To all whom it may concern:

Be it known that I, GUSTAV STRANDT, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Bottle-Capping Machines, of which the following is a specification.

My invention relates to improvements in that class of bottle-capping machines for which Letters Patent No. 1,040,488 in the United States were issued to me October 8, 1913, and, like the capping machines, shown and described in said application, it includes a device for delivering the cap upon the resistance of a bottle in position to be capped. In other words, unless a bottle is in place to receive a cap, no cap will be discharged from the machine.

My present improvements pertain more especially, among other things, first, to the construction of the reciprocating slide by which a cap is conveyed from the cap receptacle to the place of discharge above the bottle to be capped; second, to the device for yieldingly resisting the upward movement of the plunger and plunger-enclosing sleeve as they are together raised preparatory to receiving a bottle; and third, to the pecu-

lar construction of the cap-supporting collar whereby it is adapted to support each cap successively in a true horizontal position above and parallel with the bottle-supporting seat; also to the device for delivering the cap slightly above the lower end of the bottle preparatory to being forced into such seat.

My device is further explained by reference to the accompanying drawings, in which:

Figure 1 is a plan view thereof.

Fig. 2 is a side view.

Fig. 3 is a front view.

Fig. 4 is a side view, part in vertical section.

Fig. 5 is a side view, part in section, of one of the spring-actuated stops, and

Fig. 6 is a transverse vertical section of one of the reciprocating slides and its supporting guide ways.

Like parts are identified by the same reference numerals throughout the several views.

1 represents a milk bottle of ordinary construction in position to be capped. The movable parts of the capper are supported from the shaft 7.

While my improvements are adapted to be used for capping either a single bottle or any desired number of bottles at a time, so the same is, for brevity of description, shown and described as adapted to cap two bottles at a time.

4, 4 represent the mouth pieces of the capper, which are adapted to inclose the upper ends of the bottle as the same are being capped. 5, 5 are chambers for the reception of the plungers 6, 6, 9, 9 are plunger-supporting shafts. 8 is a cross head. 12, 12 are receptacles for the reception of the caps 13. 14, 14 are platforms upon which the caps 13 are supported preparatory to being forced into the mouths of the bottles. 15, 15 are reciprocating slides by which the caps are successively brought into place above the bottles to be capped. 17, 17 are spiral springs through which a yielding movement is communicated from the cross head 8 to the actuating slides 15 through the collars 18, arms 19, pivotal bolts 20, links 21, pivotal bolts 22, arms 23 and 24, pivotal bolts 25, pins 26, links 28, and pivotal bolts 29.

The receptacles 12 are supported from the sides of the chambers 5 at a slight distance above the platforms 14, whereby a sufficient space is provided between the lower ends of the receptacles 12 and the platforms 14 for the movement of the reciprocating slides 15, by which the paper caps are moved from the receptacles 12 beneath the plungers 6 preparatory to being forced into the mouths of the bottles.

In operating the device the spiral springs 17 are compressed by the downward movement of the shaft 7 until the tension of such spring exceeds the resistance of the caps, when said caps will be forced by the tension of such spring into the mouth of the bottle. The paper caps are supported above the bottles on the downwardly converging annular flanges 27 within one of the annular grooves 27. Motion is communicated from the shaft 7 to the reciprocating slides 15 through the mechanism previously described, whereby said slides are forced back from the position shown in Fig. 2 to the outer ends of the platforms 14 preparatory to engaging the next succeeding cap above.

Thus it is obvious that by the downward
movement of the actuating means, a paper cap is forced into the mouth of the respective bottles while the cap operating slides are simultaneously thrown back preparatory to engaging the next succeeding cap, while by the upward movement of said vertically moving shaft, the cap actuating slides are thrown, by the action of said cooperating parts, in the opposite direction, whereby other caps are brought beneath the plungers preparatory to being forced into the mouths of the bottles by the next succeeding downward movement of said vertically moving shaft.

The annular grooves 27' are formed for the reception of the paper caps as they are successively brought into place, and the object of such grooves is to hold each cap in a true horizontal position, parallel with the mouth of the bottle, whereby all parts of the periphery of the caps are simultaneously brought into the seats of the bottles. The downwardly converging flange 27 is adapted to extend into the mouth of the bottle a slight distance as the mouth piece 4 engages the exterior surface of such bottle, whereby the liability of the caps being accidentally forced to one side of their seats in the neck of the bottle is avoided. It will be understood that the capper is adapted to be adjusted to bottles of two or more different heights, that, when capping bottles of the greatest height, it is adjusted as shown in Figs. 2 and 4, whereby the mouth piece 4, plunger 6 and other cooperating parts, which are suspended from the cross head 8, are supported from the upper notch 11', formed in the vertical shaft 7. When, however, shorter bottles are being capped, such parts are supported from the notches 12' and 13' of said shaft.

Preparatory to adjusting the cross head 8 higher or lower on said shaft 7, the set screws 6' are turned back out of impinging contact with the standards 8'. When this is done, the clamping bolt 14' is turned up slightly in its bearings, whereby the supporting plate 15' is free to be moved back out of the notch 11', when the cross head 8 and the parts suspended therefrom may be raised or lowered to conform to the height of the bottles which are being capped, when the plate 15' is moved back into engagement with one of said notches. When the parts have been thus adjusted, the plate 15' is secured in place by turning down the clamping screw 14' in its bearings. The plate 15' is provided with an elongated slot 16' for the reception of the guide screw 18', which elongated slot 16' permits of the required adjustment of said supporting plate 15'. When the cross head 8 has been thus adjusted to conform to the height of the bottles which are being capped, the set screws 6' are again turned forward in their bearings until their inner ends are brought into impinging contact with said vertical posts 8'.

As the apparatus is being moved upwardly by the upward movement of the vertical shaft 7, the shoulders 31, formed in the exterior wall of the channel 5, are brought into contact with the yielding stops 32, and said stops serve to gradually arrest the upward movement of such parts. The stops 32 are supported from the yoke 9 through the horizontal plates 33, which plates are rigidly connected with said yoke in any convenient manner. The stops 32 are connected with said plates 33 through the vertical sleeves 34 and the spiral springs 35. The springs 35 are interposed between the upper ends of said stops and the upper ends of said sleeves, whereby the jar or shock, which would otherwise occur when the moving parts of said apparatus are brought to the limit of their upward movement, is resisted by the yielding movement of said spiral springs.

The stops 32 are retained in place beneath said spiral springs by the central vertical members 36, which members 36 extend through apertures 36', provided therefor, in the top of the sleeves 34, and are provided with nuts 37, by which they are secured in place in a said sleeve. Thus it is obvious that, as the capper moves upwardly, the shoulders 31 will be brought into contact with the lower ends of said yielding stops 32, whereby the spiral springs 35 are slightly compressed, when, with the downward movement of the capper, said stops 32 are thrown down, by the recoil of said springs until the nuts 37 are again brought into contact with the top of said sleeves.

By the device shown in my said prior patent, the arms 24 were connected with the reciprocating slides 15 by simply inserting the lower ends of said arms 24 through apertures provided therefor in the respective sides of said slides 15, while, by my improved form, the member 40 serves as a rigid support for the pivotal bolts 26' through which said slides are connected with the lower ends of the arms 24, as previously described. Said reciprocating slides 15 are rigidly connected with the reciprocating member 40 by a plurality of bolts or rivets 41. The member 40 serves to reinforce and stiffen the reciprocating slides, while it also partially surrounds and engages the vertical sides and a portion of the bottom of its supporting platforms 14, as shown in Fig. 6, whereby it becomes impossible for the slides 15 to move vertically from or laterally upon its supporting platform.

The cap receptacles 12 are each provided with vertical slots 12' for the reception of the handles 13' of the weights 14', while
said slots 12 also enable the operator to see the paper caps and to ascertain when the supply has been exhausted. The object of the weights 14 is to hold the caps in place and force them down upon the supporting platforms as they are successively withdrawn from the receptacles by the reciprocating slides, while the handles 13 protrude through said slots in such a manner as to enable the user to readily grasp the same when desirous to remove the weights for the purpose of replenishing the receptacles with caps.

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

1. The combination with the actuating member of a bottle capper, of a cap retaining mouth piece provided with a plurality of annular grooves for the reception of the caps, said grooves being adapted to hold said caps in a proper position to enter the mouths of the bottles.

2. In a bottle capping machine of the described class, the combination of a vertical shaft, provided with a plurality of transverse notches for the reception of the end of a supporting plate, a cross head connected with said vertical shaft, a plate provided with an elongated slot slidably supported on said cross head, means for slidably securing said plate to said cross head, whereby the latter may be moved horizontally and caused to engage any one of the notches in said vertical shaft, all substantially as and for the purpose specified.

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

GUSTAV STRANDT.

Witnesses:

Jas. B. ERWIN,
C. L. ERWIN.