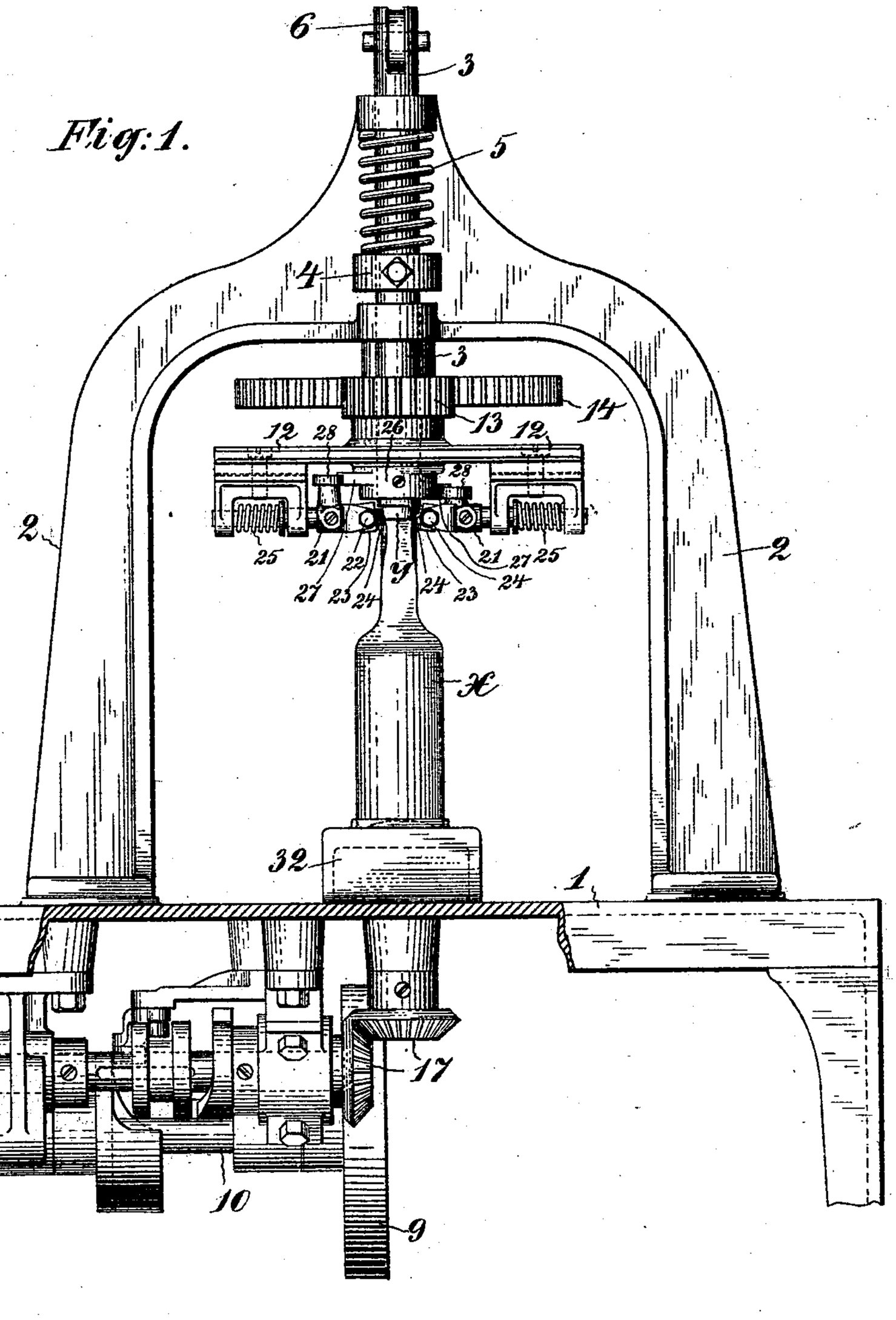
(No Model.) 3 Sheets—Sheet 1.

# N. B. ABBOTT & H. RAU.

## APPARATUS FOR CAPPING BOTTLES.

No. 521,751. Patented June 19, 1894.

*Fig: 1.*

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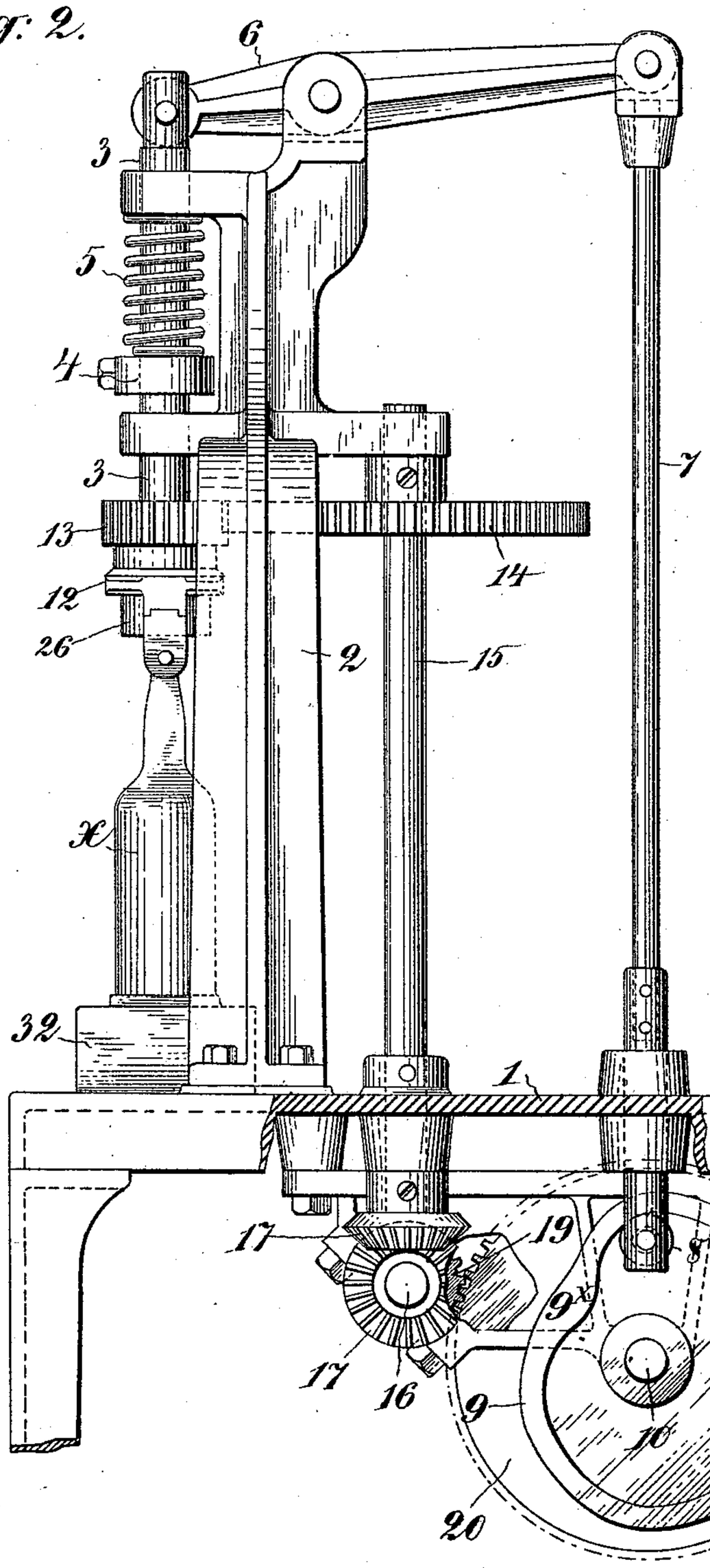
## APPARATUS FOR CAPPING BOTTLES.

No. 521,751. Patented June 19, 1894.

*Fig. 2.*

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(No Model.) 3 Sheets—Sheet 3.

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## APPARATUS FOR CAPPING BOTTLES.

No. 521,751. Patented June 19, 1894.

Fig: 3.

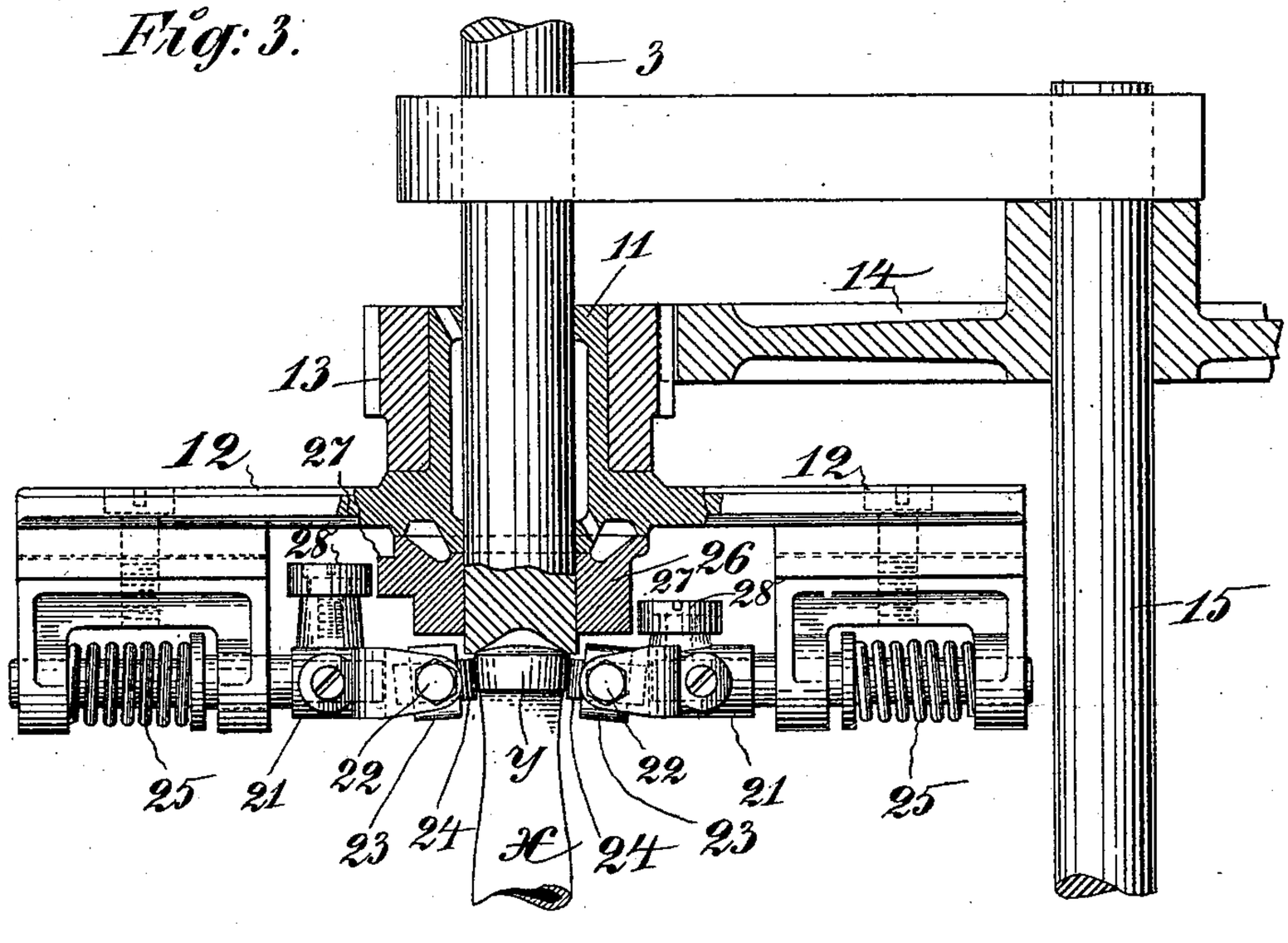



Fig: 4.

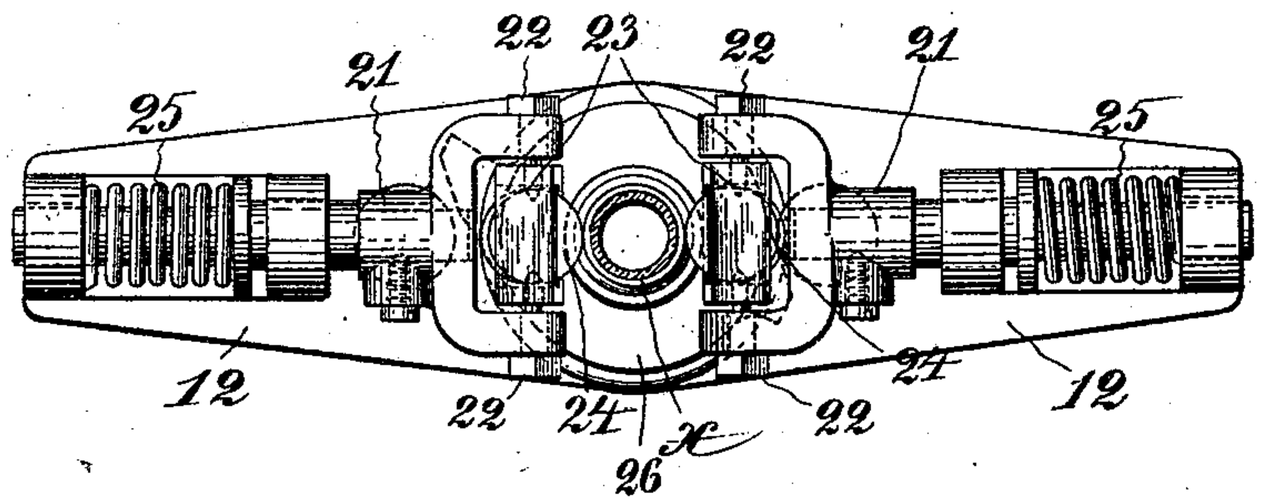
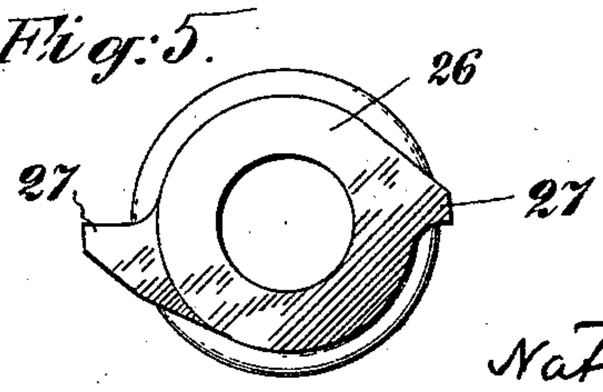



Fig: 5.

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# UNITED STATES PATENT OFFICE.

NATHANIEL B. ABBOTT AND HENRY RAU, OF BROOKLYN, NEW YORK; SAID RAU ASSIGNOR TO SAID ABBOTT; SAID ABBOTT ASSIGNOR OF ONE-HALF TO WILLIAM D. ELGER, OF SAME PLACE.

## APPARATUS FOR CAPPING BOTTLES.

SPECIFICATION forming part of Letters Patent No. 521,751, dated June 19, 1894.

Application filed February 20, 1894. Serial No. 500,845. (No model.)

*To all whom it may concern:*

Be it known that we, NATHANIEL B. ABBOTT and HENRY RAU, both citizens of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Apparatus for Sealing and Capping Bottles, of which the following is a specification.

Our invention relates to the application of a sealing cap to a bottle and particularly to those sealing caps which are designed to resist internal pressure, as distinguished from capsules of thin, soft material designed mainly for ornament. And the object of the invention is to provide a simple and effective machine or apparatus for holding down the cap on the bottle and simultaneously rolling down the flange upon the neck of the bottle. It is quite a simple matter to apply a thin, soft metal capsule, but when a retaining cap of refractory material is to be dealt with a special machine is required.

In carrying out the invention, a bottle which is flared toward its mouth is employed so that the cap may embrace tightly the smaller part of the neck below the mouth; the cap is made from thin sheet metal of a kind which may be spun down close against the neck, said cap having a pendent flange to embrace the neck of the bottle. This cap contains in its crown a disk or piece of cork, or other similar sealing material, to close the bottle mouth, and the metal cap serves as a retainer for this cork. After the cap is placed on the bottle, the pendent flange thereof is rolled or pressed down upon the neck smoothly, whereby it embraces a smaller part of the neck than that adjacent to the bottle-mouth, so that the cap cannot be removed except by applying considerable force. The apparatus employed for effecting this object comprises, essentially, means for pressing and holding the cap down firmly on the bottle and a rubber or rubbers which revolve about the bottle-neck and press down the flange of the cap upon the neck, pressure being applied to the rubbers as they revolve. Preferably we employ two oppositely arranged rolling rubbers, and preferably, also, means for spreading these rubbers apart so as to admit of placing the capped bottle under the follower which holds the cap down in place.

The accompanying drawings illustrate an embodiment of an apparatus or machine for applying the sealing caps to bottles, containing our invention.

Figure 1 is a front view of the apparatus with the bed partly broken away; and Fig. 2 is a side elevation. Fig. 3 is an enlarged detail view of the device for spinning the flange of the cap down upon the bottle-neck; and Fig. 4 is an under side view of the same. Fig. 5 is a detail view of a cam.

We will describe the construction shown in the drawings.

1 represents a bed or table, which may be provided with legs if desired. On this bed the bottle, *x*, rests. Mounted to slide in a frame, 2, on the bed is a plunger, 3, having some longitudinal play in its bearings. This plunger has on it a collar, 4, between which and the upper bearing of the plunger, is arranged a strong spring, 5, which tends to force the plunger down. The plunger is splined in its bearings so that it may not rotate, or is otherwise stopped against rotation, and at its upper end it is coupled to the shorter arm of a lifting lever, 6, fulcrumed on the frame 2. The longer arm of the lever 6, is coupled to a rod, 7, which extends down through the bed 1, and carries at its lower end a stud-roller, 8, which engages the flange on a cam, 9, fixed on a counter-shaft, 10. When the cam 9, is rotated, at one point $9^{\times}$ it acts on the stud-roller 8, to draw down the rod 7, and raise the plunger 3, compressing the spring 5. Rotatively mounted on the plunger is a carrier, which consists of a boss, 11, with two arms, 12. On the boss is secured a pinion, 13, whereby the carrier is rotated through the medium of a spur wheel, 14, on an upright shaft, 15. This shaft is driven from the main shaft, 16, through the medium of miter gears, 17. The main shaft has on it a pulley, 18, to receive a driving belt, and it drives the counter-shaft 10, through the medium of a pinion, 19, on the former gearing with a spur wheel, 20, on the

latter. On each of the arms 12 (which are oppositely arranged) is mounted in suitable bearings, a fork, 21, in which is mounted on pivots, 22 (see Fig. 4), a gimbal ring or frame, 23, in which is rotatively mounted a rolling rubber, 24, which in this instance is a roller of hard material mounted with its axis at right-angles to the pivots of the gimbal ring, 23. The rolling rubbers are pressed up forcibly toward the axis of rotation of the carrier by strong springs, 25. Fixed on the plunger 3, below the boss 11, of the carrier, is a collar 26, on which are two oppositely arranged cams, 27, set in different planes, and on the forks 21, respectively, are mounted rollers, 28, in the planes of the respective cams.

So far as the mechanism has been described, the operation is as follows: At starting, the parts being at rest, the plunger 3, is held upraised by the cam 9, and the rubbers 24, drawn back and held away by the cams 27. A cap, *y*, is placed on the bottle *x*, and the latter set on the bed 1, under the plunger 3. The machine is set in motion and the first movement of the cam 9, releases the plunger 3, and allows the spring 5, to drive it forcibly down upon the cap. Preferably the plunger is made concave at its lower end so that its margin rests on the margin of the cap. As soon as the plunger has settled the cap down firmly on the bottle the carrier begins to rotate, and this causes the rollers 28, to pass off the cams 27, thus permitting the springs 25, to force the rubbers 24, into contact with the pendent flange of the cap *y*, and force said flange up to the bottle-neck. As the rubbers revolve about the bottle-neck they roll or spin the flange down smoothly thereon. The rubbers may be caused to make as many revolutions as desired, but as herein shown the cam 9, which raises the plunger 3, is geared to the carrier of the rubbers in such a manner that the rubbers will make three revolutions to each rotation (and operation) of said cam. At each revolution of the carrier the rubbers will be drawn back by the cams 27, and the object in placing these cams in different planes is to prevent both cams from acting to withdraw each rubber. At the termination of the third revolution, however, when the rotation of the carrier ceases, the two rubbers will be found, as at starting, drawn away from the bottle. As soon as the rotation of the carrier ceases, the cam 9, acts to raise the plunger 3, when the cam ceases to rotate and supports the plunger upraised.

We have shown a known device whereby the motion of the mechanism is arrested at the termination of the capping of each bottle, but as this mechanism is not specifically new with us and as it is not essential to the carrying out of our invention, it will only be necessary to say that by means of suitable intermediate mechanism between the main shaft 16, and counter-shaft 10, at the termination of the third revolution of the rubbers 24, they are withdrawn and cease to rotate, and when they have ceased to rotate the plunger 3, is raised, carrying with it the carrier and rubbers. At starting, the plunger first descends on the cap *y*, and then the rubbers begin to rotate. Of course these movements might be controlled by hand but we prefer to employ a known mechanism for effecting it automatically.

As clearly shown in Fig. 3, the face of the roller 24 is made a little wider than the flange on the cap, so that there is no necessity for any endwise movement of the bottle or rollers with respect to each other; the bottle is held immovable while the flange is being rolled and the rollers merely revolve and rotate about it, always in the same plane.

The machine may be provided with a support, 32, for the bottle to rest on while being capped, and such supports, of different heights, may be employed for bottles of different sizes.

That the rubber 24 may apply itself to the surface of the bottle-neck properly, it is mounted pivotally in the carrier as shown. The function of the rubber is, as stated, to spin down the metal of the cap *y*, and we do not limit ourselves to the use of a roller or rollers for the purpose. One or more of these rubbers may be employed, but it is preferable to employ two, three or four. A sheet metal sealing cap containing a disk of cork and secured by crimping it in under an annular flange or bead on the bottle, has been before employed, but we do not employ that particular kind of cap nor secure it in that way. Our cap is spun down smooth so as to present no points or projecting parts.

Having thus described our invention, we claim—

1. An apparatus or machine for applying a sheet metal sealing cap upon a bottle, comprising a base to support the bottle, means for holding the bottle stationary and the cap pressed down thereon, a rotating carrier adapted to move concentrically about the axis of the bottle, rollers mounted in said carrier and adapted to bear on the flange of the cap as they revolve, springs which keep said rollers pressed upon the flange on the cap, and stationary cams which serve to press the rollers outwardly, radially, at each rotation of the carrier, substantially as set forth.

2. An apparatus or machine for applying a sheet metal sealing cap upon a bottle, comprising a base to support the bottle, a plunger 3, arranged to press upon the cap and hold it down on the bottle, the spring 5, on the plunger, the rotating carrier provided with rollers for rolling down the flange of the cap, the springs behind the rollers, the cams 27, a lever 7, for raising the plunger 3, the cam and its rod for operating said lever, and gearing intermediate said cam and the rotating carrier, whereby the withdrawal of the plunger is automatically effected when the rollers are withdrawn and the bottle thus released, substantially as set forth.

3. The combination with the frame, the plunger 3, mounted in the frame, mechanism for imparting a reciprocating movement to said plunger at regular intervals, the rotating carrier mounted in the frame concentrically with said plunger, gearing connecting the carrier-rotating and plunger-operating mechanism, the rollers 24, mounted in sliding forks in the carrier, the said forks, the roller-springs 25, the cams 27, arranged in different planes, and the rollers 28, on the said forks and adapted to bear and roll on the respective cams 27 as the carrier rotates, substantially as set forth.

4. In an apparatus for applying a sealing cap on a bottle, the combination with means for holding the cap down firmly in place on the bottle, of a rotating carrier, a fork 21, mounted in said carrier, a rolling rubber 24, carried by said fork, and a spring 25, which keeps the rubber pressed up toward the bottle-neck, said rubber being mounted on rocking bearings so that it will adapt itself to the surface of the bottle-neck, as set forth.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

NATHANIEL B. ABBOTT.
HENRY RAU.

Witnesses:
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FLORENCE COOK.