindle is prevented from turning in its bearing by a spline on the one fitting a groove in the other.

By this arrangement of parts I obtain an elongated bearing, which will prevent the spindle from wearing loose. I am also enabled to increase the length of the spring, and to place it in such position that its pressure can readily and conveniently be adjusted at any time.

The stopping and starting mechanism that I now make use of is as follows: The gear *a* is loose on crank-shaft C. Alongside of gear *a* is a hub, N, fixed to the shaft. Through the hub works a clutch-pin, *n*, which is pressed up toward the contiguous face of gear *a* by a spring, *o*. From the clutch-pin projects a radial pin, *p*, through a slot formed in the periphery of the hub N, the slot being in line with the socket in the hub, and of sufficient length to permit the pin *p* to move the required distance back and forth. The gear *a*, in its face, has formed a series of holes, a^2, arranged so that each in turn will come opposite the clutch-pin *n*. The spring *o* pushes the pin forward, so that, as the gear revolves, the pin will find and enter one of the holes a^2. When this takes place the crank-shaft C will partake of the rotary movement of the gear *a*. In order to disengage the gear and the clutch-pin *n*, I provide a stop-piece, *r*, the inner end of which is beveled on the side, as seen at *r'*, and so placed that when the crank-shaft revolves in the direction indicated by the arrow the pin *p*, which may be termed the "unlocking-pin," will, at the proper time, be brought in contact with the stop, and caused to travel over its beveled or inclined face in such manner as to retract the pin *n*, and thus arrest the movement of the press. This takes place when the yoke F is at its highest point, at which time the cranks of shaft C are about passing their upper dead-centers.

The engine continues in motion, while the press remains at rest, until the unlocking-pin is disengaged from the stop. This disengagement I readily effect by mounting the stop on the inner arm of a lever-treadle, O. By depressing the treadle, the stop will be drawn back from the pin, thus leaving the spring clutch-pin free to again engage the gear *a*. This mechanism is simpler, cheaper, and less liable to get out of order than that used by me in my patented machine.

The crank-shaft, under the arrangement described, makes one full revolution, and then stops, unless the treadle is depressed so as to take the stop out of the way of the unlocking-pin.

In lieu of the sliding mold-guide plate shown in my patented machine, I now make use of a rotary plate, P. This, preferably, has four equidistant sockets for the molds, and makes a quarter-revolution at each rise and fall of the plunger, its movements being so timed that they take place when the plunger is removed from the molds.

When the mold reaches the point 1 it is filled, and the glass is cut off. The next quarter-turn brings it to position 2, where the glass is pressed. The glass then cools in passing successively to positions 3 and 4, and at the latter point is removed from the mold. The movement of the rotary mold-plate is effected in this instance by a worm-thread, *s*, on the periphery of the hub N, which engages a crown-wheel, *t*, on a vertical arbor, R, supported so as to revolve in suitable bearings.

The rotary mold-plate is attached to the upper end of the arbor R. The worm-thread on the hub N extends over only one-half the periphery, so that the intermittently-rotating plate has movement during one-half only of each revolution of the shaft C. The worm-thread is so positioned upon the hub that this motion of the mold-plate takes place while the plunger is removed from the molds. Inasmuch as it may be desired to use the bed-plate A in the ordinary way, I make the rotary mold-plate removable from its arbor, providing it for this purpose with a square or equivalently-formed spindle, that enters a like socket in the upper end of the arbor. I also provide the bed-plate with the ordinary mold-guides *s'*, which can be used when the rotary plate is taken off.

I have provided an automatic mechanism for lifting the pressed glass article out of its mold at the proper time. Each mold-socket in the rotary mold-plate has a central hole, *v*, in

it, and at the point 4 a coinciding hole, v', is formed in the bed-plate. Up through this hole works a lifter-rod, T, which has a rising and falling motion imparted to it by a rack, w, on its lower end, which meshes with a toothed sector, V, on a rock-shaft, W, which carries also a crank-pin, w', that works in a cam-groove, x, on a crank-shaft, C. This cam-groove is so formed and positioned, as shown, that it will give a rocking motion to the shaft only when the mold-plate is at rest. At this time the lifter-rod rises, lifts the glass, and then falls below the level of the bed-plate before the mold-plate moves. The glass, when thus lifted, is taken by pinchers and deposited in any suitable place.

To enable the lifter-rod to thus operate, the mold is formed with a central movable plug in its bottom, which is pushed upward by the lifter-rod.

I have described one simple form of mechanism for operating the lifter-rod and the mold-plate. It is manifest, however, that the same may be varied without departure from my invention. It is also manifest that the structure and arrangement of the engine may be varied according to the necessities of the case and the nature of the motor, whether it be a steam, gas, or air engine, the principal feature here being the combination, with a portable or movable glass-press, of a motor arranged on and carried by the frame of the press, whereby I am enabled to obtain a direct application of the power to the working parts of the press without the intermediary of belting.

Having now described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is as follows:

1. In a portable or movable power-press for molding glass, the combination, with the press proper, of a motor-engine arranged on and carried by the frame of the press, and directly connected with and operating the rotating crank-shaft, from which motion is imparted to the various parts of the press, substantially as and for the purposes set forth.

2. The combination, with the motor-engine, and the reciprocating plunger of the glass-press, of a governor operated by the plunger, or some part moving in unison therewith, to increase and diminish the supply of steam or other motor fluid to the engine, at the times and in the manner substantially as set forth.

3. The combination of the reciprocating yoke, the throttle-valve, the lever or handle for the same, and the governor-rod provided with adjustable stops engaging and operated on by the yoke, as set forth.

4. The tubular plunger screw-rod, in combination with the plunger-spindle, fitting and movable longitudinally within said rod.

5. The combination, substantially as described, of the tubular plunger screw-rod, the plunger-spindle, the spring-case at the upper end of said rod, the inclosed spring, and the adjustable screw-presser, the combination being and acting as set forth.

6. The combination, with the rotating crank-shaft that operates the plunger, of an intermittently-rotating mold-plate, connected with and operated by the crank-shaft, substantially as set forth.

7. The combination, with the rotary crank-shaft that operates the plunger, of an intermittently-rotating mold-plate and an intermittently-reciprocating lifter, the parts being connected with and operated by the crank-shaft, substantially as set forth.

8. The stopping and starting mechanism, consisting of the lever-treadle formed or provided at its inner end with an inclined or beveled stop, as described, in combination with the crank-shaft, the spring clutch-pin and its unlocking-pin, and the loose gear on said shaft, for operation as shown and set forth.

9. The combination of the removable rotary mold-plate, its arbor, and the main bed-plate, substantially as set forth, whereby either said rotary plate or the fixed bed-plate, as desired, can be used to receive the molds.

In testimony whereof I have hereunto signed my name this 15th day of July, 1876.

JONATHAN HALEY.

Witnesses:

EWELL A. DICK,

HENRY R. ELLIOTT.