No. 616,664. Patented Dec. 27, 1898.

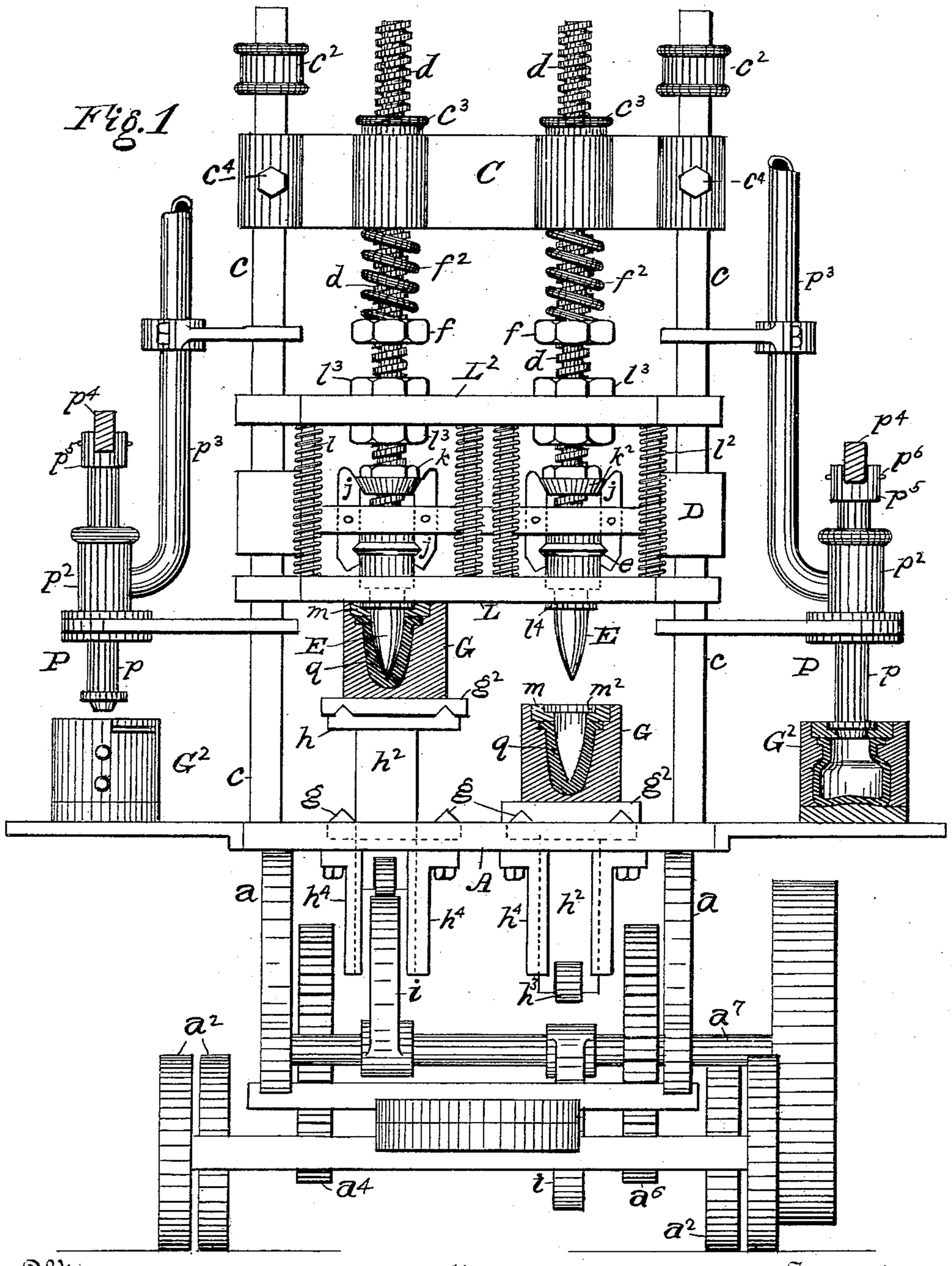
W. HALEY.

GLASS PRESS.

(Application filed July 26, 1897.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1



Witnesses
Lorin R. Vorce
Ernest G. Wilcox

Inventor
William Haley
By his Attorney
C. M. Vorce

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W. HALEY.

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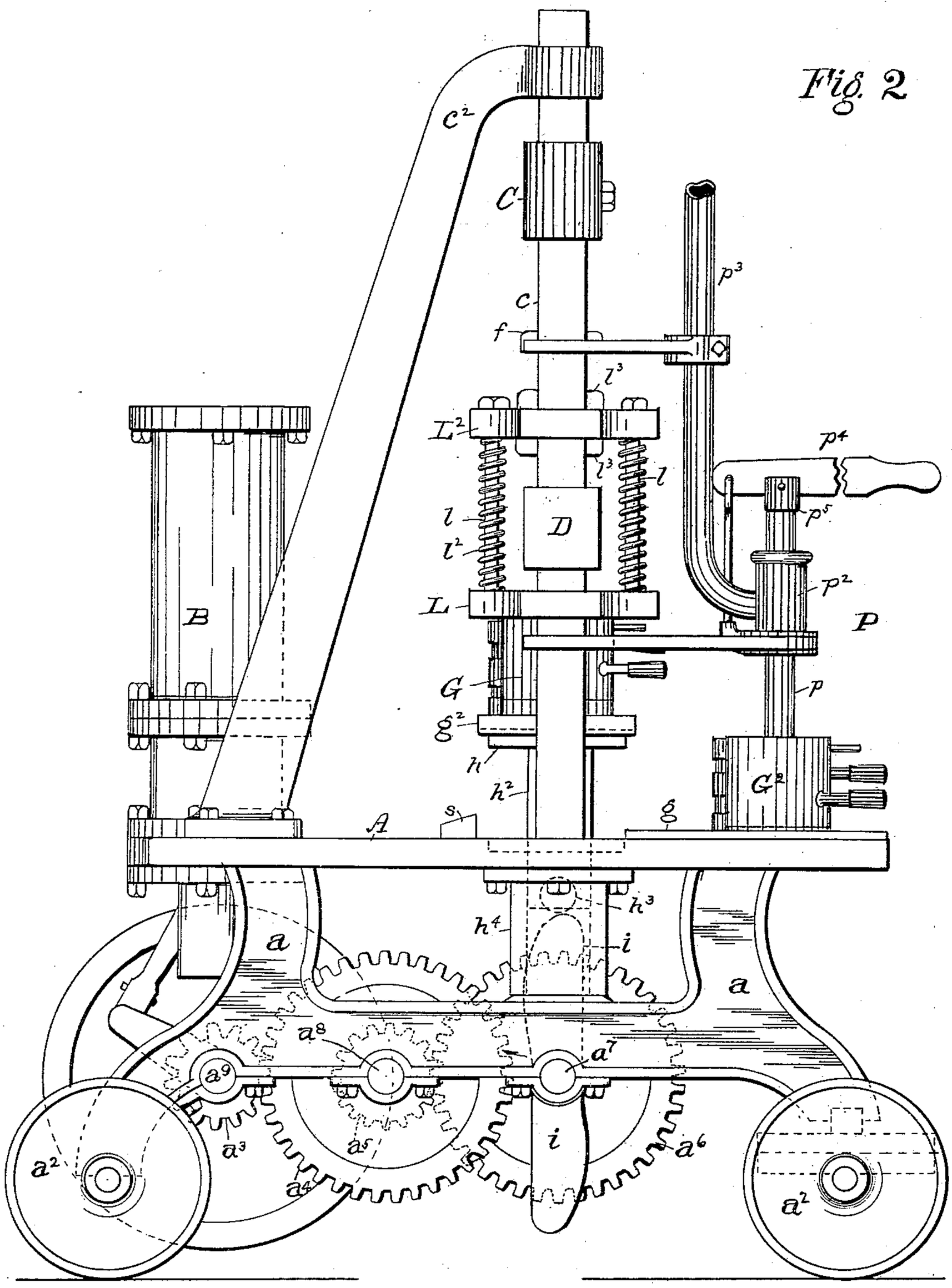
(No Model.) 3 Sheets—Sheet 2

Fig. 2



Witnesses

L. J. Ramsell

Louis Bruton

William Haley Inventor

By his Attorney

C. M. Orgee

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(No Model.) 3 Sheets—Sheet 3.

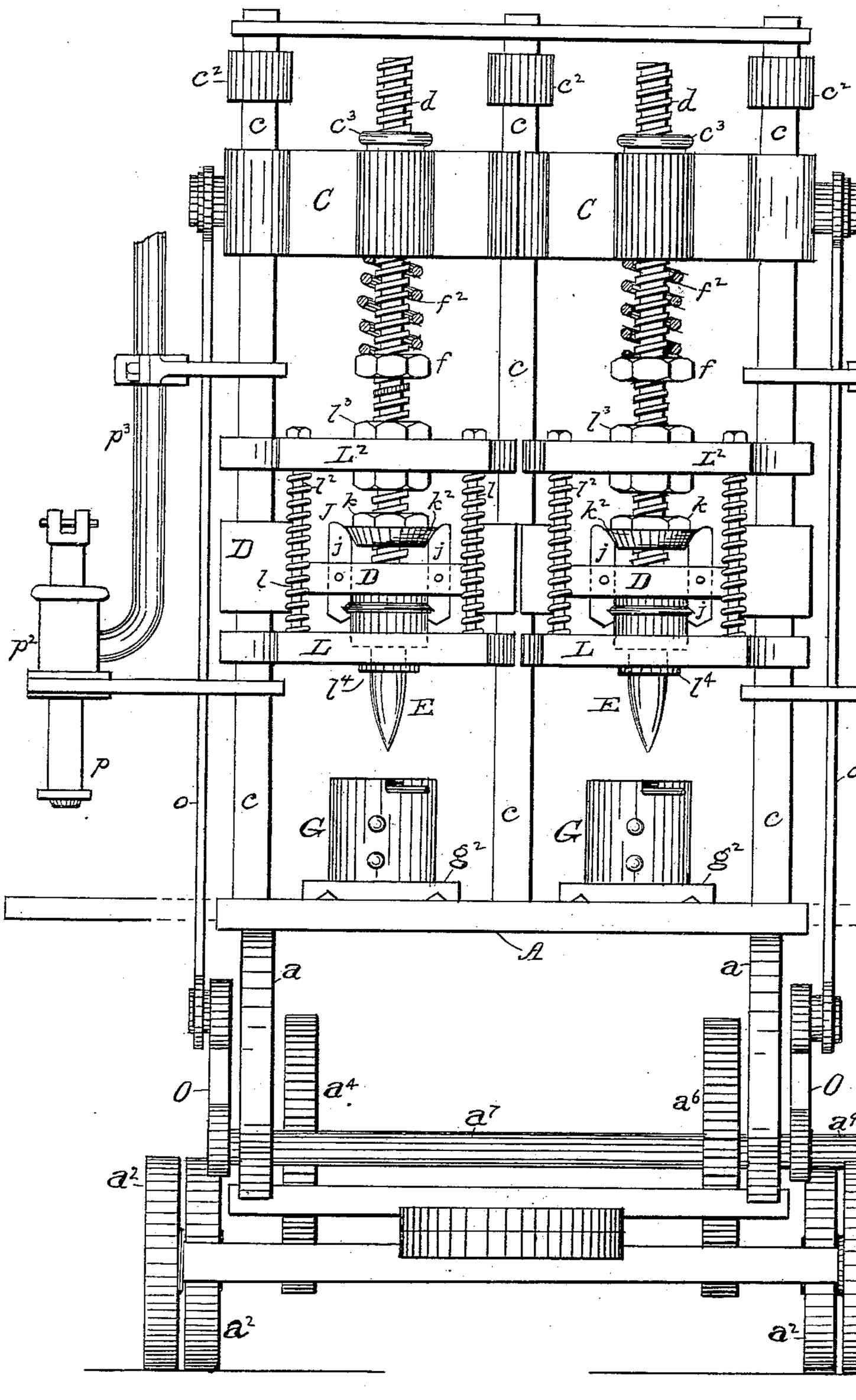

Fig. 3

Witnesses

L. J. Randall

Louis Prentiss

Inventor

William Haley

By his Attorney

C. M. Orr

UNITED STATES PATENT OFFICE.

WILLIAM HALEY, OF BEAVER FALLS, PENNSYLVANIA, ASSIGNOR TO THE NATIONAL MOLD AND CASTING COMPANY, OF SAME PLACE.

GLASS-PRESS.

SPECIFICATION forming part of Letters Patent No. 616,664, dated December 27, 1898.

Application filed July 26, 1897. Serial No. 645,899. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HALEY, a citizen of the United States, residing at Beaver Falls, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Glass-Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in power-operated glass-presses, the object of the invention being to improve the efficiency and utility of the press and its speed of operation, so as to increase the output of finished work, and thus reduce the cost of manufacture.

The invention consists in the novel features of construction, combination, and correlation of parts hereinafter fully described, and specifically pointed out in the claims.

In the drawings, Figure 1 represents in front elevation a glass-press embracing my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a front elevation exhibiting an alternative or modified form of construction.

In its broadest phase my invention consists in the employment in a power-press of a plurality of constantly-acting plungers, and these are made to act simultaneously or alternately, as preferred, and are capable of independent action while operating simultaneously, all as hereinafter fully explained.

In the drawings, A represents the bed of the press, supported by a frame a a, preferably mounted on truck-wheels a^2 a^2, and in which frame are suitably supported the train of gears a^3 a^4 a^5 a^6, &c., by which the press is power-actuated from any suitable source of power, such as the motor B, which may be an electrical motor or a steam, air, or gas engine, as preferred. Although the motor is shown mounted on the back of the press-bed, it may of course be located elsewhere and the gearing of the press be driven by belting in the common well-known manner. Upon the press-bed are fixed standards c c, supported by braces c^2, upon which standards slides a yoke C, to the outer ends of which yoke are attached the upper ends of connecting-rods o, whose lower ends are connected to cranks O, rigid with a shaft, as a^7, which is actuated by the gearing a^3 a^4, &c. In place of the cranks eccentrics could of course be used. As thus arranged the yoke C is given a reciprocating motion; but it is obvious that the molds instead of the yoke could be moved, and this modification of structure is a part of my invention and is fully described farther on. Below the yoke is a cross-head D, which also slides on the standards c as guides and carries the plungers E E in a manner presently to be described. Strong adjusting-screws d d are secured to the cross-head D and pass up through the yoke C, in or upon which yoke are seated adjusting-nuts c^3, threaded upon the screws d d. On each of the screws d, below the yoke, is threaded a tension-nut f, between which and the yoke is interposed a strong buffer-spring f^2, which yields under an unusual resistance to the plunger—such as might be caused by a mold being filled too full or other cause—and thus avoids the breaking of any of the parts.

On the press-bed are arranged ways g g, on which slide plates g^2 for receiving the molds G G. The press-bed is recessed beneath each of the plungers, as shown in Fig. 1, and plates h h are seated in the recesses, with their tops flush with the top of the bed A, and preferably carry a section of the ways g, as seen in Fig. 1, whereby the shifting of the mold is prevented. To the under side of the plates h h are attached depending pillars h^2, which pass through the press-bed, sliding in guides h^4, affixed to the under side of the press-bed, and at their lower ends engage cams i i, carried by a shaft, as a^7, rollers h^3 being preferably provided on the lower ends of pillars h^2 to lessen the friction. Obviously the cams may be so set as to act simultaneously, alternately, or in any desired sequence of time.

The plungers E are supported in clutches J J, which comprise the bars j j, pivoted on the cross-head D and notched at their lower ends to engage the bead e on the plunger, and a nut k, threaded on the adjusting-screw d and having an inclined face k^2 to bear against and force apart the upper ends of the bars j j to cause them to grip the plunger. The upper ends of the plungers when in place bear

against the under side of the cross-head D, and thus seat firmly and rigidly in place.

Below the cross-head D is arranged a registering-plate L, perforated to admit the passage of the plungers and carrying rigid therewith bolts or headed rods $l\ l$, which pass freely through a similar plate L^2 above the cross-head. Springs l^2 are interposed between the plates L and L^2, and the upper plate is rigidly secured to the screws d, as by the nuts l^3. The plate L carries a ring l^4, which enters a corresponding recess m^2 in the covering-ring m of the mold G, and thus insures the registering of the mold with the plunger. The plates L L^2 guide on the standards $c\ c$, and the registering-plate L comes down upon the top of the mold before the plunger acts. The upper plate L^2, sliding on the rods $l\ l$ as the cross-head and plunger continue to descend, compresses the springs l^2, and thus prevents the lifting of the covering-ring or of the mold as the plunger lifts.

In Fig. 1 the cranks O are omitted and the press is shown as adapted to operate by lifting the molds against the stationary plungers, while in Fig. 3 the cams i and pillars h^2 are omitted and the press is shown as adapted to operate by depressing the plungers into the stationary molds, and both of these methods of operating are embraced within my invention. It is also a part of my invention to so construct and arrange the press that both of the foregoing features are simultaneously present, the press being constructed with both the cranks O and the cams i and their respective coacting structures. When this is the case, the yoke C is provided with binding-screws c^4, by means of which it can be fixed rigidly to the standards $c\ c$ at the proper point, which is regulated, of course, by the height of the mold and the throw of the cams $i\ i$, the connecting-rods o being in such case disconnected from the cranks O for the time being.

A modification of the structure of the press is shown in Fig. 3, whereby the plungers are adapted to act independently and alternately or at any desired interval of time. The yoke C, cross-head D, and the plates L and L^2 are centrally divided, and a third standard c is placed midway between the two, (shown in Fig. 1,) each part of the yoke, cross-head, and plates L L^2 guiding at one end on the outer standard and at the other (inner) end on the central third standard. The two halves of the yoke and their connected parts move separately and independently, each actuated by one of the cranks O and connecting-rods o, and may be made to move in any relation of time to each other, according to the relative position of the cranks toward each other. This construction may be obviously further modified by employing four standards instead of three and using two standards to guide each half-yoke and its plunger.

In Fig. 1, P represents an air-blast for blowing bottles, jars, &c., the necks of which have been formed by the press. It comprises the sliding nozzle p, adapted to fit upon the opening of the covering-ring m and sleeved in a cylinder p^2, communicating by the pipe p^3 with a source of air-pressure. (Not shown.) The sliding nozzle p communicates with the interior of the cylinder p^2 and is actuated by a suitable handle p^4, affixed to its upper part p^5, as by the pin p^6. One of such blowing-nozzles is preferably provided at each side of the press. When operating in this manner, a bloom q is formed in a suitable bloom-mold G—such as shown in Fig. 1, for instance—by the press, and when the mold and bloom are passed to the assistant at the blowing-nozzle he transfers the bloom q to a blow-mold G^2 and placing the mold beneath the nozzle p brings down the nozzle upon the mold and finishes the article by the blast in the usual way.

In operating the press when the plungers move synchronously the pressman inserts two of the molds G, one with each hand, simultaneously, and as the plungers rise he passes one mold to each of the two blowing-nozzles to be finished, as above described, by assistants stationed there and being continuously supplied with fresh molds places two more beneath the plungers before they descend again, and so on indefinitely, or he may place a mold under each one of the plungers alternately and remove a pressed mold from beneath the other plunger an instant later, in time to place another filled mold there to be pressed, thus changing the mold beneath each plunger alternately. When the press is used without the use of the blowing-nozzles, as it may be, any ordinary press-mold is of course to be used. The operation is the same when the plungers are stationary and the molds are lifted by the cams. When the plungers act independently, the operator places a mold beneath the plunger which is about to descend and at the same time removes the mold from which the other plunger has just emerged. In molding small articles it is thus quite feasible for one operator to keep up with three or four plungers, since he is able to make the necessary motions in less time than is required for the downward and upward motions of the plunger, and the use of three or more plungers is completely within my invention, the construction required therefor being simply a duplication of that shown in the drawings. By saving the time required to pull the lever of the hand-press a very great advance was made by the power-operated glass-press, and by employing a plurality of plungers each of which is continuously operating I am enabled to utilize all of the time hitherto spent by the pressman in waiting for the power-operated plunger to act. By the term "continuously operating" I mean a plunger which acts as often as its actuating mechanism performs the necessary downward and upward motions in contradistinction to those presses in which a plurality of plungers are employed consecutively, only one acting at a time and the others

being idle and incapable of doing any work at the same time.

By the construction shown I am able to work on the same press two molds of different sizes at the same time, which has not hitherto been accomplished.

Any of the usual accessory apparatus employed with glass-presses—such as cooling-blasts, mold-tables, &c.—may also be employed with my improved press, above described, in the usual manner. Also the plates and ways *g* may be omitted and the molds merely placed against fixed guides *s* on the press-bed in the common manner.

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

1. In a power-operated glass-press the combination of continuously-rotating cranks, a plurality of plungers each carried by a separate cross-head, and independent connections from the cranks to their respective cross-heads, whereby the plungers may be made to act at definite intervals of time, substantially as described.

2. In a power-operated glass-press the combination of a plurality of plungers, a plurality of mold-carrying devices corresponding thereto, continuously-rotating cams adapted to engage and move said mold-carrying devices, and means for correlating the movement of said cams, substantially as described.

3. In a power-operated glass-press the combination with standards, a yoke guiding thereon, and mechanism for constantly reciprocating said yoke, of a cross-head guiding on said standards, two plungers secured to said cross-head, screws attached to said cross-head and passing through said yoke, buffer-springs interposed between the yoke and cross-head, and a mold-receiving device in operative relation to each plunger substantially as described.

4. In a power-operated glass-press the combination with standards, a yoke guiding thereon, and mechanism for constantly reciprocating said yoke, of a cross-head guiding on said standards, two plungers secured to said cross-head, screws attached to said cross-head and passing through said yoke, buffer-springs interposed between the yoke and cross-head, a registering-plate guiding on said standards and adapted to engage the mold, a yielding connection between said registering-plate and said screws, and a mold-receiving device in operative relation to each plunger, substantially as described.

5. In a power-operated glass-press the combination with the plunger of a vertically-movable mold-receiving plate adjusted beneath the plunger, and having a depending pillar, and a constantly-revolving cam adapted to engage and raise said pillar and plate, substantially as described.

6. In a power-operated glass-press the combination with the plunger of a vertically-movable mold-receiving plate adjusted beneath the plunger, and having a depending pillar, a roller on said pillar, and a constantly-revolving cam adapted to engage said roller and raise said pillar and plate, substantially as described.

7. The combination with the plunger of a glass-press, of guiding-ways on the press-bed, a plate recessed in the press-bed beneath the plunger and having corresponding ways, a pillar depending from said plate, and a constantly-revolving cam adapted to bear against and lift said pillar and plate, substantially as described.

8. The combination with a power-operated glass-press having a plurality of constantly-operating plungers, of a number of blowing-nozzles corresponding to the number of plungers, substantially as described.

9. In a glass-press, the combination of a bed, a plurality of standards mounted thereon, a plurality of yokes guiding on said standards, a plunger borne by each yoke, and means for independently and continuously reciprocating said yokes, substantially as described.

10. In a glass-press the combination with the continuously-reciprocating yoke, of a cross-head, two adjusting-screws secured to said cross-head and passing through the yoke, adjusting-nuts threaded on said screws and seating upon said yoke, a tension-nut on each screw, a buffer-spring interposed between each tension-nut and said yoke, and plungers carried by said cross-head, substantially as described.

In testimony whereof I hereto affix my signature in presence of two witnesses.

WILLIAM HALEY.

Witnesses:
L. J. RANDALL,
LORON PRENTISS.