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W. EBNETHER & J. A. LAUGHEAD.  
TOOL FOR FINISHING BOTTLE NECKS.

APPLICATION FILED FEB. 11, 1904.

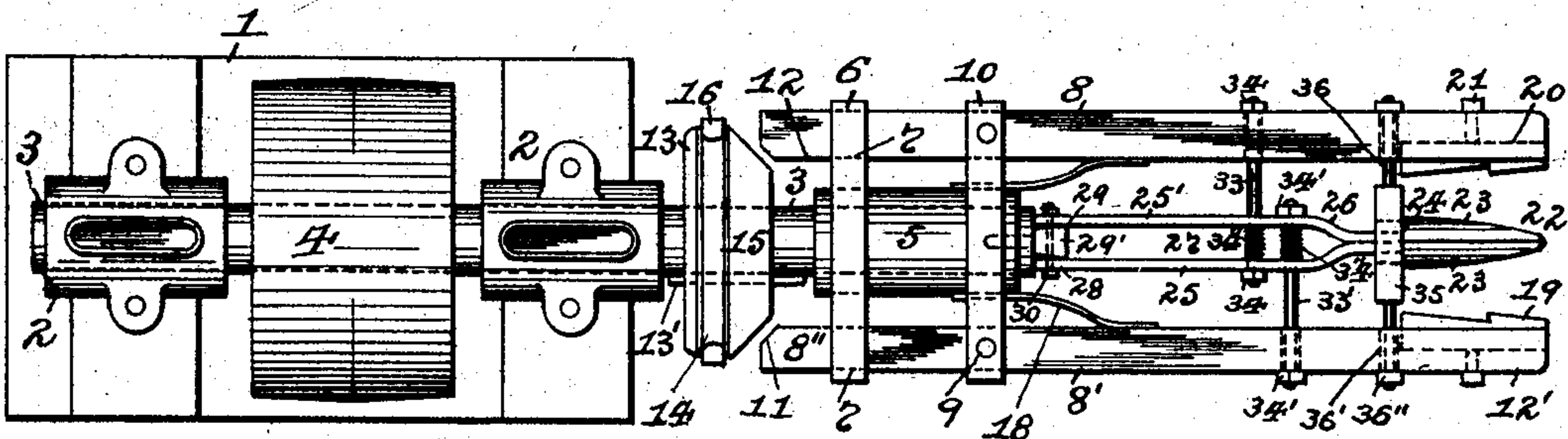


Fig. 1

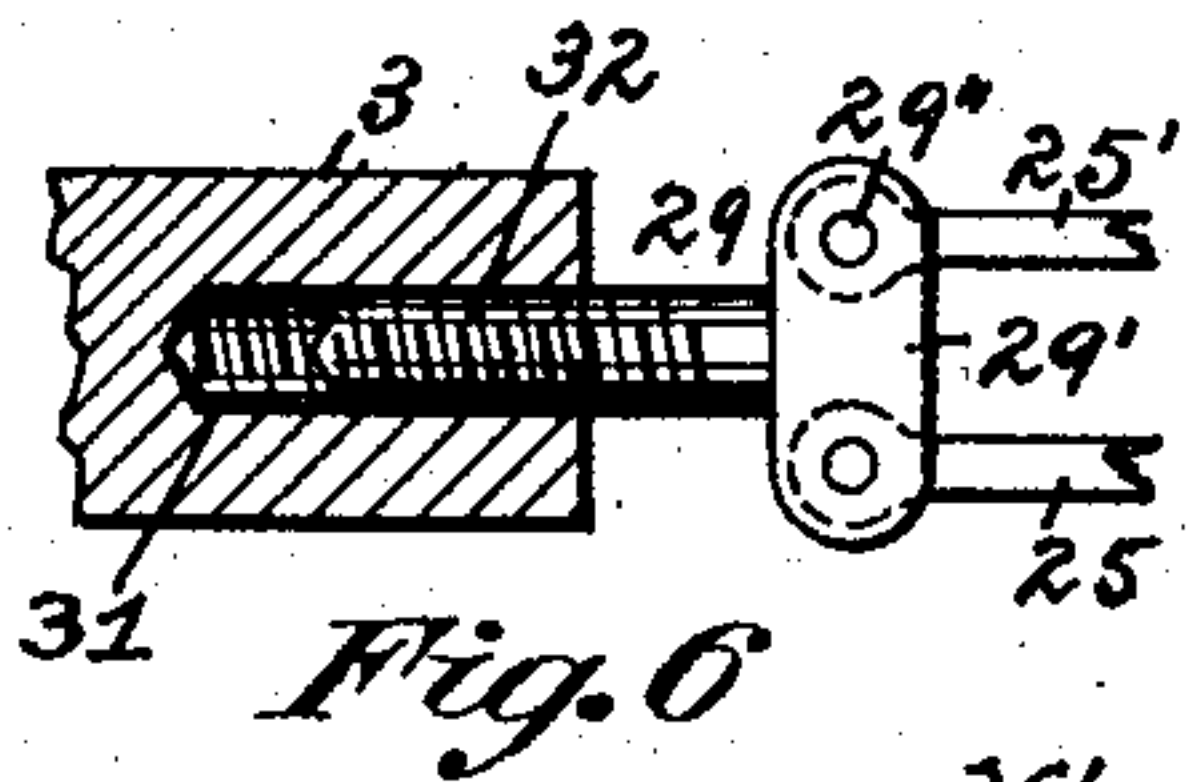


Fig. 6

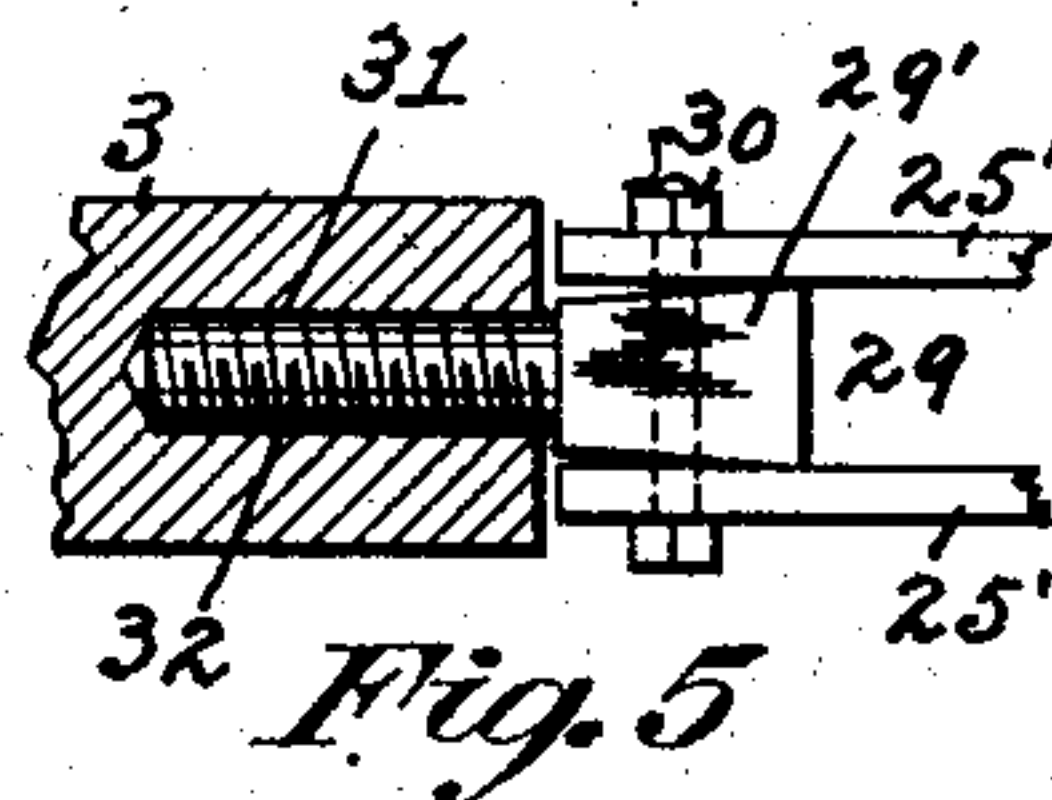


Fig. 5

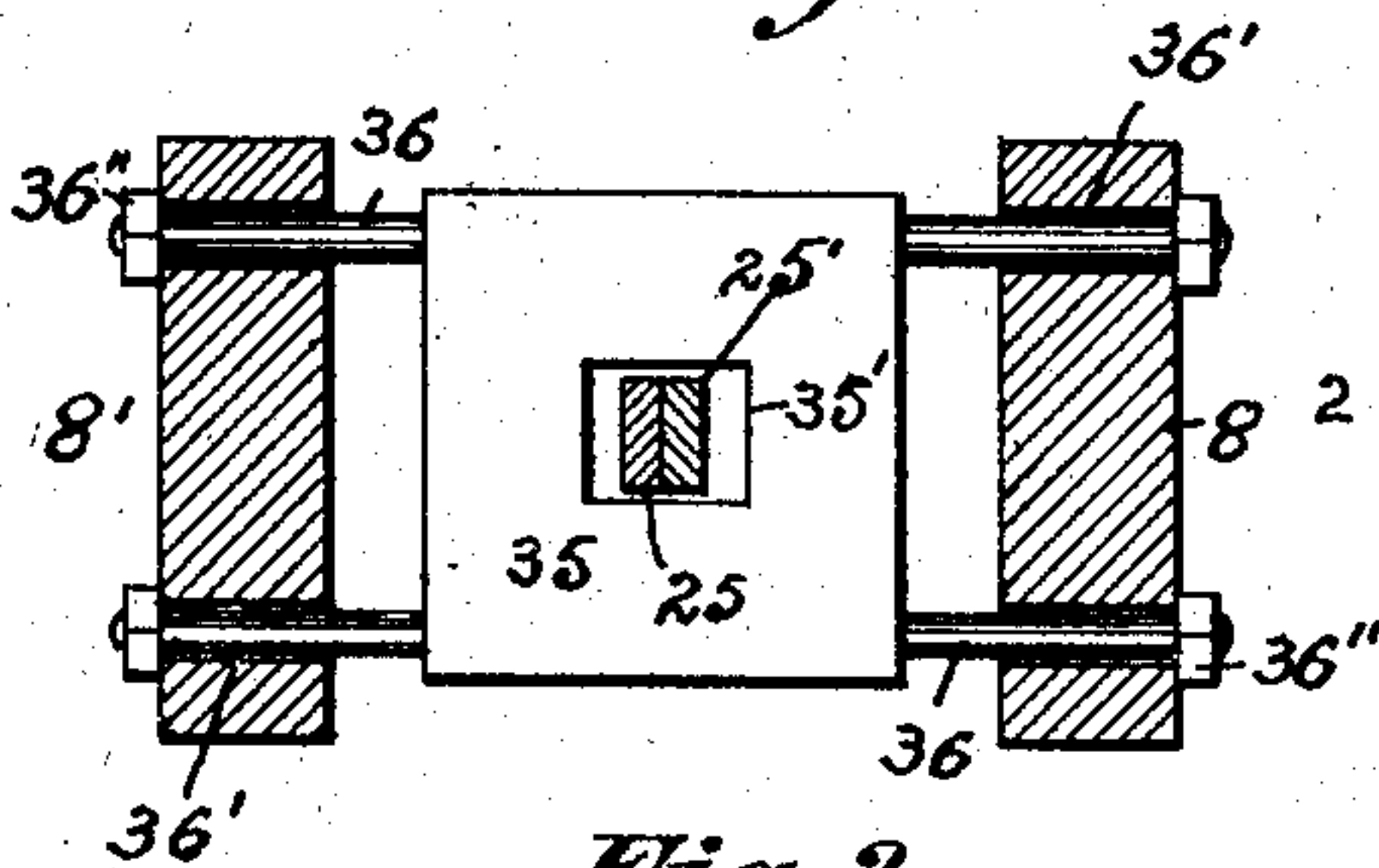


Fig. 3

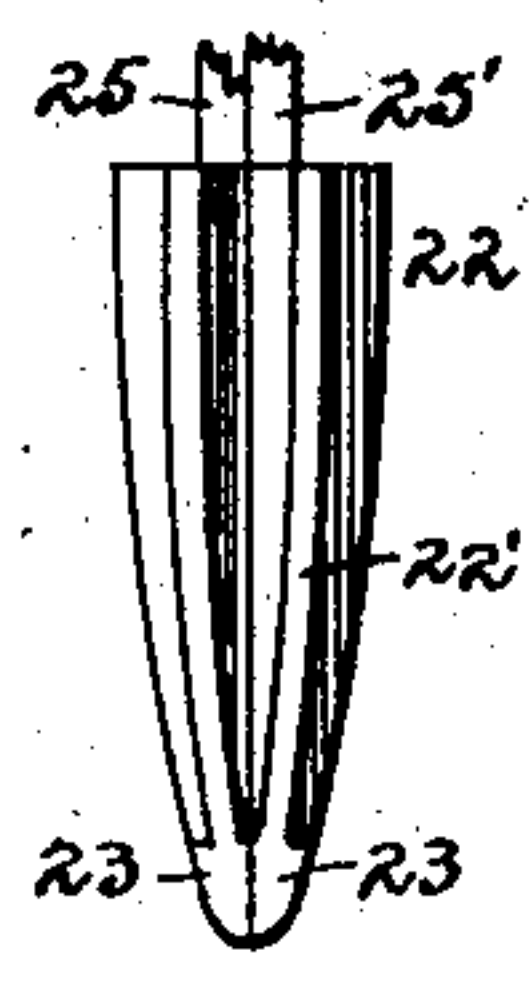


Fig. 7

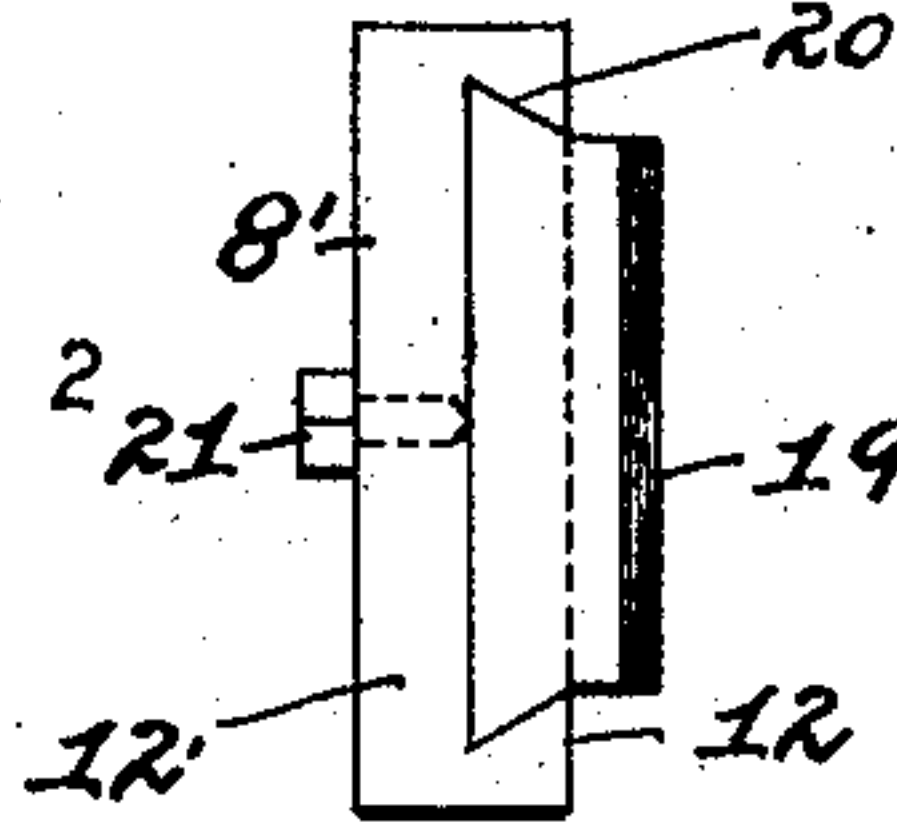


Fig. 4

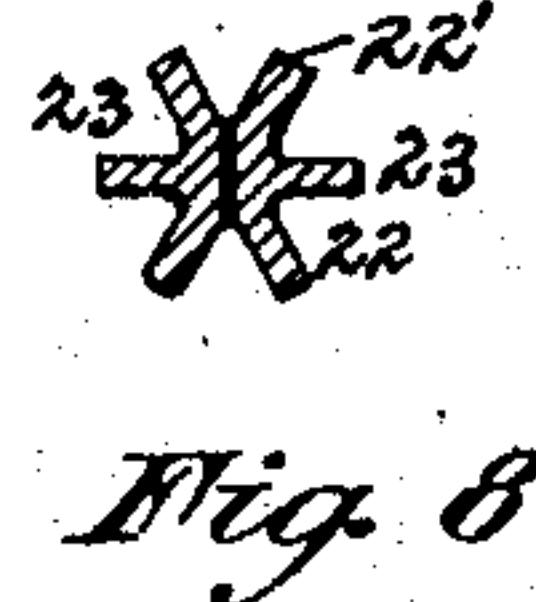


Fig. 8

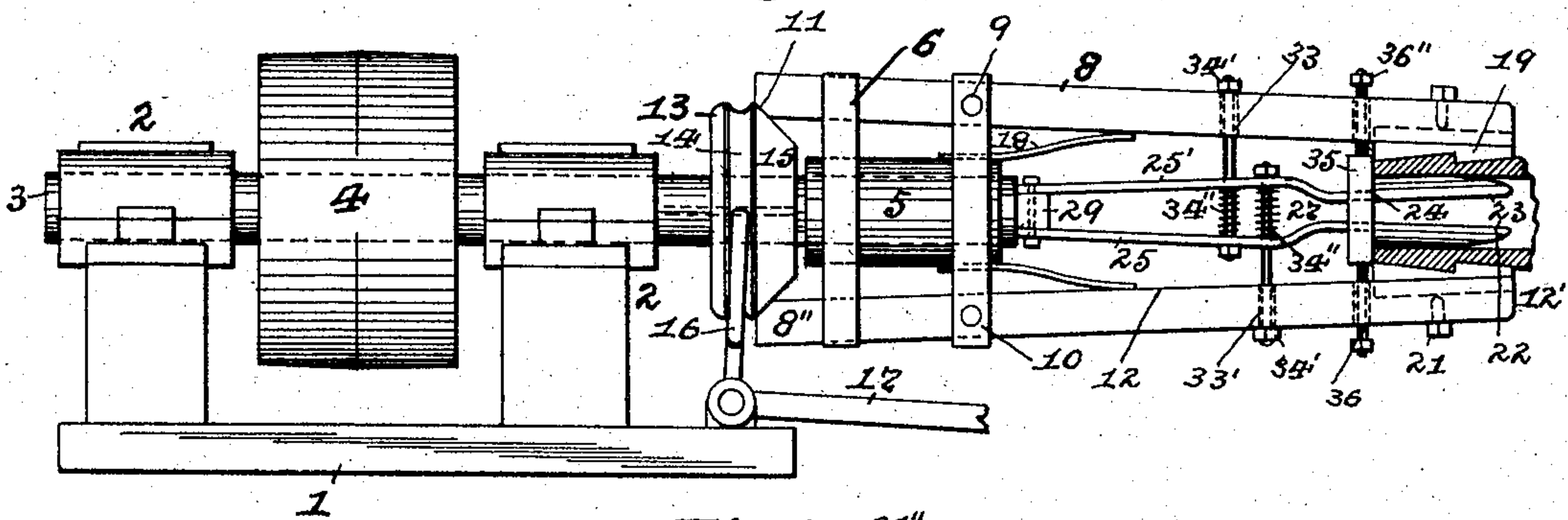


Fig. 2

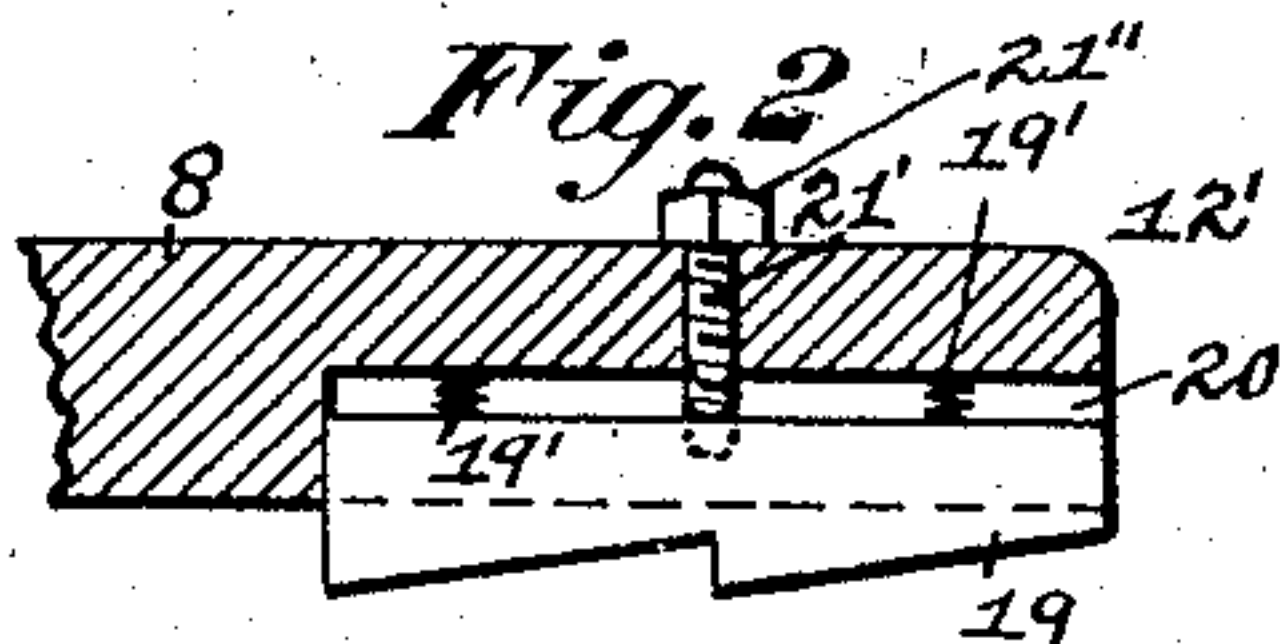


Fig. 9

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# UNITED STATES PATENT OFFICE.

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## TOOL FOR FINISHING BOTTLE-NECKS.

SPECIFICATION forming part of Letters Patent No. 791,459, dated June 6, 1905.

Application filed February 11, 1904. Serial No. 193,101.

*To all whom it may concern:*

Be it known that we, WILLIAM EBNETHER and JOSEPH A. LAUGHEAD, residents of Jeannette, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Improvement in Tools for Finishing Bottle-Necks; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to certain improvements in a machine for finishing bottle-necks, and has for its object to provide a cheap, simple, and effective machine for the purpose, as well as one which practical use has proven will finish bottle-necks rapidly, perfectly, and uniformly without the employment of any skilled labor.

Our invention consists, generally stated, in the novel arrangement, construction, and combination of parts, as hereinafter more specifically set forth and described, and particularly pointed out in the claims.

To enable others skilled in the art to which our invention appertains to construct and use our improved machine for finishing bottle-necks, we will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a plan view of our improved machine for making bottle-necks, showing the same in its normal position. Fig. 2 is a side elevation of the same, showing the manner of finishing a bottle-neck thereon. Fig. 3 is an enlarged face view of the head-plate, showing parts of the plug and jaws in section. Fig. 4 is an enlarged end view of one of the jaws. Fig. 5 is an enlarged sectional view of the front end of the shaft and showing in full lines the device for holding and adjusting the plug therein. Fig. 6 is an enlarged detail view, partly in section, of another form of attaching the strips or bars of the mandrel or plug to the shaft. Figs. 7 and 8 are views of another form of plug. Fig. 9 is a sectional view of another form of holding the dies.

Like symbols of reference herein indicate like parts in each of the figures of the drawings.

As illustrated in the drawings, 1 represents a frame on which are the bearings 2 for the shaft 3, and on this shaft is mounted a pulley 4 for revolving said shaft by means of a belt (not shown) in the ordinary manner. A head 5 is formed or secured on said shaft 3, and extending out from said head is a guiding-plate 6, which is seated on each side, as at 7, for the reception of the jaws 8 8', and these jaws are pivoted at 9 in a supporting-plate 10, extending out from the head 5. The rear or inner ends 8'' of the jaws 8 8' are provided with the inclined or beveled faces 11 on their inner faces 12, with which a cone-clutch 13 is adapted to engage, this clutch being slidably mounted on the shaft 3 by a feather 13' and being provided with a groove 14 around the same in the rear of its beveled engaging face 15 for the reception of a yoke 16, to which an operating lever or bar 17 is attached for moving the clutch along said shaft 3.

Springs 18 are placed between the head 5 and the inner faces 12 of the jaws 8 8' for holding the front or outer ends 12' of said jaws 8 8' normally outward, and dies 19 for giving the exterior shape to the bottle-neck are secured in dovetailed recesses 20 on the inner faces 12 and at the outer ends 12' of said jaws 8 8' by means of the set-screws 21.

Between the dies 19 on the jaws 8 8' is the mandrel or plug 22, which is of the usual cylindrical and tapered-point form, and such plug is divided longitudinally into two sections 23. Extending backward from the rear end face 24 of said plug 22, and from each section 23 thereof, are the bars 25 25', and these bars are curved outwardly, as at 26, in order to form the space 27 between them. The rear ends 28 of said bars 25 25' are secured to a screw-plug 29 by means of a bolt 30, passing through a head 29' on the same, and such screw-plug 29 is screwed into



a threaded seat 31 in the front end of the shaft 3 by means of the threaded portion 32 thereon for holding and adjusting the plug 22.

The jaw 8 is connected to the bar 25 by means of the rod 33, which passes loosely through the jaw 8 and bars 25 25' and is provided with the nuts 34 at each end thereof for bearing against the outer faces of the jaws 8 and bar 25 in the normal position of said jaws, while the jaw 8' is connected to the bar 25' by means of the rod 33', which passes loosely through the jaw 8' and bars 25 25' and is provided with nuts 34' at each end thereof for bearing against the outer faces of the jaws 8' and bars 25' in the normal position of said jaws. The rods 33 33' have spiral springs 34'' around the same and interposed between and against the bars 25 25', so as to be confined within the space 27, and such springs 35 act to cushion the bars 25 25' and allow such bars to have an outward tendency and with them the plug 22 when in operation.

The bars 25 25' on the plug 22 pass through an enlarged opening 35', formed in a head-plate 35, which is adapted to rest against the rear end face 24 of said plug and is provided with rods 36, extending out from the same, which pass loosely through openings 36' in the jaws 8 8' and back of the dies 19 therein and have nuts 36'' engaging with the ends thereof and with the outer faces of said jaws.

The use and operation of our improved machine for finishing bottle-necks is as follows: When power is applied by means of the belt (not shown) to the pulley 4 on the shaft 3, the said shaft, jaws 8 8', plug 22, and their connecting parts are all continuously revolved with said pulley, and when it is desired to finish a bottle-neck, as shown in Fig. 2, the unfinished neck of the bottle is inserted between the jaws 8 8' over the plug 22 and against the head-plate 35 in the rear of said plug. At about the same time as this is being done the operator pulls the lever 17, connecting the yoke 16 on the cone-clutch 13 on the shaft 3, and so moves said clutch forward along said shaft, which allows the beveled engaging face 15 on said clutch 13 to engage the beveled faces 11 on the jaws 8 8', thereby forcing outwardly the rear ends 8'' of said jaws, so that the front ends 12' of said jaws will be forced inwardly by reason of the pivoting of said jaws at 9. When the front ends 12' of said jaws 8 8' are thus forced inwardly, the springs 18 between said jaws and the head 5 are compressed and the dies 19 come in contact with the glass in the unfinished bottle-neck and against the head-plate 35, so that as the jaws 8 8' and plug 22 are revolved the neck will be finished between the dies 19, and during this movement of the jaws the sections 23 of the plug 22 will be forced outwardly to form the interior and assist in the finishing of the neck by the releasing of the compression on the spiral springs 34'' in the space 27

on the bars 33 33' and bearing against the bars 25 25'. After the neck of the bottle has been thus finished and it is desired to remove the same all that is necessary is to push back the lever 17 and with it the yoke 16, fitting around the cone-clutch 13, thereby allowing said clutch to be forced back along the shaft 3, so that its beveled face 15 will be freed from the beveled faces 11 on the jaws 8 8' and permitting the springs 18 to throw out the front ends 12' of the pivoted jaws 8 8'. When the ends 12' of the pivoted jaws 8 8' are thus thrown out or open, the sections 23 of the plug 22 are brought together by the rods 33 33', thereby compressing the springs 34'' around said rods and within the space 27 between the bars 25 25', so that the dies 19 and plug 22 are released from the finished bottle-neck, when such neck can be withdrawn, another unfinished neck inserted over the plug 22, and the operations repeated.

In Fig. 6 there is shown another manner of attaching the plug-bars 25 25' to the screw-plug 29 in the shaft 3 by having said bars hinged or pivoted to the head 29' on said screw-plug 29, as at 29'', so that said bars can be swung from said head 29' to open and close the sections 23 of the plug 22, and in such case the springs 34'' can be dispensed with. In Figs. 7 and 8 the sections 23 of the plug 22 are shown as fluted throughout their length, as at 22', in order to lessen the friction of such plug, and in Fig. 9 the dies 19 are shown as provided with the springs 19' within the seats 20 for bearing against said dies, in which case bolts 21' can pass loosely through the jaws into said dies and be held by nuts 21'' in the ends of the same. This will allow the dies 19 to expand and make the neck of the bottle always uniform. These and various other modifications and changes in the construction and design of our improved machine for finishing bottle-necks may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a machine for finishing the necks of bottles, the combination of a shaft, a mandrel or plug formed in two sections, bars connecting said plug-sections and said shaft, spring-jaws pivotally connected to said shaft, dies on the front end of said jaws, a head-plate loosely connected to said jaws and loosely fitting around said bars, said head-plate being adapted to fit against the plug-sections, rods loosely connected to said jaws and adapted to pass through one of said bars and be connected to the other one of said bars, and connections between said jaws and shaft for simultaneously opening and closing the plug-sections and the dies, respectively.

2. In a machine for finishing the necks of bottles, the combination of a shaft, a man-



drel or plug formed in two sections, bars connecting said plug-sections and said shaft, spring-jaws pivotally connected to said shaft, dies on the front end of said jaws, a head-plate loosely connected to said jaws and loosely fitting around said bars, said head-plate being adapted to fit against the plug-sections, rods loosely connected to said jaws and adapted to pass through one of said bars and be connected to the other one of said bars, connections between said jaws and shaft for simultaneously opening and closing the plug-sections and the dies, respectively, and means on said shaft for adjusting the length of the mandrel or plug.

3. In a machine for finishing the necks of bottles, the combination of a rotatable shaft, a mandrel or plug formed in two sections, bars connecting said plug-sections and said shaft, spring-operated jaws pivotally connected to said shaft and provided with inclined faces at their rear ends, dies on the front ends of said jaws, a head-plate loosely connected to said jaws and loosely fitting around said bars, said head-plate being adapted to fit against the plug-sections, rods loosely connected to said jaws and adapted to pass through one of said bars and be connected to the other one of said bars, and a clutch adapted to slide on said shaft and provided with a cone or beveled face thereon for engaging with the inclined faces on the rear ends of the jaws to simultaneously open and close the plug-sections and dies, respectively.

4. In a machine for finishing the necks of bottles, the combination of a rotatable shaft, a mandrel or plug formed in two sections, a screw-plug fitting within a threaded seat in the front end of said shaft by a threaded portion thereon, bars connecting said plug-sections and said screw-plug, spring-operated jaws pivotally connected to said shaft and provided with inclined faces at their rear ends, dies on the front ends of said jaws, a head-plate loosely connected to said jaws and loosely fitting against the plug-sections, rods loosely connected to said jaws and adapted to pass through one of said bars and be connected to the other one of said bars, and a clutch adapted to slide on said shaft and provided with a cone or beveled face thereon for engaging with the inclined faces on the rear ends of the jaws to simultaneously open and close the plug-sections and dies, respectively.

5. In a machine for finishing the necks of bottles, the combination of a rotatable shaft, a mandrel or plug formed in two sections, bars connecting said plug-sections and shaft,

spring-operated jaws pivotally connected to said shaft and provided with inclined faces at their rear ends, dies on the front end of said jaws, a head-plate loosely connected to said jaws and loosely fitting around said bars, said head-plate being adapted to fit against the plug-sections, rods loosely connected to said jaws and adapted to pass through one of said bars and be connected to the other one of said bars, springs fitting around said rods and between said bars, and a clutch adapted to slide on said shaft and provided with a cone or beveled face thereon for engaging with the inclined faces on the rear ends of the jaws to simultaneously open and close the plug-sections and dies, respectively.

6. In a machine for finishing the necks of bottles, the combination of a shaft, a mandrel or plug formed in two sections and fluted throughout its length, bars connecting said plug-sections and said shaft, spring-jaws pivotally connected to said shaft, dies on the front end of said jaws, a head-plate loosely connected to said jaws and loosely fitting around said bars, said head-plate being adapted to fit against the plug-sections, rods loosely connected to said jaws and adapted to pass through one of said bars and be connected to the other one of said bars, and connections between said jaws and shaft for simultaneously opening and closing the plug-sections and the dies, respectively.

7. In a machine for finishing the necks of bottles, the combination of a shaft, a mandrel or plug formed in two sections, bars connecting said plug-sections and said shaft, spring-jaws pivotally connected to said shaft, dies fitting within recesses on the front end of said jaws, springs within said recesses and engaging with said jaws, bolts passing loosely through said jaws and engaging with said dies, a head-plate loosely connected to said jaws and loosely fitting around said bars, said head-plate being adapted to fit against the plug-sections, rods loosely connected to said jaws and adapted to pass through one of said bars and be connected to the other one of said bars, and connections between said jaws and shaft for simultaneously opening and closing the plug-sections and the dies, respectively.

In testimony whereof we, the said WILLIAM EBNETHER and JOSEPH A. LAUGHEAD, have hereunto set our hands.

WILLIAM EBNETHER.  
JOSEPH A. LAUGHEAD.

Witnesses:

J. N. COOKE,  
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