No. 779,602. PATENTED JAN. 10, 1905.

E. E. HOFFMAN.

APPARATUS FOR MAKING HOLLOW GLASSWARE.

APPLICATION FILED APR. 7, 1904.

2 SHEETS—SHEET 1.

FIG. 1.

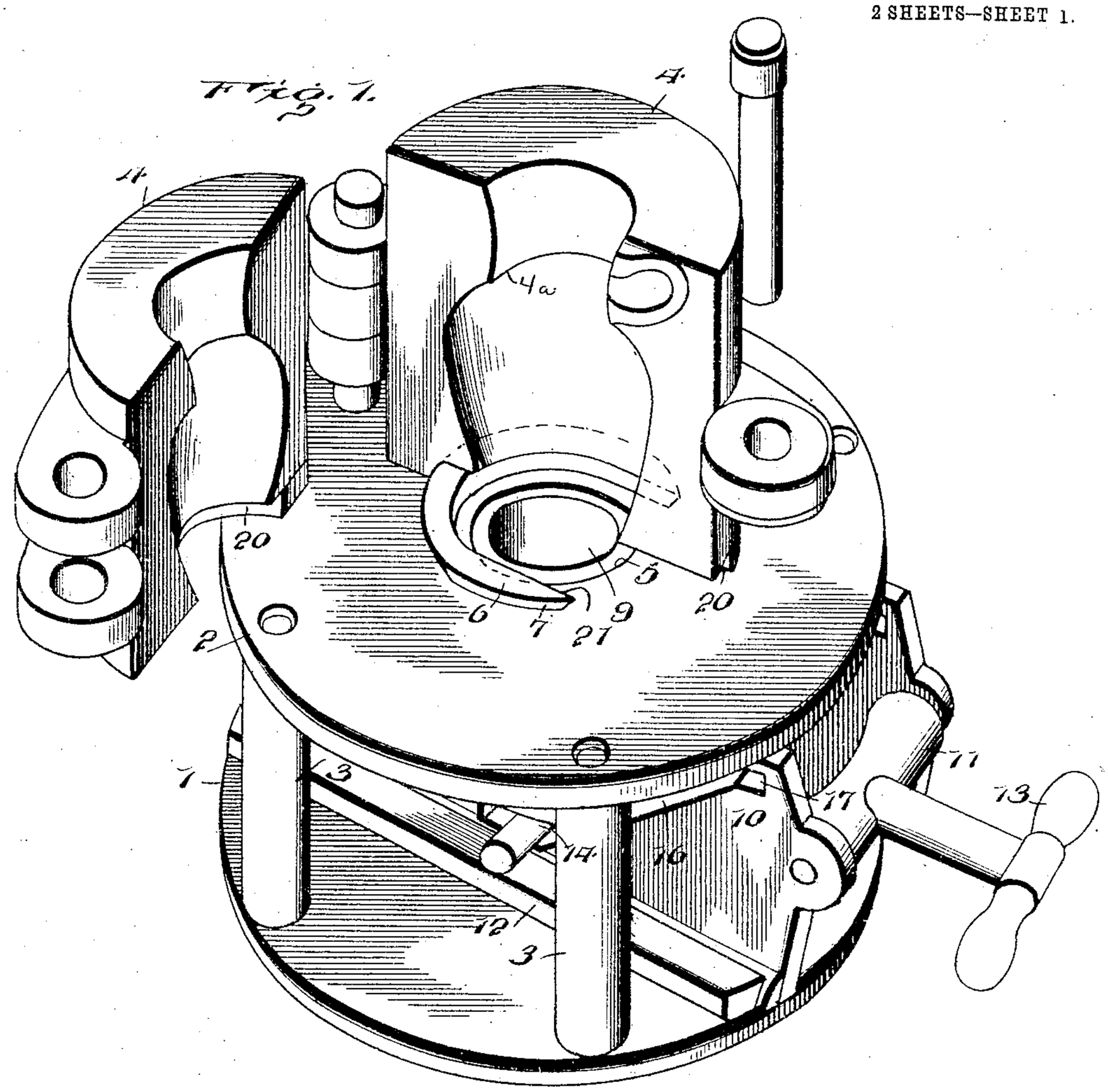
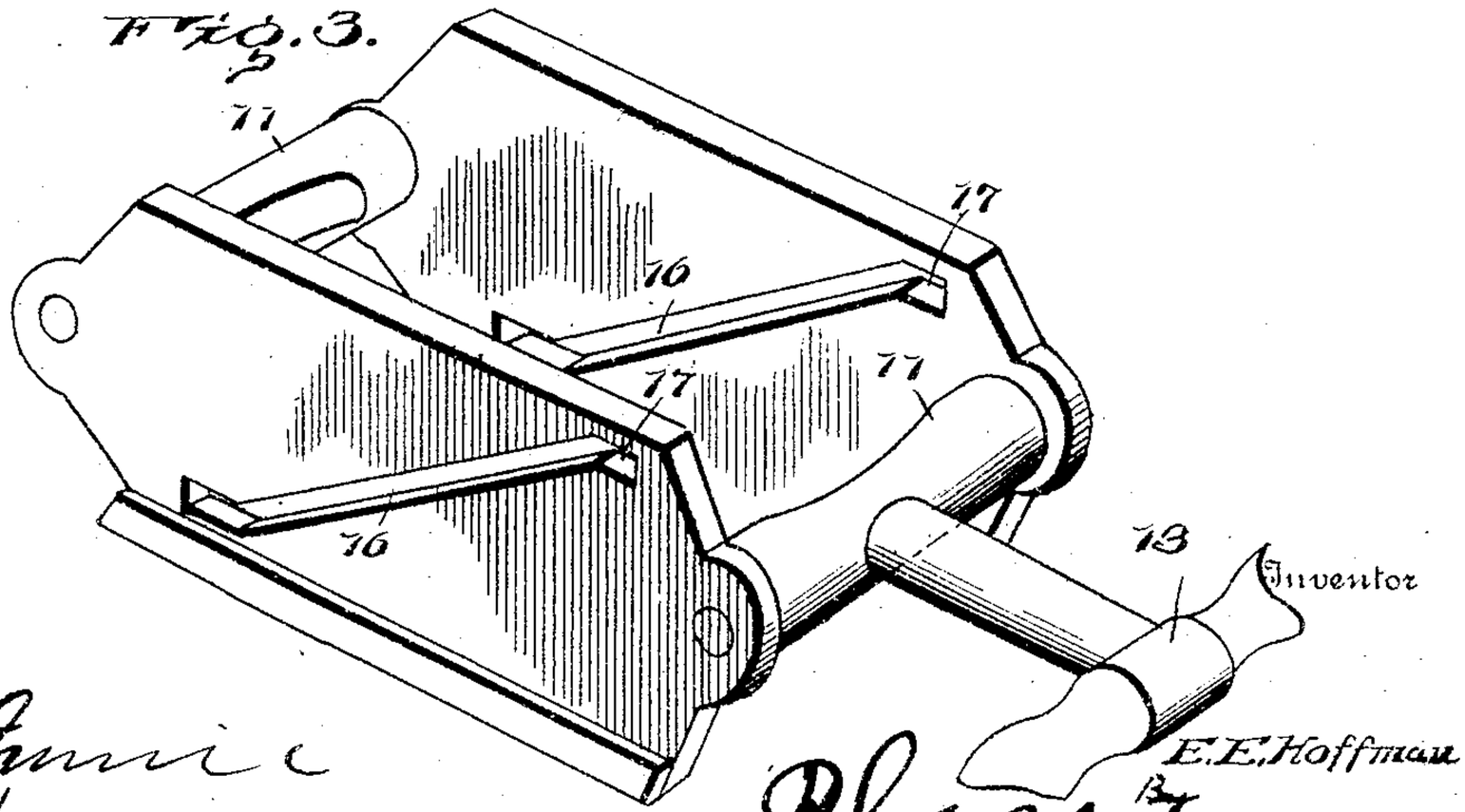


FIG. 3.



Witnesses

Inventor

E. E. Hoffman

By

Attorneys

No. 779,602. PATENTED JAN. 10, 1905.

E. E. HOFFMAN.

APPARATUS FOR MAKING HOLLOW GLASSWARE.

APPLICATION FILED APR. 7, 1904.

2 SHEETS—SHEET 2.

Fig. 5.

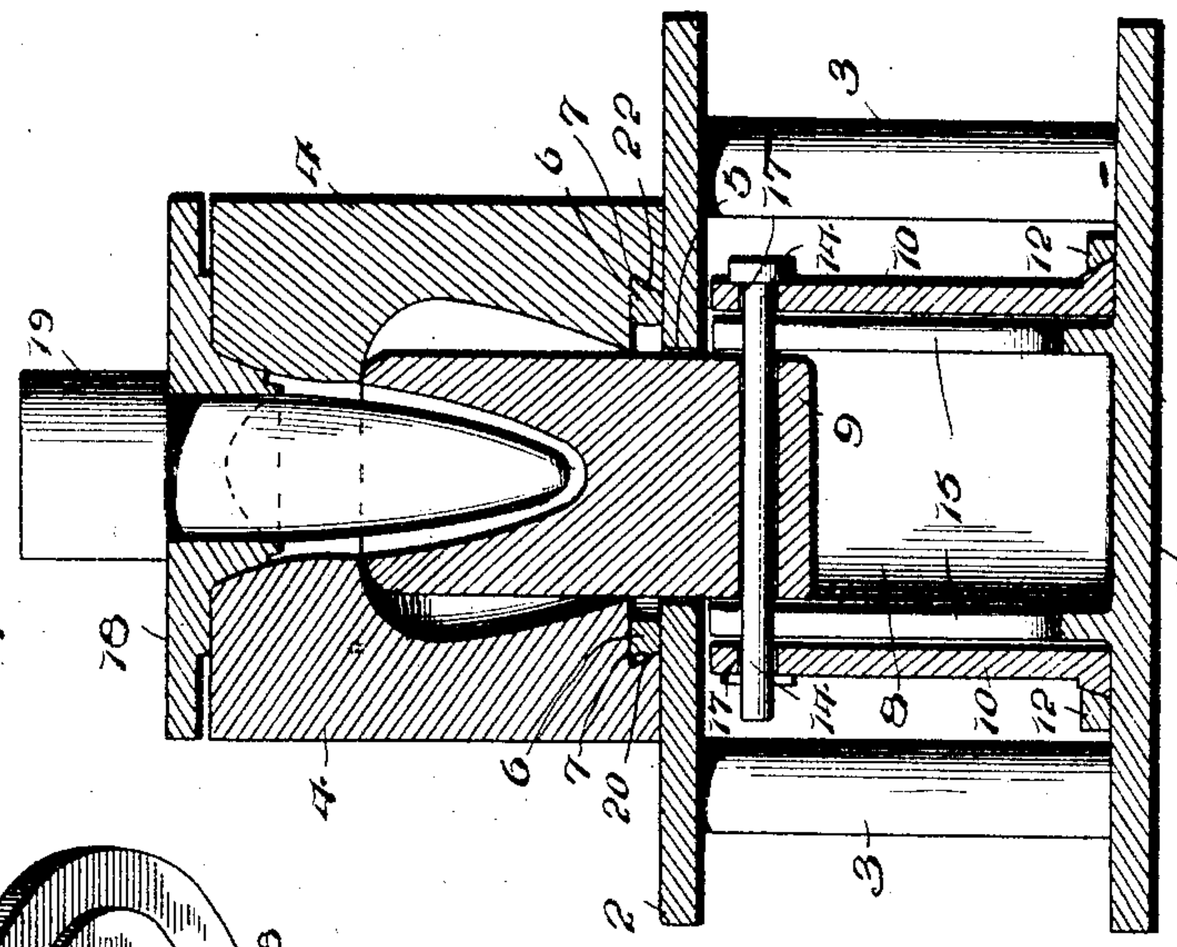


Fig. 4.

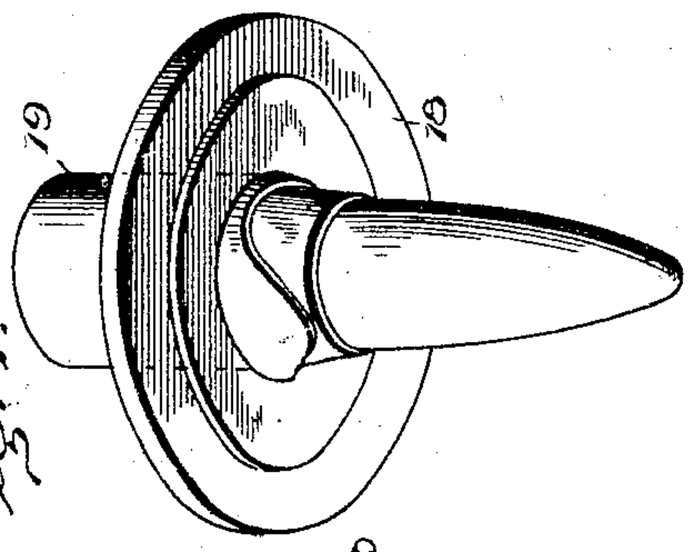


Fig. 3.

Fig. 6.

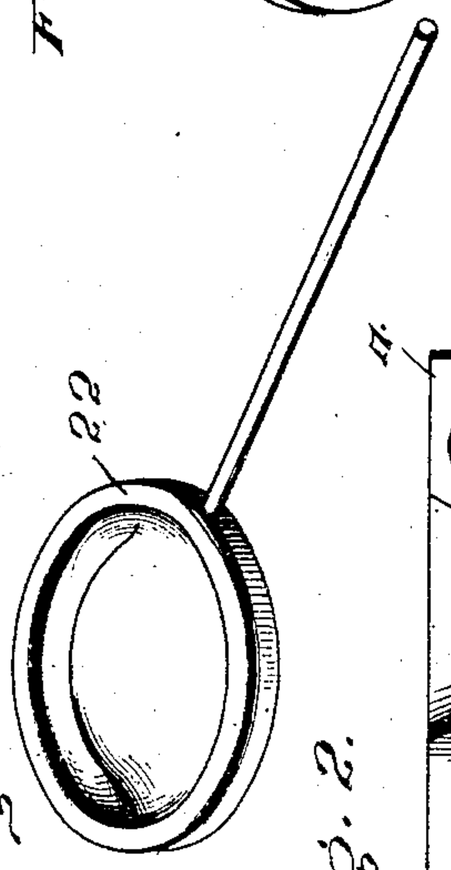


Fig. 2.

Witnesses
Jas. Shinne
W. N. Woodson

Inventor
E. E. Hoffman
By
R. A. D. Lacey, Attorneys

No. 779,602. Patented January 10, 1905.

UNITED STATES PATENT OFFICE.

EUGENE E. HOFFMAN, OF UPLAND, INDIANA.

APPARATUS FOR MAKING HOLLOW GLASSWARE.

SPECIFICATION forming part of Letters Patent No. 779,602, dated January 10, 1905.

Application filed April 7, 1904. Serial No. 202,044.

To all whom it may concern:

Be it known that I, EUGENE E. HOFFMAN, a citizen of the United States, residing at Upland, in the county of Grant and State of Indiana, have invented certain new and useful Improvements in Apparatus for Making Hollow Glassware, of which the following is a specification.

The object of this invention is to provide a novel molding apparatus for making glassware, such as bottles, pitchers, mugs, ointment-pots, or similar necked articles.

In the practical embodiment of the invention the ware is both pressed and blown in the manufacture thereof, the operation being facilitated by means which will be set forth more clearly as the description proceeds.

The invention involves particularly a special construction of former coöperating with the mold by which the blank is initially acted upon preparatory to being blown to form the body of the receptacle and operating means for actuating this former.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and accompanying drawings.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view, one of the sections of the mold being thrown open and the cover-plate of said mold being removed. Fig. 2 is a vertical sectional view. Fig. 3 is a detail perspective view of the actuator by means of which the movable former is operated. Fig. 4 is a detail perspective view of the former. Fig. 5 is a vertical sectional view taken on a line about at a right angle to Fig. 2. Fig. 6 is a detail perspective view of the bottom mold-plate.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

My invention consists of a support which comprises a bed-plate 1, on which is disposed a supporting-plate 2. The supporting-plate 2 is mounted upon vertical bars 3, which are interposed between this part and the bed-plate, said bars being of a suitable number to rigidly dispose the parts in their relative positions, as above indicated. The mold is disposed upon the supporting-plate 2 and comprises the usual movable sections 4, which are hingedly connected in any suitable manner. The supporting-plate 2 is provided about centrally thereof with an opening 5, and upon the upper side of the supporting-plate and partially surrounding the opening 5 aforesaid is provided a flange 6, the outer walls of which converge, as shown at 7. The under sides of the sections 4 of the mold are cut away, so as to embrace and engage the flanges 6, and when closed are thus secured upon the supporting-plate 2 aforesaid. A shell or casing 8 extends upwardly from the supporting-plate 1, immediately beneath the opening 5 therein, and this shell or casing houses or receives the blank-former 9, which latter is hollow in cross-section and adapted to be projected into and out of the mold in a manner which will appear more fully hereinafter. The former 9 is vertically movable and is adapted to rest normally in a lowermost position within the shell 8.

Peculiar actuating means are utilized to effect the vertical movement of the former 9, whereby same is projected into and out of the mold in the operation of forming the glass article therein. This means consists of an actuator comprising spaced members 10, disposed upon opposite sides of the shell 8 between the bed-plate 1 and the supporting-plate 2. The spaced members 10 are connected at their front and rear ends by means of cross-bars 11, and said members are adapted for a longitudinally-slidable movement beneath the supporting-plate 2 of the device. The actuator is guided in its slidable movement by means of longitudinal guides 12, which are rigidly secured to the upper side of the bed-plate 1 and which coöperate with the lower portions of the spaced members 10 of said actuator to direct the movement of the latter. A handle 13 extends from one of the cross-bars 11 of the actuator, power being applied to

this member in effecting movement of the actuator in the practical operation of the invention. The actuator may be operated manually by grasping the handle 13 or by means of any suitable power applied thereto, as found most suitable in the use of the invention. The former 9, which is disposed within the shell 8, is provided with engaging members 14, which constitute the end portions of a pin passed transversely through the lower portion of the former, and these engaging members project laterally from the sides of the former and cooperate with the actuating member which is designed to impart movement to the former. The engaging members 14 extend through vertical guide-slots 15 in the shell 8, and the extremities of these engaging members are received by inclined slots 16, provided in the spaced members 10 of the actuator. The slots 16 of the spaced members aforesaid constitute inclined ways or guides in which the engaging members 14 move as the actuator is operated. The actuator is adapted for a reciprocal movement in effecting operation of the former 9, and when the former is in its normal position the engaging members 14 thereof are disposed at the lower ends of the slot 16. When a slidable or reciprocal movement is imparted to the actuator by operation of the handle 13 or any suitable power medium, the engaging members are caused to move upwardly along the inclined ways or slots 16, thus actuating the former so as to impart a vertical movement thereto, said former being guided in its vertical movement by the vertical slots 15 of the shell 8. The aforesaid vertical movement of the former projects the same upwardly through the opening 5 of the supporting-plate into the mold, as will be readily seen. In order to hold the former at the limit of its upward movement, the slots 16 merge at their upper ends into horizontal slots 17, and the engaging members rest in said slots 17 after the former has been projected upwardly into the mold. It is contemplated that the spaced members 10 of the actuator may be provided with any suitable inclined ways or members for coöperation with the engaging members 14 of the former 9, and the walls of the spaced members 10 adjacent the ends of the slotted portions thereof constitute stops to limit the reciprocal movement of the actuator, as well as the vertical movement of the former itself. This is important in that since means are provided upon the actuator for limiting the movement of the former 9 the latter cannot strike against the mold-sections, so as to jar or strain the latter in any manner whatever.

A cover-plate 18 rests upon the upper sides of the mold-sections 4, and this plate is provided about centrally thereof with an opening through which a movable plunger 19 is adapted to pass in the formation of the glass article within the mold. The plunger 19 is disposed above the mold and is adapted to be actuated by any suitable means usually designed for this purpose in an apparatus of the class to which my invention relates. Said plunger is of approximately conical form.

The mold-sections 4 which are illustrated in my drawings are adapted for the formation of a glass cream-pitcher or the like, said sections being provided with the inner shoulders 4ª, which represent the line of juncture of the neck of the pitcher with the body thereof, as shown most clearly in Figs. 1 and 2. The under sides of the sections 4 are cut away, as shown at 20, and the flange 6 of the supporting-plate 2 is likewise cut away, as shown at 21, so as to admit of introduction into the mold of the bottom mold-plate 22, which forms the bottom of the receptacle which is blown or molded in the operation of the invention.

Describing the operation of my invention, in order to form the glass article within the mold and the former 9 being disposed in its normal position in the shell or casing 8 the actuator is first operated by a reciprocal or vertical movement thereof, so as to force the former 9 upwardly until the upper end thereof is approximately in contact with the shoulder 4ª upon the inner sides of the movable sections 4 of the mold. The cover-plate 18 is now placed in position upon the upper side of the mold, and the requisite quantity of glass is cut off. The plunger 16 now descends into the upper portion of the mold and into the hollow body of the former 9, and the same thus forms the neck, lip, and handle of the pitcher, (if this is the receptacle which is being made.) The descent of the plunger 19 also forms a hollow blank in the former 9, and this blank consists of a body of glass sufficient when blown to form the body of the receptacle or pitcher in the instance above mentioned. The plunger 19 having accomplished the above is now withdrawn from the mold and the actuator is again operated so as to lower the former 9 into the shell, the blank or body of glass previously located in the former being now suspended from the neck of the receptacle which has just been formed by the plunger 19. After the former has reached its lower normal position a mold-plate 22 is introduced through the cut-away portions 20 and 21 of the mold-sections 4 and the flange 6, respectively. Compressed air is then admitted into the mold, and the blank suspended from the neck is blown out into the mold, completing the glass article in a manner which will be readily appreciated. The completed article is both pressed and blown, and the lip and handle of the pitcher are formed at the same time without necessitating the removal of the glass from the mold until the entire article is complete.

Having thus described the invention, what is claimed as new is—

1. The combination of a mold, a movable former, engaging members extended from the

former, guide means coöperating with said engaging members, and an actuator engaging the said engaging members to effect movement of the former.

2. The combination of a mold, a movable former, engaging members extended from opposite sides of the said former, and an actuator comprising spaced members engaging the engaging members of the former to impart movement to the said former.

3. The combination of a mold, a shell or casing, a former movably mounted in said shell or casing and adapted to be projected into and out of the mold, guides provided upon the shell or casing, engaging members extended from opposite sides of the former and coöperating with the guides aforesaid, and an actuator comprising spaced members having inclined ways engaging the engaging members of the former for actuation of the latter.

4. The combination of a bed-plate, a supporting-plate carried by said bed-plate, a mold disposed upon the supporting-plate, a shell disposed between the bed and supporting plates, a former movable in said shell and adapted to be projected into and out of the mold, longitudinal guides secured to the bed-plate, an actuator comprising spaced members slidable upon the bed-plate in the longitudinal guides aforesaid and disposed upon opposite sides of the shell, connecting means between said spaced members, said spaced members being provided with inclined slots, the shell being provided with vertical guide-slots, engaging members extended from the former and coöperating with the guide-slots of the shell and the inclined slots of the actuator members, means for limiting the movement of the former, and a plunger movable into and out of the mold and coöperating with the former.

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

EUGENE E. HOFFMAN. [L. S.]

Witnesses:
CARL C. GILES,
ORVILLE B. PEELLE.