

No. 752,597.

PATENTED FEB. 16, 1904.

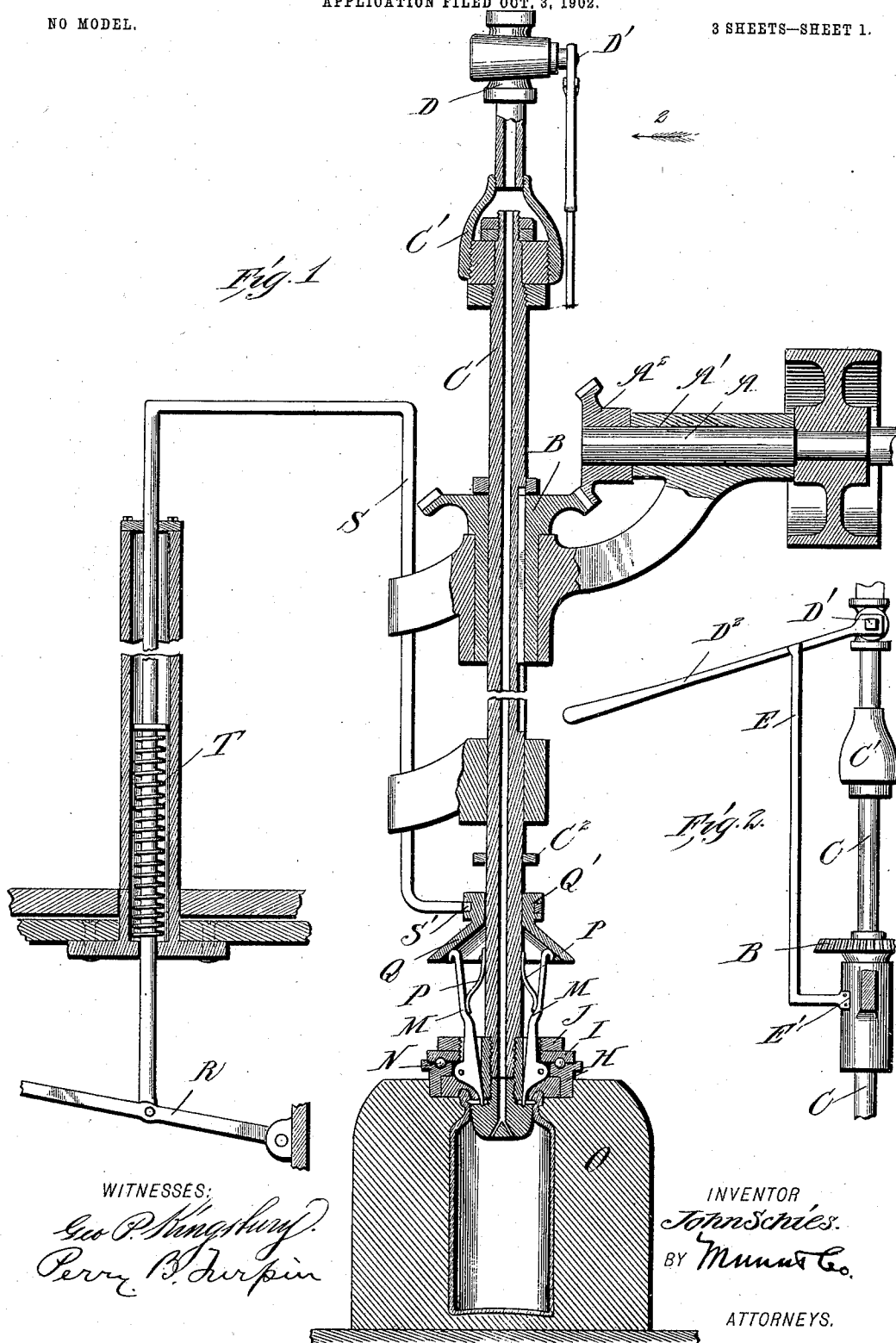
J. SCHIES.

GLASS BLOWING AND FINISHING MACHINE.

APPLICATION FILED OCT. 3, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



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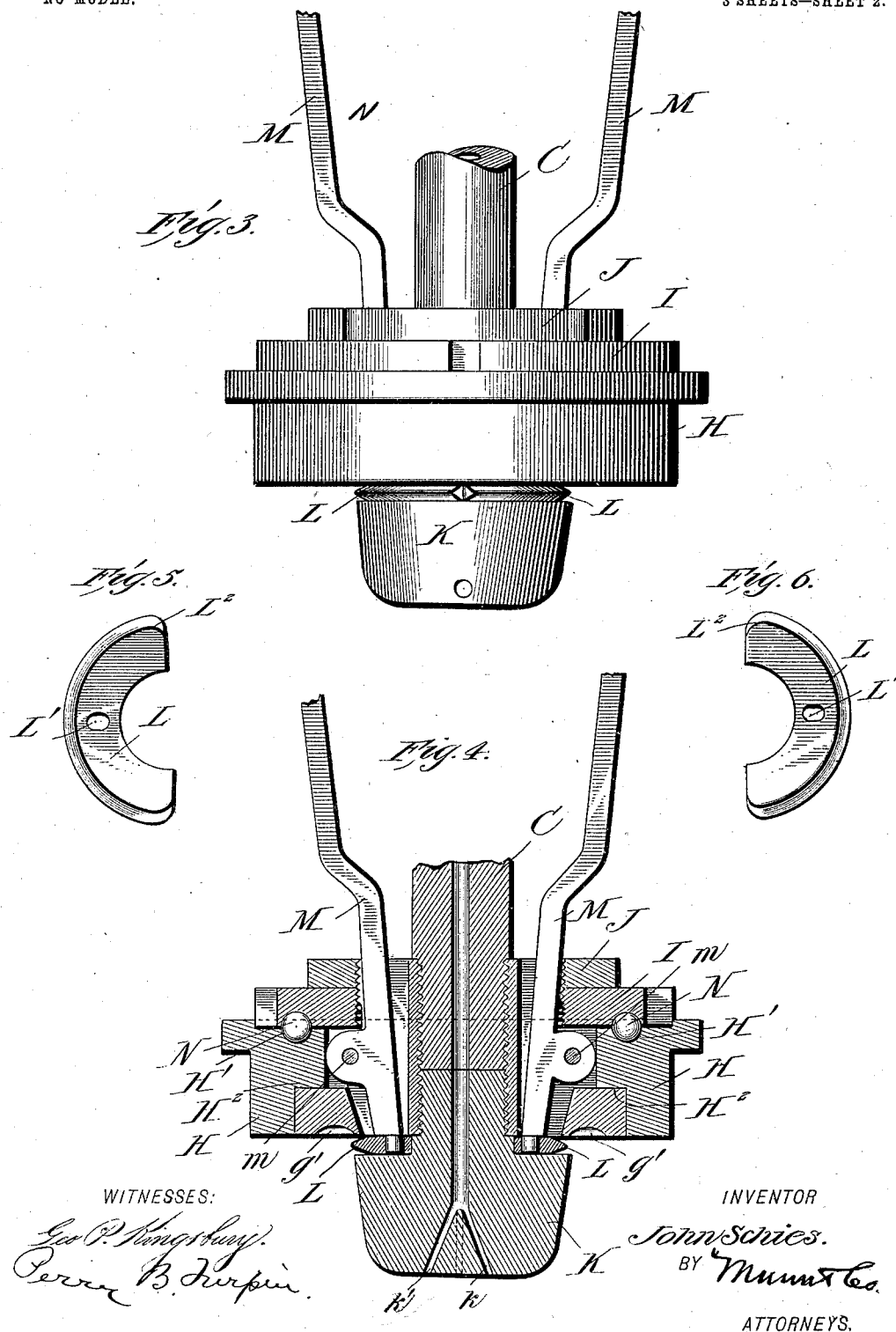
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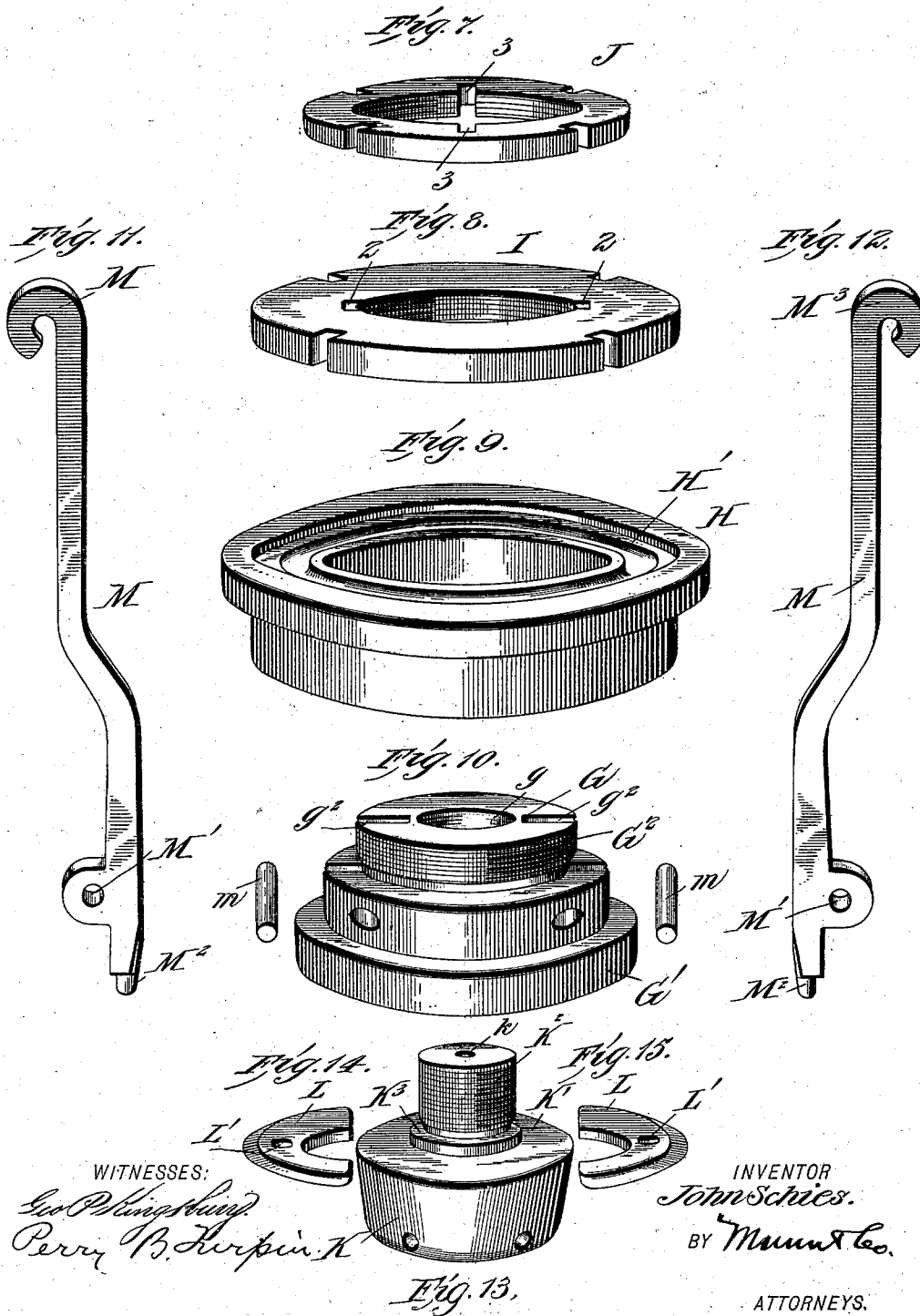
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

JOHN SCHIES, OF ANDERSON, INDIANA.

GLASS BLOWING AND FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 752,597, dated February 16, 1904.

Application filed October 3, 1902. Serial No. 125,794. (No model.)

To all whom it may concern:

Be it known that I, JOHN SCHIES, a citizen of the United States, residing at Anderson, in the county of Madison and State of Indiana, have made certain new and useful Improvements in Glass Blowing and Finishing Machines, of which the following is a specification.

My invention is a combined blowing and finishing machine designed to take the bottle as it is delivered from the press-molds of an ordinary glass-machine to finish the mouth thereof and to produce an internal groove within the neck of the bottle at one operation; and the invention consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a sectional elevation of a machine embodying my invention, parts being broken away. Fig. 2 is a detail elevation taken in the direction of the arrow 2 in Fig. 1. Fig. 3 is a side elevation of the pressing and blowing head, the upper portions of the levers being broken away. Fig. 4 is a vertical longitudinal section of the blowing and finishing head, the levers being partly broken away. Figs. 5 and 6 are detail views of the grooving-plates. Fig. 7 is a detail perspective view of the jam-nut. Fig. 8 is a perspective view of the main nut. Fig. 9 is a perspective view of the base-ring. Fig. 10 is a perspective view of the body portion of the head and the pins for pivoting the levers. Figs. 11 and 12 are detail views of the levers. Fig. 13 is a detail perspective view of the former, and Figs. 14 and 15 are perspective views of the grooving-plates.

By my invention I provide a blowing and finishing head for application to the unfinished bottle or jar for finishing the lip of the same and for producing the circumferential groove within the neck of the jar. To this end I provide a suitable framing in which is journaled at A' the drive-shaft A, to which power may be communicated in any suitable manner, and this shaft A is provided with a beveled gear A², which meshes with a beveled gear B, which is keyed to the main shaft C, so the latter can move longitudinally to a limited extent through the gear B. This main shaft C is the

air-supply pipe through which air is communicated to the head presently described, and the shaft C is connected by the coupling C' to the valve-section D, provided with a valve whose stem D' is provided with the handle-arm D², which rests in a bar E, secured at E' to the framing, so the tube C as it moves up will tend to close the valve and as it lowers will cause the valve to open by the bearing of its handle-arm D² on the bar E, which is connected with the framing. I thus provide in connection with the sliding tube a valve and an abutment on the frame for engagement by a part connected with the valve, so that the valve will be positively opened as the tubular shaft descends to operative position and will be permitted to close as the shaft rises from said position, the shaft being operated by the means presently described. At its lower end the tube C carries the blowing and finishing head F, which is of a special construction, as best shown in Figs. 3 to 15, inclusive, and as shown in operative position in Fig. 1. As shown, the head F is composed of a body portion G, (see Fig. 10,) a base-ring H, (see Fig. 9,) a main nut I, (see Fig. 8,) a jam-nut J, (see Fig. 7,) a former K, (see Fig. 13,) the grooving-plates L, (see Figs. 5, 6, 14, and 15,) and the levers M (see Figs. 11 and 12) for operating the grooving-plates, as will be presently described. In Figs. 7 to 15, inclusive, I show the several parts of the former detached, while in Figs. 3 and 4 I show the parts assembled. The body portion G is provided with a centrally-threaded opening *g* and has in its under side a groove *g'* to form the lip of the jar. At its lower edge the body portion has the laterally-projecting flange G' and is provided at its top with the externally-threaded portion G², on which are threaded the nuts I and J, as presently described. The body is also provided with the opposite longitudinal openings *g*², which extend through it from top to bottom and appear as slots in the parts of the body portions above the flange G'. The levers M are pivoted at M' by means of pins *m* within the openings *g*² and project at their lower ends below the body portion and fit at said ends at M² in openings L' in the grooving-plates L, so the levers as they are rocked at

their upper ends in and out will cause the grooving-plates L to project and be withdrawn so they will protrude in one position beyond the outer edge of the former K in producing the grooves in the jar-necks, as shown in Fig. 1, and will in the other position be retracted to form no projection beyond the outer face of the former K. At their upper ends the levers M project considerably above the head F and are engaged at their ends M³ by the operating device presently described, said ends M³ being preferably turned slightly, as shown in Figs. 11 and 12.

The former K is provided with the upwardly-facing shoulder K', upon which rest and operate the plates L, as above, the said shoulder K' having a projecting threaded tenon K², which journals in the lower end of the threaded opening g of the body portion G. The former is provided at the base of the tenon K² with a narrow rib K³, which stops the former K in position to provide proper space for the operation of the grooving-plates L. The former K is tapered slightly to facilitate its entrance into the jar-neck and is shaped to conform to the finished jar-neck and is provided with an air-passage k, through which air is supplied from the shaft C, and discharges at k' into the jar being finished. The head K thus operates to supply air to the jar in blowing and finishing the same, to form the internal surface of the jar-neck, and to produce therein by means of the plates L the internal annular groove desired. In operation the former is practically a portion of the body G and turns therewith in forming and grooving the neck of the jar, the body portion resting upon the mouth of the jar and producing by this groove g' the lip of the jar as desired. It will be understood that this body operates within a ring, which may bear upon the mold, serving as a base for the head and as a support for the jar to be finished. The ring, as shown in Figs. 4 and 9, may preferably be formed with a ball-race H' in its upper face and have its bore rabbeted at H to rest upon the lateral flange G' of the body G. The main nut I threads on the portion G² of the body G down toward the base-ring H, balls N being arranged between the main nut and the base-ring, as shown in Fig. 4. It may be preferred to provide ball-races in both the base-ring and the main nut, as shown, and when the nut I has been adjusted on the threaded portion of the body G to the desired position it may be secured in such position by the jam-nut J, turning down on the portion G² and jamming in connection with the nut I to lock the latter in the desired position. I have shown the nuts I and K as provided in their peripheries with notches for engagement by a wrench and in their bores or central openings with notches 2 and 3, so the nuts I and J can be slipped over the levers M in assembling the parts.

As best shown in Figs. 5 and 6, the grooving-plates L are rounded on their outer edges and also at their ends at L², so they will then operate properly in the soft glass in the use of the invention.

When the parts are assembled as shown in Figs. 3 and 4, it will be noticed the body can revolve within the base-ring, carrying with it the former K and the nuts I and J, the nut I rolling on the balls N and the base-ring H being arranged to bear upon the mold O, in which the jar is held, as shown in Fig. 1. Manifestly this mold O can be made in sections to facilitate the insertion and the removal of the jar, and when the parts are assembled as shown at Fig. 4 the air is supplied from the tube C directly to the former K and passes thence into the jar being finished. The levers M extend upwardly along the opposite side of the tube C and are pressed normally outward at their upper ends by springs P, so the lower ends of the levers are normally retracted and retain the grooving-plates L in the retracted position shown in Fig. 4. In order to raise the tube C and to permit it to lower and also to contract the upper ends of the levers M after the head has been lowered by the lowering of the tube C, I provide on the tube C a shoulder or projection C², below which is supported the lever-compressor Q, which is in the form of a flaring hood, converging upwardly and operating at its lower face upon the upper ends of the levers M in such manner as to contract the same when the compressor Q is lowered into engagement with the said levers. This compressor is slidable upon the tube C and may be adjusted from the position shown in Fig. 1, wherein it compresses the upper ends of the levers M upwardly to release said levers and then to move into engagement with the projection C² on the shaft C in such manner as to raise the shaft C and lift the head F out of the jar after the grooving-plates L have been permitted to adjust to the position shown in Fig. 4. The compressor is operated from a treadle or other lever R through a connecting-rod S, which is operated on by a spring T in such manner as to hold the compressor Q normally in elevated position, and the rod S is connected with the compressor Q by means of a ring or collar S', operating in a groove Q' in the compressor, so the latter when it is adjusted into engagement with the upper ends of the levers M may revolve with the said levers in the operation of the head F in blowing and finishing the bottle.

From the foregoing it will be understood that the shaft C is hollow and receives air from a suitable supply and that such shaft may move longitudinally through the beveled gear B, by which it is turned, as such gear B is keyed to the shaft C, as before described. If the parts be in the position shown in Fig. 1 and the jar has been finished, pressure on

the lever R may be released, and the compressor Q will move upward, first releasing the levers M, which will be spread at their upper ends by the springs P and retracted at their lower ends in such manner as to adjust the grooving-plates L out of the groove which they have produced in the neck of the jar. Further upward movement of the compressor Q will cause it to engage beneath the projection C² of the shaft C, and the shaft C will then be lifted, raising the head F out of the jar, which can then be removed and another placed in the mold O for the finishing operation. As the shaft C moves upward to lift the head F the handle D² of its valve will as the shaft C rises operate to close the valve and shut off the supply of air to the pipe C when the head F is out of the jar to be finished. After another jar has been inserted in the mold the lever R may be operated to force the compressor downward. As such compressor lowers, the weight of the head and of the shaft C will carry such parts down until the head rests upon the mold and in contact with the jar to be finished. Further movement of the lever R will cause the compressor to move down into engagement with the levers M, compress the upper ends of said levers, and cause the plates L to be forced downward to produce the groove in the neck of the jar. It will be understood that during all this operation the shaft C and the head F are being constantly revolved and that as the head is pressed into contact with the mold O the base-ring will bear upon the said mold, and the body portion of the head and the parts immediately connected therewith may turn within the base-ring in the operation of finishing the jar. It will also be understood that as the tubular shaft C moves downward the valve-handle D² will engage with the abutment E on the frame of the machine, and the valve will be opened to admit air. I thus provide a machine by which the jar is blown and finished at the one operation and which involves no complicated construction of parts which would likely get out of order in the use of the machine.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A finishing-head substantially as herein described, comprising the body portion having the central threaded opening, the annular groove in its under side and the laterally-projecting flange at its lower end, and the external threaded portion above said flange and provided with opposite openings formed longitudinally through it, the former having an air-passage and provided with the upwardly-facing shoulder and above the same with the threaded tenon screwed into the lower end of the body, the grooving-plates operating between the upwardly-facing shoulder or top of the former and the lower side of the body, the levers pivoted between their ends to the body,

engaged at their lower ends with the grooving-plates, and arranged at their upper ends for engagement by the operating device, the base-ring resting on the lateral flange of the body and surrounding the lower portion of said body, the main nut threaded on the upper portion of the body, the balls between said nut and the base-ring, and the jam-nut turning on the body portion down against the main nut, substantially as and for the purposes set forth.

2. In a machine substantially as described, a forming-head having a body provided at its lower end with a former and above the same with laterally-movable grooving-plates and with a groove to form the lip of the jar, levers for operating such plates, and the ring within which the body revolves, substantially as set forth.

3. In a head for glass-machines, the combination of the body portion provided with a former and above the same with laterally-movable circumferentially-extending grooving-plates said plates being approximately semicircular in form, means for operating said plates, and a ring held on said body and within which the body may revolve substantially as set forth.

4. The combination in a finishing-head of the body portion having the central threaded opening, and the laterally-projecting flange at its lower end, and the externally-threaded portion above said flange, and provided with the opposite openings extending longitudinally through it, the former provided with the upwardly-facing shoulder and above the same with the threaded tenon screwed into the lower end of the body, the grooving-plates operating between the upwardly-facing shoulder of the former and the lower side of the body, the levers connected with the grooving-plates, the base-ring surrounding the lower portion of the body and resting on the lateral flange thereof, and the retaining devices for said ring, substantially as set forth.

5. The combination with a body having a former, of laterally-movable grooving-plates carried by said body, the body being provided with a lateral flange, and a ring encircling the body and resting on the flange, and means for securing the ring to the body, substantially as set forth.

6. The combination with the body having forming devices for producing a groove in the neck of the bottle, of a ring encircling the body and held thereto and adapted to rest upon the mold and within which the body is free to turn, substantially as set forth.

7. A head for glass-machines comprising the body provided in its lower side with a groove for forming the lip of the jar and below the same with a former to enter the mouth of the jar, and between said body and former with approximately semicircular plates concentric with the former for producing an in-

ternal groove in the jar-neck, substantially as set forth.

8. The combination in a head for glass-machines, of the body provided at its lower end with a lateral flange and below the same with a former and with means for producing a groove in the interior of the bottle-neck and having above said flange an externally-threaded portion, the base-ring encircling the body and resting on the lateral flange thereof, and a nut turned on the upper threaded portion of the body and securing the base-ring upon the body, substantially as set forth.

9. The combination with the body having the central threaded opening and the openings on opposite sides of same for the levers, of the former below the same and having a threaded tenon screwing into the body, the laterally-movable grooving-plates operating between the former and the body, the ring within which the body is free to turn and the levers pivoted to the body and connected with the grooving-plates and projecting through and above the body for operation, substantially as set forth.

10. The combination of the body having the central internally-threaded portion, the shaft threaded in one end of said opening, the former having a tenon threaded in the opposite end of the opening, the grooving-plates and means for operating the same, substantially as set forth.

11. The combination with the ring and the body turning in the ring and having the central threaded opening for the tenon of the former, the upwardly-projecting threaded portion for the retaining-nut and the longitudinal openings for the levers, the former having a threaded tenon screwing in the central opening of the body, the retaining-nut for the base-ring threaded on the externally-threaded portion of the body, of the levers fitting in said openings and pivoted to the body, the grooving-plates arranged for operation by said levers, and means for operating the levers for the grooving-plates, substantially as set forth.

12. The combination with the body having a centrally-threaded opening and longitudinal openings on opposite sides thereof, of the former having a threaded tenon screwed in the central opening of the body, the grooving-plates operating between the former and the lower side of the body, and the levers pivoted within the longitudinal openings of the body, and arranged to operate the grooving-plates, substantially as set forth.

13. A head for glass-machines comprising the former provided with the upwardly-facing shoulder and above the same with the threaded tenon, the body portion having a central threaded opening receiving such tenon of the former, and provided at its lower end with the lateral flange and with the externally-threaded portion above the same, the base-

ring fitting around the body and resting on said flange, and the nut screwed on the externally-threaded portion of the body above said base-ring, substantially as set forth.

14. The combination in a glass-machine, of the head having a body portion provided with a central internally-threaded portion, the former provided at its upper end with a threaded tenon screwing into the lower portion of said opening, the main shaft screwing into the upper end of said opening in the body, the grooving-plates arranged and operating between the body and the former, and the levers for operating said plates, substantially as set forth.

15. The combination of the former, the body portion supporting the former, and having a laterally-projecting flange and above the same an externally-threaded portion, the base-ring resting upon the flange of the body, and the retaining-nut for said ring threaded on the externally-threaded portion of the body, substantially as set forth.

16. The combination of the former, the body supporting the former, and having the opposite longitudinal openings, the grooving-plates arranged and operating between the former and the body, the levers for operating said plates, said levers extending through the longitudinal openings in the body, the base-ring within which the body may turn, and the retaining devices for said ring connected with the body above the ring, substantially as set forth.

17. The combination in a machine substantially as described, of the shaft provided with a projection, and below the same with a head having grooving-plates and levers for operating the same, the compressor operating on the shaft, below the said projection and in position to engage the levers and operate the same to spread the grooving-plates and to move from said position into engagement with the projection, whereby to permit the readjustment of the grooving-plates and to subsequently lift the shaft with the head thereon, substantially as set forth.

18. The combination of the shaft, the head thereon and provided with the body and the grooving-plates, the ring encircling said body and within which the body may revolve with the shaft, the levers carried by the body and arranged to operate the grooving-plates and projecting above the body, the springs for normally spreading the upper ends of the levers, the compressor slidable on the shaft above the levers and into engagement therewith, and a projection on the shaft above the compressor, and in position for engagement therewith, substantially as and for the purposes set forth.

JOHN SCHIES.

Witnesses:

MARY SCHIES,
MICHAEL KENNEY.