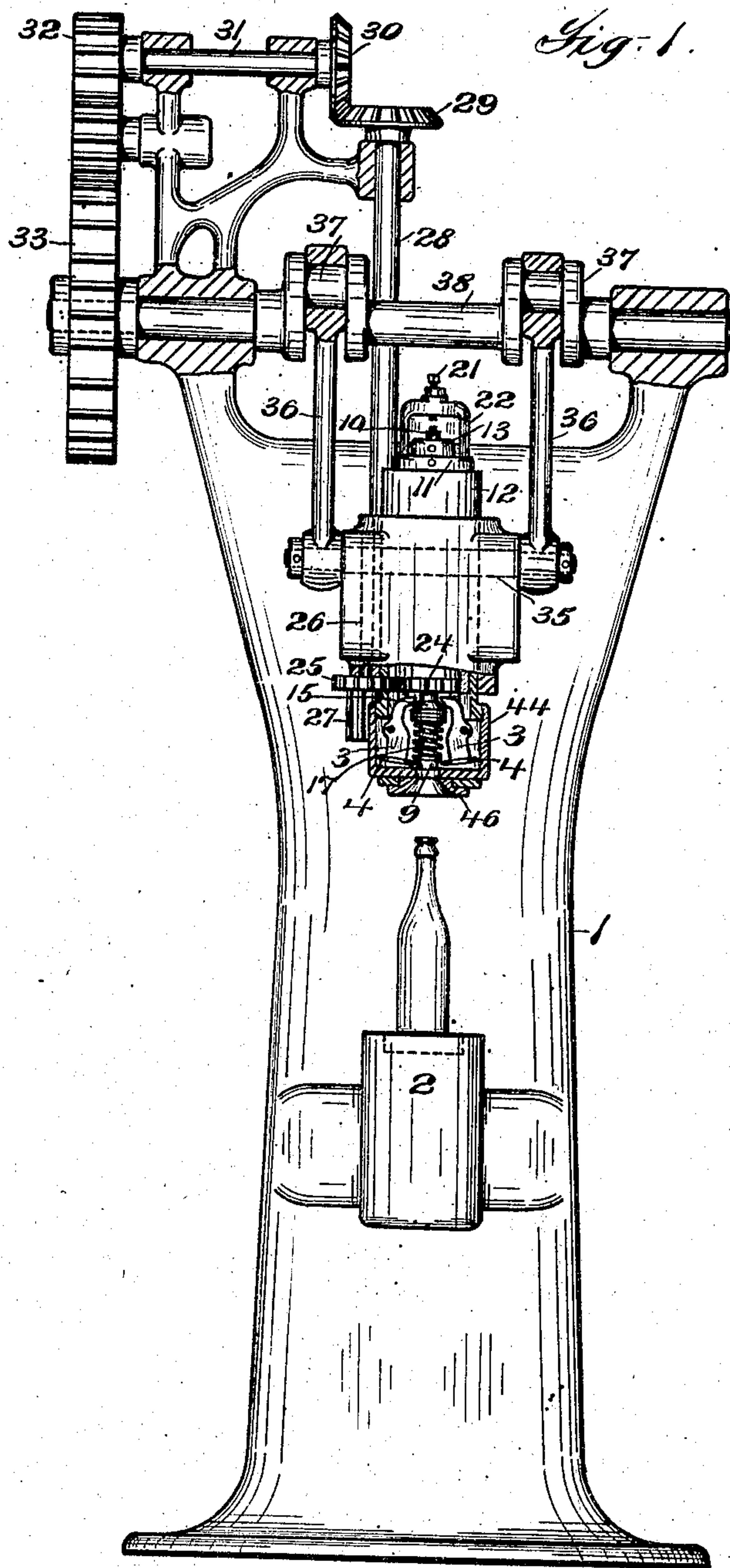


F. MUELLER & G. W. GWINN.
CAPPING MACHINE.
APPLICATION FILED JAN. 14, 1905.

915,992.

Patented Mar. 23, 1909.
4 SHEETS—SHEET 1.



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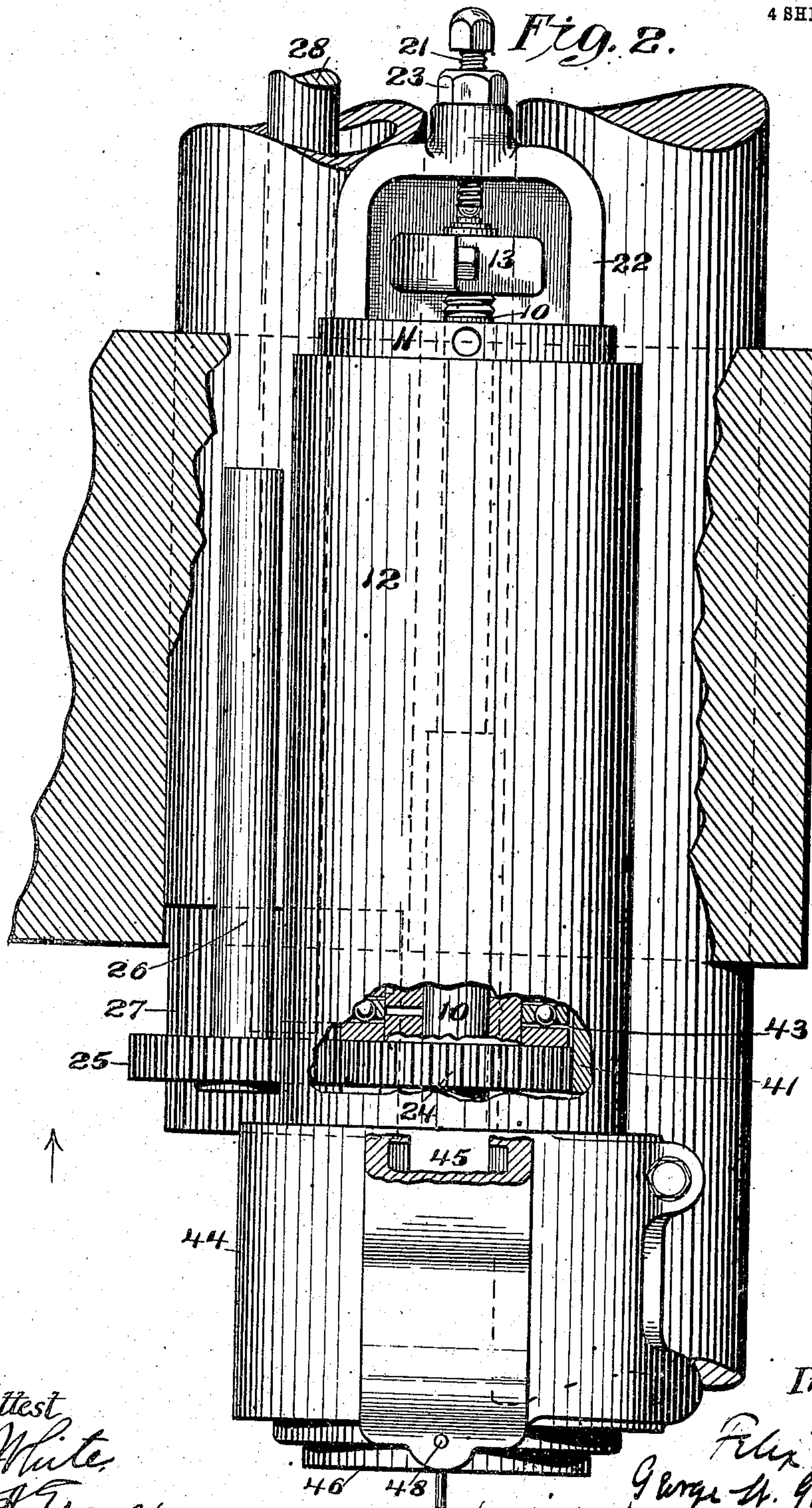
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4 SHEETS—SHEET 2.



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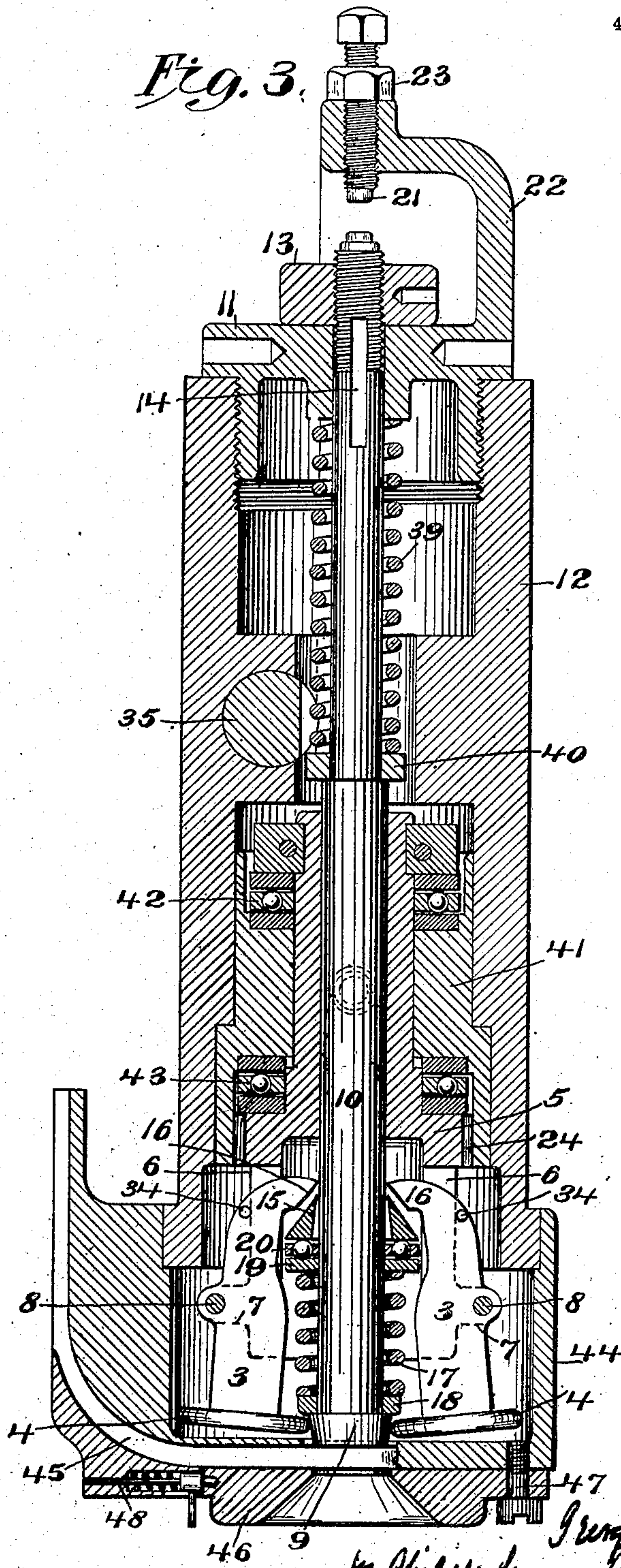
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4 SHEETS—SHEET 3.

Fig. 3.



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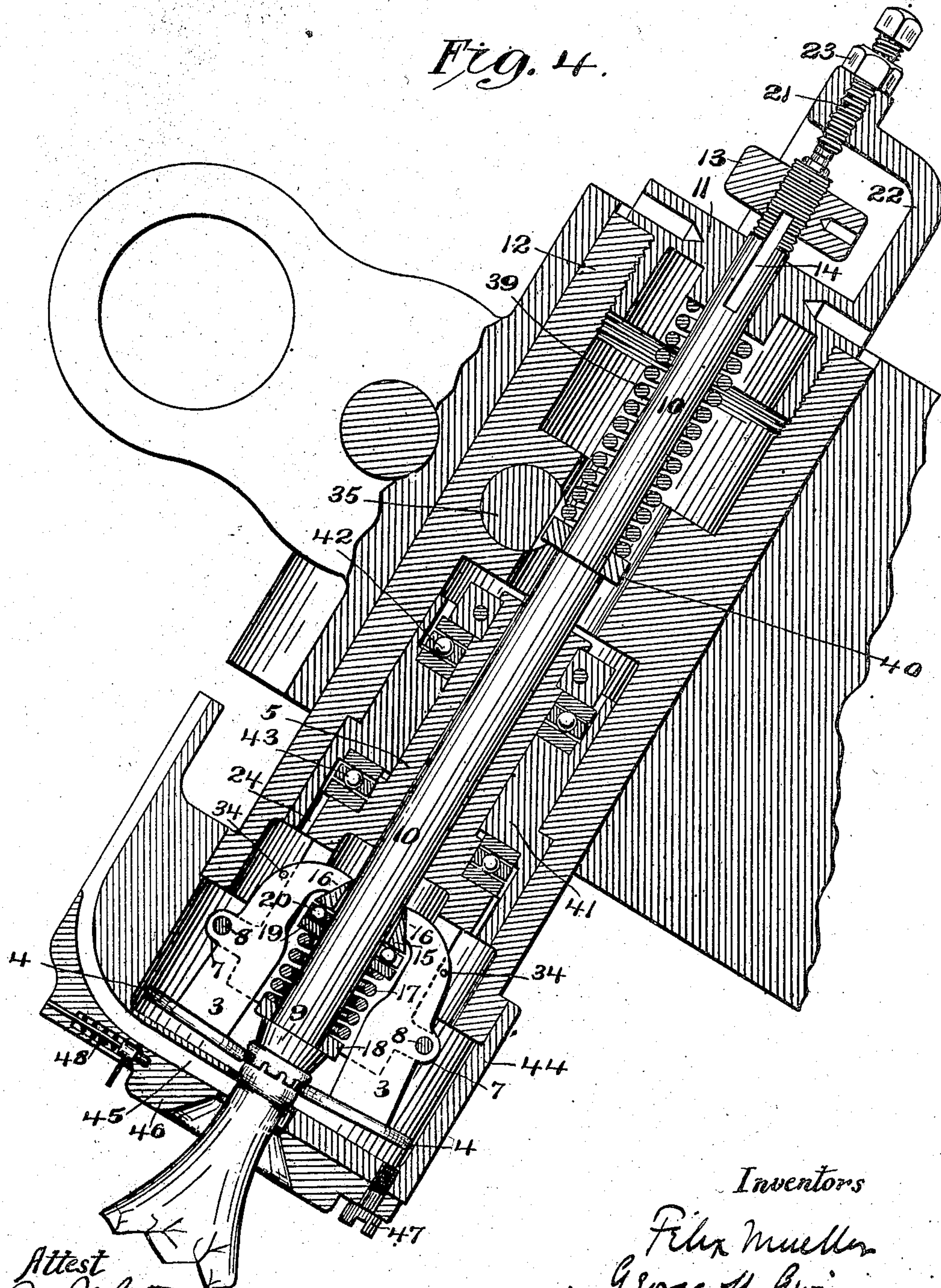
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4 SHEETS—SHEET 4.

Fig. 4.



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UNITED STATES PATENT OFFICE.

FELIX MUELLER AND GEORGE W. GWINN, OF NEW YORK, N. Y., ASSIGNORS TO STANDARD STOPPER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW-JERSEY.

CAPPING-MACHINE.

No. 915,992.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed January 14, 1905. Serial No. 241,137.

To all whom it may concern:

Be it known that we, FELIX MUELLER, a subject of the German Emperor, and GEORGE W. GWINN, a citizen of the United States, and both residents of the city, county, and State of New York, have invented certain new and useful Improvements in Capping-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in capping machines.

In machines employed to attach caps to receptacles by bending or forcing the flange of the cap beneath a shoulder on the receptacle, it is desirable to provide means which will enable the cap flange bending or forcing devices to operate readily on receptacles the outside diameters of the shoulders of which vary somewhat. Furthermore, in machines intended to operate upon glass-receptacles, it is also desirable to so construct the capping devices that provision will be made for irregularities in the circumferential outline of the shoulders, inasmuch as even in receptacles made in the same mold and intended to be substantial duplicates, considerable variation in outline occurs.

One of the objects of this invention is to produce an improved capping mechanism in which capping devices may readily operate upon receptacles the shoulders of which vary in diameter.

A further object of the invention is to produce an improved capping mechanism in which the capping devices will readily operate upon receptacles the shoulders of which are irregular in outline.

A further object of the invention is to produce a capping mechanism which shall be simple, and, therefore, cheap in construction and which shall be effective in operation.

With these and other objects not specifically stated in view, the invention consists in certain constructions, and in certain parts, improvements and combinations as will be hereinafter fully described and specifically set forth.

Referring to the drawings—Figure 1 is a front elevation of so much of a capping machine as will enable the invention to be understood. Fig. 2 is an elevation, on an

enlarged scale, of the capping mechanism, certain parts being shown in section. Fig. 3 is a vertical section of the construction shown in Fig. 2. Fig. 4 is a sectional view, similar to Fig. 3, but showing the parts in a different position, the section, furthermore, illustrating the position in which the capping mechanism is mounted in the machine.

In the drawings which illustrate a preferred embodiment of the invention, 1 indicates a frame in which the operative parts of the mechanism are mounted. The machine will include a rest or support upon which the receptacle to be capped rests, such a support being indicated at 2. The machine in which the invention is embodied is designed for attaching caps to receptacles, such, for instance, as bottles which have shoulders surrounding the mouths, the flanges of the caps being forced underneath the shoulders so as to lock the caps in sealed relation with the bottles.

The devices for forcing the flange of the cap underneath the shoulder of the receptacle may be varied in construction and will vary according to the construction in which the invention is embodied. In the particular construction shown, these devices consist of a series of pivoted levers 3 which are provided with spinning wheels 4. While the number of these levers may vary, it has been found in practice that three levers and spinning wheels form an efficient construction. These levers may be supported in any suitable manner. As shown, they are mounted in a carrier 5, said carrier having depending arms 6 which form slots in which the levers are located, these arms having bosses 7 extending therefrom to which the levers are pivoted by pins 8.

In the particular construction shown, means are provided for forcing the cap down onto the receptacle just prior to the time when the cap flange forcing devices come into operation. These means consist, in the particular construction shown, of a head 9 having a stem 10 which extends up through the capping mechanism, the stem being guided at its upper end by a nut 11 which is screwed into the upper end of the outer casing 12 in which the several parts are mounted. In the particular construction shown, the upper end of the head is threaded

and is provided with a nut 13 by which the position of the head with respect to the cap flange forcing devices may be adjusted, the protrusion of the head through the cap flange forcing devices being controlled by the position of the nut. In the particular construction shown, the head will be arranged in a generally vertical position, so that it is free to drop through the nut 11, the amount of the drop being determined by the position of the nut 13. In the particular construction shown, the head is held against rotation, this being effected by providing the head with a feather 14 which takes into a suitably formed groove in the nut 11, or in any other suitable manner.

The means for causing the cap flange forcing devices to operatively engage the flange of the cap may be considerably varied in construction, but will preferably include a member which yieldingly forces these devices against the flange of the cap. The construction of this member may be varied within wide limits. As shown, it consists of a conical ring 15. In the best constructions, the means for mounting this conical ring so as to yieldingly force the cap flange forcing devices against the flange of the cap will be of such a character that the ring will have not only a yielding movement but also a tipping movement. While the means by which the member is mounted in order to accomplish the desired functions may be widely varied, as shown, the bore of the ring 15 is made larger than the stem which it surrounds, and it is forced against the ends of the levers 3 which are preferably bent inward at their upper ends, as shown at 16, by means of a spring 17. This spring, in the particular construction shown, bears at one end against a collar 18 which rests against the head 9 and at its other end bears against a plate 19 on which is an anti-friction bearing 20, the conical member 15 resting on this bearing.

The capping mechanism is brought into operative relation with the receptacle to be capped by producing a relative movement between said mechanism and the support on which the receptacle rests. When, in the progress of this relative movement, the head 9 strikes the cap, the plunger and the stem will be forced upward, causing the cone-shaped member 15 to be forced against the inwardly bent end 16 of the levers 3. The cone shaped member acting against these levers causes them to swing, thus bringing them into operative relation with the flange of the cap which at this time is forced down upon the receptacle by the head. It will be understood that in the particular construction shown, the cone shaped member and spring will properly force the cap flange forcing devices into operative relation with the

flange of the cap, where the shoulders of the receptacles to which the caps are applied vary in diameter within limits, the yield of the spring being proportionately greater, the greater the diameter of the shoulder on the bottle or other receptacle upon which the bending devices are to act.

Devices will preferably be employed for limiting the upward movement of the head and stem. While these devices may vary in construction, they will preferably be adjustable. In the particular construction shown, a stop screw 21 is employed for this purpose, this stop screw being tapped through an opening in a bracket 22 which rises from the nut 11 before referred to, the screw being locked in position by a lock nut 23, if this be thought desirable. In the operation of the machine this screw will be adjustable so as to allow the greatest upward movement of the stem necessary, that is to say, the amount which necessarily takes place when a receptacle having a shoulder of small diameter is inserted in the machine.

When, as in the construction shown, the cap flange forcing devices are spinning devices, it is of course necessary to produce a relative rotating movement between the receptacle and said devices. While this may be effected in any suitable manner, in the construction selected to illustrate the invention, it is effected by rotating the cap flange forcing devices. The particular means employed for rotating the cap flange forcing devices may be varied widely in construction. As shown, the carrier 5 is provided with a gear 24 which gear is in mesh with a gear 25 carried on a vertical shaft 26, the casing 12 being slotted in order to permit the engagement of these gears. This vertical shaft 26 is supported in the frame of the machine and the gear 25 is in mesh with a long pinion 27 mounted on a shaft 28, this shaft being provided at its upper end with a beveled gear 29 which is in mesh with a bevel gear 30 carried on a counter shaft 31 suitably supported in the frame of the machine. This shaft 31 is provided with a gear 32 which is driven from the main driving gear 33, this gear being driven in any suitable manner, as by a pulley, not shown. It will be understood that when the gearing just described is set in motion, the carrier will be rotated and the spinning wheels will be rotated around a cap held on the bottle or other receptacle by the head 9. This rotation will necessarily be rapid, and the centrifugal force generated will tend to throw the levers 3 carrying the spinning wheels outward. In order to prevent an excessive outward movement of these wheels, each of the levers is or may be provided with a stop pin 34 which strikes against the downwardly projecting arms 6 of the carrier.

In the preferred construction of the ma-

chine, the head will be rotating at the time when the receptacle is inserted into the capping mechanism. When this occurs, the cone-shaped ring will be moved upward, as shown in Fig. 4, thus forcing the spinning wheels inward against the flange of the cap, as clearly shown in that figure. It will be seen, as has been before pointed out, that the inward movement effected by the cone shaped member will depend upon the diameter of the shoulder of the article to be capped, the spring 17 yielding more the larger the diameter of the shoulder. Furthermore, it will be seen that the construction is such as to allow a compensating movement of the cap flange forcing devices for irregularities in the shoulder of the receptacle. If, for instance, in its movement, one of the spinning wheels 4 strikes an enlargement on the receptacle as the wheels travel around the shoulder of the receptacle; the cone will be moved laterally until its upper edge finds a fulcrum point on the stem, after which the cone may tip around this fulcrum point, the spring permitting this tipping movement. As soon, however, as the spinning wheel has passed the enlargement on the shoulder, the spring will force the cone to resume its normal position.

The means by which the receptacle is brought into the range of action of the capping mechanism may be widely varied, it being possible to effect this function either by moving the capping mechanism or support or by moving both. In the particular construction shown, the capping mechanism is made movable. When the capping mechanism is made movable to bring the receptacle within the range of action of the capping devices, the particular mechanism employed for this purpose may be variously constructed and arranged. As shown, the casing 12 has an opening therethrough through which passes a cross bar 35. To this cross bar are secured connecting rods 36, these rods being in turn secured to cranks 37 mounted on an operating shaft 38 suitably supported in the frame, this being the shaft on which the gear 33 is mounted. As the shaft 38 rotates, the capping mechanism will be given a reciprocating movement, and this movement takes place without interrupting the driving of the carrier in which the cap flange forcing devices are mounted, the long pinion 27 permitting a vertical movement of the capping mechanism without disengaging this pinion and the gear 25. While the gravity of the head and stem might be depended upon to retain the head in its protruded position with respect to the cap flange forcing devices, in the preferred construction, and especially when it is desired to make a hermetic seal between the cap and the mouth of the receptacle by means

of an introduced cork disk, a spring will be employed against the tension of which the head is lifted. In the construction shown, this spring is marked 39 and bears against the underside of the nut 11 and against a collar 40 carried on the stem.

The carrier before referred to may be held in position in any suitable way. As shown, the stem is guided through it, the carrier being held in position by means of a block 41, anti-friction bearings 42, 43 being provided to reduce the friction of the turning movement.

The caps may be presented to the capping mechanism in any desired manner, that is to say, they may be placed upon the receptacle and carried by it into the capping mechanism, or they may be supported in the capping mechanism, being fed to it either by hand or automatically. In the construction shown, the caps are designed to be fed automatically to the capping mechanism and are supported therein in such a manner that when the bottle is brought into the range of action of the capping mechanism it carries the cap with it. While this may be effected in any desired manner, in the construction shown, the casing 44 is cut away at its bottom on one side to form a passage 45, this passage being continued upward in a curved path through the side wall of the casing, as clearly shown, in order that a chute down which the caps are fed may be placed in communication therewith. A block 46 is provided which has a flared opening therein which communicates with the channel 45. The opening in this block 46 is large enough to permit the receptacle to enter therein, but not large enough to allow the cap to pass down through it. This block 46 is shown as pivoted on a screw 47 and is held in position by a spring pin 48 which permits the block to be swung to one side in order that access may be had to the channel 45 for cleaning or other purposes.

While the mechanism illustrated and which has just been described forms an effective means for carrying out the invention, it is to be understood that the invention may be embodied in mechanism which differs widely therefrom. The invention is not, therefore, to be limited to the specific construction herein illustrated and described.

What is claimed is:—

1. In a capping mechanism, the combination with a head, of a plurality of cap applying devices, means for moving said devices toward a cap held on a receptacle by said head, said means including a member mounted to have yielding and tipping movements.
2. In a capping mechanism, the combination with a head, of a plurality of cap applying devices, means for producing a relative

rotating movement between a cap held by the head and the cap applying devices, and means for moving said devices toward the cap, said means including a member mounted to have yielding and tipping movements.

3. In a capping mechanism, the combination with a head, of a plurality of pivoted arms, means for producing a relative rotating movement between a cap held by the head and the pivoted arms, flange bending means carried by the arms, and a spring supported conical member for rocking the arms to force the bending means into operative relation with the flange of a cap held in position by the head.

4. In a capping mechanism, the combination with a head, of a plurality of pivoted arms, flange bending devices carried by the arms, and a conical member mounted to have yielding and tipping movements for forcing the bending means into operative relation with the flange of a cap held in position by the head.

5. In a capping mechanism, the combination with a head, of a plurality of pivoted arms, flange bending devices carried by the arms, means for producing a relative rotating movement between the arms and a cap held in position by the head, a conical member having an open interior, a guide for the member passing through the interior of the conical member and spaced therefrom, and a spring for supporting the conical member.

6. In a capping mechanism, the combination with a head, of a plurality of pivoted arms, cap bending devices carried by the arms, means for rotating the arms with respect to the cap held in position by the head, a conical member having an open interior for moving the arms to force the bending devices into operative relation with the flange of a cap, a guide passing through the interior of the member and spaced therefrom, a support for the member, anti-friction bearings between the member and the support, and a spring on which the support rests.

7. In a capping mechanism, the combination with a head mounted to have a longitudinal movement, of adjustable means for limiting said movement, a plurality of rotating cap applying devices, and yielding means for moving said devices toward a cap held in position by the head.

8. In a capping mechanism, the combination with a head mounted to have a longitudinal movement, of adjustable means for limiting said movement, a plurality of cap

applying devices, and a member mounted to have yielding and tipping movements for forcing the cap applying devices into operative position with respect to the flange of the cap held by the head.

9. In a capping mechanism, the combination with a head, of a stem on which the head is carried, said head and stem being mounted to have a longitudinal movement, adjusting means for limiting said movement, a plurality of arms having flange bending means mounted thereon, means for producing a rotating movement between the arms and the head, a conical member surrounding the stem and guided thereby for moving the arms to bring the bending devices into operative relation with the flange of the cap held by the head, and a spring intermediate the head and the conical member.

10. In a capping mechanism, the combination with a head, of a stem on which the head is carried, said head and stem being mounted to have a longitudinal movement, adjusting means for limiting said movement, a plurality of arms having flange bending means mounted thereon, means for producing a rotating movement between the arms and the head, a conical member surrounding the stem and guided thereby for moving the arms to bring the bending devices into operative relation with the flange of the cap held by the head, said member being spaced from the stem, and a spring intermediate the head and the conical member.

11. The combination with a head, of a stem on which the head is carried, said head and stem being mounted to have a longitudinal movement, adjustable means for limiting said movement, a spring against the tension of which the longitudinal movement takes place, a plurality of pivoted arms carrying cap flange bending devices, a conical ring for moving the arms to throw the bending devices into operative relation with the flange of a cap held by the head, said ring surrounding the stem and being spaced therefrom, a support for the ring, an anti-friction device between the ring and support, and a spring intermediate the head and the support.

In testimony whereof, we have hereunto set our hands in the presence of two subscribing witnesses.

FELIX MUELLER.
GEORGE W. GWINN.

Witnesses:

J. A. GRAVES,
A. WHITE.