

W. BUTTLER.
GLASS SHAPING APPARATUS.

APPLICATION FILED AUG. 24, 1901.

NO MODEL.

3 SHEETS—SHEET 1.

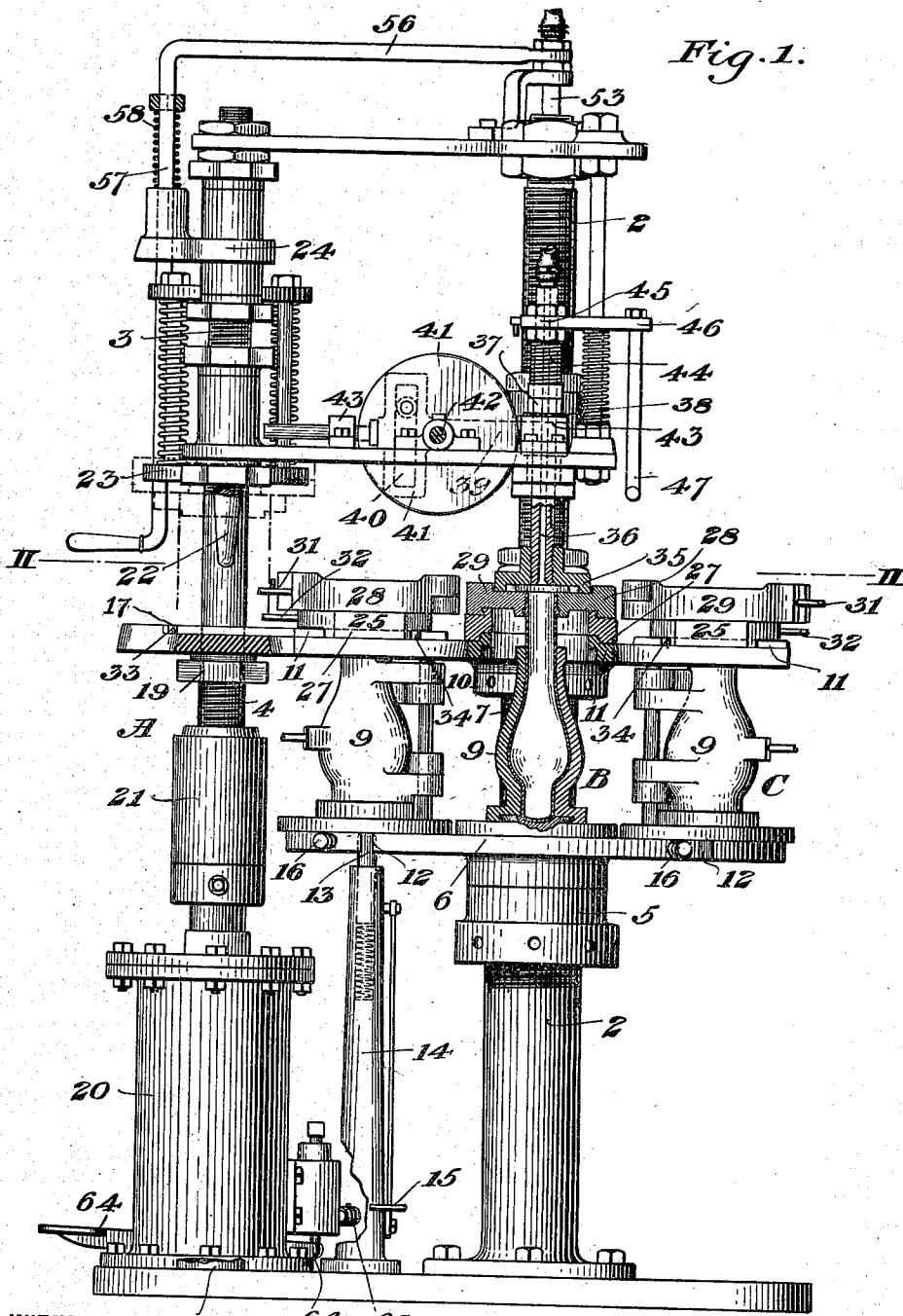


Fig. 1.

WITNESSES

Warren W. Swartz
Geo. B. Blumberg

INVENTOR

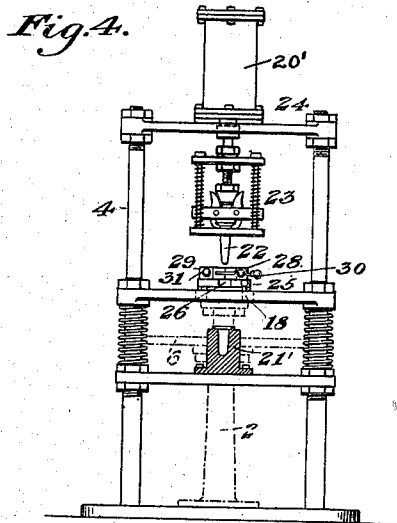
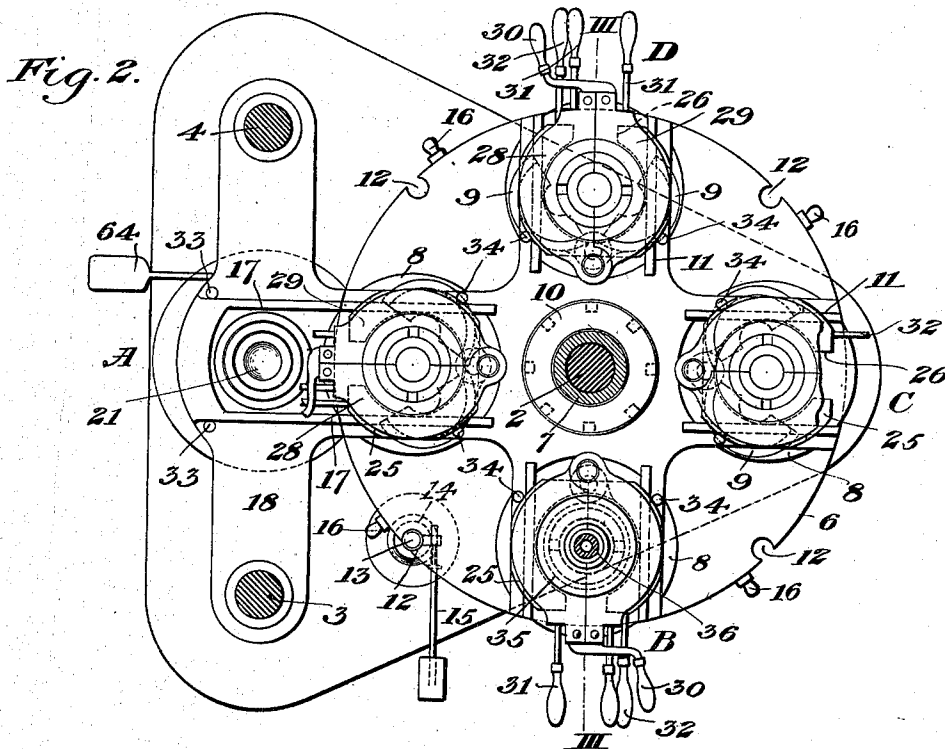
Wm. Butler
by Rakemil & Byrne
his attorneys

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3 SHEETS—SHEET 2.



WITNESSES

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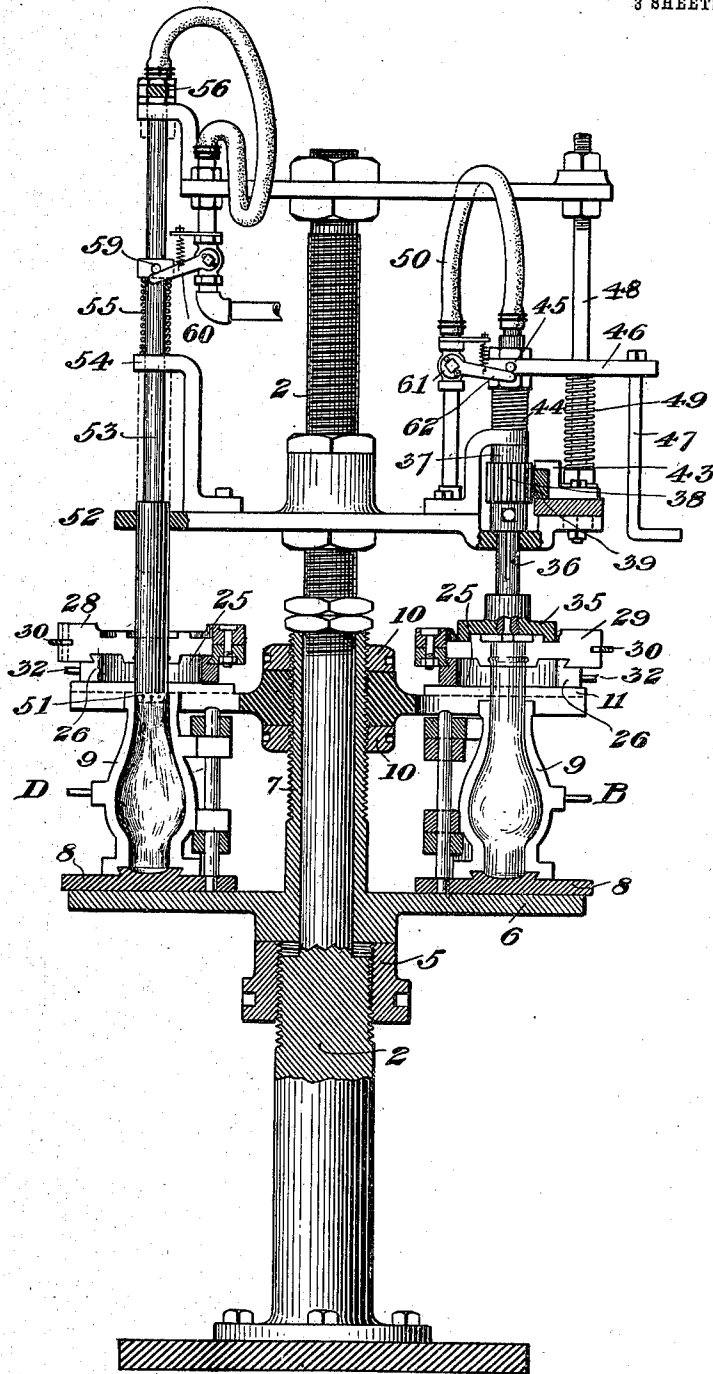
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3 SHEETS—SHEET 3.

Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM BUTTLER, OF REDKEY, INDIANA.

GLASS-SHAPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 738,657, dated September 8, 1903.

Application filed August 24, 1901. Serial No. 73,145. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BUTTLER, of Redkey, Jay county, Indiana, have invented a new and useful Glass-Shaping Apparatus, 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 side elevation, partly broken away, of my apparatus. Fig. 2 is a horizontal section on the line II II of Fig. 1. Fig. 3 is a vertical section on the line III III of Fig. 2, and Fig. 4 is a detail of a modification.

My invention relates to apparatus for shaping hollow glass articles by pressing a hollow blank and then expanding the blank within a finishing-mold; and its object is to provide a simple and cheap machine of this character which may be operated rapidly and afford a large output.

In the drawings, 2, 3, and 4 represent vertical posts or standards forming a part of the framework. The post 2 is provided with an adjustable sleeve 5, having screw-threaded engagement therewith and forming a support upon which rests a table or platform 6, secured to a long sleeve 7, surrounding a reduced smooth portion of the post 2. The rotary table is provided with a series of mold-bases 8 and a corresponding number of two-part blow-molds 9, engaging therewith. The sleeve projecting upwardly from this table is provided with external screw-threads which engage corresponding internal threads upon nuts 10, which clamp between them a carrier having sets of tracks 11, projecting outwardly therefrom. These tracks are the same in number as the blow-molds and project on either side of the blow-molds, turning with them as the supporting-table is turned. The table is provided with locking recesses 12 at suitable intervals around its circumference, with which engage a spring-pressed latch 13, movable within a tubular support 14, and which may be depressed by the foot-lever 15, having link connection therewith, as shown. The table may be turned by means of handles 16, projecting from the base, and during its turning the spring-latch is pressed against the under face of the table until the next recess is reached, when it is forced thereinto and locks the table in the desired position.

When in locked position, one of the tracks which projects toward the space between the other posts 3 and 4 is in registry with the fixed track portion 17, secured to a cross-head 18, whose end collars are secured by nuts 19 engaging the reduced and screw-threaded portions of the post. Beneath the stationary track is located a vertical motive cylinder 20, to the upper end of whose piston-rod is secured a press-mold 21, and above the track and in registry with the mold is a plunger 22, carried upon the ordinary form of plunger-supporting mechanism 23, the carrying cross-head 24 of which is carried upon the upper parts of the posts 3 and 4 and is vertically adjustable thereon.

Each of the radially-extending tracks 11 is provided with a ring-shaped slide 25, which is slotted or provided with an opening 26 at one side and has flanges 27 fitting over the rails of the tracks. On its top the slide is provided with an undercut annular flange arranged to enter corresponding recesses in a mold-ring composed of two parts 28 and 29 when closed thereon. This connection of the slide and mold-ring prevents upward movement of the mold-ring, but allows it to rotate upon a slide. The mold-ring may be locked in closed position by the usual lever 30, and each half is preferably provided with a handle 31. The slide is likewise provided with a handle 32, by means of which it and the mold-ring may be slid back and forth upon the tracks. The stationary track is provided with stops 33 in its outer end, and the movable tracks are provided with stops 34 near their inner ends, these stops being suitably arranged to center the mold-ring over the press-mold and over the blow-mold, respectively.

Above the blow-mold station B, I provide a vertically-movable blow-head 35, secured to a shaft 36, having a keyway connection with a tubular shaft 37, carried between suitable bearings on the frame. The hollow shaft is provided with a pinion 38, which engages the teeth of a horizontal rack 39, having a slotted cross-head 40, engaged by crank-pin on the crank-disk 41. This disk is mounted upon a shaft 42, which is actuated by an electric or other suitable motor. The rack is supported in suitable guides 43, and thus gives a reciprocatory motion which imparts an oscillatory

motion to the blow-head. The blow-head is held normally in elevated position by spiral spring 44, extending between the bearing and a collar 45, secured to the tubular blow-head shaft, this collar having an arm 46, provided with depending handle 47 and guided upon a stem 48, extending through it. A spiral spring 49 may also be provided below the arm to assist in lifting the blow-head when released. Compressed air is supplied to the hollow blow-head shaft through a flexible tube 50 or other suitable connection.

After passing the take-out station C the blow-molds pass to a spraying-station D, where the interior of the opened blow-mold is sprayed with water. For carrying out this step I provide a spray-head 51, guided within the plate 52 and secured to a tubular stem 53, guided within a bracket 54. A spiral spring 55 incloses the stem and normally lifts the spray-head to its upper position. The spray-head may be depressed by any suitable means, such as the connecting-arm 56 and depending handle-rod 57, as shown. The handle-rod is also preferably provided with a spiral spring 58 and is positioned at the pressing-station A, so that the pressing-operator may spray the mold before it is taken to the pressing-station.

The supply-pipe for the spray-head is provided with a top having a projecting arm 59, which contacts with a lever 60 after the spray-head has passed through the mold-ring and entered the mold, and the supply-pipe to the blow-head is provided with an automatic valve 61, having a similar opening device 62, both valves being spring-closed as soon as the heads are released.

It will be noted that all parts of the apparatus are made vertically adjustable to provide for different heights of molds for producing different articles.

The pressure-supply pipe 63 is normally closed by a spring-actuated valve and is opened by a foot-lever 64. In the operation of the apparatus the pressman supplies the proper amount of glass to the press-mold and cuts it off. The mold-ring and supporting-slide having been drawn forward into registry with the mold, the operator admits the fluid to the motive cylinder and forces up the mold. The upper end of this mold is arranged to fit within the lower recess of the slide and as it moves upwardly lifts the slide of the mold-ring and forces the mold up over the plunger, thus pressing the article within the mold-ring and mold. The pressure then being exhausted from the motive cylinder, the mold is lowered to its normal position and as it moves down the slide is stopped upon the stationary track, and the article is left hanging from it. The pressman then slides the mold-ring and slide rearwardly upon the movable track and over the blow-mold, which is at this time opened. The blowing-operator then turns the table a quarter of a revo-

lution, and thus brings the mold-ring, with its article depending within the blow-mold, below the constantly-oscillated blow-head. He then closes the blow-mold and depresses the blow-head upon the mold-ring. This blow-head is provided with a crab clutch connection with the mold-ring, formed by interfitting lugs and recesses, and consequently the mold-ring and article are oscillated within the blow-mold while the article is being expanded. The operator then releases the blow-head handle and turns the table another quarter of a revolution, thus bringing the next mold-ring, pressed blank, and blow-mold to the blowing-station. The finished article is removed by a boy at the take-out station C, and the mold is left open, and at the spraying-station the press-operator sprays each blow-mold before it is brought to the pressing-station.

Instead of raising and lowering the press-mold I may use a fixed mold, the plunger being raised and lowered to carry out the pressing operation. Thus in Fig. 4 I show the mold 21' secured in stationary position, the plunger being moved down by the motive cylinder 20', supported upon the top of the machine. In this case the operation is the same as before, the slide and mold-ring, however, remaining upon the track at all times.

The advantages of my invention will be apparent. The several steps are rapidly and easily carried out without the use of complicated machinery and with few operators. The machine is simple and not liable to get out of order. It is easily adjusted for different sizes and shapes of articles and does not require skilled workmen.

I claim—

1. In apparatus for forming hollow glass articles, a rotary carrier having a series of guiding-tracks extending outwardly thereon, and a mold-ring movable upon and guided by said tracks; substantially as described.
2. In apparatus for forming hollow glass articles, a rotary support having radial extending guiding-tracks, a blow-mold beneath each track, and a mold-ring resting upon each track; substantially as described.
3. In apparatus for forming hollow glass articles, a turning support having a series of outwardly-extending tracks, a stationary track-section arranged to register with the movable tracks in succession, and a mold-ring movable along said tracks; substantially as described.
4. In apparatus for forming hollow glass articles, a rotary support having outwardly-extending tracks, a relatively stationary track arranged to register therewith, pressing apparatus registering with the stationary track-section, and a mold-ring arranged to move along the track; substantially as described.
5. In apparatus for forming hollow glass articles, a rotary support having a set of blow-molds, outwardly-projecting tracks or

guides above each blow-mold, and mold-rings movable radially upon said tracks; substantially as described.

5 6. In apparatus for forming hollow glass articles, a rotary support having a set of blow-molds, a track above each mold, mold-rings movable upon the tracks, and pressing mechanism arranged to register with the mold-rings at a point outside of the blow-
10 molds; substantially as described.

7. In apparatus for forming hollow glass articles, an endless carrier having blow-molds, guides above the blow-molds, a pressing-station provided with pressing apparatus and
15 having a guide registering with those upon the carrier, and a mold-ring movable upon said guide; substantially as described.

8. In apparatus for forming hollow glass
20 articles, a spray-pipe having a movable portion, a blow-mold, mechanism for moving the spray-pipe into and out of the mold, and a connection from the spray-pipe to a source of liquid-supply; substantially as described.

9. In apparatus for forming hollow glass articles, a spray-pipe having a movable portion, a blow-mold, mechanism for bringing
25 the pipe and mold into position with the mold around the pipe, and a valve in the pipe connected to a source of liquid-supply; substantially as described.

10. In apparatus for forming hollow glass articles, a vertically-adjustable turn-table carrying blow-molds, and outwardly-projecting guides above these blow-molds; substantially as described.

11. In apparatus for forming hollow glass articles, a vertically-adjustable turn-table carrying blow-molds, and vertically-adjustable guides located above and movable with
35 the turn-table; substantially as described.

In testimony whereof I have hereunto set
40 my hand.

WILLIAM BUTTLER.

Witnesses:

A. B. MCSWAIN,
HENRY WHITEHAIR.