

T. M. RICHARDS.
BOTTLE FINISHING MACHINE.
APPLICATION FILED NOV. 9, 1907.

916,598.

Patented Mar. 30, 1909.

3 SHEETS—SHEET 1.

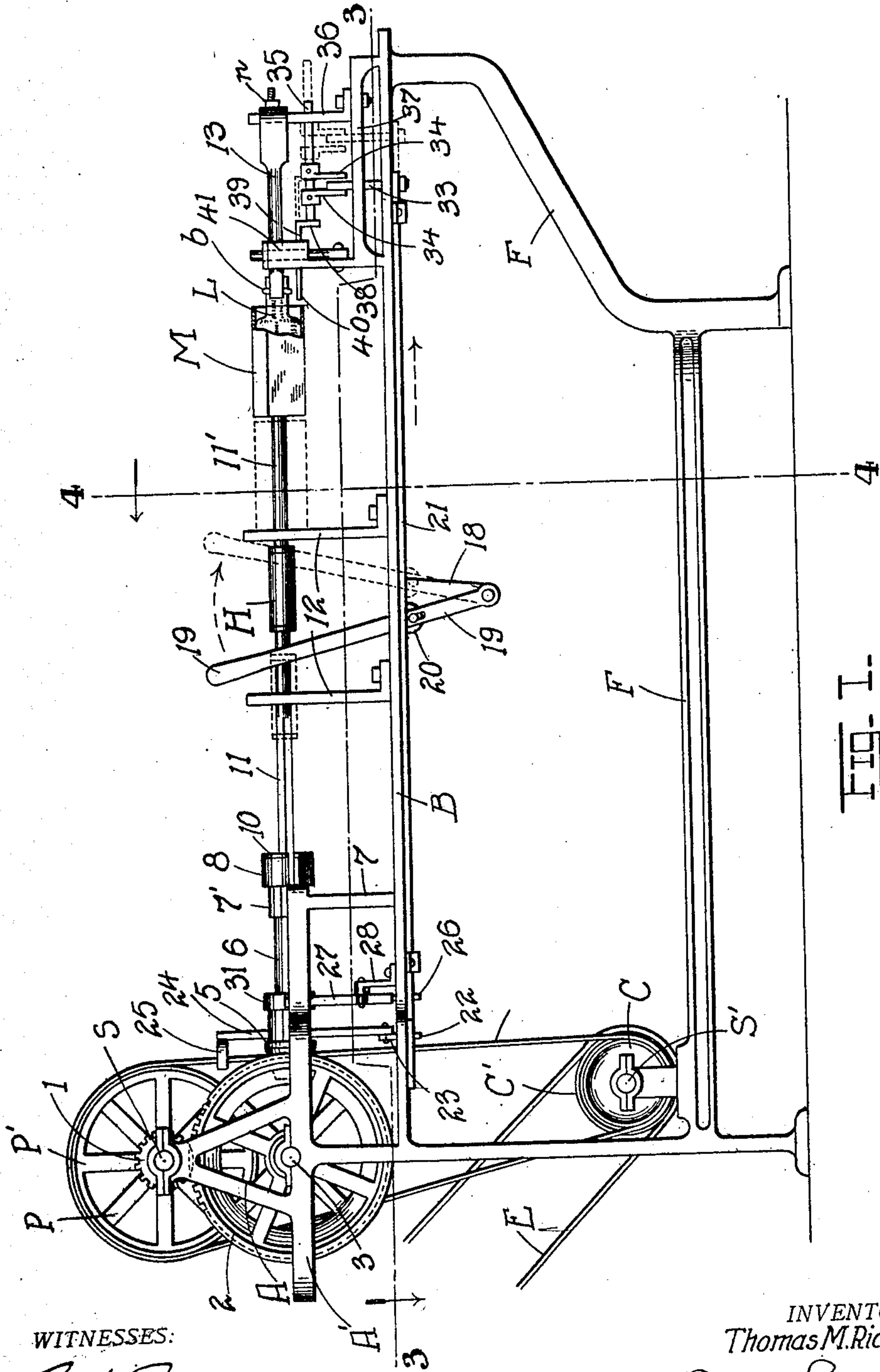


FIG. 1.

WITNESSES:

Wm. J. Navy
H. O. Kiehn

INVENTOR.
Thomas M. Richards

BY

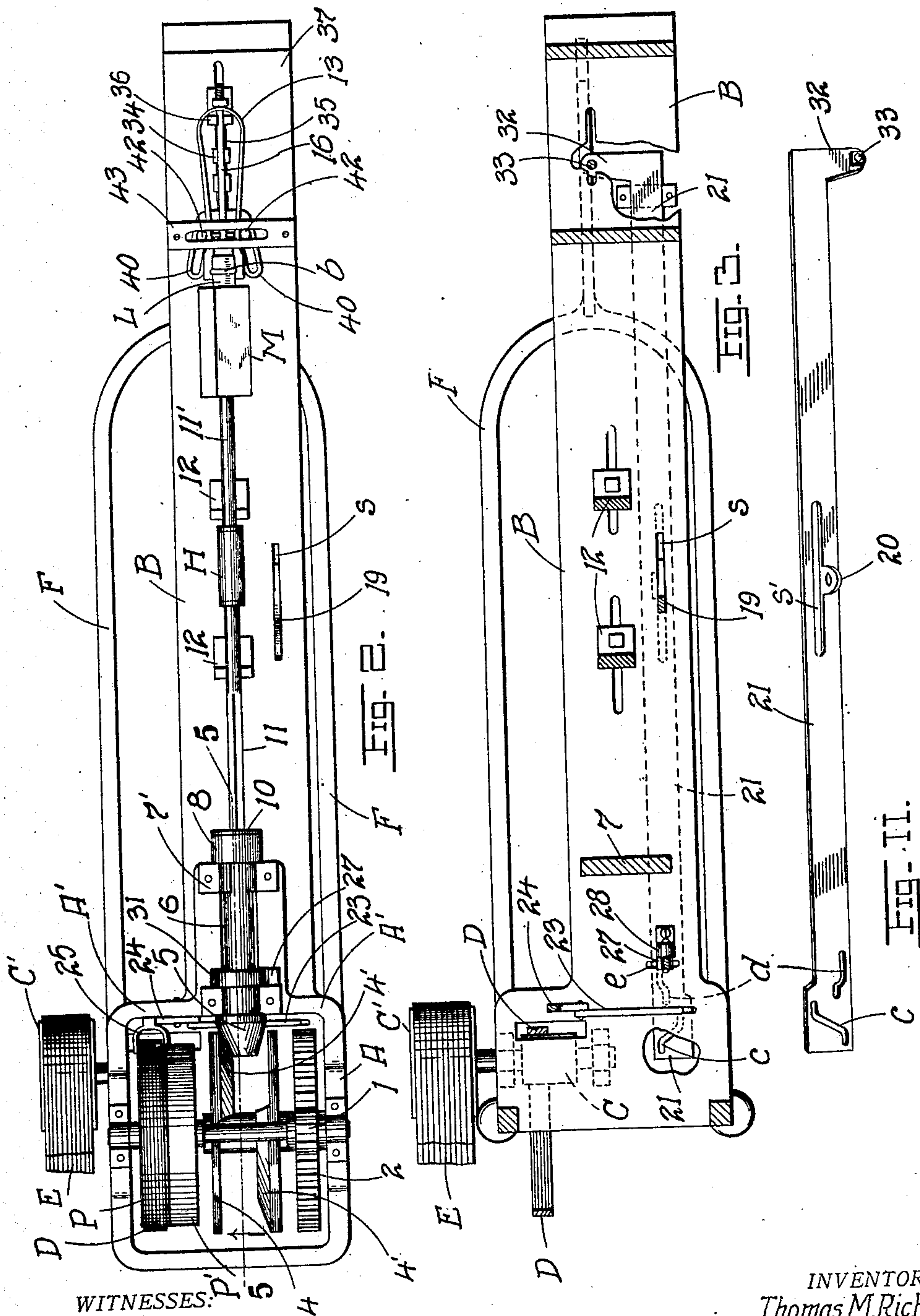
Wm. J. Navy
ATTORNEY.

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WITNESSES:

W. J. Navy
W. C. Kellum

INVENTOR.
Thomas M. Richards

BY

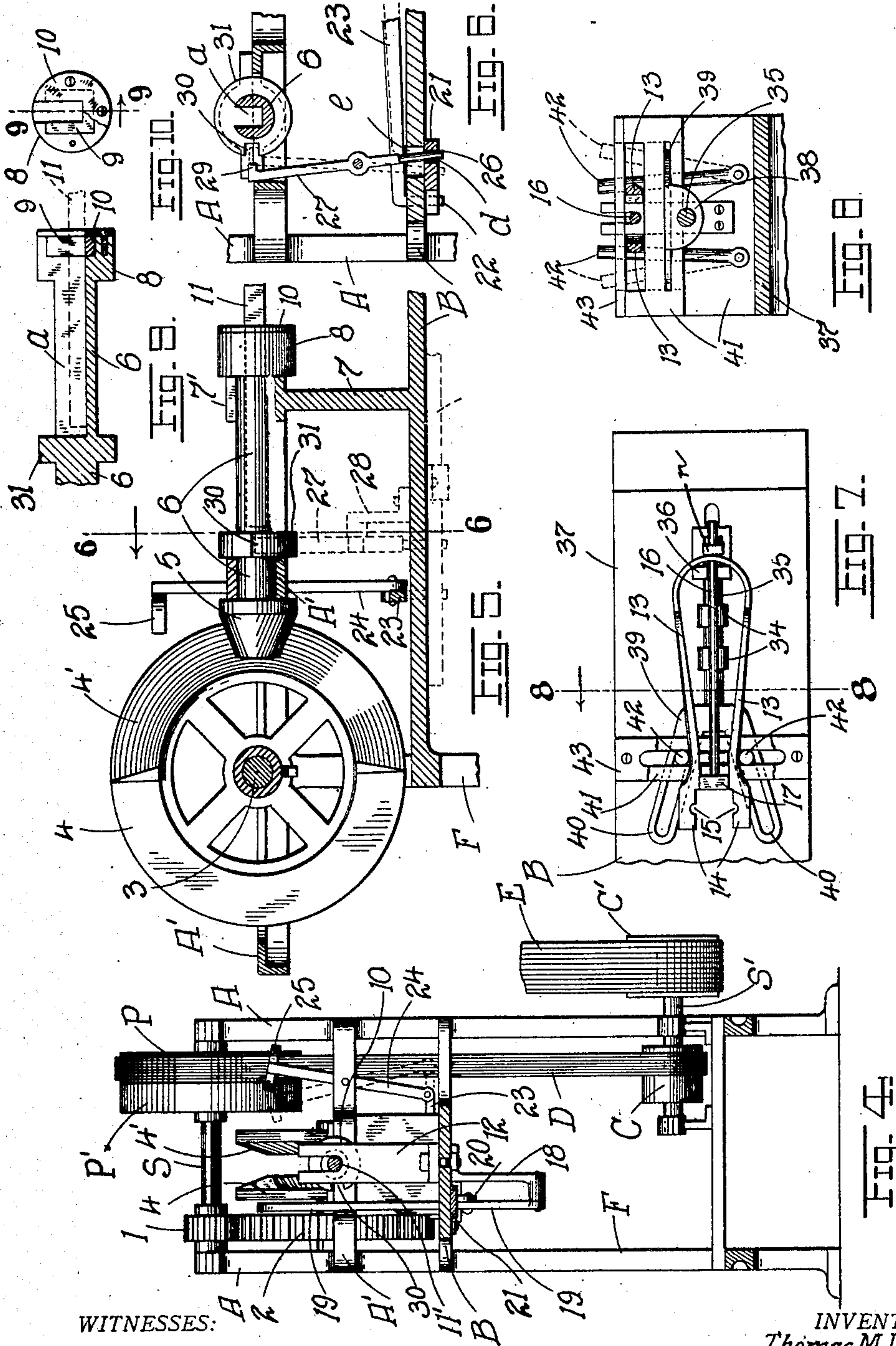
Robert L. Storer
ATTORNEY.

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3 SHEETS—SHEET 3.



WITNESSES:

J. J. Rawny
W. P. Kieck

INVENTOR.
Thomas M. Richards

BY

Ernest L. Storer
ATTORNEY.

UNITED STATES PATENT OFFICE.

THOMAS M. RICHARDS, OF ALTON, ILLINOIS.

BOTTLE-FINISHING MACHINE.

No. 916,598.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, THOMAS M. RICHARDS, citizen of the United States, residing at Alton, in the county of Madison and State of Illinois, have invented certain new and useful Improvements in Bottle-Finishing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in bottle-finishing machines; and it consists in the novel construction and arrangement of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of the machine in operating position; Fig. 2 is a top plan thereof; Fig. 3 is a horizontal section on the line 3—3 of Fig. 1; Fig. 4 is a vertical transverse section on the line 4—4 of Fig. 1; Fig. 5 is a vertical section on the line 5—5 of Fig. 2; Fig. 6 is a transverse section on the line 6—6 of Fig. 5; Fig. 7 is an enlarged top plan of the finishing tool and mechanism for controlling the same; Fig. 8 is a vertical transverse section on the line 8—8 of Fig. 7; Fig. 9 is a vertical longitudinal section on the line 9—9 of Fig. 10 showing the socket for receiving the spindle of the bottle-supporting mold; Fig. 10 is an end view of Fig. 9, with wall partly broken; and Fig. 11 is a perspective of the shifting bar by which the operating parts are controlled.

The object of my invention is to construct a machine for finishing the necks of bottles, using the same tools as are now employed in finishing the bottles by hand. By operating the tools mechanically much time and labor is thereby saved, and the finished product is apt to be more uniform, thereby facilitating the filling and corking of the bottle by the machines intended for this purpose.

The advantages of the present invention will be better apparent from a detailed description thereof which is as follows:

Referring to the drawings, F represents a suitable frame having a bed-plate B over which the operating parts are mounted. Mounted at one end of the frame between standards A, is a shaft S, having tight and loose pulleys P, P' respectively from which leads a belt D to a pulley C carried on a main drive-shaft S' which is mounted in bearings at the base of the frame F. From a pulley C' at the outer end of the shaft S' leads a belt E to any suitable source of power (not

shown). Carried by the shaft S is a pinion 1 which meshes with a gear wheel 2 on a shaft 3 mounted in the oblong base A' of the standards A, the intermediate portion of the shaft 3 having mounted thereon the disks 4, 4', having each formed on its inner face a semi-circular bevel friction-gear section 4', which sections 4' are located relatively diametrically apart, so as to alternately engage a bevel friction-pinion 5 at the adjacent end of a shaft 6 having bearings respectively in the portion A' and in a bracket 7 projecting from the bed B. With any rotation imparted to the shaft S, it is apparent that a rotation of considerably lower velocity will be communicated to the shaft 3 through the gearing 1, 2, the friction-gear sections 4' on said shaft 3 in turn imparting a rotary reciprocating motion to the shaft 6, by virtue of the alternate engagement of said sections 4' with the shaft-pinion 5.

The shaft 6 is provided with a longitudinal socket a of polygonal or oblong cross-section, the mouth of the socket being located in the terminal head 8 of the shaft, the sides of the socket in said head being provided with a hardened steel block 9 retained in place by a plate 10 (Figs. 9, 10), the block being located at the mouth since it is at this point where the socket is most subjected to wear. The bearing 7' at the top of the bracket 7 is open or split (Fig. 2) so that access may be had into the socket (as presently to be seen) when the shaft has been turned to present the socket upwardly (Figs. 5, 6). This socket a temporarily receives the polygonal shank or end 11 of the cylindrical arbor or spindle 11' carrying the mold M into which the bottle L has been blown, the spindle 11' being temporarily supported in bearing brackets 12, 12, mounted adjustably along the bed B in any approved mechanical manner.

When the bottle is blown into the mold, the glass-blower breaks off the stem forming a continuation of the bottle-neck and of course the neck while still plastic must be properly finished. The finishing tool is shown to best advantage in Figs. 7 and 8 and is well known. It is composed of the spring-arms 13, whose free ends terminate in expanded portions 14 having inner shaping grooves 15, the base of the bend between the arms having projecting therefrom a central stem 16 which terminates in a finishing head 17 designed to enter the neck of the bottle,

the grooves forming a bead *b* (Fig. 1) on the neck when finished. The spindle 11' is provided with a cylindrical sleeve or handle H loosely encompassing the same, and in practice the spindle is moved up to the finishing tool by the hand of the operator. The limits of the longitudinal movement thus imparted to the spindle 11' are defined by the length of the socket *a*, and as long as any portion of the shank 11 remains in said socket, rotation will be imparted to the spindle with the rotation of the shaft 6.

Whenever rotation is imparted to the shaft 6 by the shifting of the belt D onto the fast pulley P, then, not only is the necessary rotation imparted to the spindle 11' and its mold M and bottle L, but at the same time the necessary mechanism is brought into play by which the arms 13 are snugly closed over the neck of the bottle. The manner of shifting the belt and the manner of control of said devices is as follows: Pivoted to a depending bracket 18 is an operating lever 19 passing upward through a longitudinal slot *s* of the bed plate B, the lever being loosely coupled at a point above its fulcrum to a lug 20 formed adjacent to a slot *s'* of a reciprocating shifter bar 21 (Figs. 3, 11) located beneath the bed B. One end of this bar is provided with slots *c*, *d*, of compound curvature as shown. The slot *c* is engaged by a pin 22 depending from the adjacent end of a link 23 whose opposite end is pivotally coupled to the end of the lower arm of a belt shifting lever 24 pivoted to the frame A', the free end of the lever carrying a belt shifting fork 25 as usual. The slot *d* is engaged by a pin 26 (passing through a slot *e* of the bed-plate B, Fig. 6) at the end of one arm of a brake-lever 27 pivoted to a bracket 28, the end of the upper arm of the lever being provided with a finger 29 adapted to engage a peripheral notch 30 in a collar 31 formed on the shaft 6 at the inner end of the socket *a*. It will be seen that as the lever 19 is swung to the full position shown in Fig. 1, the bar 21 will be forced with it in the same direction, causing the pins 22, and 26 to traverse their respective slots *c*, *d* in such a manner that the pin 22 will draw on the link 23 and oscillate the belt-shifter in proper direction to throw the belt D onto the fast pulley P, and the pin 26 will oscillate the lever 27 to disengage the finger or pawl 29 from the notch 30 (Fig. 6) thus allowing the shaft 6 to rock back and forth with the oscillatory rotations imparted to the shaft by the gears 4' 4'. These oscillations are in turn communicated to the shank 11, its spindle 11', and the bottle L, so that the finishing is accomplished by the same character of movement as is imparted to the spindle 11' by hand when hand finishing is resorted to.

The opposite end of the bar 21 is provided with an arm 32 from which projects up-

wardly through the bed-plate B, a pin 33, said pin operating between two lugs or arms 34, 34, depending from a rod 35 whose one end loosely passes through a bracket-bearing 36 secured to the platform 37 at the adjacent end of the machine, the inner end of the rod 35 being coupled to a lug 38 formed at the adjacent end of a plate 39 provided with diverging longitudinally slotted legs or arms 40, 40, said plate being movably mounted in the standard 41 of the platform 37. The slots of the legs 40, 40 loosely receive the pins 42 which are pivotally secured at their lower ends to the standard 41, the free ends of the pins operating in the slot of a cap-plate 43 and engaging the arms 13 of the finishing tool from the outside. With a movement of the controlling or operating lever 19 to the full position shown in the drawings, (as already referred to) the bar 21 will cause the pin 33 to bear against the left lug 34 (Fig. 1) thus shoving the sliding rod 35 in the same direction, and this in turn will force the plate 39 carrying the slotted arms 40 in proper direction to cause the pins 42 to pass toward the converging ends of the slots of said arms, this convergence closing the pins or oscillating them from opposite directions against the resilient arms 13, 13 of the finishing tool, whereupon the neck of the bottle is snugly embraced by said arms, and the head 17 is made to bear against the rough edge of the neck. The bottle being rotated back and forth, it follows that the finishing of the neck is quickly accomplished, the head 17 smoothing the edge of the neck, and the grooves 15 forming the bead *b* as already specified. The finishing tool is secured at the proper elevation to the bracket 36, by a nut *n* (Figs. 1, 7). So that it follows that with a swing of the lever 19 in one direction, the belt is shifted to the fast pulley P, the brake-lever 27 is disengaged from the collar 31, and the finishing tool closes over the neck of the bottle which is moved to the tool by the hand of the operator seizing the handle H. With a swing of the lever to the dotted position (Fig. 1) a reverse of the several operations takes place, the belt being shifted to the loose pulley P', the brake lever engaging the notch 30 of the collar 31 and arresting the motion of the shaft 6, and the plate 39 is shoved rearwardly to open up the pins 41 which at once release the resilient arms 13, 13, permitting the shank 11 to be removed from the socket, and the entire spindle 11' and its mold removed from the machine and a fresh one inserted as occasion demands.

Having described my invention, what I claim is:

1. In a bottle-finishing machine, a shaft having a longitudinal open socket formed therein, means for imparting rotary reciprocation to said shaft, a spindle having a shank adapted to be received by the socket, a mold

at one end of the spindle, a finishing tool comprising a series of resilient arms and a central head respectively engaging the outer and inner surfaces of the neck of the bottle carried by the mold, a controlling lever, a drive shaft having fast and loose pulleys, a belt, a belt-shifter, a brake-lever coöperating with the socket-shaft, intermediate gearing between the drive-shaft and socket shaft for imparting rotary reciprocation to the latter with the rotation of the drive-shaft, a longitudinally reciprocating bar coupled to the controlling lever, and intermediate connections between the bar and the belt-shifter and brake-lever and finishing tool for respectively shifting the belt from the loose to the fast pulley, disengaging the brake-lever, and forcing the arms of the finishing tool and the head thereof into engagement with the neck of the bottle, upon an oscillation of the controlling lever in one direction, substantially as set forth.

2. In a bottle-finishing machine, a finishing tool comprising a series of resilient arms and a central head for respectively engaging the outer surface and end of the neck of the bottle, a reciprocating plate or member having diverging slotted arms, pins hinged at their ends and passing through the slotted arms and bearing against the outside of the resilient arms of the finishing tool, and means for shifting the plate in proper direction to cause the pins to pass toward the converging ends of the slotted arms thereof and close over the resilient arms and force the same into engaging contact with the neck of the bottle inserted between them, substantially as set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

THOMAS M. RICHARDS.

Witnesses:

W. C. KILLEEN,
J. M. BATES.