

(No Model.)

2 Sheets—Sheet 1.

H. RAU.
APPARATUS FOR CAPPING BOTTLES.

No. 560,930.

Patented May 26, 1896.

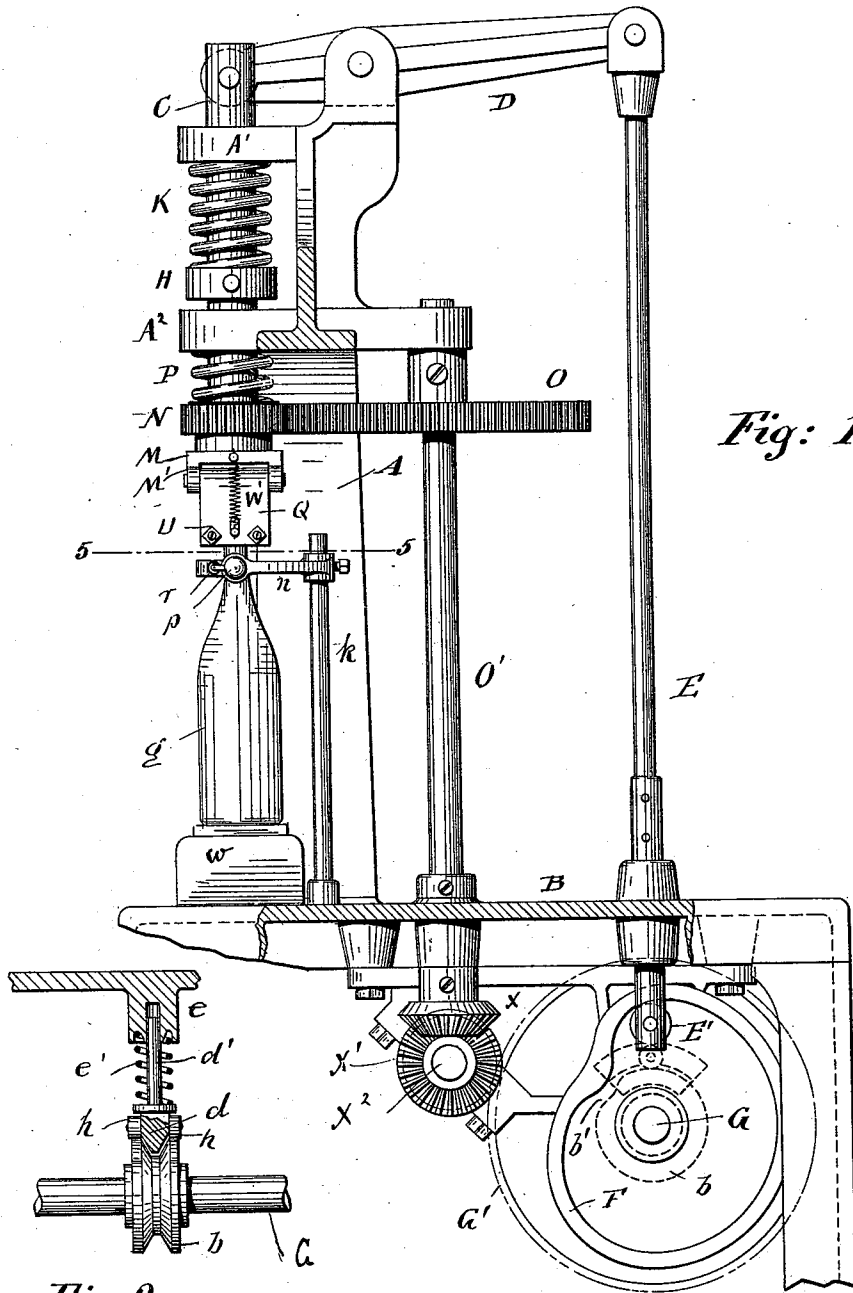


Fig. 1.

Fig. 2.

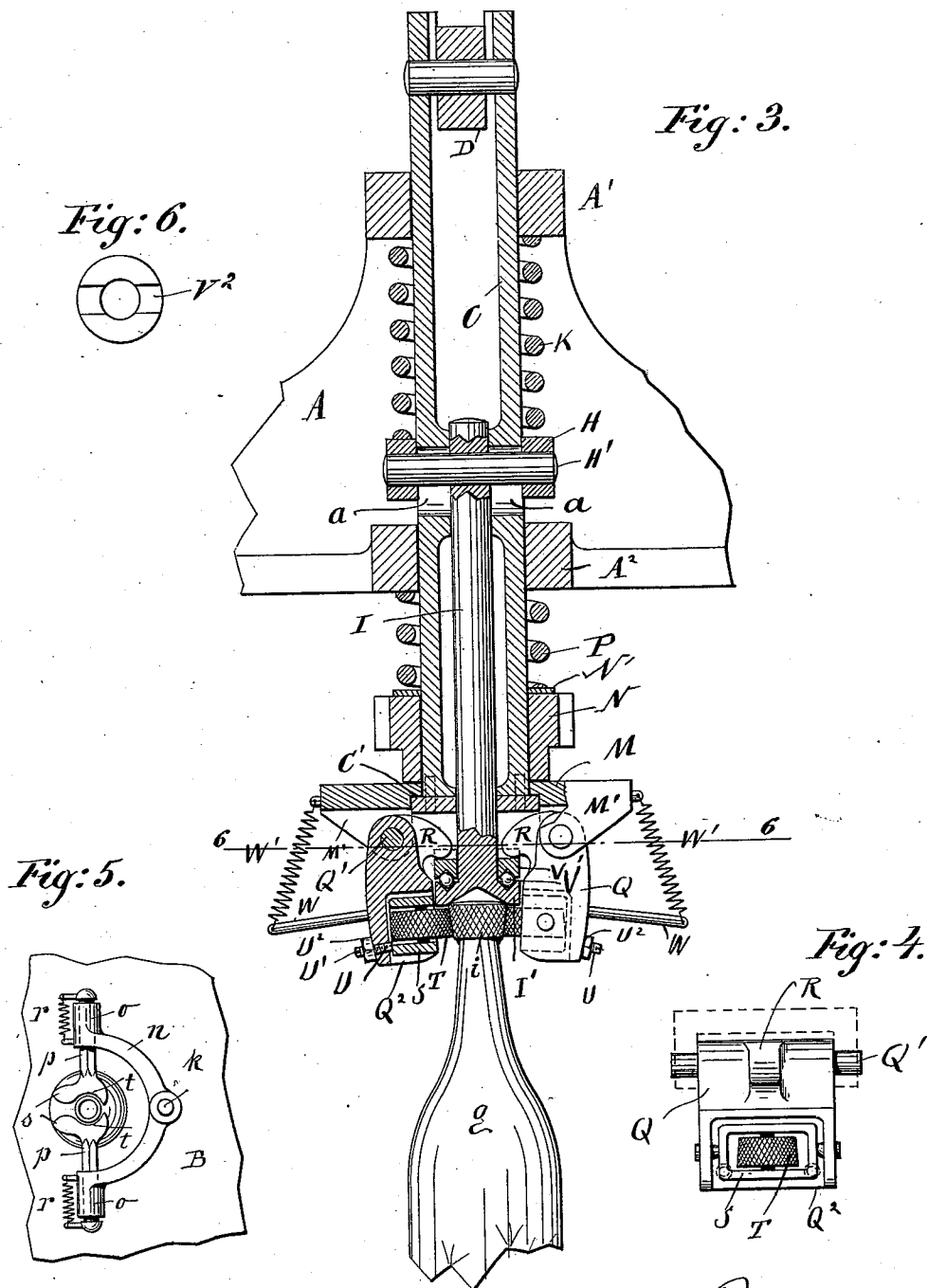
Witnesses
D. P. Palm
Emil Mueller

H. Rau Inventor
By his Attorney *Chas. F. Tamm*

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Witnesses
S. Petri-Palmedy
Emil Mueller.

H. Rau. Inventor
By his Attorney *Osborn & Tunn.*

UNITED STATES PATENT OFFICE.

HENRY RAU, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE NEW YORK BOTTLE CAP AND MACHINE COMPANY, OF NEW YORK, N. Y.

APPARATUS FOR CAPPING BOTTLES.

SPECIFICATION forming part of Letters Patent No. 560,930, dated May 26, 1896.

Application filed October 25, 1894. Renewed April 21, 1896. Serial No. 588,524. (No model.)

To all whom it may concern:

Be it known that I, HENRY RAU, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Apparatus for Capping Bottles, of which the following is a specification.

This invention relates to improvements in the apparatus for capping bottles, for which Letters Patent No. 521,751 were issued to Nathaniel B. Abbott and myself on the 19th day of June, 1894.

The object of my invention is to simplify and improve the construction of the apparatus, to reduce the cost of the same, to make the same more effective, and cause the same to run noiselessly.

The invention consists in an apparatus provided with a presser for pressing the cap on the bottle-head, a spring acting on said presser, a rotating head carrying rollers for spinning the flanges of the cap on the side of the bottle-head, a separate spring acting on said spinning devices, and means for automatically pressing the spinning devices against the flanges of the bottle-head when the head is lowered under the action of the spring.

The invention also consists in the construction and combination of parts and details, as will be fully described and set forth hereinafter, and finally pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side view of my improved apparatus for capping bottles, parts being broken out and others shown in section. Fig. 2 is a detail sectional view of the brake device on the cam-shaft. Fig. 3 is an enlarged vertical transverse sectional view through the plunger and the cap pressing and holding rod in the same and the swinging jaws, &c., pivoted to the plunger-head. Fig. 4 is a detail face view of one of the swinging jaws, the pivot-box in the same, and the roller in the box. Fig. 5 is a detail horizontal sectional view on the line 5 5 of Fig. 1, showing the device for centering the bottle. Fig. 6 is a detail horizontal section on the line 6 6 of Fig. 3, the jaws being omitted.

Like letters of reference indicate like parts in all the figures.

The upright frame or standard A is formed or secured to the base-plate B, and said standard is provided at its front and upper part with two brackets A' and A², in which the tubular plunger C is mounted to slide vertically, the upper end of the plunger being pivoted to one end of a lifting-lever D, pivoted in the top of the standard and having its opposite end pivotally connected with the upper end of a rod E, having its lower end guided to move vertically in the base-plate, said rod carrying an antifriction-roller E' at its side below the base-plate, on which roller E' the cam F acts that is secured on the cam-shaft G.

A collar H surrounds the plunger C loosely above the bracket A², and through the same a pin H' passes transversely, which also passes through longitudinal slots *a* in the plunger and through the upper end of a pressing-rod I, mounted and guided to move longitudinally in the tubular plunger and projecting from the lower end of the same. A powerful helical spring K surrounds the plunger between the bracket A' and the said collar H, the lower end of the spring bearing on the collar and the upper end against the under side of the bracket A'.

A head M is mounted loosely on the lower part of the plunger C and rests loosely upon the annular bottom of plate C' of the plunger, so as to adapt said head to turn freely on the plunger. A pinion N, connected with the head M, is also mounted loosely on the plunger and is engaged by cog-wheel O, fixed on the upper end of a vertical shaft O', passing through the base-plate and driven in a manner that will be set forth hereinafter.

A powerful helical spring P surrounds the plunger C between the bracket A² and the top of the pinion N, the upper end of said spring bearing against the under side of the bracket A² and the lower end bearing on a washer N', resting on the top of the pinion N.

The head M is provided at each end with a pair of downwardly-projecting lugs M', and between each pair of lugs a jaw Q is pivoted by the pivot-pins Q', passing through said lugs and the upper parts of the jaws, so as to adapt said jaws to swing toward and from each

other. Each jaw Q is provided at its top and inner side with a projecting cam-nose R, which is shaped and rounded as shown. In its lower part each jaw Q is provided in its inner side with a recess Q², open at the bottom and extending almost the entire length of the jaw, and in each recess Q² a box S is pivoted at its ends between the ends of the recess Q², so as to adapt said box to rock on its longitudinal central axis.

In the center of each box S a roller T is pivoted to turn on a vertical axis, said roller being made slightly tapering to conform to the exterior shape of the bottle-head, and said roller projects some distance from the box S, as shown. The rim of the roller T is preferably milled or corrugated so as to act as a knurl.

For the purpose of adjusting the box S in the jaw Q in such a manner that the roller T impinges just as much as is necessary and no more on the cap on the bottle-head two adjusting or setting screws U are screwed through the outer side of each jaw Q in such a manner that their inner ends bear against the outer sides of the boxes S at the bottoms thereof. The screws U are each provided at the outer end with a slit U' for receiving a screw-driver or analogous implement, and on each screw U a locking-nut U² is screwed, which rests against the jaw Q. By means of said screws the lower parts of the boxes S can be swung toward each other, more or less, as may be required, to properly set the rollers T.

The rod I is provided at its lower end with an exterior annular flange I', the top of which is grooved annularly to form a bearing for balls V', on which a ring or rotating head V rests loosely, and which is also grooved on its under side and is provided on its top with two diametrically opposite notches V² for receiving cam-noses R on the jaws Q. A rod or arm W projects from the outer side of each jaw Q and is connected by a helical spring W' with the end of the head M. The vertical shaft O' is driven by means of the bevel-gears X and X' from the main power-shaft X², and the cam-shaft G is driven by means of the cog-wheel G' from the power-shaft X². A brake-wheel b, provided with an annular V-shaped groove in its rim and a cam-recess b' in the rim, is fixed on the cam-shaft G. A V-shaped brake-shoe d, fitting in the groove in the rim of the brake-wheel, is mounted above the same and is fixed on the lower end of a rod d', suitably guided in a socket on the under side of the base-plate and pressed downwardly by a helical spring e' surrounding it. The brake-shoe is provided on each side with a roller h, which rollers are pressed by the spring e' upon the rim of the brake-wheel b. A rod k projects upward from the base-plate, and on the same a U-shaped or semicircular piece n is mounted, vertically adjustable, and in each end of the same a guide o is formed. In each guide a slide p is mounted, the outer end of

each slide being connected with the outer end of a helical spring r, the opposite ends of which springs are fastened to the guides so that the springs press the slides p toward each other. The slides are each provided at the inner end with a curved arm s, having a recess t, so that when a bottle is placed upon the bottle-support w on the base B and its neck pressed in between the arms s said arms can give until the bottle-neck rests in the recessed parts of the arms, whereby the bottle is centered and held vertically below the pressing and holding rod I.

The operation is as follows: When the machine is at rest, the plunger C is held in the raised position by the action of the cam F on the roller E', and the springs K and P are compressed. The bottle is placed upon the bottle-support and its neck pressed in between the arms s of the slides p for centering it. When the machine is started, the cam F rotates and permits the plunger to be pressed downward by the springs P and K. Thereby the bottom of the holding-rod I is pressed upon the cap i previously placed upon the bottle and presses said cap firmly on the top of the bottle-head. When the holding-rod has been forced down as far as the bottle will permit, the plunger still descends under the action of the springs P, and the cam-noses R of the jaws Q strike against the top of the head or ring V and thereby the jaws are pressed toward and against the sides of the cap on the bottle-head. The head M is now rotated by means of the mechanism shown and the noses R drop into the notches V² of the ring V and said ring turns on the balls V' with the head M. As the spring P presses the rollers T forcibly against the sides or flanges of the cap i said flanges are spun closely against the sides of the bottle-head by said rollers as they rotate around the bottle-head. When the cam-shaft completes its rotation, the cam F again raises the plunger and rod I, the springs K and P are compressed, and the cam-noses R are lifted off the ring V and are thrown outward and from each other by the springs W'. A fresh bottle can now be placed upon the bottle-support w, and so on. When the cam-shaft G is at a standstill, the rollers h on the brake-shoe d rest in the recesses b' of the brake-wheel b and the brake-shoe is forced into the groove of the said brake-wheel. As soon as the cam-shaft begins to rotate the rollers h run up on the raised parts of the rim of the brake-wheel, and thereby the brake-shoe is lifted out of the groove of the brake-wheel and remains in this position until the cam-shaft G has about completed its rotation, when the rollers h again run into the recesses b' and the brake-shoe is lowered into the groove of the brake and binds in the same, thus preventing the machine from overrunning—that is, prevents the cam-shaft G from rotating after the cam F has brought the plunger in its highest position.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for capping bottles with sheet-metal caps, the combination with a presser-rod, for pressing the cap on the bottle-head and holding it there while being applied, of a spring exerting a downward pressure on said rod and on the cap below the rod, a cam for raising said presser-rod, against the pressure of said spring, a rotating head, a separate spring acting on said head to press the same downward, jaws pivoted to said head and rollers pivoted in said jaws and projecting from the same, substantially as herein shown and described.

2. In an apparatus for applying a sheet-metal cap on a bottle-head, the combination with a frame, of a tubular plunger, a rotating head on the lower end of the same, a spring acting on said plunger and pressing the same downward, means for raising the plunger at times, a spring-pressed presser-rod in said plunger a flange on the lower end of said presser-rod, a loose head on the said flange, rotating jaws pivoted to the head on the plunger, noses projecting from the jaws to bear on the head of the presser-rod and rollers mounted in said jaws substantially as herein shown and described.

3. In an apparatus for applying a sheet-metal cap on a bottle-head, the combination with the frame, of a plunger a rotating head on the lower end of the same, a spring acting on said head to press the same downward, jaws pivoted to said head, noses on said jaws, rollers mounted in said jaws, a presser-rod in the plunger a head on the lower end of the presser-rod and a separate spring acting on said presser-rod, both of said springs surrounding the plunger and a cam for raising the presser-rod at times, substantially as herein shown and described.

4. In an apparatus for applying a sheet-metal cap on a bottle-head, the combination with a frame of a tubular plunger, a presser-rod, in the same, a spring for pressing the presser-rod downward, a rotating head on the lower end of the plunger, jaws pivoted to the same, noses projecting from said jaws, rollers pivoted in said jaws, a flange on the lower end of the presser, balls on said flange, a ring

resting loosely on balls to rotate on the same and a spring acting on the plunger substantially as herein shown and described.

5. In an apparatus for applying a sheet-metal cap on a bottle-head, the combination with a frame, of a tubular plunger, a collar surrounding said plunger loosely, a spring exerting a downward pressure on said collar, a presser-rod in the plunger and connected with said collar, a head on the lower end of the presser-rod a loose rotating head on the lower end of the plunger a spring exerting a downward pressure on said plunger-head, jaws pivoted to said head, noses on said jaws, which noses can bear on the head of presser-rod and rollers pivoted in said jaws, substantially as herein shown and described.

6. In an apparatus for applying a sheet-metal cap on a bottle-head, the combination with a frame, of a plunger, in the same, a head on the plunger, a presser-rod in the plunger, a spring acting on the head on the plunger, a separate spring acting on the presser-rod, jaws pivoted to the said head, rollers in said jaws, noses on the jaws, a head on the lower end of the presser-rod on which head the noses can bear, rods projecting outward from the jaws and springs fastened to said rods and to the head substantially as herein shown and described.

7. In an apparatus for applying a sheet-metal cap on a bottle-head, the combination with a main frame of a presser for pressing the cap on the bottle-head, means for spinning the flanges of the cap on the sides of the bottle-head, a cam-shaft, a cam on the same for raising the presser-rod, a circumferentially-grooved brake-wheel on the cam-shaft and provided with a recess in its rim, a brake-shoe fitting in the groove of the brake-wheel, a spring for pressing said brake-shoe downward and rollers on said brake-shoe, running on the rim, of the brake-wheel substantially as herein shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 2d day of October, 1894.

HENRY RAU.

Witnesses:

OSCAR F. GUNZ,
D. PETRI-PALMEDO.