

(No Model.)

2 Sheets—Sheet 1.

D. C. RIPLEY.
APPARATUS FOR BLOWING GLASS.

No. 580,349.

Patented Apr. 6, 1897.

FIG. 6.

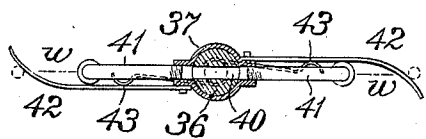


FIG. 7.

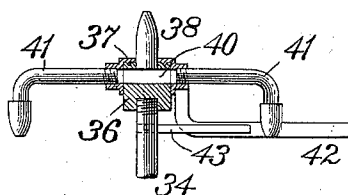
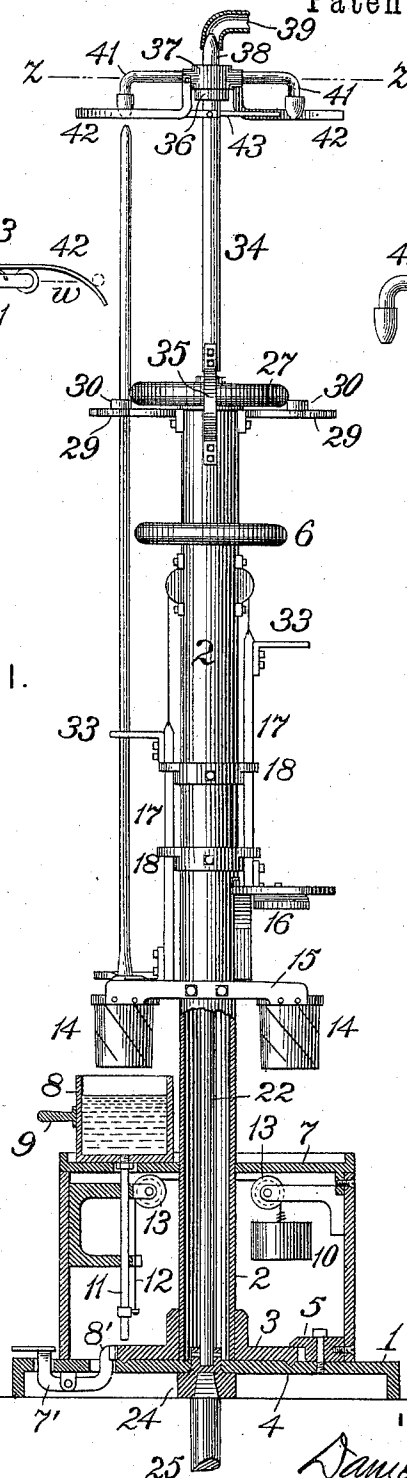


FIG. 1.



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(No Model.)

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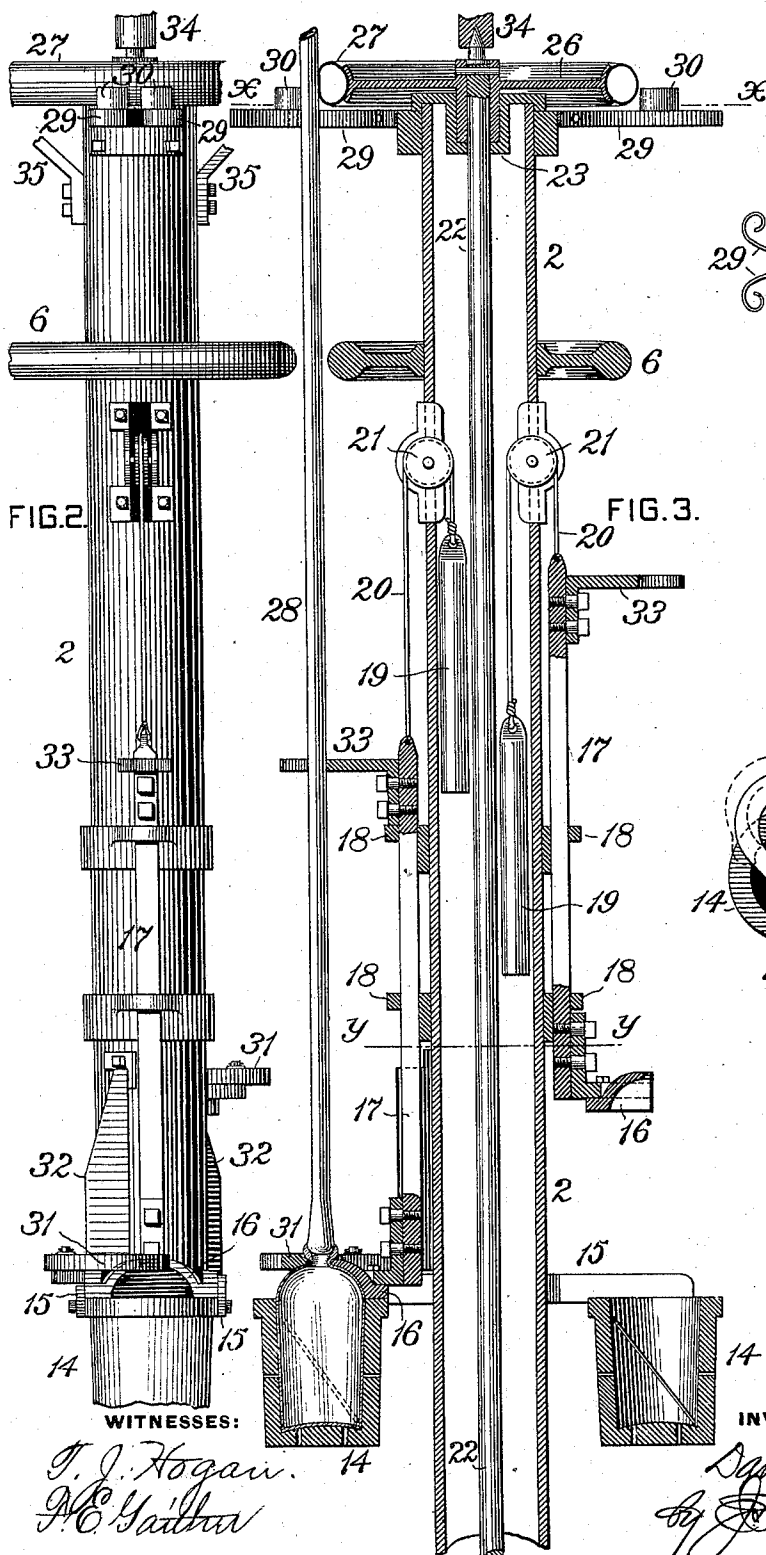


FIG. 2.

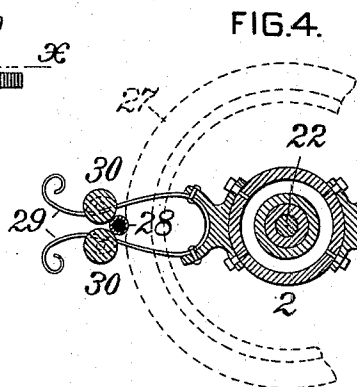


FIG. 4.

FIG. 3.

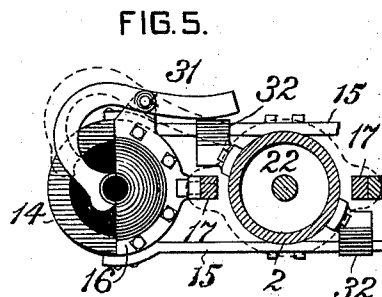


FIG. 5.

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UNITED STATES PATENT OFFICE.

DANIEL C. RIPLEY, OF PITTSBURG, PENNSYLVANIA.

APPARATUS FOR BLOWING GLASS.

SPECIFICATION forming part of Letters Patent No. 580,349, dated April 6, 1897.

Application filed August 7, 1896. Serial No. 601,956. (No model.)

To all whom it may concern:

Be it known that I, DANIEL C. RIPLEY, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Apparatus for Blowing Glass, of which improvement the following is a specification.

The object of my invention is to expedite and facilitate the manufacture of hollow articles of glassware in paste-molds and to dispense with the two-part molds heretofore employed in such manufacture.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a side view, partly in section, of a glass-blowing apparatus, illustrating an application of my invention; Fig. 2, a front view, in elevation and on an enlarged scale, of a portion of the same; Fig. 3, a vertical central section through said portion; Figs. 4 and 5, horizontal sections at the lines *x x* and *y y*, respectively, of Fig. 3; Fig. 6, a similar section at the line *z z* of Fig. 1, and Fig. 7 a vertical section at the line *w w* of Fig. 6.

In the practice of my invention I provide a bed-plate or stand 1, upon which a vertical tubular support 2 is mounted centrally, with the capacity of movement about its axial line. The support 2 rests upon the bed-plate through a circular bearing-plate 3, secured upon the lower end of the support and having an annular V-shaped projection 4 on its lower side fitting a corresponding groove in the bed-plate. One or more guide-blocks 5, having projecting flanges fitting over the upper surface of the bearing-plate, may also be secured to the bed-plate. A hand-wheel 6, by which the tubular support may be moved in either direction about its axial line, is secured upon it near its upper end, and it is locked in and released from position for the detachment of the blown glass from the molds by a treadle 7', carrying a stop 8', which may be brought into engagement with and released from a circumferential recess in the bearing-plate, as from to time required.

A table 7, fixed upon the bed-plate 1, supports a water-tank 8 for moistening and cooling the molds, said tank being raised and

lowered to inclose and to be withdrawn from the molds, respectively, by a handle 9 and being counterbalanced by a weight 10, which is connected to a vertical guide-stem 11, secured to the bottom of the tank by a cord 12, passing around sheaves 13, journaled in bearings fixed to the table.

Two molds 14 14, each of which is integral or made in one piece and has its top entirely open, are secured upon the ends of arms 15 15, each of which is secured centrally to the tubular support 2. The molds 14 are set at equal distances from the axial line of the support and on the same horizontal level, their bottoms being slightly above the top of the water-tank 8. Each of the molds is provided with a dome-shaped or outwardly-curved cover 16, which is segmentally recessed or cut away on the side of its center farthest from the tubular support, so as to cover only, say, about one-half of the opening at the top of the mold and admit of the insertion and removal laterally of a blow pipe while removed from the mold, as clearly shown in Figs. 2, 3, and 5.

Each of the mold-covers 16 is secured to the lower end of one of a pair of bars 17, fitted to slide vertically in guides 18, fixed to the periphery of the tubular support 2, the weight of each bar 17 and the connected mold-cover being counterbalanced by a weight 19, the weights 19 traversing in the inside of the tubular support 2 and being connected to the mold-covers by cords 20, passing around sheaves 21, journaled in openings on opposite sides of the tubular support.

A shaft or spindle 22 passes centrally through the tubular support 2 and is journaled at its upper end in a cap-plate 23, fixed thereon, and at its lower end in the bed-plate 1. A coupling-section 24, secured upon the lower end of the spindle 22, is engaged by a driving-shaft 25, through which rotation is imparted to the spindle in order to rotate a blowpipe therefrom during the movement of the latter, while journaled on the tubular support, through a semicircle about the common axial line of the spindle and the support. To this end a driving-wheel 26, having an elastic tire or rim 27, is secured upon the upper end of the spindle, and two pairs of springs

29, upon each member of which is journaled a guide-roller 30, are secured to the tubular support 2 on diametrically opposite sides of its axial line and adjacent to the driving-wheel 26. While one or the other of the mold-covers 16 is raised off the top of its mold, as shown on the right side of Fig. 3, the blowpipe 28 is inserted between the guide-rollers 30, which stand above said mold on the same side of the tubular support, and is held in rotative contact with the rim 27 of the driving-wheel 26 by said rollers and their supporting-springs. The mold-cover and blowpipe are then lowered until the cover rests on the mold, as shown at the left of Fig. 3, and the lower end of the blowpipe is centered with the mold by a double-armed lever 31, which is pivoted to the mold-cover and has one of its ends, which is adapted to bear on the glass adhering to the blowpipe, recessed to the curvature of the central recess in the mold-cover. The opposite arm of the lever 31 bears against an inclined guide-piece 32, two of which are secured on opposite sides to the support 2 adjacent to the level of the mold. The blowpipe is guided intermediately between its ends by a recess in the outer end of a guide-arm 33, one of which is fixed to the upper end of each of the bars 17, to which the mold-covers are attached.

A standard 34, which may be either solid or tubular, as preferred, is secured by bars 35 (which are outwardly curved to clear the driving-wheel 26) to the upper end of the tubular support 2, concentrically therewith and with the spindle 22, the upper end of which may be conically formed and fitted in a recess in the lower end of the standard 34 to maintain true axial alinement of the latter, as shown in Fig. 3. A cylindrical block 36 is secured to the upper end of the standard 34, and a cap 37 is fitted, with the capacity of free rotation, on the block 36. A short section of pipe 38 is secured centrally in the cap 37, the outer end of said section fitting, so as to be rotatable freely, in the end of a pipe 39, through which air under pressure is led from a suitable source of supply.

The pipe 38 communicates with a transverse passage 40 in the block 36, and two pipes 41 41 are secured to and project in opposite directions from the cap 37. In one position of the tubular support 2, to wit, that in which the mold-covers 16 stand in line axially with the molds, the pipes 41 communicate freely with the central passage 40 of the block 36, and said pipes are turned downwardly at their outer ends, the axes of which are at the same distance from the axial line of the tubular support and spindle as the axes of the molds 14. Plate-springs 42 42 are secured to and project in opposite directions from the cap 37, each of said springs bearing against one of the pipes 41 near its outer end, and springs 43 43 are secured to the standard 34, each bearing against one of the springs 42.

In the operation of the apparatus, compressed air being supplied to the pipes 41 through the pipes 39 38, the operator places the gathering of glass upon the lower end of the blowpipe 28 and enters the blowpipe, which is inclined outwardly and upwardly, into the recess of the guide-arm 33 on the side of the machine farthest from the water-tank, the bar 17, carrying said arm, and a mold-cover having been previously raised to its highest point. The blowpipe then presses against the spring 42 on that side of the machine and through said spring swings the cap 37 on the block 36, so as to move the adjacent pipe 41 away from the blowpipe until the latter has been entered between the guide-rollers 30 and brought below the level of the outer end of the pipe 41. The springs 43 then return the cap 37 to the position shown in the drawings, in which the outer discharge end of the pipe 41 will be in line axially with the blowpipe. In the downward movement of the blowpipe, which is made coincidently with that of the adjacent bar 17 and mold-cover 16, the mold-cover is brought into contact with its mold, and the double-armed lever 31 bears against the adjacent inclined guide 32 and is thereby brought into the position shown in Figs. 2, 3, and 5, in which it bears on the glass on the lower end of the blowpipe and properly centers it at its lower end. The tubular support 2 is then swung around through a semicircle by the hand-wheel 6, and during its traverse the article is blown by the compressed air supplied to the blowpipe, which is meanwhile rotated by frictional contact with the elastic rim of the driving-wheel 26. The blowpipe is not connected with the pipe 41, from which it receives its supply, but is separated therefrom by a free space, the operation being in this particular similar to that described in Letters Patent No. 557,298, granted to the United States Glass Company, as assignee of F. Altenbaugh, under date of March 31, 1896.

When the blowpipe and mold have been brought into position above the water-tank, the bar 17 and mold-cover 16 are raised, the blowpipe and the attached blown article are removed, and the mold may be cooled and moistened in the tank, as required. The operation is repeated, using the mold on the opposite side of the tubular support, and so on in regular course.

In the manufacture of articles of the class of those for the formation of which my improvement is more particularly designed it is necessary, as is well known to those skilled in the art, that there shall be relative movement about an axis between the blowpipe and the mold, and in the instance exemplified such movement is imparted to the blowpipe while the mold is held stationary. It will, however, be apparent that the feature above specified may be embodied without variation of operative principle if movement about its

axis be imparted to the mold instead of to the blowpipe and I therefore include as the mechanical equivalent of the construction herein described and shown an apparatus in which while preserving the same relation of the blowpipe and air-supply pipe the conditions of rest and movement of the blowpipe and mold are reversed in the blowing operation, that is to say, in which the blowpipe is held stationary and movement about its axis is imparted to the mold.

My invention attains the advantages of economizing time and labor in blowing hollow articles, as the insertion of one blowpipe and the removal of another on the opposite side may be effected simultaneously. The capability of employing an integral mold in lieu of the two-part molds heretofore used is also of material advantage in reducing cost of construction and maintenance and allowing the interior of the mold to be visible during the operation of blowing.

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

1. In an apparatus for blowing glass, the combination, substantially as set forth, of an integral, open-topped mold, a disconnected mold-cover, which is movable toward and from the mold, and is segmentally recessed or cut away on one side to admit of the lateral insertion and removal of a blowpipe when removed from the mold, and a blowpipe adapted to sustain and blow a gathering of glass below the cover when said cover is fitted against the top of the mold.

2. In an apparatus for blowing glass, the combination, substantially as set forth, of an integral, open-topped mold, a disconnected mold-cover, which is movable toward and from the mold, and is segmentally recessed or cut away on one side to admit of the lateral insertion and removal of a blowpipe when removed from the mold, a blowpipe adapted to sustain and blow a gathering of glass below the cover when said cover is fitted against the top of the mold, and means for holding the blowpipe in line axially with the mold.

3. In an apparatus for blowing glass, the combination, substantially as set forth, of an integral, open-topped mold, a disconnected mold-cover, which is movable toward and from the mold, and is segmentally recessed or cut away on one side to admit of the lateral insertion and removal of a blowpipe when removed from the mold, a blowpipe adapted to sustain and blow a gathering of glass below the cover when said cover is fitted against the top of the mold, and means for effecting relative movement about an axis between the blowpipe and the mold.

4. In an apparatus for blowing glass, the combination, substantially as set forth, of a support, an integral, open-topped, mold fixed thereto, a partially open mold-cover fitted to

from the mold, a blowpipe adapted to sustain and blow a gathering of glass below the cover when fitted against the mold, a spindle journaled to rotate adjacent to the support, and gearing for imparting rotation to the blowpipe from said spindle.

5. In an apparatus for blowing glass, the combination, substantially as set forth, of a support, an integral, open-topped, mold fixed thereto, a partially open mold-cover fitted to traverse on guides on said support toward and from the mold, a blowpipe adapted to sustain and blow a gathering of glass below the cover when fitted against the mold, a spindle journaled to rotate adjacent to the mold, gearing for imparting rotation to the blowpipe from said spindle, and a guiding device for maintaining the blowpipe in line axially with the mold.

6. In an apparatus for blowing glass, the combination, substantially as set forth, of a support, an integral, open-topped, mold fixed thereto, a partially open mold-cover fitted to traverse on guides on said support toward and from the mold, a blowpipe adapted to sustain and blow a gathering of glass below the cover when fitted against the mold, a spindle journaled to rotate adjacent to the mold, gearing for imparting rotation to the mold from said spindle, a lever connected to the mold-cover for centering the adjacent end of the blowpipe, and a fixed guide for moving said lever into operative position in and by the traverse of the mold-cover toward the mold.

7. In an apparatus for blowing glass, the combination, substantially as set forth, of a bed-plate, a tubular support mounted, with the capacity of movement about its axis thereon, two integral, open-topped, molds, fixed oppositely to said support and projecting at equal distances from its axial line, two partially open mold-covers, each fitted to traverse on guides on said support toward and from one of said molds, a spindle journaled to rotate in the axial line of said support, a frictional driving-gear fixed on said spindle, pairs of friction-rollers connected to the support adjacent to and on opposite sides of said frictional driving-gear, and a blowpipe which is insertible between the rollers of either pair, and against the frictional driving-gear, in position to sustain and blow a gathering of glass below the cover of one of the molds when fitted against said mold.

8. In an apparatus for blowing glass, the combination, substantially as set forth, of a support movable about its axial line, two integral, open-topped, molds fixed oppositely thereto, two partially open mold-covers, each fitted to traverse on guides on said support toward and from one of said molds, a central standard connected to and movable with the support, a cap fitting on said support and capable of movement about the axis thereof, oppositely-projecting pipes connected to said cap

and communicating with a compressed-air-
supply pipe, and a blowpipe which is adapted
to be placed in position to receive air from
either of said projecting pipes and to sustain
5 and blow a gathering of glass below the cover
of one of the molds when fitted against said
mold.

In testimony whereof I have hereunto set
my hand.

DANIEL C. RIPLEY.

Witnesses:

J. SNOWDEN BELL,
F. E. GAITHER.