No. 648,272. Patented Apr. 24, 1900.

C. LENG.

MACHINE FOR FINISHING GLASSWARE.

(Application filed Aug. 26, 1899.)

(No Model.) 2 Sheets—Sheet 1.

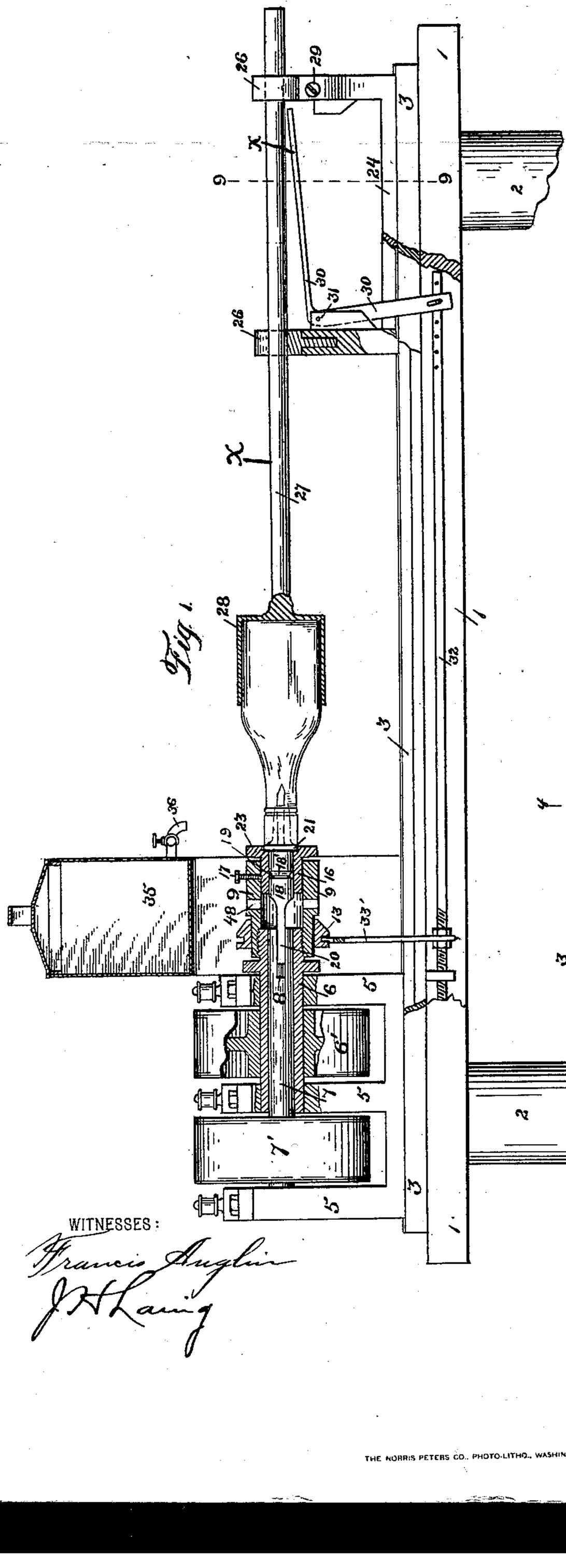

Fig. 1.

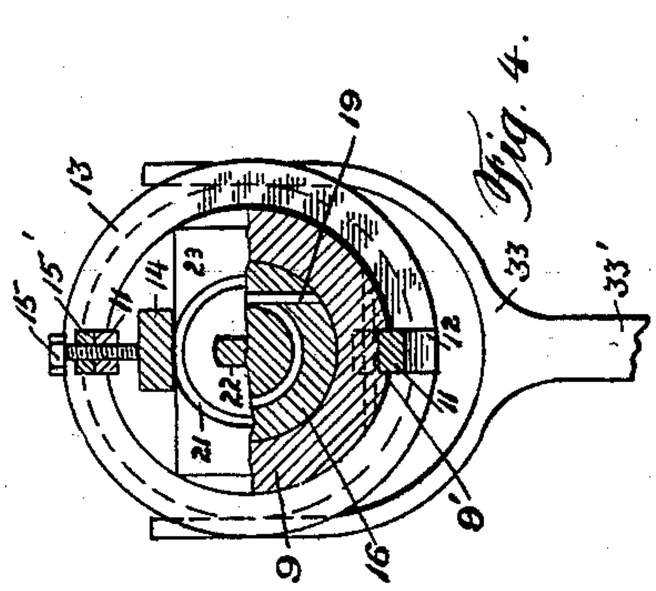

Fig. 4.

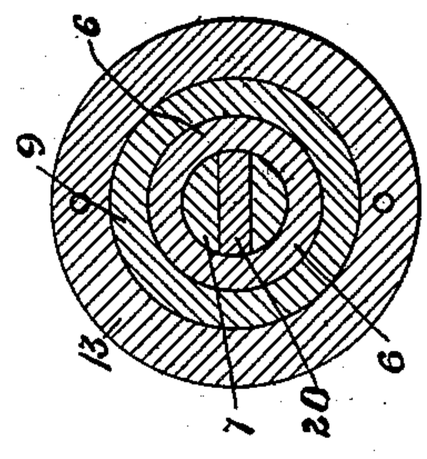

Fig. 3.

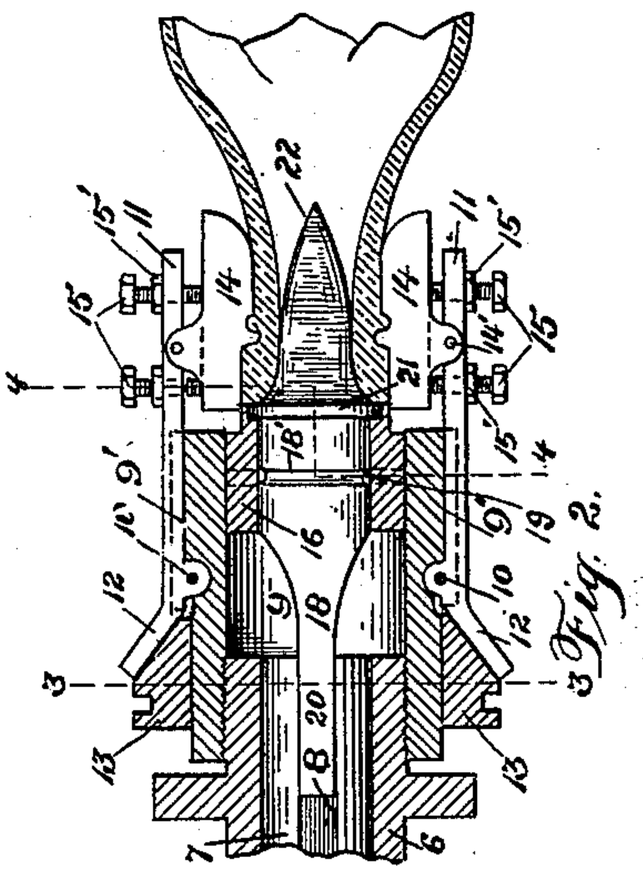

Fig. 2.

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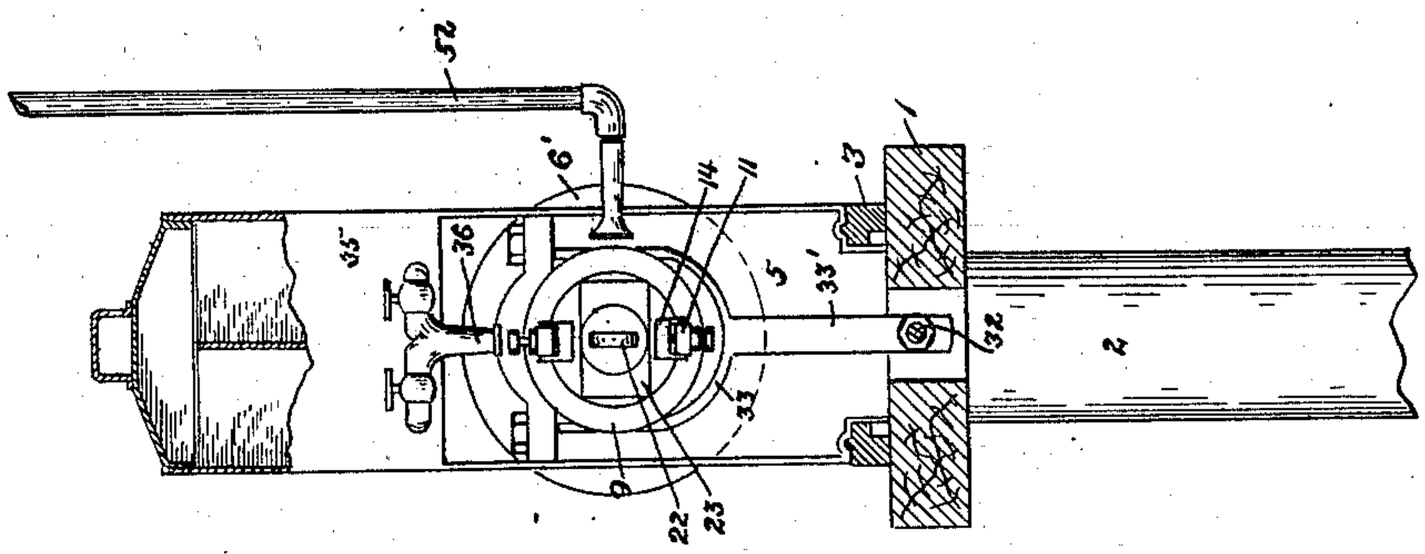

Fig. 8

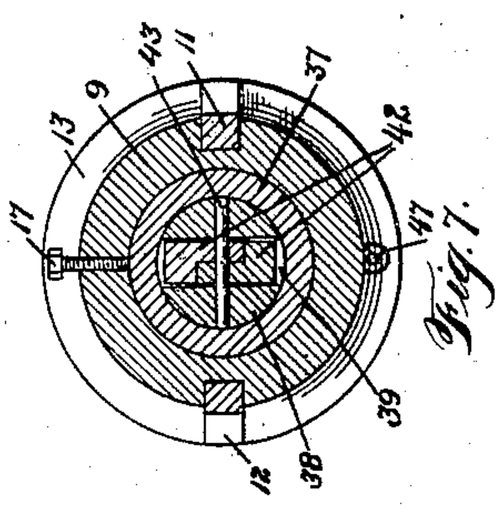

Fig. 7.

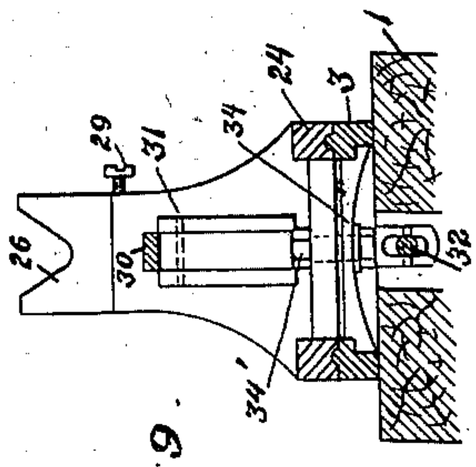

Fig. 9.

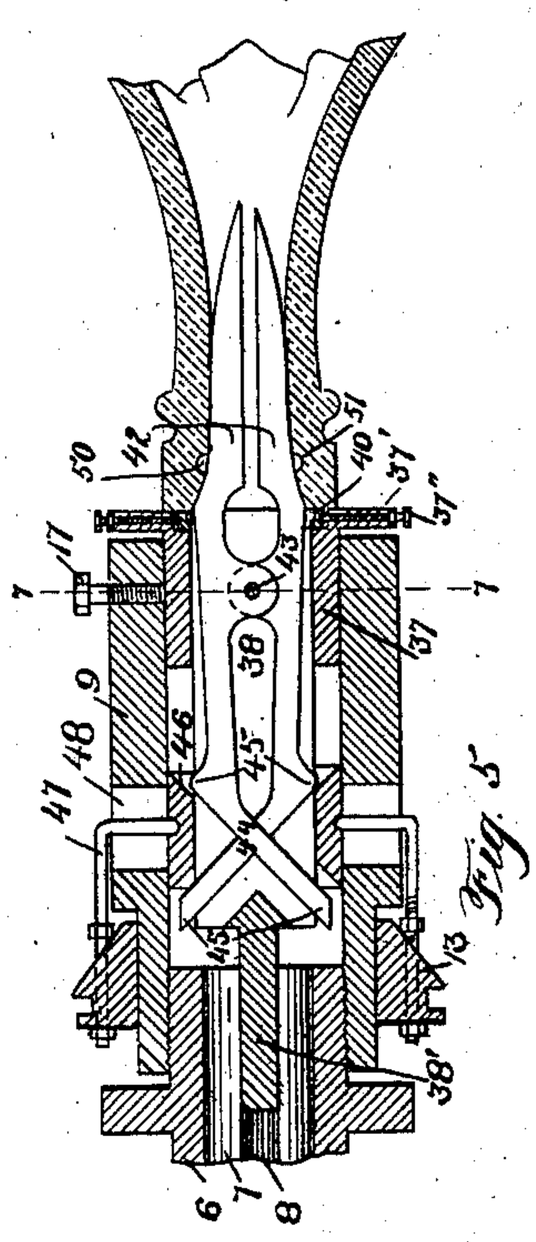

Fig. 5.

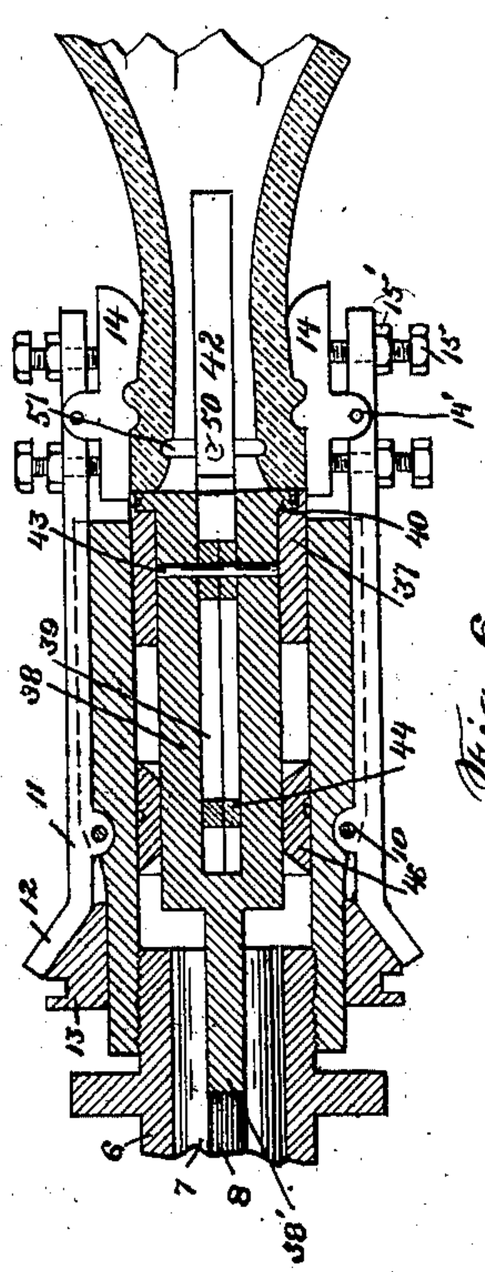

Fig. 6.

WITNESSES:

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J. H. Laing

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UNITED STATES PATENT OFFICE.

CHARLES LENG, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO CHRISTIAN F. LENG, OF SAME PLACE.

MACHINE FOR FINISHING GLASSWARE.

SPECIFICATION forming part of Letters Patent No. 648,272, dated April 24, 1900.

Application filed August 26, 1899. Serial No. 728,623. (No model.)

To all whom it may concern:

Be it known that I, CHARLES LENG, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Machines for Finishing Glassware, of which the following is a specification.

This invention is a machine for finishing the necks of bottles and other glass articles, and relates more particularly to certain improvements over the machines patented to myself and C. F. Leng March 18, 1890, No. 423,482, and to myself May 20, 1890, No. 428,214. In the patented machines just referred to two shafts, one within the other, rotate in opposite directions, one carrying a former for the interior of the bottle-neck and the other carrying dies for forming the neck exterior. The range of said machines is limited, as the inner and outer formers or dies are not adjustable longitudinally with relation to each other, and such adjustment is one of the improvements embodied in my present invention.

Further improvements are in the manner of supporting and adjusting the outer dies and in the means for throwing the machine in and out of operation. The invention also includes improved means for grooving the interior of the bottle-neck.

Other advantages and improvements will become apparent as the nature of the invention is developed by the following specification, the claims appended thereto, and by the accompanying drawings, in which—

Figure 1 is a side elevation of my improved machine, portions thereof being broken away and other portions shown in section. Fig. 2 is a longitudinal sectional view taken at right angles to the neck-forming mechanism shown in Fig. 1. Figs. 3 and 4 are cross-sectional views on lines 3 3 and 4 4, respectively, of Fig. 2. Figs. 5 and 6 are longitudinal sectional views, taken at right angles to each other, of an adaptation of the machine for forming an interior groove in the bottle-neck. Fig. 7 is a cross-sectional view on line 7 7 of Fig. 5. Fig. 8 is a face view of the forming-machine shown in Figs. 1 and 2, the base being shown in section. Fig. 9 is a sectional view on line 9 9 of Fig. 1.

1 is a base supported on legs 2, and resting on the base is bed-frame 3 of the machine, from which rise bearing-posts 5, and journaled in these posts are shafts 6 and 7, one within the other, and carrying, respectively, pulleys 6′ and 7′ for driving the machine. Shaft 6 is threaded at the inner end, and shaft 7, extending through shaft 6, is slotted at its inner end at 8.

Uniting with the threaded end of shaft 6 is chuck-head 9, depressed longitudinally on opposite sides of its exterior at 9′, and pivoted at 10 in these depressions are arms 11, which at one end are outwardly deflected at 12 to operatively engage cone-collar 13, slidable on chuck 9. The opposite ends of said arms extend beyond the corresponding end of the chuck and carry dies 14. The latter are pivoted between their ends at 14′ to said arms, and the desired angle at which the dies work is secured and maintained by set-screws 15, working through the arms and locked by nuts 15′. The inner faces of the dies are shaped to give the bottle-neck exterior the requisite form, which may be changed and varied as desired by substituting different dies.

Fitting the bore of chuck 9 is bushing 16, adjustable longitudinally and held by set-screw 17.

18 is a short shaft rotatable in the bushing and peripherally grooved at 18′ to receive pin 19, which holds it against longitudinal play. One extremity of the shaft is flattened at 20 to enter slot 8 of shaft 7, and the shaft is flanged at 21 to fit a corresponding depression in the end of bushing 16, and beyond the flange is integral inner die or forming plug 22, which enters the bottle-neck and shapes the interior thereof, said plug being flattened on opposite sides to permit egress of air from the bottle during the forming operation.

Integral with the extremity of bushing 16 is transverse plate 23, the sides of which are almost intersected by flange 21, with which said plate alines, and said sides of the plate are also substantially coincident with the in-

ner ends of dies 14. The plate has greater length than width, and hence has considerable projection at right angles to dies 14, as shown in Fig. 4.

Slidable on bed-frame 3 is carriage 24, and vertically adjustable in the upright members of the carriage are racks 26, having V-shaped notches to receive handle 27 of bottle-holder 28, the racks being clamped in desired adjustment by screws 29.

30 is a bell-crank lever fulcrumed to the carriage at 31 and adjustably connected at its lower end to reach-rod 32, which connects with stem 33' of fork 33, which embraces cone-collar 13, whereby the latter is moved to actuate arms 11. Carriage 24 may be moved toward and away from the forming mechanism, as circumstances may require, and is secured in position by clamping-plate 34 and bolt 34'.

In operation the bottle-holder is placed in position shown in Fig. 1, remaining all the while in the grasp of the operator at about points X, with die-plug 22 entered in the bottle-neck, dies 14 being held away by centrifugal action until closed onto the neck by cone 13, the inner and outer dies having constant rapid rotation in opposite directions. Lever 30 is then drawn up by one hand of the operator without releasing handle 27 of the bottle-holder, thereby moving cone 13 against the deflected ends 12 of arms 11 and closing dies 14 on the exterior of the bottle-neck, as seen in Fig. 2. With the inner and outer dies rotating oppositely the bottle remains still and its neck is quickly given its interior and exterior form. The extremity of the neck bears against revolving plate 23, which smooths and finishes it, preventing fins or other roughness from remaining thereon. When the operation is completed, lever 30 is simply released, and the centrifugal action of dies 14 throws them clear of the bottle, and the latter is quickly withdrawn and another inserted by manipulation of the bottle-holder.

35 is an elevated tank having two compartments, one for oil and the other for salt water, which drip from a common spigot 36 onto the dies, keeping them in proper condition for finishing and polishing the glass.

52 is a pipe which emits a blast of air on the dies, preventing overheating.

In Figs 5, 6, and 7 I show an adaptation of the machine for forming the bottle-neck with an interior groove. When the same is to be used, bushing 16 and shaft 18 are removed from chuck 9 and bushing 37 inserted and secured in proper longitudinal adjustment by set-screw 17. Rotatable in bushing 37 is shaft 38, slotted longitudinally at 39 and at its rear end flattened at 38' to enter slot 8 of shaft 7. Said shaft is formed at the outer end with circular head 40, having a continuous peripheral groove to receive screws 37'', entering from facing-plate 37' of bushing 37, whereby shaft 38 is held against longitudinal movement, yet is free to rotate. Facing-plate 37' corresponds to plate 23 of bushing 16 and performs the same work of smoothing the end of the bottle-neck.

The interior die or former consists of two jaw-like members 42, pivoted together and to shaft 38 in the slot of the latter in scissors fashion, as indicated at 43. Rear ends 44 of the jaws cross each other in diagonal lines, the extremities of the crossed parts forming four bearing-points 45, which protrude from shaft-slot 39 and between which collar 46 is movable on shaft 38. This collar is peripherally grooved to receive angular fingers 47, extending thereto from cone 13, the fingers passing through slots 48 in chuck 9. The operative ends of the die or former members are pointed and narrow in cross-section, and each carries a nib or projection 50, which when the former members are separated turn groove 51 in the neck interior for sealing or other purposes. Otherwise the divided former performs the same work in shaping the neck interior as described of former 22. The former is opened and closed by the same movement of cone 13 which actuates dies 14. Different forms of grooves, depressions, &c., may be had by providing the former members with projections corresponding to the effect desired.

While my improvements are here shown and described in connection with forming and finishing a bottle-neck, I do not limit myself thereto, as it may be readily adapted to other articles. Nor do I restrict my invention to inner and outer dies rotating in opposite directions, as they may be used independently of each other or in any other desired relation. Also many details of construction may be varied without departing from the spirit or intent of the invention.

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

1. An improved machine for finishing glassware, comprising two revoluble die or former carriers arranged concentrically, means for adjusting one carrier longitudinally of the other carrier, and interior and exterior dies or formers on the carriers, substantially as shown and described.

2. An improved machine for finishing glassware, comprising two revoluble die or former carriers arranged concentrically, one within and adjustable longitudinally of the other, and interior and exterior dies or formers on the carriers, substantially as shown and described.

3. An improved machine for finishing hollow glassware, comprising a chuck, outer finishing-dies carried thereby, an interior finishing die or former, a holder for the latter in which it rotates and is held against longitudinal movement, said holder being adjustable longitudinally with relation to the chuck

and rotatable therewith, and mechanism for independently actuating the chuck and interior die, substantially as shown and described.

4. An improved machine for finishing hollow glass articles, comprising a chuck, exterior finishing-dies carried by the chuck, a bushing adjustable longitudinally in the chuck and rotatable therewith, a shaft rotatable in the bushing but secured therein against longitudinal movement, an interior die or former carried by the shaft, and actuating mechanism, substantially as shown and described.

5. An improved machine for finishing glass articles, comprising a chuck, dies carried thereby for exterior finishing, an interior die or former, an end-finishing plate at the inner ends of the dies, said plate being rigid with the chuck, and actuating means, substantially as shown and described.

6. An improved machine for finishing hollow glass articles, comprising a chuck, exterior finishing-dies carried thereby having opposite position, a bushing adjustable longitudinally between the dies and in the chuck and secured in the latter, the outer end of the bushing being formed into an end-facing plate having substantially the same width as the space between the dies, the length of the plate being greater than its width and extending at right angles to the dies, an interior finishing die or former, and actuating mechanism, substantially as shown and described.

7. An improved machine for finishing hollow glass articles, comprising two shafts, one within the other, means for actuating the shafts, exterior finishing-dies operatively carried by the outer shaft, a longitudinally-adjustable shaft carrying an interior die or former, said shaft having elongated slidable union with the first-mentioned inner shaft, and means for securing said movable shaft in desired longitudinal adjustment, substantially as shown and described.

8. An improved machine for finishing hollow glass articles, comprising outer shaft 6 and inner shaft 7, the latter slotted at 8, actuating mechanism for the shafts, exterior forming-dies operatively carried by the outer shaft, a shaft carrying an interior former or die, said shaft being flattened at one end to enter slot 8 of shaft 7, and means for securing said flattened shaft in desired longitudinal adjustment, substantially as shown and described.

9. An improved machine for finishing glass articles, comprising interior and exterior formers adjustable longitudinally with relation to each other, and end-finishing means, substantially as shown and described.

10. The combination of a die-support, a die pivotally secured to the support and adapted to swing thereon, and set-screws adapted to rigidly unite the support and die with the latter in desired adjustment, substantially as shown and described.

11. The combination of a die-support, a die pivotally secured between its ends to the support, and set-screws at opposite sides of the die-pivot for adjusting the die and for holding it in desired adjustment, substantially as shown and described.

12. An improved machine for finishing hollow glass articles, comprising a chuck, a longitudinally-slotted and longitudinally-adjustable shaft rotatable within and independently of the chuck, a longitudinally-divided former within the shaft and protruding from the chuck, the former members being pivoted between their ends to the shaft, and mechanism operative on the rear ends of the members for separating and contracting their forward ends, substantially as shown and described.

13. An improved machine for finishing hollow glass articles, comprising a chuck, a longitudinally-slotted shaft rotatably secured in the chuck, a longitudinally-divided former pivoted between its ends in the shaft-slot with its operative end projecting beyond the chuck, the rear ends of the former members being inclined in opposite directions and crossing each other, a collar movable within the chuck and operatively engaging said inclined former ends to open and close the forward operative end of the former, exterior formers or dies carried by the chuck, and actuating means, substantially as shown and described.

14. An improved machine for finishing hollow glass articles, comprising a chuck, exterior dies having opposite position thereon, a bushing secured in the chuck, a longitudinally-slotted shaft rotatably secured in the bushing, a longitudinally-divided interior die or former having its members pivotally secured together and to the shaft in the slot thereof, mechanism common to all the dies for moving them to operative position, and actuating mechanism, substantially as shown and described.

15. An improved machine for finishing hollow glassware, comprising outer dies adapted to open and close on the exterior of the article, an interior two-part die adapted to open and close within the article, mechanism adapted to close the outer dies and open the inner die, and vice versa, and mechanism for rotating the outer and inner dies in opposite directions, substantially as shown and described.

16. An improved machine for finishing glass articles, comprising interior and exterior formers adjustable longitudinally with relation to each other, substantially as shown and described.

17. An improved machine for finishing glass articles, comprising oppositely-rotatable interior and exterior formers adjustable longitudinally with relation to each other, substantially as shown and described.

18. An improved machine for finishing glass articles, comprising interior and exterior formers, the interior former being adjustable longitudinally of the exterior former, and an end-finishing device movable longi-

tudinally with the interior former and rotatable with the exterior former, substantially as shown and described.

19. An improved machine for finishing glass articles, comprising a bed-frame, finishing mechanism, rack-supporting carriage 24 slidable on the bed-frame toward and away from the finishing mechanism, and clamping-plate 34 adapted to secure the carriage to the frame in desired adjustment, substantially as shown and described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES LENG.

Witnesses:
J. M. NESBIT,
C. A. WILLIAMS.