

No. 630,284.

W. BUTTLER & H. H. CLOUGH.

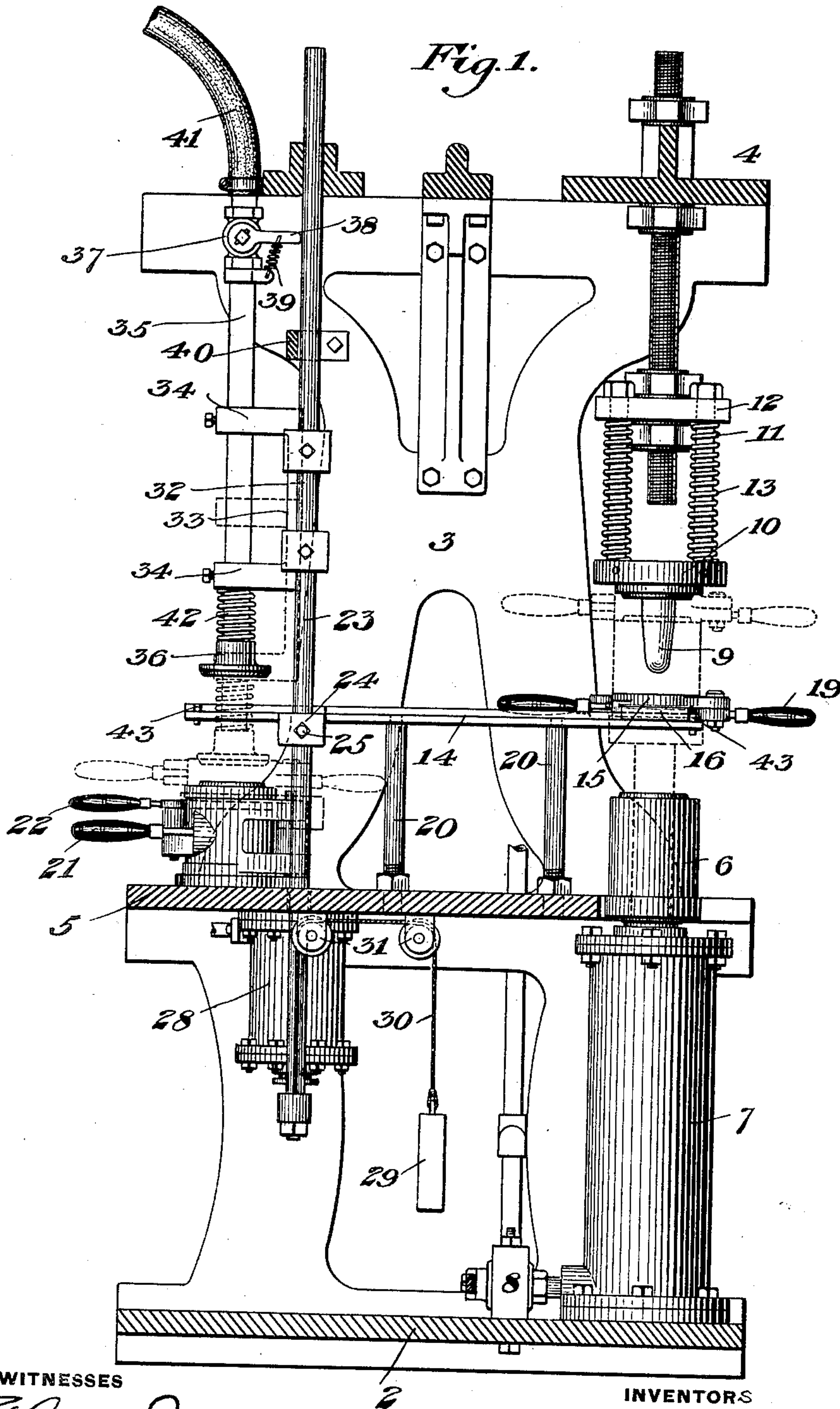
Patented Aug. 1, 1899.

APPARATUS FOR FORMING HOLLOW GLASS ARTICLES.

(Application filed Apr. 28, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

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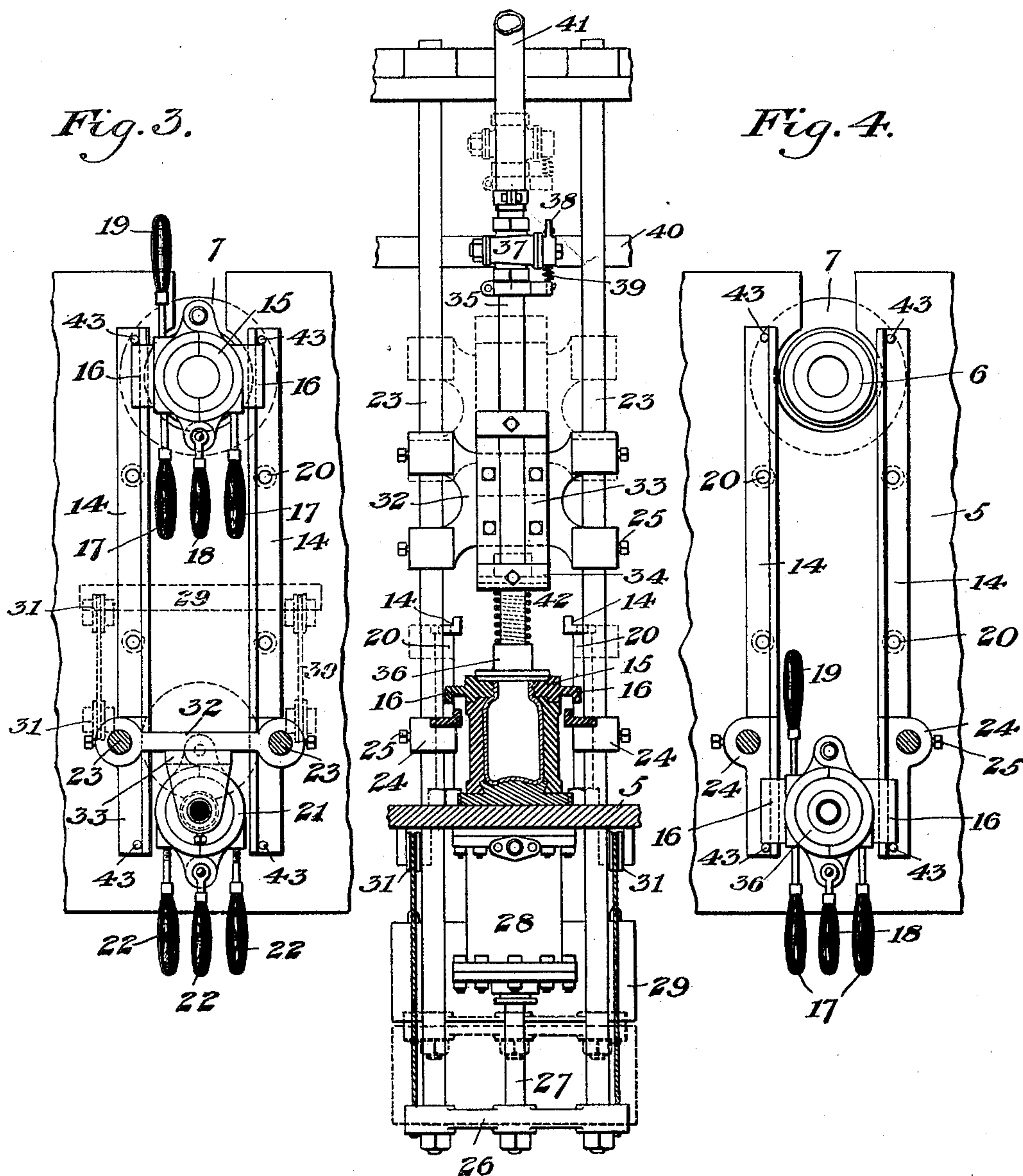
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2 Sheets—Sheet 2.

Fig. 2.

Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR FORMING HOLLOW GLASS ARTICLES.

SPECIFICATION forming part of Letters Patent No. 630,284, dated August 1, 1899.

Application filed April 28, 1899. Serial No. 714,775. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM BUTTLER, of Redkey, in the county of Jay and State of Indiana, and HENRY H. CLOUGH, of Elyria, in the county of Lorain and State of Ohio, have invented a new and useful Improvement in Apparatus for Forming Hollow Glass Articles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional side elevation of our improved apparatus. Fig. 2 is a partial end elevation, partly broken away; and Figs. 3 and 4 are horizontal sections showing the mold-ring in its two different positions.

Our invention relates to the forming of hollow glass articles by pressing a blank and then expanding it in another mold by blowing; and its object is to provide a simple and easily-operated machine for this purpose.

In the drawings, 2 represents the base-plate of the frame having vertical end standards 3, with a transverse top plate and an intermediate operating-table 5 located at a convenient height for the operator. Along the front of the machine are located press-molds 6, which are secured at the upper ends of plungers movable in the single-acting cylinders 7, having fluid-admission valves 8. Any desired number of these molds may be used, and for clearness we show only one press-mold with its stationary plunger and other parts. The mold-entering plunger 9 projects downwardly from the head 10, carried upon depending rods 11, extending through holes in an upper plate 12. The head 11 is normally pressed down by the springs 13, but may be moved up slightly when the press-mold is brought into the position shown in dotted lines in Fig. 1. The plunger 9 is in registry with the mouth of the mold, and in a horizontal plane between them extends a track consisting of rails 14, upon which a sliding mold-ring 15 is carried, this ring having flanged wings 16, which fit over the ribs of the tracks, allowing the mold-ring to be slid back and forth along it. The mold-ring is provided with the usual opening-handles 17 and the locking-handle 18, and on the opposite side

with a handle 19, by which the press-mold operator shoves it along the track. The track is supported upon vertical standards 20, and at the rear of the machine it extends above a blow-mold 21, set between the lines of the rails and having the operating-handles 22. Those portions of the rails which are above the blow-mold are severed from the other portions of the rails and are carried upon reciprocatory vertical rods 23, which extend through lugs 24 of these movable track-sections and are secured to the lugs by set-screws 25. The rods are reciprocated by means of a lower cross-head 26, secured to the lower end of the piston-rod 27, projecting downwardly from the piston of cylinder 28, secured to the lower face of the table between the rods. The rods and attached parts are counterbalanced by a counterweight 29, having flexible connections 30, extending over pulleys 31 and secured to the cross-head 26. Above the track a cross-head 32 is secured to the rods, having bolted thereto a plate 33, provided with horizontal guides 34, through which extends a pipe 35, having a blow-head 36, secured at its lower end and arranged to fit the recess in the upper face of the mold-ring. The upper end of the pipe 35 is provided with a regulating-valve 37, having an operating-lever 38, provided with a spring 39, which normally holds the valve closed. The valve is opened at a determined point in the downward movement of the rods 23 in their attached parts by a lug 40, which contacts with the lever 38. A flexible supply-tube 41 is connected to the upper end of the pipe 35, and a spring 42 between the blow-head and the guide 34 normally forces the blow-head downwardly, but allows it to move slightly in the guides after entering the mold-ring.

The operation of the machine is as follows: The mold-ring being closed and placed at the front end of the track, as shown in Fig. 1, the requisite quantity of glass is dropped into the press-mold 6, and fluid is admitted to the cylinder 7 by operating the valve 8 through a suitable foot-lever. The mold-being forced upwardly passes between the rails of the track and, engaging the mold-ring, lifts it, and the two pass up into the position shown in dotted

lines, thus pressing the blank and giving the final shape to the head. We have shown the apparatus as adapted for forming fruit-jars, the opening in the mold-ring having suitable internal screw-threads to shape the mouth. After the blank is thus pressed the fluid is exhausted from the cylinder 7, and as the mold is lowered the mold-ring will be stopped on the track and the mold will lower away from it, leaving the blank hanging from the mold-ring. The operator then slides the mold-ring and blank along the track by handle 19, the mold-ring being stopped in proper position at each end by suitable pins or stops 43. It thus being brought into position above the blow-mold and resting on the movable track-section, fluid is admitted to the cylinder 28 by a suitable handle, and the cross-head 26, moving downwardly, carries down the track-section, the mold-ring, and the air-pipe 35. The mold-ring being stopped and centered on the blow-mold, as shown in Fig. 2, the track-sections move down and the blow head is brought into place in the mold-ring. The lever 38, contacting with the stop 40, opens the air-supply and the air expands the blank into final form. The mold-ring is then opened, and the fluid then being exhausted from the cylinder 28 the counterweight 29 raises the track-section to its normal position, and the mold-ring is shoved back to its first position. The blow-mold is opened and the finished article taken to the leer.

The advantages of our invention will be apparent to those skilled in the art, since the operations are simple and easily carried out and do not require skilled labor. The use of the mold-ring, which moves on the track, allows the blank to be drawn from the press-mold automatically and renders the action simple and rapid.

The blank-mold may be stationary and the plunger moved down, carrying the ring and a movable track-section with it, and many other changes may be made in the form and arrangement of the mold, the mold-ring, and the track without departing from our invention, since

We claim—

1. The combination with a track, of a press-mold and a plunger located at a fixed point along the track and movable relative to each other, and a mold-ring having supports normally at the track-level and movable therealong, said supports being arranged to be

moved to a different level by the pressing apparatus, substantially as described.

2. The combination with a track, of glass-pressing mechanism and glass-blowing mechanism, each having a mold located at a fixed point along the track, and a mold-ring having supports normally at the track-level and movable therealong, said supports being arranged to be moved to a different level by the pressing mechanism and the blowing mechanism, substantially as described.

3. The combination with a horizontally-extending track having a vertically-movable portion, of pressing apparatus and blowing apparatus at different points in the length of the track, a mold-ring resting upon and movable along the track, and mechanism for moving the mold-ring and movable track-section to a different level than the normal track-level, while operating upon the glass, substantially as described.

4. The combination with a track, of a mold-ring having supports normally at the track-level, and movable therealong, said mold-ring resting loosely on the track so as to be easily lifted therefrom; a press-mold and plunger located at a fixed point along the track, a blow-mold and blow-head located at another fixed point along the track and mechanism for raising the press-mold and thereby lifting the mold-ring and its supports above the track, substantially as described.

5. The combination with a track, of a blow-head and blow-mold, located at a fixed point along the track and movable relative to each other, a press-mold and plunger located at another fixed point along the track and a mold-ring having supports normally at the track-level, and movable therealong, said supports being arranged to be moved to a different level by the blowing apparatus, substantially as described.

In testimony whereof we have hereunto set our hands.

WILLIAM BUTTLER.
HENRY H. CLOUGH.

Witnesses as to the signature of William Buttler:

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