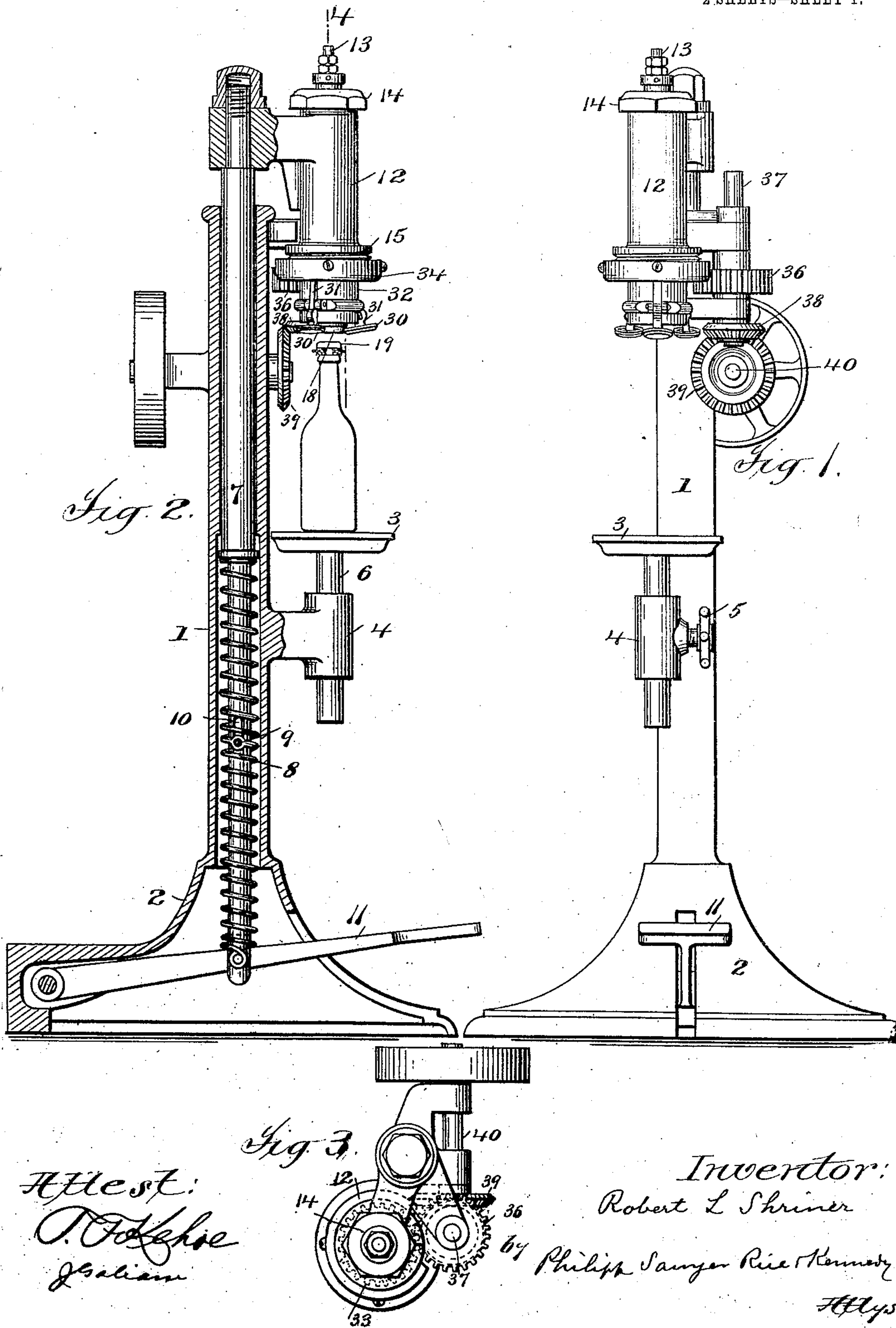


R. L. SHRINER.
BOTTLE CAPPING MACHINE.
APPLICATION FILED JUNE 5, 1902.

938,612.

Patented Nov. 2, 1909.

2 SHEETS—SHEET 1.



Attest:
T. F. Schae
Notary

Inventor:
Robert L. Shriner

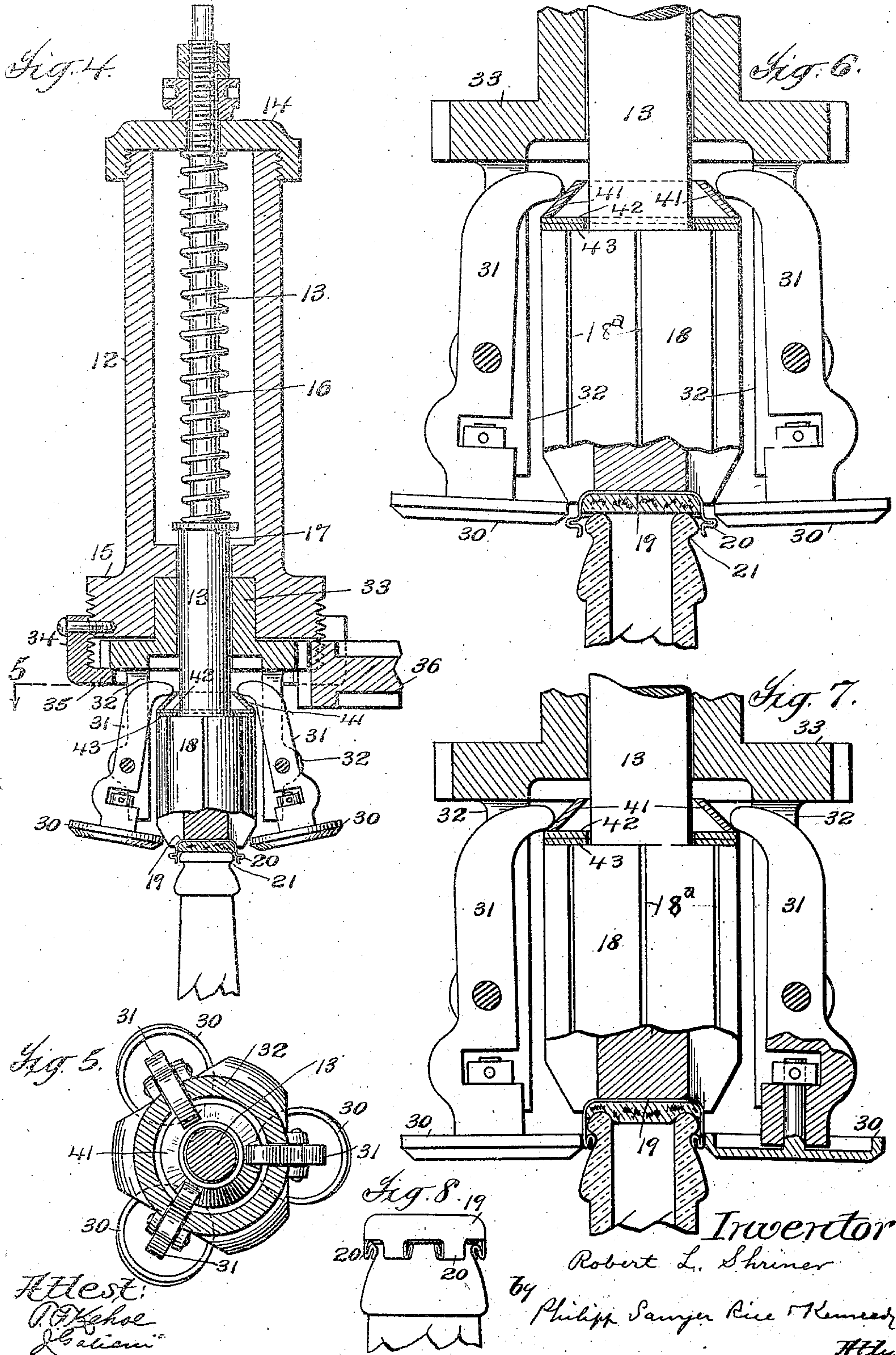
by Philip Sawyer Rice Kennedy
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Attest:
O. P. Kehoe
Notary

Inventor
Robert L. Shriner
by Philip Sanger Rice & Kennedy
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UNITED STATES PATENT OFFICE.

ROBERT L. SHRINER, OF NEW YORK, N. Y., ASSIGNOR TO STANDARD STOPPER COMPANY,
OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

BOTTLE-CAPPING MACHINE.

938,612.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed June 5, 1902. Serial No. 110,265.

To all whom it may concern:

Be it known that I, ROBERT L. SHRINER, a citizen of the United States, residing at New York city, county of New York, and State of New York, have invented certain new and useful Improvements in Bottle-Capping Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to improvements in bottle capping machines, that is to say, machines adapted to bend the downwardly extending portion or portions of a bottle cap into engagement with the neck of a bottle or a shoulder thereon.

It is the object primarily of the present invention to provide a machine of this class which may be relied upon to properly and securely cap bottles, notwithstanding variations in the size of their necks or irregularities in the contour or shape thereof.

In the accompanying drawings—Figure 1 is an elevation of a capping machine embodying the present invention. Fig. 2 is an elevation of the same, partly in section, looking toward the right of Fig. 1. Fig. 3 is a plan view of the machine, the base plate of the machine being omitted. Fig. 4 is a sectional elevation, on an enlarged scale, taken on the line 4 of Fig. 2, of that part of the machine known as the machine head, which is vertically movable and which contains a pressing head or presser for yieldingly engaging the end of a bottle and a cap thereon and also devices, movable toward the bottle neck, for bending the depending portion or portions of the cap, while so engaged by the presser, into engagement with a shoulder upon the bottle neck. Fig. 5 is a horizontal section, on the line 5 of Fig. 4. Fig. 6 is a sectional elevation, on an enlarged scale, of the lower portion of the machine head, presser and bending devices shown in Fig. 4, the machine head being lowered somewhat from the position shown in Fig. 4 the presser being broken away at its lower end to illustrate its construction more clearly, namely, that it is slitted longitudinally so as to provide a central core and a plurality of ribs or segments radiating therefrom and integral therewith, said core being shown by hatched lines. Fig. 7 is a view similar to Fig. 6, illustrating the same parts with the machine head, however, lowered still farther

and with the bending devices moved inwardly toward the bottle neck into position to bend the depending portion or portions of the cap into engagement with the shoulder on the bottle neck; and Fig. 8 is an elevation of the bottle neck with a cap secured to the neck thereof, after the manner illustrated in Fig. 7.

Referring to said drawings, 1 represents a tubular casing or standard, mounted on a suitable base 2, and 3 a bottle support adjustably mounted in a bracket 4 projecting from said standard. Bracket 4 is provided with a set screw 5 (see Fig. 1) for engaging the stem 6 of the bottle support 3 and thus locking said support in any position to which it may be adjusted vertically, the purpose of this adjustable mounting of the bottle support being to accommodate bottles which vary in length or height.

Within the tubular casing or standard 1, is mounted a vertically movable rod 7 which is normally maintained in its lowermost position by a spring 8 encircling the lower contracted portion of the rod and connected with the tubular casing or standard 1 by a pin 9 secured to said casing or standard and passing through a slot 10 in the rod 7, as illustrated in Fig. 2. At its lower end the rod 7 is connected with a treadle 11 fulcrumed in the base 2 of the machine, and at its upper end said rod has secured to it a machine head 12, which, on the depression of the treadle 11, is lowered into position for engagement with the neck of a bottle resting upon support 3.

The machine head 12 contains an endwise movable rod 13 passing through openings in the opposite ends 14, 15, of the machine head, and which is normally held in its lowermost position in the machine head by a spring 16 bearing against the upper end 14 of the machine head and against a shoulder or enlargement 17 at the lower end of said rod. The rod 13 carries at its lower end, a bottle presser or pressing head 18 rigidly fixed to or integral with said rod 13 and having a preferably concave lower face for engagement with the upper end or lip of a bottle neck and a metal cap, as 19, resting thereon and which is secured to the bottle neck by having its depending portions or legs bent inwardly into engagement with a shoulder 21 upon the bottle neck (see Fig. 8).

Normally, the machine head 12 is in its

elevated or uppermost position, as illustrated in Figs. 1, 2 and 4. When a bottle is placed upon the bottle support 3 with a cap 19 upon the upper end thereof ready to be secured in position upon the neck of the bottle, the treadle 11 will be depressed by the operator, thus lowering the machine head 12, so that the pressing head 18 carried by rod 13 will first engage the cap 19 after the manner illustrated in Figs. 4 and 6, and finally (the downward movement of the machine head being continued from this position) force the cap 19 down upon the bottle neck, with the result that the lips of the bottle will become embedded in the cork or other yielding sealing disk within the cap 19, as illustrated in Fig. 7. It will, of course, be understood that during the downward movement of the machine head from the position in which it is shown in Fig. 4 to that in which it is shown in Fig. 7, the pressing head or presser 18 will be arrested in its downward movement by the bottle and caused to move upwardly through the machine head against the pressure of its spring 16.

With the presser 18 in the position shown in Fig. 7, the bottle and its cap 19 are held securely by the presser 18 and support 3 against turning or other movement, and while they are thus held the downwardly projecting portions or legs 20 of the cap 19 are bent inwardly into locking engagement with the shoulder 21 on the bottle neck by bending mechanism which will now be described. This bending mechanism consists of a series of rolls 30 journaled in the lower ends of levers 31 pivoted in arms 32 depending from a rotary carrier 33 through which the presser rod 13 passes, and which is supported upon the lower end of the machine head by a ring 34 secured to the machine head and having a horizontal flange 35 engaging the under side of the carrier 33. The carrier 33 is provided with gear teeth engaged by a pinion 36 upon a vertical shaft 37, which is provided at its lower end with a bevel pinion 38 engaged by a bevel pinion 39 secured to a constantly rotated shaft 40 provided with a pulley connected with a suitable source of power (not shown).

While the machine head is in its elevated position (see Figs. 1 and 2) and also while the presser 18 is moving downwardly with it, the levers 31 and cap bending rolls 30 are spread outwardly or away from the bottle neck, as shown. When, however, during the downward movement of the machine head, the downward movement of the presser is arrested by the bottle as before stated, and said presser is caused thereby to move upwardly through the machine head, the lower ends of the bending levers 31 and the rolls 30 thereon are gradually moved inwardly toward each other and toward the bottle neck until they assume the position illustrated in

Fig. 7, in which position (the carrier 33 being rotated through the connections described) they revolve about the bottle neck and press the depending portions or legs 20 of the cap 19 into engagement with the shoulder 21 upon the bottle neck. To secure this movement of the cap bending levers 31 and their rolls 30, inwardly toward the bottle neck, the presser 18 carries at its upper end a cone-shaped plate or ring 41, which, as the downward movement of the presser 18 is arrested by the bottle and said presser is caused to yield, engages the noses or inwardly turned upper ends of levers 31 and spreads the upper ends of said levers outwardly and thus moves or swings their lower ends and the bending rolls 30 thereon inwardly toward the bottle neck and into bending engagement with the depending portions or legs of the cap.

One of the difficulties met with in the capping of bottles by machinery is that the bottle necks, instead of being circular in contour or shape, are sometimes oval or "egg shaped" as it is termed. Another of the difficulties met with is that the contour or shape of the bottle necks, whether circular or oval, is often irregular or broken by projections or depressions. Where these difficulties, or either of them, exist, it often happens that in attempting to cap the bottles, many of the bottles are broken, and, even if not broken, it is often impossible to properly cap them. Provision, however, is made by the present invention for the perfect capping of such imperfectly formed bottles of this kind; the bending mechanism of the present invention being such that, no matter what the contour or shape of the bottle be,—that is, whether it be truly circular or oval,—and no matter what break or irregularity may occur in its contour or shape,—such bending mechanism will accommodate itself to the contour or shape of the bottle neck and thus perfectly cap the same. To this end the member, *i. e.*, the conical plate 41) for moving the lower ends of the bending levers 31 and rolls 30 inwardly toward the bottle neck and into engagement with the cap thereon, is mounted loosely upon the rod 13 and presser 18 so that while in engagement with the upper ends of said levers it is free to turn and also to move or play laterally upon the rod 13, and is furthermore made of spring metal so that it may yield under the pressure of the levers 31. By reason of this construction and arrangement of the member 41 the levers 31 are not held rigidly by the plate 41 in any fixed position relatively to the axis of rotation of their carrier 33 or the axis of the bottle, but are free at their lower ends to follow the contour or shape of the bottle neck, whatever it may be; the plate 41, by reason of its looseness and resiliency, accom-

modating or adjusting itself to any position which the levers 31 may assume while so following the contour or shape of the bottle neck. To further insure this freedom to move laterally on the part of the plate 41, the latter, instead of resting directly upon the upper end of the presser 18, has interposed between it and said presser, metal plates or washers 42, 43, which, like the plate 41, are loosely mounted on rod 13 so as to be capable of movement or play laterally; the provision of these plates or washers overcoming or preventing any tendency on the part of the plate 41 to stick or jam against the presser while moving the upper ends of levers 31 outwardly.

Bottle necks are also often imperfect in still another particular, namely, in the size of their necks, the necks of some being sometimes larger than the necks of others. In such cases, it sometimes happens that the bottle is broken by the pressure of the presser. To prevent this the presser 18, in the present case, which is of metal, is slit longitudinally at several points, as shown at 18^a, the result of this longitudinally slitting being that the presser is formed into ribs (see particularly Fig. 7) which have a slight movement relatively to each other and to the body of the presser so as to accommodate themselves to any slight variations in the size of the bottle necks and thus avoid breakage of the bottle should the presser be brought into engagement with a bottle having a larger neck than others. These ribs, formed by the slitting at 18^a, radiate from a core (shown by hatched lines in Figs. 6 and 7) which is integral with the ribs, the core and ribs in other words being formed of one piece of metal. This slitting of the presser also is of advantage when operating upon bottles having non-circular or oval shapes or contours or irregularities or breaks in their shapes or contours.

It is to be understood that while the machine head 12, in the present case, is shown as movable to and from the bottle support 3, the invention is not to be limited to such an arrangement of machine head and support, but that the machine head might be held stationary and the bottle support arranged so as to move to and from it or the machine head and bottle support be arranged so as to both move to and from each other, without departing from the invention.

What I claim is:—

1. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of cap-bending devices movable toward and rotatable about the bottle neck, and a member adapted, when the pressing head is in engagement with the bottle, to move the bending devices toward the bottle neck, said member being so mounted as to have lateral play while so moving

said bending devices, substantially as described.

2. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of cap-bending devices movable toward and rotatable about the bottle neck, and a member adapted, when the pressing head is in engagement with the bottle, to move the bending devices toward the bottle neck, said member being of spring metal and so mounted as to yield and have lateral play while so moving said bending devices, substantially as described.

3. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of cap-bending devices movable toward and rotatable about the bottle neck, and a cone-shaped member adapted, when the pressing head is in engagement with the bottle, to move the bending devices toward the bottle neck, said member being so mounted as to have lateral play while so moving said bending devices, substantially as described.

4. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of cap-bending devices movable toward and rotatable about the bottle neck, and a cone-shaped member adapted, when the pressing head is in engagement with the bottle, to move the bending devices toward the bottle neck, said member being of spring metal and so mounted as to yield and have lateral play while so moving said bending devices, substantially as described.

5. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of pivotally mounted cap-bending levers movable toward and rotatable about the bottle neck, and a member adapted, when the pressing head is in engagement with the bottle, to swing said levers on their pivots toward the bottle neck, said member being so mounted as to have lateral play while so moving said levers, substantially as described.

6. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of pivotally mounted cap-bending levers movable toward and rotatable about the bottle neck, and a member adapted, when the pressing head is in engagement with the bottle, to swing said levers on their pivots toward the bottle neck, said member being of spring metal and so mounted as to yield and have lateral play while so moving said levers, substantially as described.

7. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of pivotally mounted cap-bending levers movable toward and rotatable about the bottle neck, and a cone-shaped member adapted, when the

pressing head is in engagement with the bottle, to swing said levers on their pivots toward the bottle neck, said member being so mounted as to have lateral play while so moving said levers, substantially as described.

8. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of pivotally mounted cap-bending levers movable toward and rotatable about the bottle neck, and a cone-shaped member adapted, when the pressing head is in engagement with the bottle, to swing said levers on their pivots toward the bottle neck, said member being of spring metal and loosely mounted so as to yield and have lateral play while so moving said levers, substantially as described.

9. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of pivotally mounted levers bearing cap-bending rollers and movable toward and rotatable about the bottle neck, and a member adapted, when the pressing head is in engagement with the bottle, to swing said levers on their pivots toward the bottle neck, said member being so mounted as to have lateral play while so moving said levers, substantially as described.

10. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of pivotally mounted levers bearing cap-bending rollers and movable toward and rotatable about the bottle neck, and a member adapted, when the pressing head is in engagement with the bottle, to swing said levers on their pivots toward the bottle neck, said member being of spring metal and so mounted as to yield and have lateral play while so moving said levers, substantially as described.

11. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of pivotally mounted levers bearing cap-bending rollers and movable toward and rotatable about the bottle neck, and a cone-shaped member adapted, when the pressing head is in engagement with the bottle, to swing said levers on their pivots toward the bottle neck, said member being so mounted as to have lateral play while so moving said levers, substantially as described.

12. In a bottle capping machine, the combination with a pressing head adapted to engage a bottle, of a plurality of pivotally mounted levers bearing cap-bending rollers and movable toward and rotatable about the bottle neck, and a cone-shaped member adapted, when the pressing head is in engagement with the bottle, to swing said levers on their pivots toward the bottle neck, said member being of spring metal and so mounted as to yield and have lateral play

while so moving said levers, substantially as described.

13. In a bottle capping machine, the combination of pressing head 18, rotatable carrier 33, cap-bending levers 31 pivotally mounted in said carrier, and loosely-mounted cone-shaped lever-actuating member 41, substantially as described.

14. In a bottle capping machine, the combination of pressing head 18, rotatable carrier 33, cap-bending levers 31 pivotally mounted in said carrier, and loosely-mounted cone-shaped lever-actuating member 41 of spring metal, substantially as described.

15. In a bottle capping machine, the combination of pressing head 18, rotatable carrier 33, levers 31 pivotally mounted in said carrier and bearing cap-bending rollers 30, and loosely-mounted cone-shaped lever-actuating member 41, substantially as described.

16. In a bottle capping machine, the combination of pressing head 18, rotatable carrier 33, levers 31 pivotally mounted in said carrier and bearing cap-bending rollers 30, and loosely-mounted cone-shaped lever-actuating member 41 of spring metal, substantially as described.

17. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle and to be moved endwise thereby, of a plurality of cap-bending devices movable toward and rotatable about the bottle neck, and a member controlled by said pressing head and adapted, when the pressing head is moved by a bottle, to move said bending devices inwardly toward each other and the bottle neck, substantially as described.

18. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle, of a plurality of cap-bending devices movable toward and rotatable about the bottle neck, and a member adapted, when the pressing head is in engagement with a bottle, to move said bending devices toward the bottle neck, said member being so mounted as to have lateral play while so moving said levers, substantially as described.

19. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle, of a plurality of cap-bending devices movable toward and rotatable about the bottle neck, and a member adopted, when the pressing head is in engagement with a bottle, to move said bending devices toward the bottle neck, said member being of spring metal and so mounted as to yield and have lateral play while so moving said bending devices, substantially as described.

20. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle and to be moved endwise thereby, of a plurality of

cap-bending devices movable toward and rotatably about the bottle neck, and a cone-shaped member controlled by said pressing head and adapted, when the pressing head is moved by a bottle, to move said bending devices inward toward each other and the bottle neck, substantially as described.

21. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle, of a plurality of cap-bending devices movable toward and rotatable about the bottle neck, and a cone-shaped member adapted, when the pressing head is in engagement with a bottle, to move said bending devices toward the bottle neck, said member being so mounted as to have lateral play while so moving said bending devices, substantially as described.

22. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle, of a plurality of cap-bending devices movable toward and rotatable about the bottle neck, and a cone-shaped member adapted, when the pressing head is in engagement with a bottle, to move said bending devices toward the bottle neck, said member being of spring metal and so mounted as to yield and have lateral play while so moving said bending devices, substantially as described.

23. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle and to be moved endwise thereby, of a plurality of pivotally-mounted cap-bending levers movable toward and rotatable about the bottle neck, and a member controlled by said pressing head and adapted, when the pressing head is moved by a bottle, to swing said levers on their pivots inward toward each other and the bottle neck, substantially as described.

24. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle, of a plurality of pivotally mounted cap-bending levers movable toward and rotatable about the bottle neck, and a member adapted, when the pressing head is in engagement with a bottle, to swing said levers on their pivots toward the bottle neck, said member being so mounted as to have lateral play while so moving said levers, substantially as described.

25. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle, of a plurality of pivotally-mounted cap-bending levers movable toward and rotatable about the bottle neck, and a member adapted, when the pressing head is in engagement with a bottle, to swing said levers on their pivots

toward the bottle neck, said member being of spring metal and so mounted as to yield and have lateral play while so moving said levers, substantially as described.

26. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle and to be moved endwise thereby, of a plurality of pivotally-mounted cap-bending levers movable toward and rotatable about the bottle neck, and a cone-shaped member controlled by said pressing head and adapted, when the pressing head is moved by a bottle, to swing said levers on their pivots inward toward each other and the bottle neck, substantially as described.

27. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle, of a plurality of pivotally-mounted cap-bending levers movable toward and rotatable about the bottle neck, and a cone-shaped member adapted, when the pressing head is in engagement with a bottle, to swing said levers on their pivots toward the bottle neck, said member being so mounted as to have lateral play while so moving said levers, substantially as described.

28. In a bottle capping machine, the combination with a longitudinally-slit pressing head adapted to engage a bottle, of a plurality of pivotally-mounted cap-bending levers movable toward and rotatable about the bottle neck, and a cone-shaped member adapted, when the pressing head is in engagement with a bottle, to swing said levers on their pivots toward the bottle neck, said member being of spring metal and so mounted as to yield and have lateral play while so moving said levers, substantially as described.

29. In a bottle capping machine, the combination of longitudinally-slit pressing head 18, rotatable carrier 33, levers 31 pivotally mounted in said carrier and bearing cap-bending rollers 30, and loosely-mounted cone-shaped lever-actuating member 41, substantially as described.

30. In a bottle capping machine, the combination of longitudinally-slit pressing head 18, rotatable carrier 33, levers 31 pivotally mounted in said carrier and bearing cap-bending rollers 30, and loosely-mounted cone-shaped lever-actuating member 41 of spring metal, substantially as described.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

ROBERT L. SHRINER.

Witnesses:

JOHN A. GRAVES,
T. F. KEHOE.