No. 646,851. Patented Apr. 3, 1900.

H. R. LOPER.

BOTTLE NECK FORMING TOOL.

(Application filed Apr. 24, 1899.)

(No Model.)

Fig. 4.

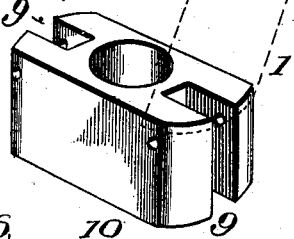


Fig. 1.

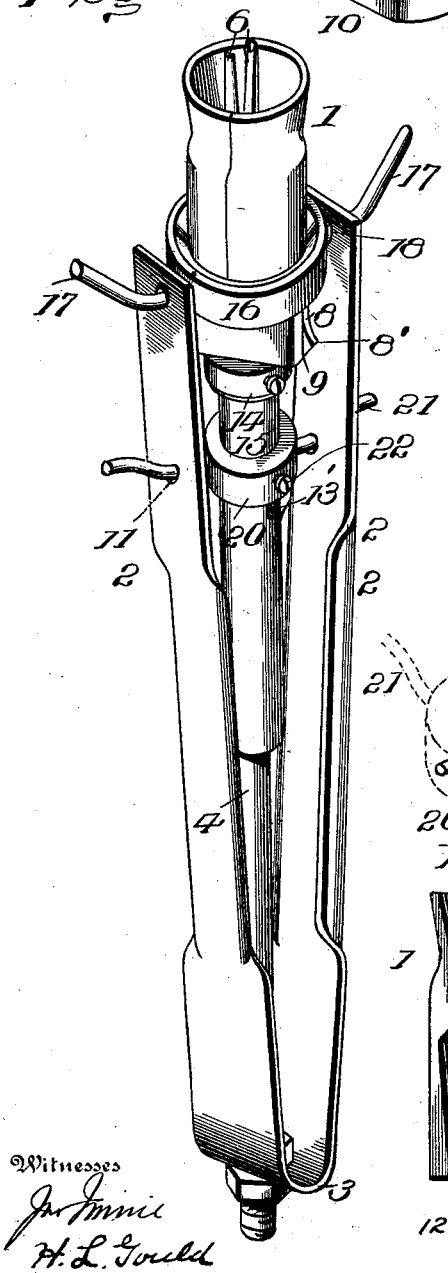


Fig. 2.

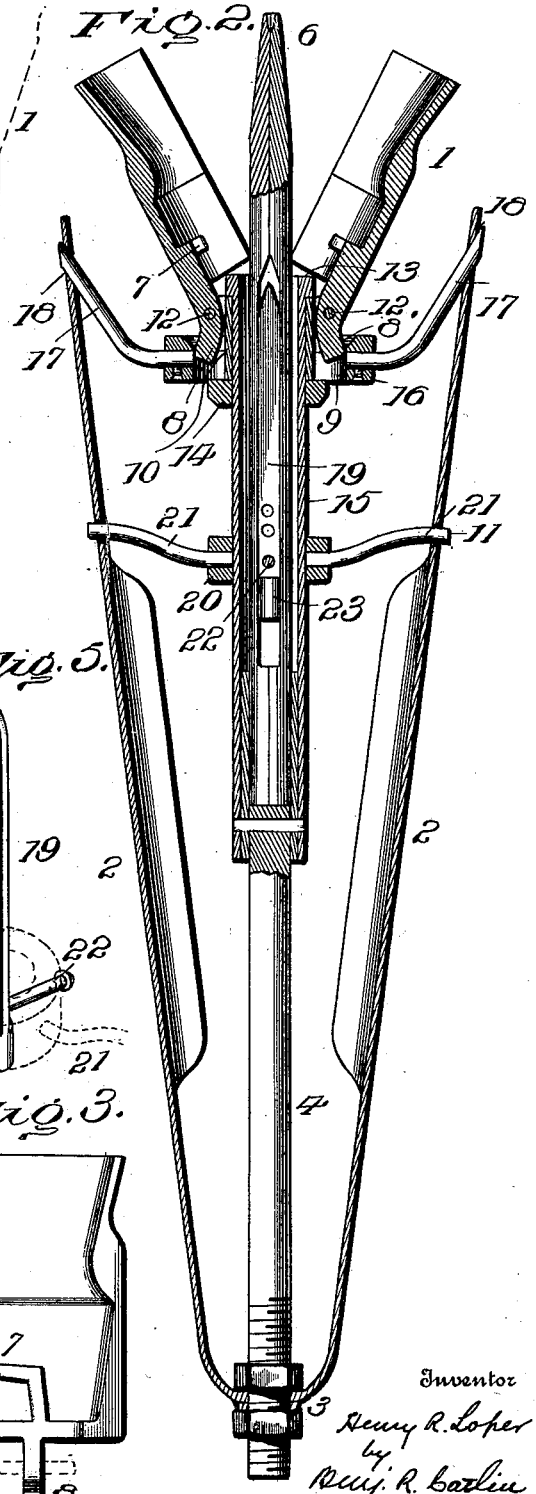


Fig. 5.

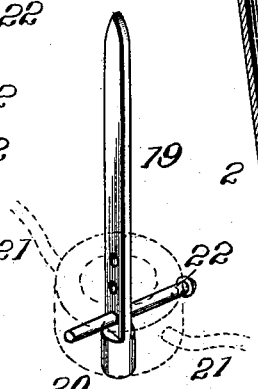
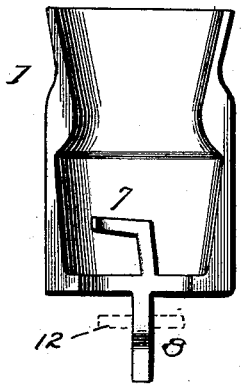


Fig. 3.



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UNITED STATES PATENT OFFICE.

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BOTTLE-NECK-FORMING TOOL.

SPECIFICATION forming part of Letters Patent No. 646,851, dated April 3, 1900.

Application filed April 24, 1899. Serial No. 714,227. (No model.)

To all whom it may concern:

Be it known that I, HENRY R. LOPER, a resident of the city of Baltimore, State of Maryland, have invented certain new and useful Improvements in Bottle-Forming Tools; 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 it pertains to make and use the same.

The invention relates to tools for forming the necks of bottles and other vessels.

It has for its object to provide an easily-rotatable sectional mold and to combine with it non-rotatable devices to form the interior of the bottle-neck, said devices being adapted to press the metal out into the mold, and in general to improve the efficiency of tools of the general nature indicated.

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

In the accompanying drawings, Figure 1 is a perspective of the improved tool. Fig. 2 is a longitudinal section of the same. Fig. 3 is an elevation of a mold-section. Figs. 4 and 5 are perspectives of details.

Numerals 1 1 denote the sections of a separable mold. 2 2 indicate bow members operatively connected to said sections to close the same to fit the mold for use, and 3 is a spring put under tension when the bow is compressed and adapted to open the mold-sections when desired. Said sections are rotatably supported on a stem 4.

A spreader or expander to press metal outwardly and into the closed mold comprises two resilient members 6 6, situated in a tubular extension of the stem 4. The compression of the bow first closes the mold-sections, which constitute the mold and which is adapted to receive the neck of a bottle. Said neck having been introduced into the mold, a further compression of the bow opens the expander-fingers 6 within the bottle-neck, which, together with the mold, is rotated about such expander and forms the neck interior and expands the metal into the mold.

7 7 indicate interior mold projections to form bayonet-joint grooves on the exterior of the bottle-neck, and the fingers 6 6 expand the metal and press it about the projections while they (the fingers) are also finishing the interior of the neck.

The mold-sections have each an extension 8, situated in a slot 9 in a mutilated ring or block 10, rotating on a stem extension 15, fixed to the stem 4 and constituting a mold-section support.

Pivots 12 connect the mold-section extensions 8 with the ring 10 in a manner to permit them to be opened and closed. Obviously the mutilated ring or block 10 if made in the form of a complete ring would operate as described; but to reduce weight it is preferred to cut the metal away, as shown.

13 denotes a mold-bottom fixed to the cylinder-stem and provided with an oblong slot 13′ to permit a pin 22, fixed in ring 20, to slide as required in the opening and closing of the expander-fingers 6.

14 is a collar fixed on the upper end of the stem or sleeve 15. The block or ring 10 rotates freely between the mold-bottom and said collar 14, but is held against movement lengthwise the tool.

16 denotes a ring loosely surrounding the mold and adapted to be moved lengthwise the mold and its extensions 8 by means of the wires 17, fixed thereto and having forwardly-inclined parts playing loosely in holes 18 in the bow members. When said members are caused to approach each other by compression of their connecting-spring 3, the inclined wires 17 are forced through the holes 18, and the ring 16 is thereby moved forward on the mold-sections, with the effect to close them and hold them closed until the spring 3 is relieved and permitted to open the bow, whereupon a reverse movement of its members draws the ring or cams down upon the mold extensions 8 and upon the outwardly-inclined parts 8′ thereof, (see Fig. 2,) which forces the ends of the extensions inwardly and opens the mold by turning its sections outwardly about the pivots 12.

When the mold is closed, it, together with its extensions and the block 10, can be rotated within the ring 16 and about the mold-bottom 13 and about the stem extension by

means of a bottle having its neck held in the mold and manipulated on the chair or table, as usual in the art.

The expander members 6 6, which are loosely supported in the stem extension 15, are opened and closed by a wedge 19, actuated by spring 3 through the medium of a ring 20, connected to the bow members by suitably-bent wires 21, passing freely through holes 11 in the bow.

When spring 3 is compressed and the bow members made to close the mold, as above described, the wires 21 are forced through holes 11, with the effect to move the ring forward. This ring is connected at 22 to the sliding piece or bar 23, which carries the wedge 19. This wedge when pushed forward by means of the bar 23 and its connection to the ring spreads apart the fingers, thereby forcing the metal into the mold. When the spring 3 opens the bow and the mold, the wedge 20 and wedge 19 are retracted and the expander closed by the resiliency of its members.

The parts are constructed substantially as shown and so that the mold will be closed before the expander is opened, and said closed expander can be used as an opener for the bottle-neck, which latter function is provided for by the extension of the fingers beyond the mouth of the mold, as indicated.

In operation the reheated bottle-neck is inserted in the closed mold upon the closed expander, and then the mold is rotated about the stem extension and mold-bottom, the bottle turning with the mold.

The expander does not rotate, but its fingers are opened subsequently to the closing of the mold by the wedge, as stated, and they spread the metal outwardly and finish the neck interior while it is rotated about the opened fingers, the metal being simultaneously pressed into the mold around the mold projections 7.

The bottle is released from the mold when opened by spring 3, which will occur as soon as the operator relaxes his grasp of the bow.

Having thus described my invention, what I claim is—

1. In a machine for forming and molding the necks of bottles, a bow, a separable and rotatable mold for forming the outside of the neck, in combination with expansible but non-rotatable fingers for forming the inside of the neck and forcing the metal into the mold, means for operating the mold-sections comprising wires coöperating with the bow to close the mold, and wires coöperating with the bow to expand the fingers.

2. In a machine for forming and molding the necks of bottles, a bow, a separable and rotatable mold for forming the outside of the neck, in combination with expansible but non-rotatable fingers for forming the inside of the neck and forcing the metal into the mold, means for operating the mold-sections comprising wires coöperating with the bow to close the mold, and wires coöperating with the bow to expand the fingers, and a ring embracing the mold to hold the mold closed independently of the bow.

3. In a tool for forming and molding the necks of bottles, a separable mold, a non-rotatable expander, a bow operatively connected to the mold and to the expander, and an expander-support fixed to the bow, the mold being rotatable about the expander and its support, and both positively opened and closed by the bow, and the bow operative to open the expander after the mold has been closed.

4. In a machine for forming and molding the necks of bottles, a bow, a separable and rotatable mold for forming the outside of the neck, in combination with expansible but non-rotatable fingers for forming the inside of the neck and forcing the metal into the mold, and a device for holding the mold closed independently of the bow, said device comprising a ring embracing both mold-sections.

5. In a machine for forming and molding the necks of bottles, a bow, a separable and rotatable mold for forming the outside of the neck, in combination with expansible but non-rotatable fingers for forming the inside of the neck and forcing the metal into the mold, and a device for holding the mold closed independently of the bow, said device comprising a ring movable endwise the mold and adapted to closely embrace it when closed.

6. In a machine for forming and molding the necks of bottles, a separable and rotatable mold for forming the outside of the neck, in combination with expansible but non-rotatable fingers for forming the inside of the neck and forcing the metal into the mold, and a device for holding the mold closed independently of the bow, said expanding fingers being suitably formed at their extremities and extending beyond the mouth of the mold and all other parts to open the neck.

7. In a machine for forming and molding the necks of bottles, a separable and rotatable mold for forming the outside of the neck, in combination with expansible but non-rotatable fingers for forming the inside of the neck and forcing the metal into the mold, and a locking device for holding the mold closed independently of the bow.

8. In a machine for forming and molding the necks of bottles, a bow, a separable and rotatable mold for forming the outside of the neck in combination with expansible but non-rotatable fingers for forming the inside of the neck and forcing the metal into the mold, and a ring for holding the mold closed independently of the bow, said ring in coöperation with the bow being adapted to close the sections.

9. In a machine for forming and molding the necks of bottles, a bow, a separable and rotatable mold for forming the outside of the neck, in combination with expansible but non-rotatable fingers for forming the inside of the

neck and forcing the metal into the mold, and a ring for holding the mold closed independently of the bow, said ring being adapted in coöperation with the bow to open the sections.

10. In a machine for forming and molding the necks of bottles, a bow, a rotatable mold comprising separable sections for forming the outside of the neck in combination with expansible but non-rotatable fingers for forming the inside of the neck and forcing the metal into the mold, and a ring bearing on the mold-sections and movable endwise of the tool to open or close said sections and to hold them either open or closed at will.

11. In a machine or tool for forming and molding the necks of bottles, a rotatable sectional mold, a sectional expander, devices whereby the mold may be opened and closed, said devices comprising cams mediately acted upon by the bow, and devices whereby the expander may be opened and closed, said expander extending out beyond the mouth of the mold to open the neck.

12. In a machine or tool for forming and molding the necks of bottles, a slotted cylindrical stem in combination with fingers held in said stem and extending beyond the end thereof, a ring turning freely on the stem, separable mold-sections pivotally connected to said ring, and devices to open and close the mold-sections without hindrance to the rotation of the closed mold.

13. In a machine or tool for forming and molding the necks of bottles, a rotatable sectional mold, a bow, a ring connected to the bow and adapted to open and close the mold-sections, a sectional expander and a second ring connected to the bow and adapted to open and close the expander-sections.

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

HENRY R. LOPER.

Witnesses:
EDGAR POE REISS,
WILLIAM W. YOUNG.