No. 794,179. PATENTED JULY 11, 1905.

L. P. HOLSTON.

GLASS MACHINE.

APPLICATION FILED OCT. 5, 1904.

2 SHEETS—SHEET 1.

FIG. 1.

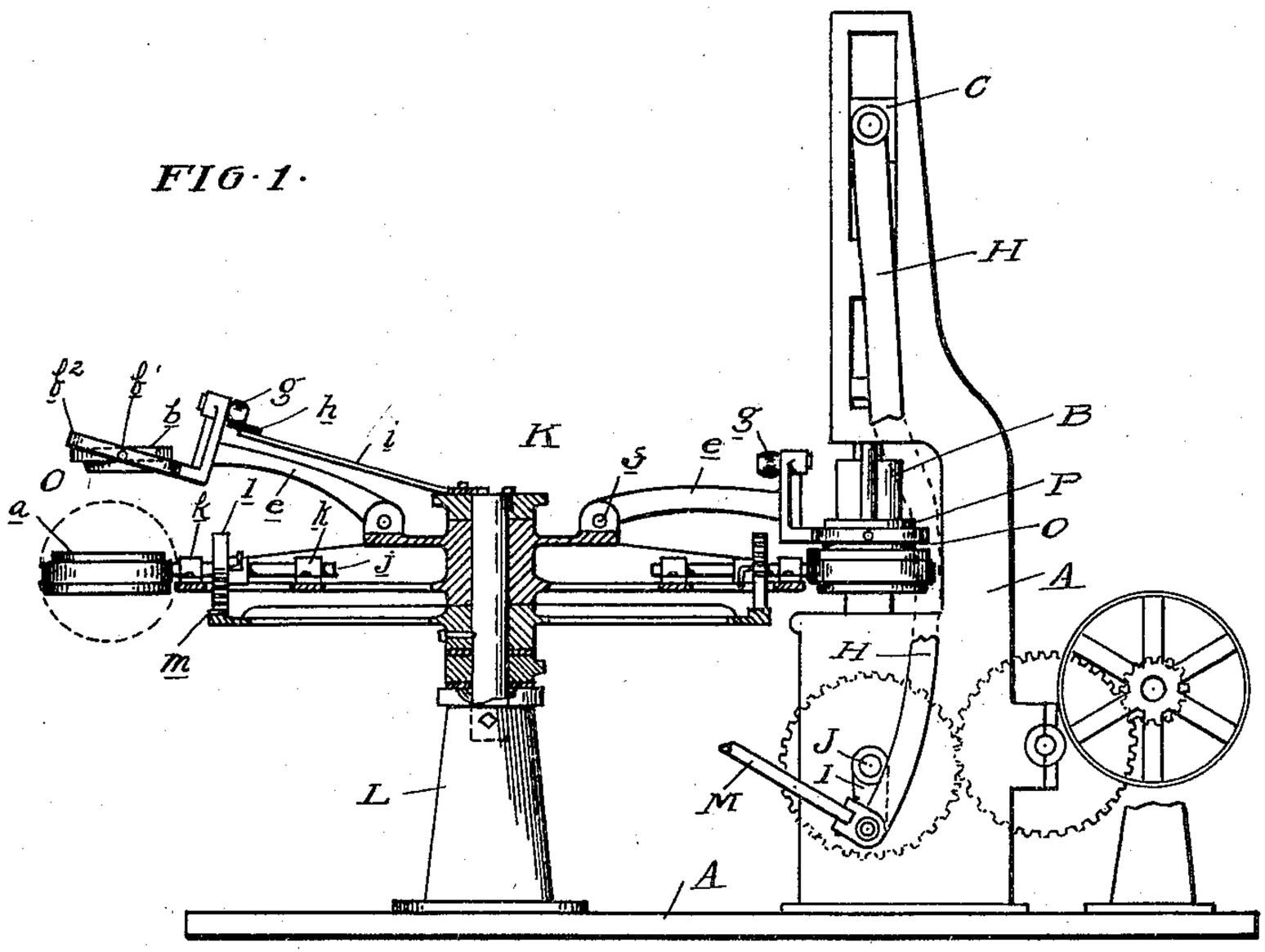
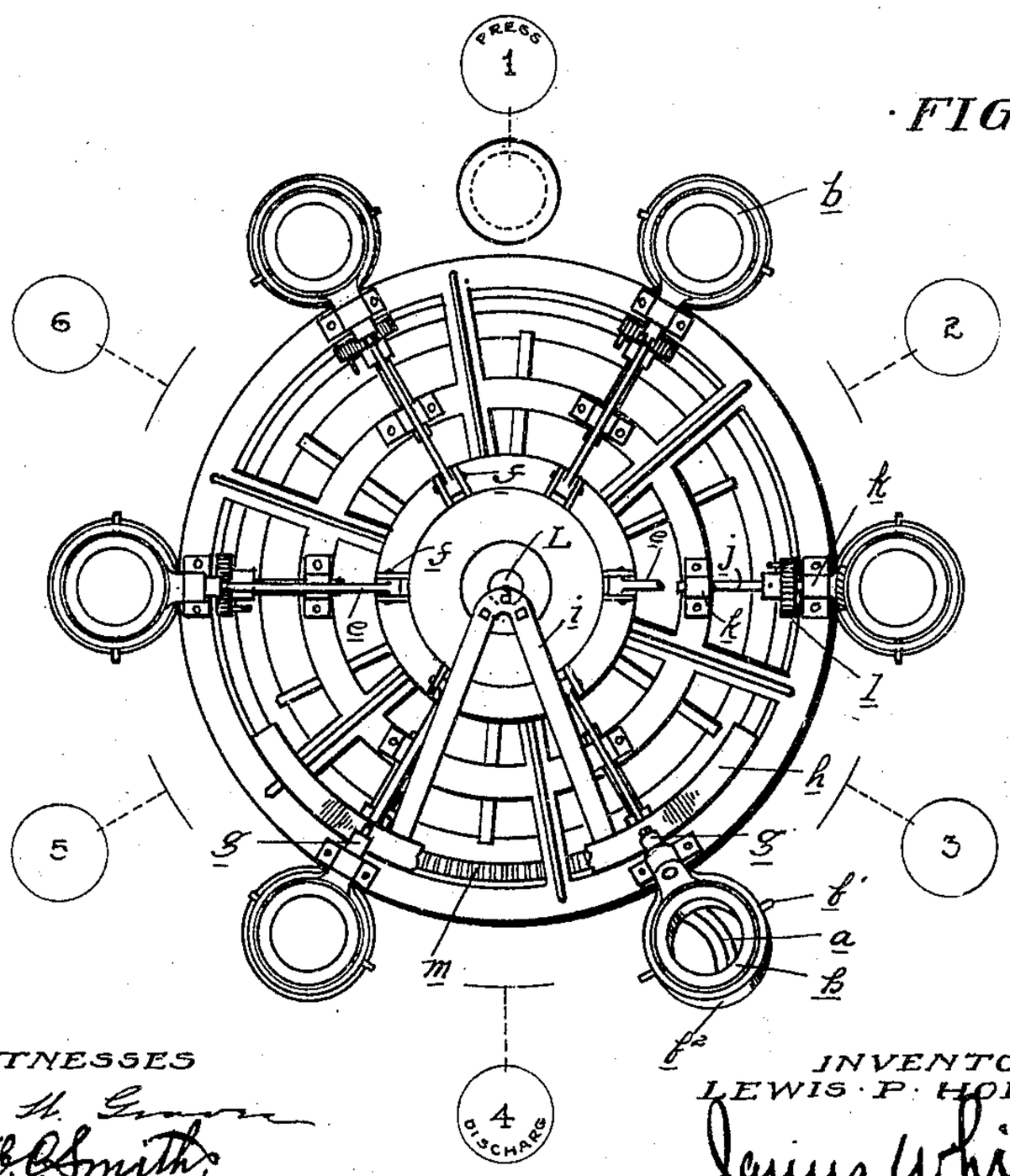


FIG. 2.



WITNESSES

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INVENTOR

LEWIS P. HOLSTON.

BY James Whittemore

ATT'Y.

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2 SHEETS—SHEET 2.

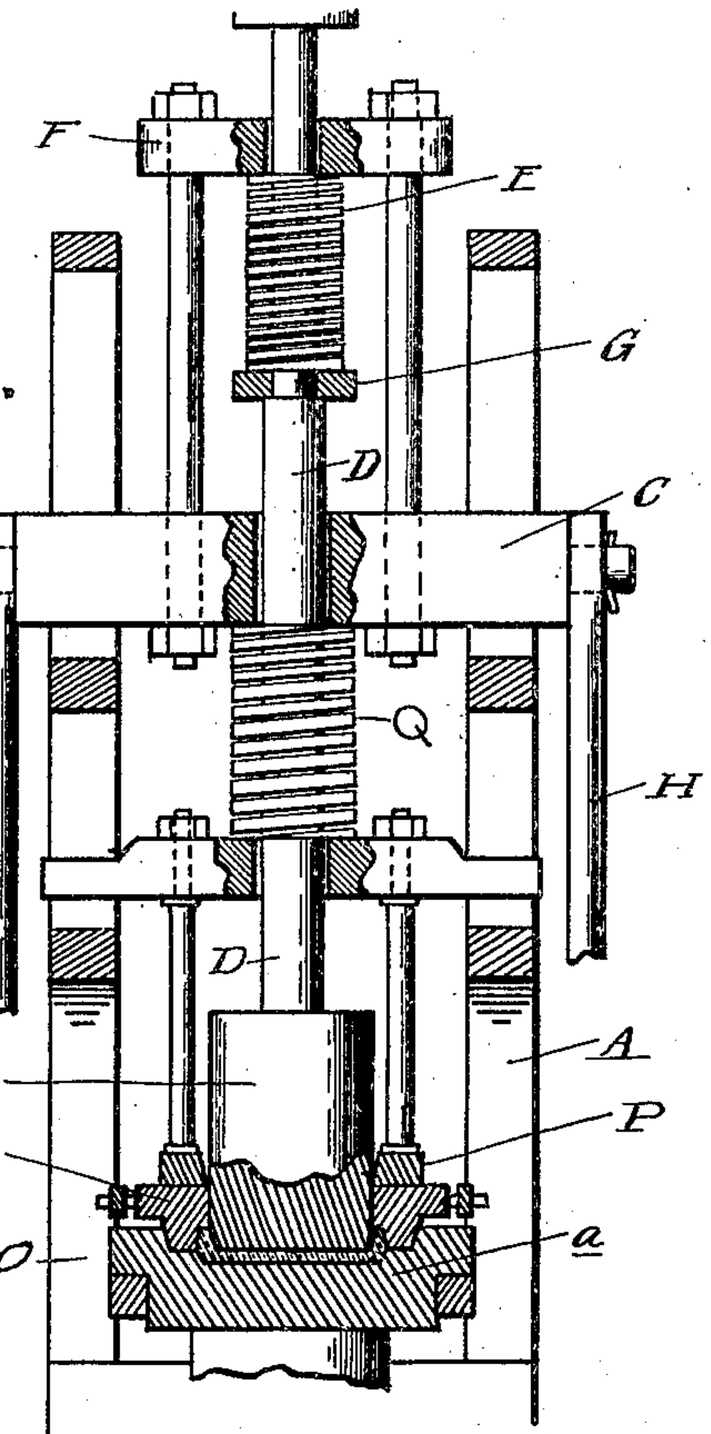


FIG. 4.

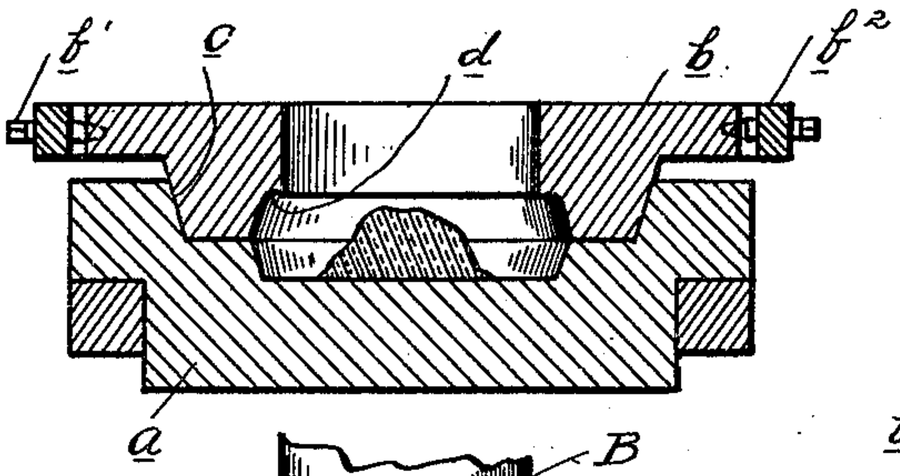


FIG. 3.

FIG. 3. B

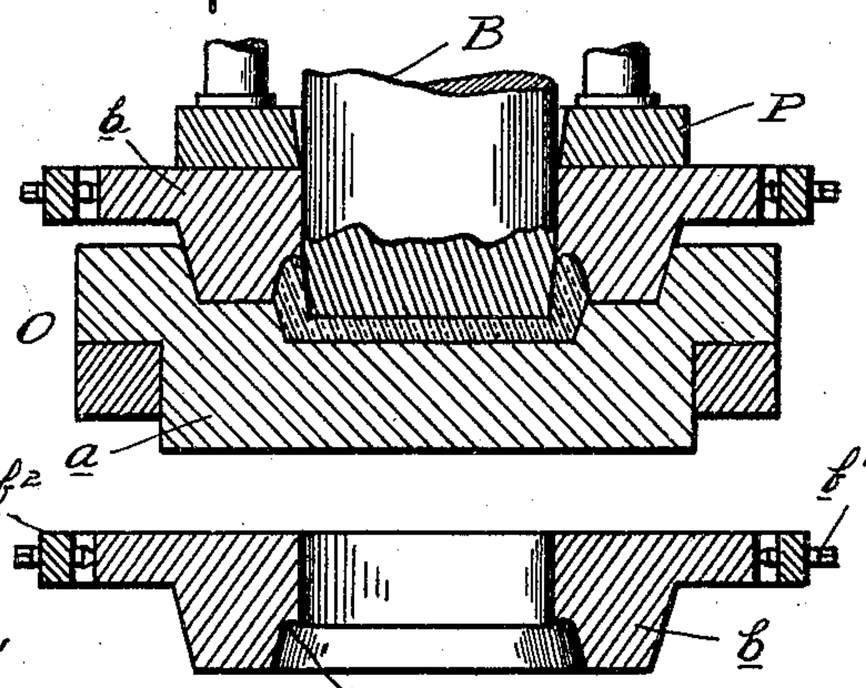


FIG. 3. A

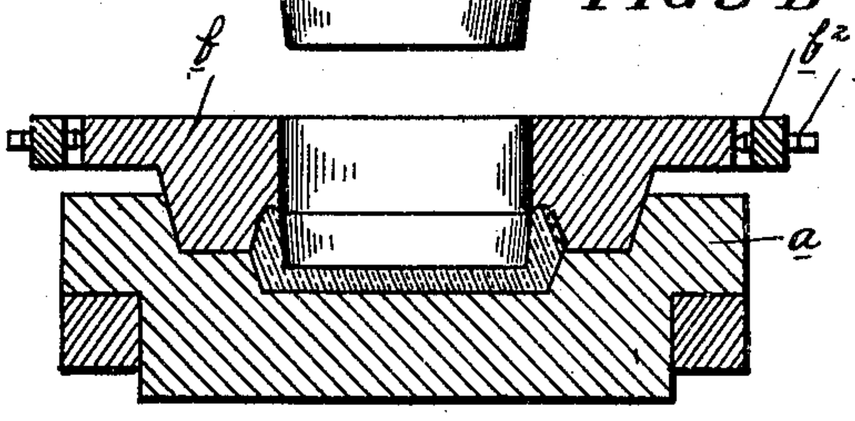
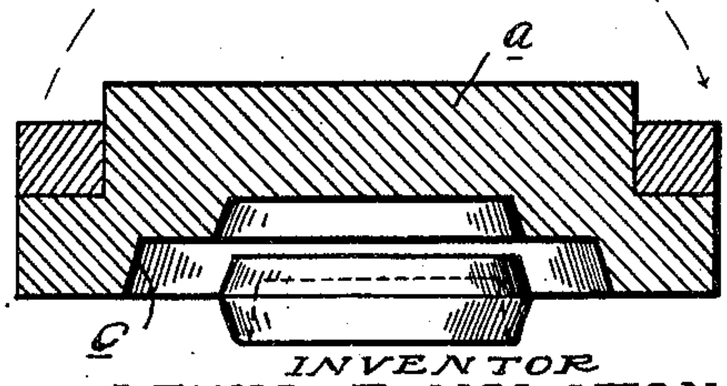


FIG. 3. C.



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LEWIS P. HOLSTON.

No. 794,179. Patented July 11, 1905.

UNITED STATES PATENT OFFICE.

LEWIS P. HOLSTON, OF WALLACEBURG, CANADA.

GLASS-MACHINE.

SPECIFICATION forming part of Letters Patent No. 794,179, dated July 11, 1905.

Application filed October 5, 1904. Serial No. 227,202.

To all whom it may concern:

Be it known that I, LEWIS P. HOLSTON, a citizen of the United States, residing at Wallaceburg, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Glass-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to a rapidly-working machine for the manufacture of glassware, and is more particularly designed for use in the molding of bottle and fruit-jar covers; but it is also applicable to the formation of other articles.

In the present state of the art certain constructions of fruit-jar covers are provided with a comparatively thin annular flange at the periphery. These articles have heretofore been usually formed of molds recessed to form the bottom portion of the article, the annular flange being fashioned by a suitably-shaped reciprocatory plunger, which forms the complementary portion of the mold. Such apparatus has been found to be defective, for the reason that the plastic glass is not sufficiently chilled during the operations of the plunger to perfectly retain its shape when the plunger is withdrawn. As a consequence the annular flange, which is unsupported after the withdrawal of the plunger, frequently bends out of shape, so as to make an imperfect article.

It is the object of the present invention to overcome this defect by the construction of a mold having a portion which remains in contact with the annular flange on the article after the withdrawal of the plunger.

It is a further object to provide means by which the article may be automatically ejected from the mold before it is again registered with the plunger and after the article is sufficiently chilled to retain its shape.

With these objects in view the invention consists in the construction as hereinafter set forth.

In the drawings, Figure 1 is a sectional side elevation of the press and mold-carrier. Fig. 2 is a plan view thereof. Figs. 3, 3^A, 3^B, 3^C are diagrammatic sectional views illustrating the successive operations performed by the machine, and Fig. 4 is a sectional front elevation of the press and mold.

A is a suitable framework in which is mounted a vertically-reciprocating plunger B, actuated by suitable means, such as a sliding cross-head C, from which the shank D of the plunger is operated through the medium of a spring E, sleeved thereon and bearing at one end against the head F, carried by said cross-head, and at the opposite end against a collar G on said shank. The cross-head C is operated through the medium of pitman-rods H, which at their lower ends engage with cranks I on the crank-shaft J.

K is a mold-carrier which is shown in the form of a circular table mounted upon a pedestal L on the frame A and intermittently actuated through a partial rotation by a rod M, connecting with the crank I and operating a suitable ratchet connection. (Not shown.) This table carries a series of molds, and the arrangement is such that these molds will be successively registered with the plunger and remain stationary during the movement of the latter, while after the withdrawal of the plunger the table is moved to bring the new mold in registration.

Each of the molds O is supported upon the table or mold-carrier and is of the following construction: *a* is the lower mold-section, which is recessed to form the bottom portion of the article. *b* is a complementary top mold which fits in a recess *c* in the mold *a* and is provided with a recess or mold-cavity *d*, which forms the projecting flange of the article. The mold *b* is centrally apertured to receive the plunger B, which latter is suitably shaped at its lower end to form the remainder of the molding-surface, so that together the plunger, the section *b*, and the section *a* form a complete mold. The section *b* of the mold is held in contact with the section *a* during the operation of the plunger by a ring P, sleeved about the plunger and actuated from the cross-head C through the medium of a spring Q.

In prior constructions it has been usual to arrange the upper mold-sections *b* in permanent relation to the reciprocating plunger B, so that whenever the plunger is withdrawn

the upper mold-section is simultaneously lifted. This causes but a very short interval in which the molded glass remains in contact with the upper mold-section, and consequently liability of a change in the shape of the article after the withdrawal of the plunger, as previously described. In the present construction the upper mold-section *b* is entirely separated from the plunger and is carried by the mold-carrier K, which permits of its remaining in contact with the glass after the pressing operation for a longer interval.

As shown, each of the sections *b* of the molds O is carried by an arm *e*, extending radially of the mold-carrier and pivotally secured at *f* to bearings upon said carrier. Pivots *b'* connect the sections *b* with the arm, which is provided with a surrounding ring b^2 and its connection permitting said mold-section to swing in relation to the arm. Each of the arms *e* is provided with an antifriction-roll *g*, which during the rotation of the carrier engages with the segmental cam-track *h*. This track *h* is supported by radial arms *i*, secured at their inner ends to the upper end of the pedestal L, the arrangement being such that whenever the rolls *g* mount upon the cam-track *h* the arms *e* will be lifted, thereby raising the mold-sections *b* from the lower mold *a*.

The lower molds *a* are provided with suitable means for ejecting the molded article therefrom, preferably consisting in means for reversing the mold at one point in its travel. As shown, this comprises a revoluble spindle *j*, which carries the mold-sections *a* and is journaled in suitable bearings *k* on the mold-carrier. *l* is a segment-pinion mounted upon the spindle *j*, which is adapted during the rotation of the carrier to engage with the segmental rack *m*, fixedly secured to the pedestal L. This rack is located in a position corresponding to that of the segment track *h*, and the construction is such that the pinion does not engage with the rack until the upper mold *b* has first been lifted to provide sufficient clearance for the rotation of the lower mold. The further movement of the carrier will then cause the rotation of the spindle *j* by the engagement of the pinion *l* with the rack *m*, so as to reverse the mold *a* and permit the molded article supported therein, to drop out. In the further rotation of the spindle the mold *a* will be returned to the upright position, and when the roller *g* disengages from the cam-track *h* the upper section *b* of the mold again engages with the lower mold, ready for another operation.

From the description given above the operation of the machine will be understood; but particularly described this operation is as follows: The plastic glass is placed in the mold while in a position just in advance of the one in which it registers with the plunger, the feeding of the glass being accomplished by dropping from the punty or in any other suitable way. The succeeding intermittent movement imparted to the mold-carrier will register the mold containing the unshapen glass with the plunger B, and while the carrier remains in this position the plunger is lowered by the downward movement of the cross-head C. This movement of the cross-head also depresses the ring P through the medium of the spring Q, which presses the mold-section *b* of the mold O in firm contact with the lower section *a*. The plunger then descends in the central recess in the mold *b* and presses the plastic glass to fill all portions of the mold-cavity. To compensate for unequal quantities of glass in the mold, the spring E, which actuates the shank D of the plunger, will yield, as is usual in presses of this character. After the withdrawal of the plunger from the mold and the lifting of the ring P the carrier will travel by successive intermittent movements until the roll *g* mounts upon the cam-track *h* to lift the upper mold *b*. As soon as this is effected the rack *m*, engaging with pinions *l*, rotates the shank *j* and reverses the mold *a*, as before described, so as to drop out the molded article. This article has, however, remained in the mold for a sufficient length of time to permanently retain its shape when ejected. The further movement of the carrier will return the parts to the initial position, where a new charge of glass is placed in the mold and the operation repeated.

The plunger is preferably constructed so as to permit of circulating water or other cooling agents therethrough to prevent it from becoming too hot.

So far as I am aware it is new to provide a means of leaving the upper section *b* on the lower section *a* after the plunger is withdrawn. Therefore I do not desire to limit myself to the precise construction which I have herewith shown and described, as it is obvious that various methods may be employed without departing from the spirit of my invention.

What I claim as my invention is—

1. In a mold-press, the combination with a reciprocatory plunger and a mold-carrier, of a mold on said carrier periodically registered with said plunger and comprising an upper and a lower section adapted to remain in contact with the glass after the retraction of the plunger, and automatic means operating before the succeeding registration for separating said mold-sections and for ejecting the pressed article from the lower mold-section.

2. In a mold-press, the combination with a reciprocatory plunger and a mold-carrier, of a mold periodically registered by said carrier with said plunger, and comprising a bottom section and an annular top section adapted to remain in contact with the glass after

the retraction of the plunger, and means operating before the mold is again registered with the plunger, for lifting said upper mold-section and ejecting the molded article from the lower section.

3. In a mold-press, the combination with a reciprocatory plunger and a mold-carrier, of a mold periodically registered by said carrier with said plunger comprising a lower section and an annular top section, means for lifting said upper section during the travel of said carrier and means for reversing said lower section while said upper section is lifted to eject the article.

4. In a mold-press, the combination with a reciprocatory plunger and a mold-carrier, of a mold periodically registered by said carrier with said plunger and comprising a bottom section and an annular top section, means for separating said sections during the movement of said carrier to eject the molded article, and a yielding presser actuated simultaneously with said plunger for holding said upper mold-section in contact with the lower mold-section.

5. In a mold-press, the combination with a reciprocatory plunger and a mold-carrier, of a mold periodically registered by said carrier with said plunger and comprising a lower section and an annular top section, a rock-arm to which said upper section is secured, fulcrumed upon said carrier, and a stationary cam with which said rock-arm engages during the movement of said carrier, adapted to lift said arm and upper mold-section to permit the removal of the molded article.

6. In a mold-press, the combination with a reciprocatory plunger and a rotary mold-carrier, of a mold mounted upon said carrier comprising a lower section and an annular upper section, a radial arm secured to said upper section and a segmental cam-track for lifting said radial arm and raising said upper mold-section to permit the removal of the molded article.

7. In a mold-press, the combination with a reciprocatory plunger and a rotary mold-carrier, of a series of molds mounted on said carrier, each comprising a lower mold-section and an annular upper mold-section, radial arms connected to said upper mold-sections, revoluble spindles carrying said lower mold-sections and pinions mounted thereon and a stationary cam and stationary rack for respectively engaging with said radial arms and said pinions to lift the upper mold-section and to rotate the lower mold-section, so as to eject the molded article.

8. In a mold-press, the combination with a reciprocatory plunger and a mold-carrier, of a mold on said carrier periodically registered with said plunger and comprising an upper and a lower section adapted to remain in contact with the glass after the retraction of the plunger, and automatic means operating before the succeeding registration for separating said upper and lower mold-sections.

9. In a mold-press, the combination with a reciprocatory plunger and a rotary mold-carrier, of a mold mounted upon said carrier comprising a lower section and an annular upper section, a radial arm pivotally secured at its inner end to said carrier, a pivotal connection between the free end of said arm and said annular mold-section, and a cam-track for lifting said radial arm and raising said upper mold-section to permit the removal of the molded article.

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

LEWIS P. HOLSTON.

Witnesses:
JAS. P. BARRY,
H. C. SMITH.