

No. 646,850.

Patented Apr. 3, 1900.

P. LINDEMEYR.

TOOL FOR FORMING BOTTLE NECKS, &c.

(Application filed May 10, 1899.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

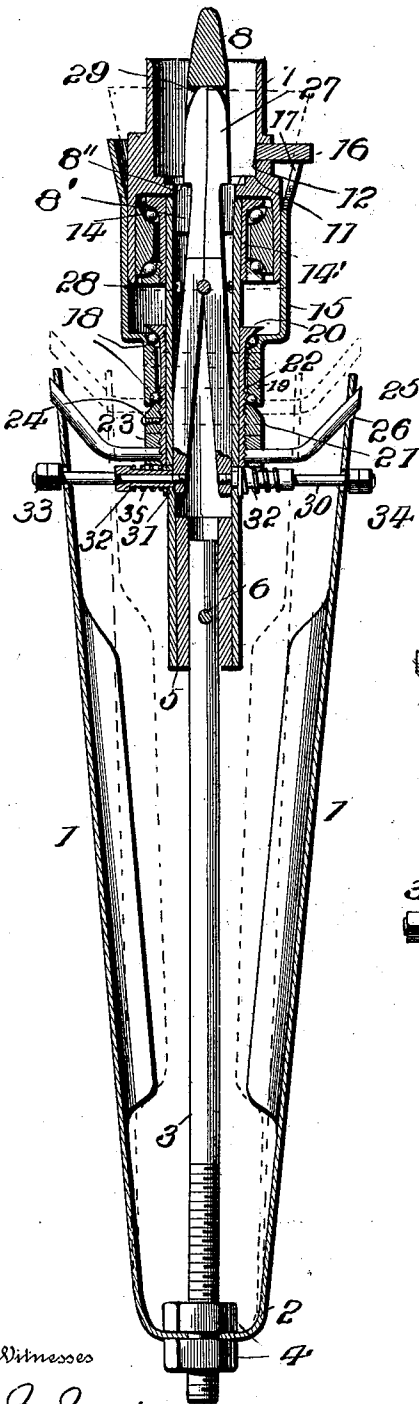
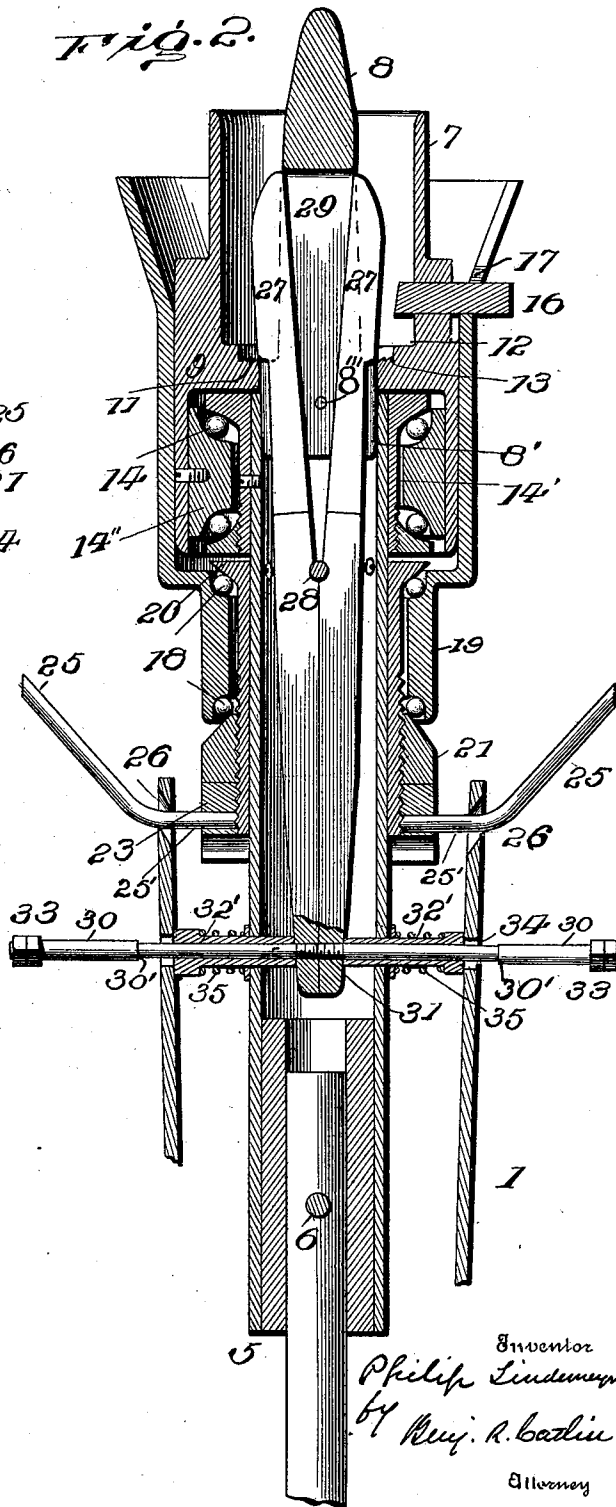


Fig. 2.



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Fig. 3.

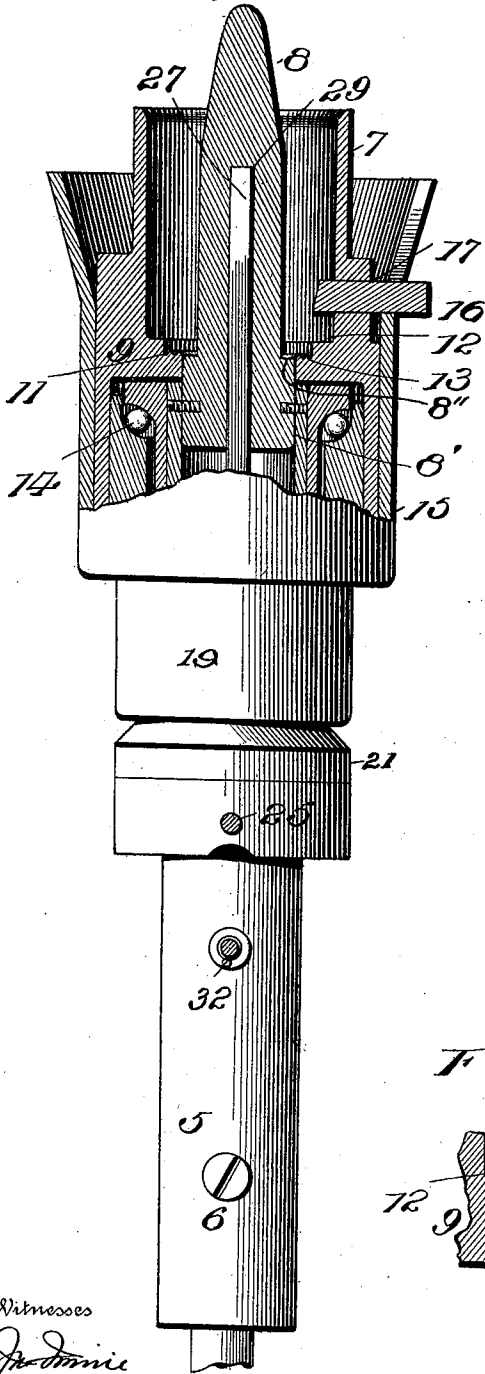


Fig. 4.

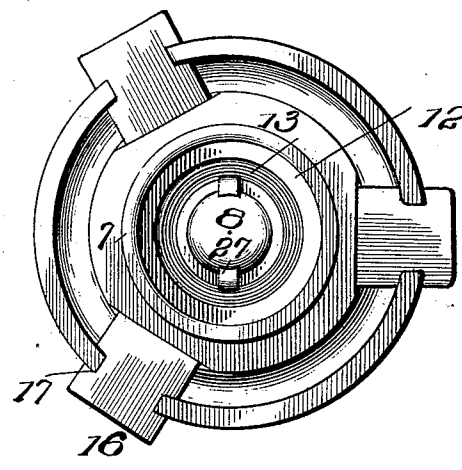


Fig. 6.

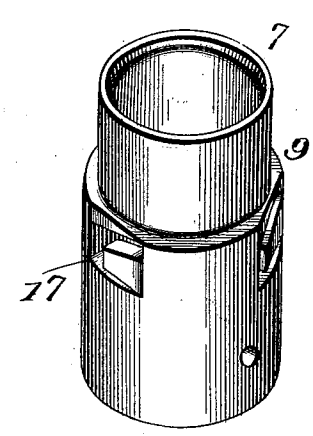
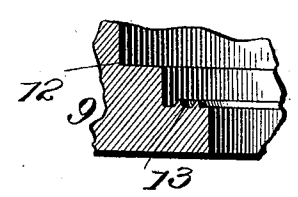


Fig. 5.



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FIG. 7.

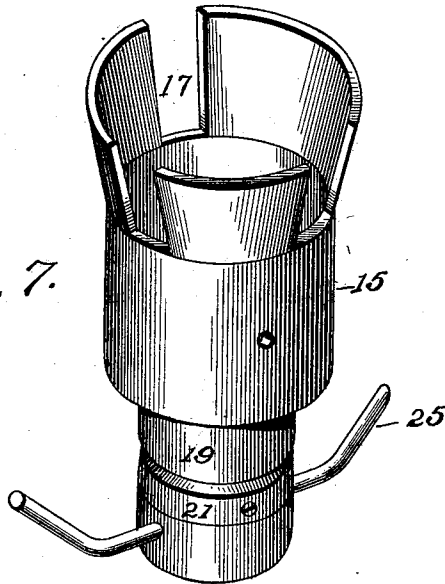
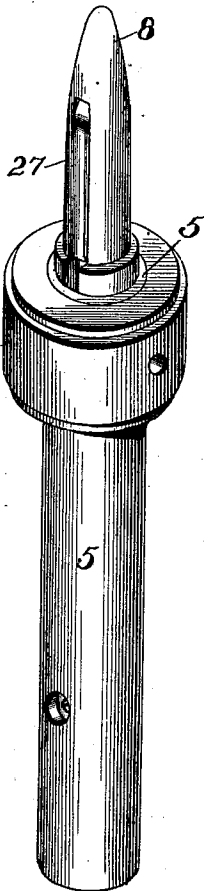


FIG. 8.



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UNITED STATES PATENT OFFICE.

PHILIP LINDEMEYR, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE
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TOOL FOR FORMING BOTTLE-NECKS, &c.

SPECIFICATION forming part of Letters Patent No. 646,850, dated April 3, 1900.

Application filed May 10, 1899. Serial No. 716,208. (No model.)

To all whom it may concern:

Be it known that I, PHILIP LINDEMEYR, a resident of Baltimore, in the State of Maryland, have invented certain new and useful
5 Improvements in Tools for Forming the Necks of Bottles and other Vessels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which
10 it pertains to make and use the same.

The invention relates to tools for molding and forming the necks of bottles and the like; and its object is to increase the efficiency of such devices.

15 The invention consists in the construction hereinafter described and pointed out.

In the accompanying drawings, Figure 1 is a central longitudinal section of the improved tool. Fig. 2 is a similar view, on a larger scale,
20 showing a different adjustment of parts. Fig. 3 is a broken elevation. Fig. 4 is a plan. Fig. 5 is an enlarged section of a detail. Fig. 6 is a perspective of a mold. Fig. 7 is a perspective of a mold-case. Fig. 8 is a perspective of opener, expander, ball-housing, and
25 stem extension.

Numeral 1 denotes a spring-bow comprising two members joined by a spring 2, and 3 is a mold-supporting stem adjustably connected to the bow by means of a screw-threaded
30 portion and nuts 4.

5 denotes a sleeve or hollow cylindrical extension of the stem, and 6 a screw for detachably fixing the stem and its hollow extension
35 together. Upon the outer end of the stem extension 5 is rotatably mounted a mold 7, and to said extension is fixed a neck-opening plug 8.

9 is the mold-bottom, comprising a part 11
40 and a raised part or shoulder 12 to form a similar shoulder on the bottle-neck. A rib or ribs 13 (see Figs. 2 and 5) may be provided on the part 11 to form a groove or grooves, and intermediate ribs in the bottle-lip to engage
45 the cork or other seal compressed thereon by the act of fastening a cap on the bottle. In some cases an equivalent construction of the lip will be produced by the combined effect of the rotating bottom part 11 and the shoulder
50 8' of the enlarged part 8' of the opener.

8'' is a screw or detachable fastening connecting the opener and sleeve 5.

The mold rotates upon a series of antifric-
tion-balls 14. It is connected by a screw or
the like to a rotatable part 14'' of the housing. 55
The screw being released and other minor parts detached, the mold, the mold-case, with
ball-housing, and the opener, with its connections, including a ball-housing, can be separated, as represented in Figs. 6, 7, and 8, respectively. This is important, and particularly as respects the opener and connected
60 parts. (Shown in Fig. 8.) The opener and fingers are liable to injury by their repeated contacts with hot metal and require renewal. 65
By the present improvement the parts can be kept in stock and substituted for those rendered defective by use. In some cases the opener will be detached singly, the screw 8''
70 being removed.

15 denotes a rotatable mold-case for suitably actuating transversely-movable supplementary mold-sections 16, adapted to move
75 through suitable slots 17 in the mold. Said mold-sections are in the present case shown with suitable form to produce bayonet-joint grooves on the exterior of the bottle-neck, beginning in the shoulder produced by part
12 of the mold-bottom. The exterior portions of the mold-sections 16 are made to engage the
80 flared mouth of the case, as shown, so that moving the case forward and lengthwise the tool closes said sections. The opposite movement opens the sections after their operation.

To avoid interference with the operation of
85 the mold, the case is adapted to rotate synchronously with it and has antifric-tion-balls 18, housed by a case extension 19, and cones 20 and 21. The cone 20 is formed at the end of a sleeve 22, fixed at its opposite end to a rim
90 23, the whole sliding on stem extension 5. The cone 21 is made adjustable by a screw-thread connection with sleeve 22. 24 is a set-screw. The mold-case and its ball-bearing and ring 23 are removable together in case it
95 is desired to separate other parts of the tool. The case is moved lengthwise to operate the mold-sections 16 by means of the horns 25, which extend through holes 26 in the bow in such manner that compressing the bow moves 100

the case forwardly and the sections 16 inwardly, while the expansion of the compressed bow by the action of its spring 2 retracts the case and opens the mold-sections, the mold-case being at all times free to rotate on sleeve 22 and the mold rotatable on ball-housing sleeve 14', carried by the stem extension 5.

The neck-opener 8 is fixed to the stem extension at 8' and extends beyond the mold, as shown. It is slotted at 29 to receive a neck expander and finisher. Said expander is composed of two fingers 27, situated in said slot and rocking about a bearing 28 in the stem extension. The fingers are normally situated within the circumference of the opener, and therefore are then in an inoperative situation, except that they may cooperate in opening the neck. Screws or projections 28' are provided to hold the separate expander members on the pivot.

Heretofore in tools comprising supplementary mold-sections movable transversely through a mold and opposite to an expander such sections and the expander have been constructed to move simultaneously toward each other, with the effect to injure the product by too-violent or extensive displacement of the plastic metal without sufficient time for it to properly adjust itself to the operation. This defect, aggravated by the opposite action of the transversely-movable sections 16 and the expander, is overcome by the present improvement, which makes the operation of the supplementary sections and the expander successive rather than simultaneous, as heretofore.

The expander is operated by means of pins 30, movable through the bow members at 34. They have a screw-thread connection at 31 with the expander-fingers and cooperate with returning-springs 35. As shown in Fig. 1, each bow member plays between a shoulder formed by a sleeve 32, fixed on the pin and nuts near the outer end of the pin. This so-called "sleeve" provides an outer bearing for a pin-returning spring 35, and it is not essential that the sleeves be separate parts. They play through suitable openings in the stem extension, and if made separate their outer ends abut against a shoulder or enlargement of the pin. Compressing the bow carries its members against the sleeves, which, in this case being fixed to the pins, cause the latter to open the expander. When the bow expands, the springs or the springs and bow return the pins and close the expander. As represented in Fig. 2, 32' denotes sleeves movable on the pins, and they constitute a medium by which the bow opens and closes the expander. The two constructions are considered equivalent. As shown in Fig. 2, however, the expander-fingers do not follow the bow members as immediately as when the sleeves are fixed upon the pins. The compression of the bow moves the sleeves inwardly and opens the expander, the springs

35 thereby being put under tension. On release of the bow the springs retract the sleeves, which are carried against the shoulders 30' of the pins, whereby the latter are moved outwardly and the opener partially closed. The further expansion of the bow completes the closing of the opener and retracts the mold-case 15 by means of the horns 25, the members of the bow being stopped by nuts 33.

The screw-thread connection of the pins 30 with the expansion-fingers provides for closing the expander when the sleeves are moved outwardly against their shoulders 30' and permits an adjustment of the pins to vary the time of this action.

It will be understood that the forward movement of the case 15, caused by the coaction of the bow and the outer portions of the horns 25, pushes the supplementary mold-sections 16 inwardly through the slots 17, formed in the mold. The opening of the expander is effected by the sleeves, while the bow members embrace the parts 25' of the horns 25, and there is no longitudinal movement of the case at such time. The opening of the expander, which is effected by a small movement, as indicated in Fig. 2, follows the longitudinal movement of the case, which draws or crowds the mold-sections 16 inwardly, which latter operation is also shown as completed in said figure.

In practice a reheated bottle-neck is introduced into the mold upon the opener, and thereupon the bow is compressed to actuate the groove-forming sections, and subsequently by a further compression of the bow the expander is actuated, its operation succeeding that of the mold-sections 16 and cooperating with them in a much better manner than when these devices are simultaneously operated. The bottle and mold are suitably rotated about the opener and fingers both before and after the latter are expanded as required to finish the neck interior and press the metal against the mold-sections.

Having thus described my invention, I claim—

1. In a tool for molding and forming bottle-necks and the like, a mold, an opener for the neck, transversely-movable supplementary mold-sections, oppositely-moving expander-fingers, and mechanism to actuate the sections and expand the fingers successively.

2. In a tool for molding and forming bottle-necks and the like, a neck-forming mold having a bottom fixed thereto and provided with projections to form depressions in the lip of the bottle to receive a seal and insure a tight joint.

3. In a tool for forming and molding bottle-necks and the like, the combination of a mold having supplementary transversely-movable sections, a bow, intermediate devices for moving the sections, a neck-expander comprising pivoted members, and devices to open the expander subsequent to the

operative movement of the sections, said devices comprising pins connected to the expander members and actuated by the bow.

4. In a tool for molding and forming bottle-necks and the like, the combination of a mold having supplementary transversely-movable sections, a bow, intermediate devices for moving the sections, a neck-expander comprising pivoted members, and devices to open the expander subsequent to the operative movement of the sections, said devices comprising pins and movable sleeves actuated by the bow.

5. In a tool for molding and forming bottle-necks and the like, a rotatable mold having in its body transverse slots, independent supplementary mold-sections movable in said slots, expansible non-rotatable fingers to force the metal outwardly around said sections, devices to expand the fingers, and mechanism to move the sections.

6. In a tool for molding and forming bot-

tle-necks and the like, a rotatable mold having in its body transverse slots, independent supplementary mold-sections movable in said slots, expansible non-rotatable fingers to force the metal outwardly around said sections, devices to expand the fingers, and mechanism to move the sections, said fingers being operated subsequent to the operation of the sections.

7. In a tool for molding and forming bottle-necks and the like, a bow, a stem, a tubular stem extension, an opener, and an expander pivoted in the extension, both the opener and the expander being held removably in the said tubular extension.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

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Witnesses:

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