

Jan. 2, 1923.

1,440,983

C. HAMMER.
CAPPING MACHINE.
FILED JUNE 25, 1920.

3 SHEETS-SHEET 1

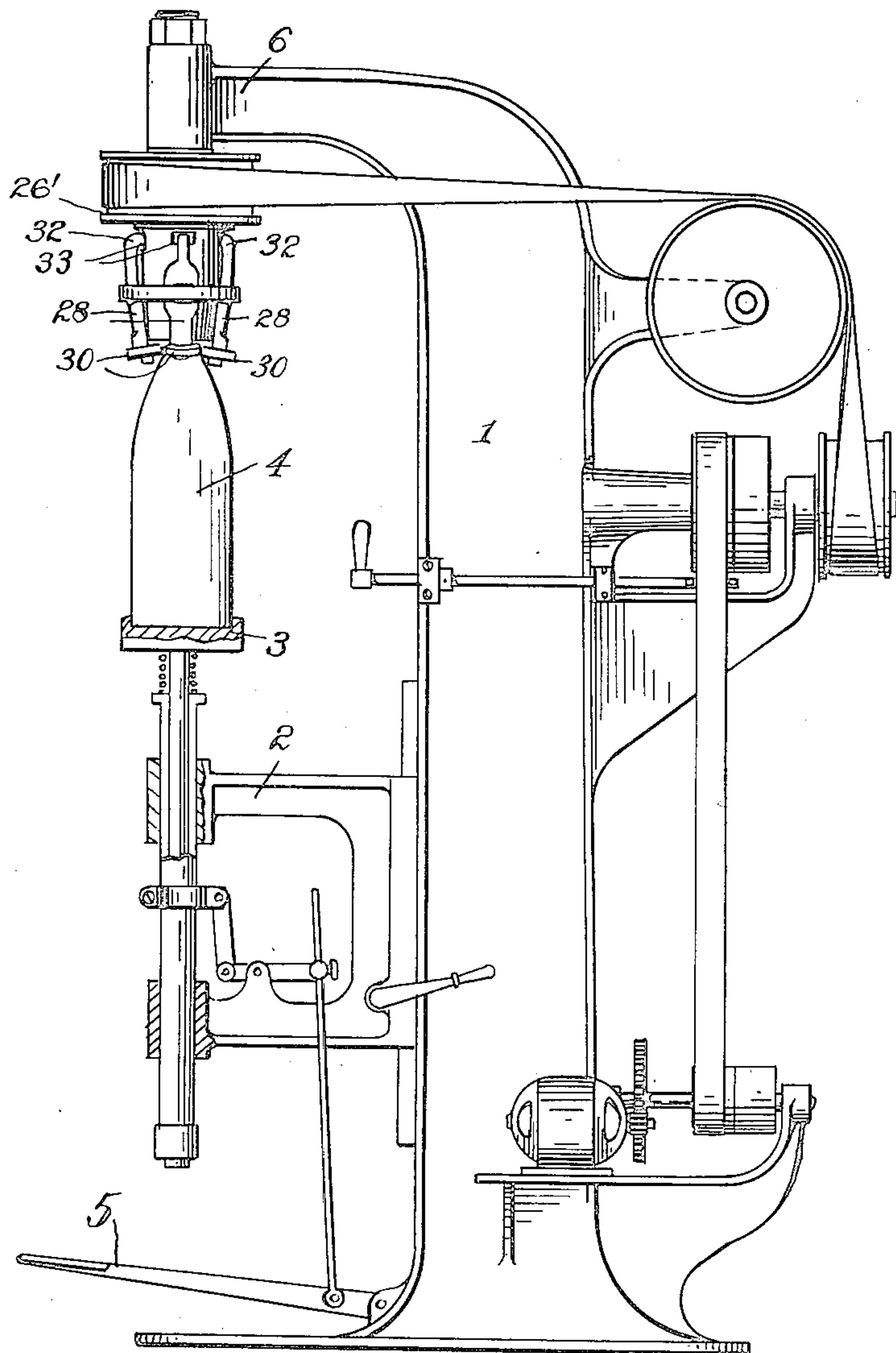


Fig. 1.

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3 SHEETS-SHEET 2

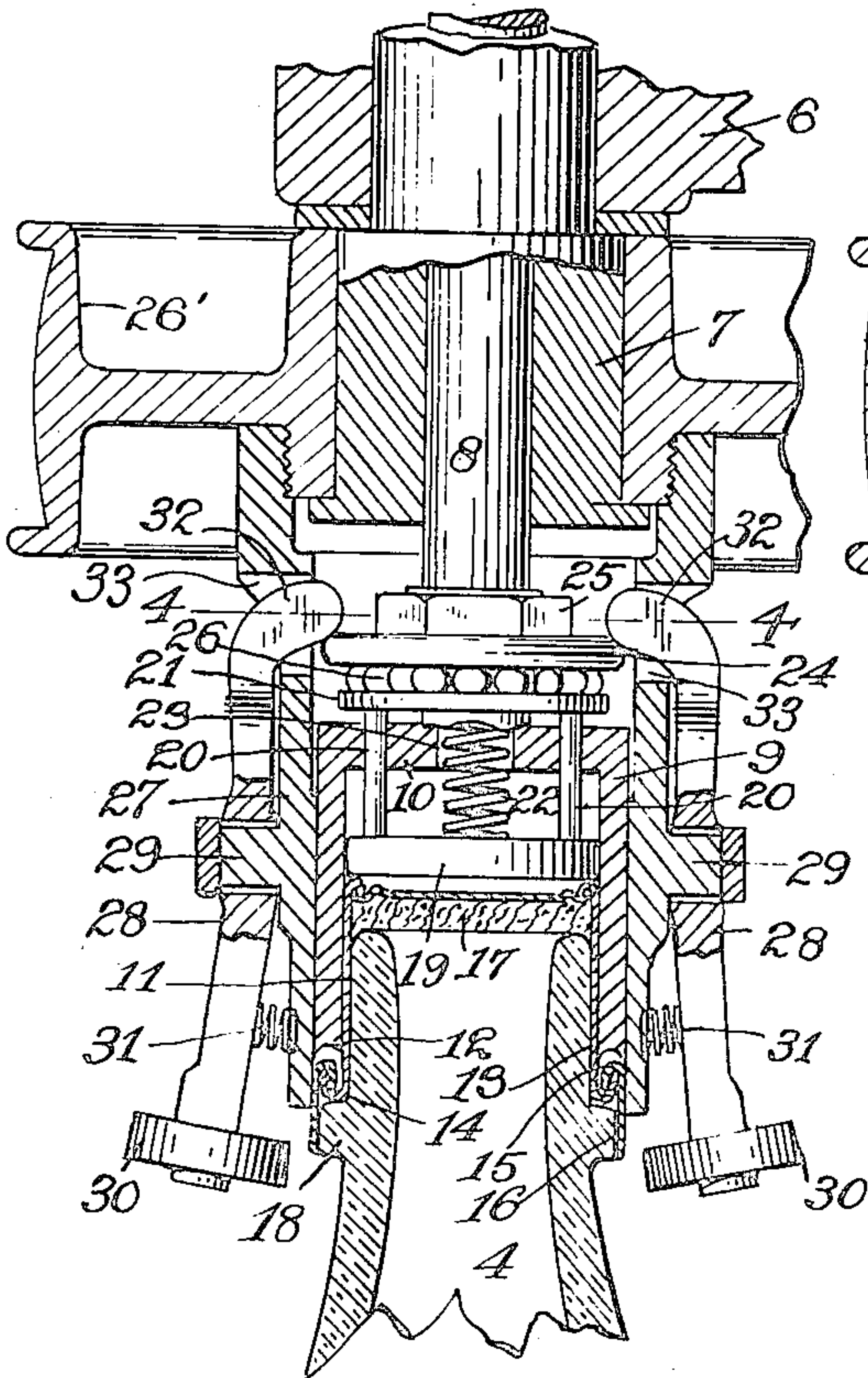


Fig. 2.

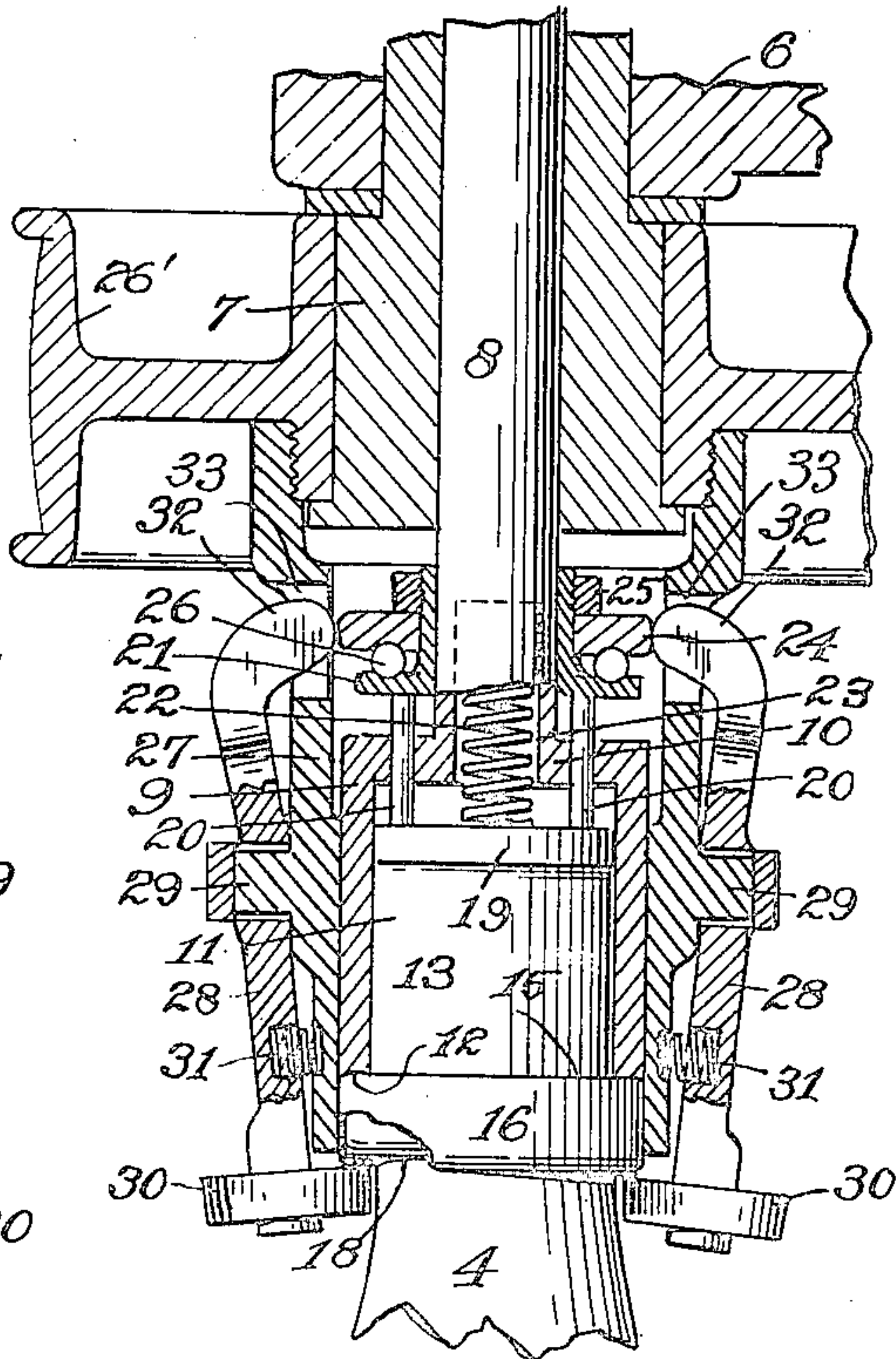


Fig. 3.

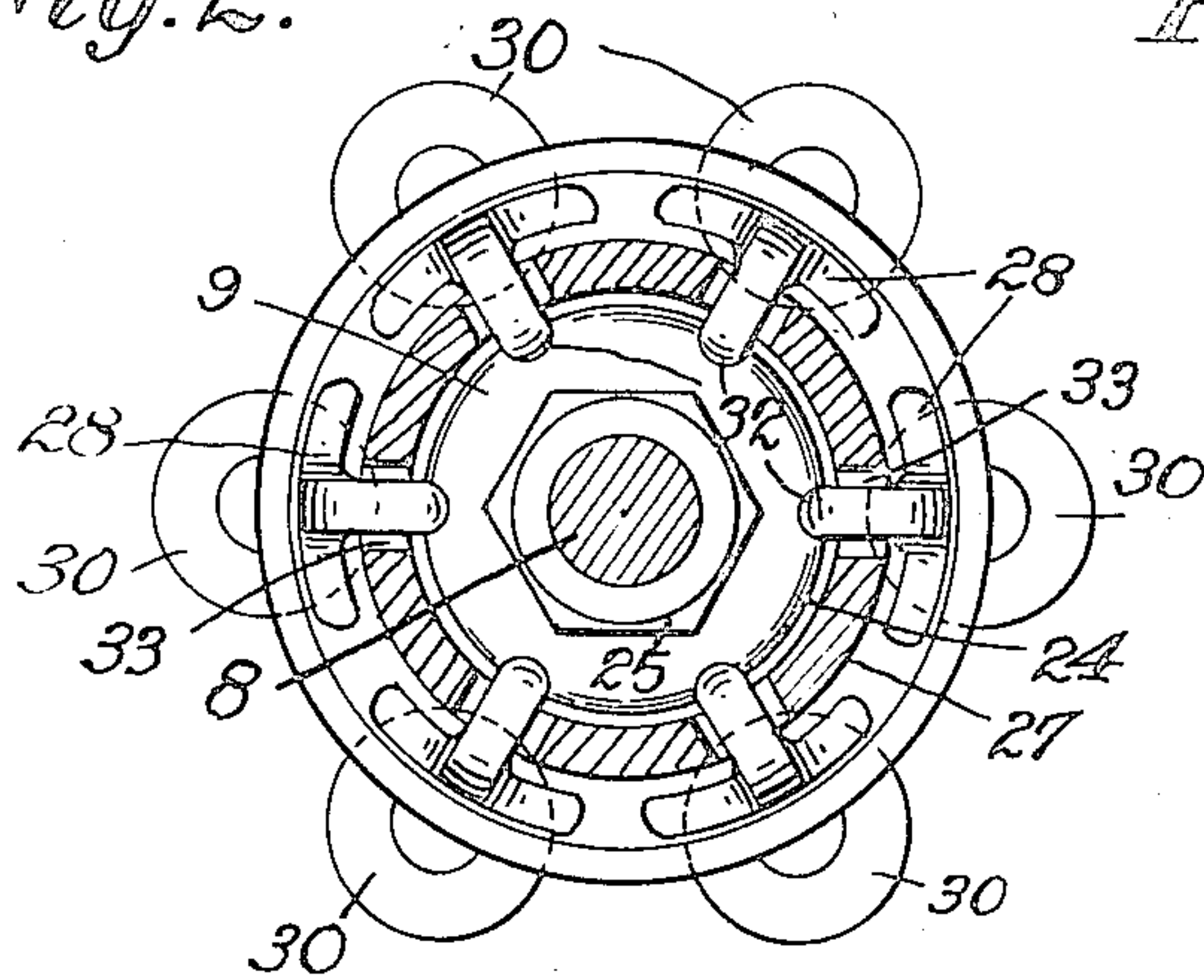


Fig. 4.

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3 SHEETS-SHEET 3

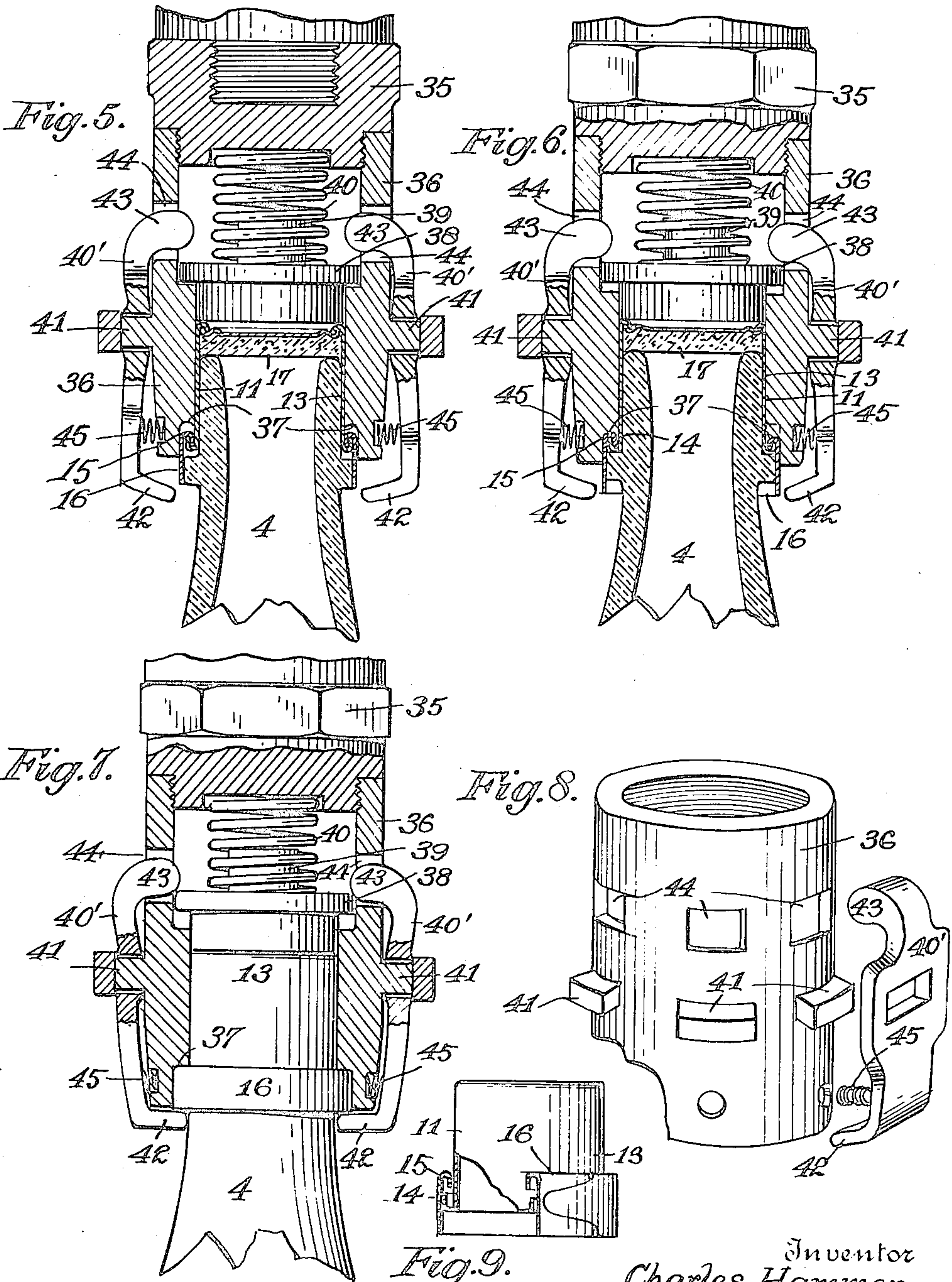


Fig. 9.
By his Attorney
Charles Hammer.
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UNITED STATES PATENT OFFICE.

CHARLES HAMMER, OF QUEENS, NEW YORK, ASSIGNOR TO AMERICAN METAL CAP COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

CAPPING MACHINE.

Application filed June 25, 1920. Serial No. 391,625.

To all whom it may concern:

Be it known that I, CHARLES HAMMER, a citizen of the United States, residing at Queens, in the county of Queens and State of New York, have invented certain new and useful Improvements in Capping Machines, of which the following is a specification.

This invention relates to cap sealing machines adapted to seal a thin sheet metal cap or closure on a bottle or similar container, which latter is provided with a sealing flange some distance below the upper edge.

The object of the present invention is the provision of an improved cap sealing machine, simple in construction and efficient in operation.

An object of the present invention is the provision of an improved machine in which one member will pass down around the cap to its lower portion and is provided with a spring member to engage the margin of the cap at the top; while a bending member is provided that will cause the lower extended edge or extension of the cap to be bent inward beneath the bottle flange, while the first two members are exerting downward pressure on the cap.

A further object of this invention is the provision of means for causing the bending member to be rotated while pressing inwardly, and which inward movement is controlled by the recession of the spring pressed member that engages the top of the container.

In the accompanying drawings showing embodiments of my invention, Fig. 1 is an elevation, partly in section of a complete machine.

Fig. 2 is a vertical section through the sealing members, showing the upper part of a container.

Fig. 3 is a similar view with the parts in the final sealing position.

Fig. 4 is a cross section on the line 4—4 of Fig. 2.

Fig. 5 shows a modified form of sealing means in vertical section.

Figs. 6 and 7 are similar views in advanced positions of the parts.

Fig. 8 is a detail of the parts shown in Fig. 5.

Fig. 9 shows the closure.

As illustrated in Figs. 1—4, the sealing machine comprises a frame or standard 1 having a bracket 2 provided with a support 3

for the container 4. In mechanism of this character it is usual to cause the container support to be forced upwardly, to bring the closure on the top of the container into engagement with the sealing member. In the present machine this can be done by a foot treadle 5 and suitable connecting means.

At the top of the standard is a supporting arm 6 that carries a head 7 for the sealing means. This head supports a stem 8 extending downward and which carries a sleeve 9 on its lower end, connected with the stem by a disc 10. The sleeve is rigidly connected with the head and does not move, and is of an inner diameter to pass down around the closure or cap 11, shown in Fig. 9. The lower edge of the sleeve is provided with a groove or channel 12. The closure comprises a body portion 13 having a flange or channel 14 on its lower end, that engages a channel portion 15 on a sealing band 16. The closure is preferably provided with an inner sealing disc 17 of compressible material. The bottle 4 is shown provided with a sealing flange 18, and the joint of the band and cap when applied to the bottle with the sealing disc in the cap, will be located a short distance above this flange when first applied, as indicated in Figs. 2 and 5.

In the bore of the sleeve 9 is arranged a plunger, comprising a disc 19 and several stems 20 passing through suitable apertures in the head disc 10. These stems are connected above the head disc by a collar 21 slidable on the stem 8. A coil spring 22 is placed in a socket 23 in the head stem 8, and presses the plunger downwardly in the sleeve 9. A bearing ring 24 is located above the collar 21, and below a nut 25 on the stem, and ball bearings 26 are between the upper face of the collar and the ring 24. This will permit rotation of the ring 24.

Means are further provided in this sealing machine to press the lower edge of the cap sealing band 16 inwardly beneath the flange 18 on the bottle, and which means in one form are caused to travel around the bottle relative to the head member, the upward movement of the bottle into the head sleeve compressing the plunger. On the head 7 is rotatably mounted a pulley 26', from which depends a sleeve 27, that surrounds the head sleeve 9 but is rotatable thereon. On this sleeve 27 are mounted a set of arms 28 on pivots 29, whereby the arms have their lower

ends, that are provided with rolls 30, swing in to engage the cap band and press it beneath the bottle flange, as shown in Fig. 3, the arms being normally held outwardly by springs 31. Means are provided for causing these arms to swing by the sliding of the spring plunger in the head sleeve, and for this purpose the upper ends 32 of these arms 28 are extended inwardly through suitable openings 33 in the sleeve 27, to engage the bearing ring 24 carried by the spring plunger.

In the operation of this mechanism, the bottle containing the closure is moved upward by the treadle, and the bottle top will enter the sleeve 9 of the head and engage the spring plunger. Further upward movement will cause pressure on the bottle top by the spring plunger, and the lower channel end of the head sleeve 9 will engage the joint of the closure and press it closed, preferably by engagement with the flange on the bottle. This will serve to compress the sealing disc on top of the bottle, by the spring plunger. The recession of the spring plunger in the head sleeve will cause the bearing ring 24 to engage the bent ends 32 of the arms, and force them outwardly and so bring the rolls 30 inward to engage the band 16, and bend it against the lower wall of the bottle flange, see Fig. 3.

It will be understood that the head sleeve 9, and the plunger 19 are not permitted to rotate, but the sleeve 27 is rotated by the pulley 26'. The bearing ring 24 is rotatable on the plunger member, by means of its ball bearings, and will partake of the movement around of the arms 28.

In Figs. 5-8 is shown a modification, comprising a sleeve with a spring plunger therein, and bending arms carried by the sleeve, but which do not rotate around the container. In this form the head 35, carried by the frame or arm 6 in a suitable manner, has a depending sleeve 36, with a grooved lower end or shoulder 37 for engagement with the cap at the joint. The spring plunger slides in the sleeve, and comprises a disc 38 with a stem 39, and a coil spring 40 between the disc and the head 35. A set of arms 40' are carried on pivots 41, with their lower bent ends 42 arranged to press the sealing band 16 in below the flange on the bottle. The upper ends 43 of these arms pass through apertures 44 in the sleeve to engage the disc 38 of the plunger, when the latter is forced upward by the advance of the bottle. Springs 45 retract the arms when free from the plunger. It will be understood that in the construction shown in Figs. 1-4 the swinging arms carried by the sleeve 27 move in a fixed path relative to the plane of the sleeve lower end, and that this path does not change during the rotation of the sleeve that carries these arms. It is the re-

cession of the plunger relative to the main sleeve that causes the arms to swing inwardly. The sleeve carrying the arms rotates relative to the main sleeve, but does not move axially of such sleeve.

In the modification shown in Figs. 5-8 the same operation is effected, but the arms always move in a fixed path relative to the supporting head.

In both of the constructions set forth it will be understood that the main sleeve has a cylindrical bore that passes down over the main portion of the cap in close proximity thereto, and its lower portion or end has a grooved shoulder to engage the joint of the cap and band whereby to close such joint, and also preferably to press this joint against the flange on the bottle. In connection therewith the plunger that slides in the said bore of the sleeve, is arranged to engage the cap at the marginal portion of its top, to force the top against the bottle end and compress the sleeve disc to form a tight joint.

The method or process of sealing the cap, as set forth in the present application, is not claimed herein, but is claimed in Patent No. 1,353,801, granted to me June 21, 1920.

Although I have described my invention in its preferred form, it is to be understood that I do not limit myself to the construction herein shown and described, except insofar as defined in the claims and embraced within the scope thereof.

What I claim is:—

1. In a machine for sealing a jointed band closure on a flanged container, the combination of supporting means, a sleeve member provided with a shoulder at the lower end portion and adapted to pass down around the closure to engage the band joint and force the closure down on the container, a spring plunger slidable in the sleeve member to engage the closure top at the marginal portion, and an annular bending member arranged to close inwardly on movement of the plunger, whereby to bend the cap band inwardly under the container flange, while the plunger exerts downward pressure on the closure top.

2. In a machine for sealing a jointed band closure on a flanged container, the combination of supporting means, a sleeve member provided with a shoulder at the lower end portion and adapted to pass down around the closure to engage the band joint and force the closure down on the container, a spring plunger slidable in the sleeve member to engage the closure top at the marginal portion, and an annular bending member arranged for operation by the plunger to close inwardly on recession of the plunger in the head, whereby to bend the cap band inwardly under the container flange, while the plunger exerts downward pressure on the closure top.

3. In a machine for sealing a jointed band closure on a flanged container, the combination of supporting means, a sleeve member provided with a shoulder at the lower end
 5 having a downwardly facing channel therein and adapted to pass down around the closure to engage the band joint and force the closure down on the container, a spring plunger slidable in the sleeve member to engage the
 10 closure top at the marginal portion, and an annular bending member arranged to close inwardly on movement of the plunger, whereby to bend the cap band inwardly under the container flange, while the plunger
 15 exerts downward pressure on the closure top.

4. In a machine for sealing a jointed band closure on a flanged container, the combination of supporting means, a sleeve member provided with a shoulder at the lower end
 20 having a downwardly facing channel therein and adapted to pass down around the closure to engage the band joint and force the closure down on the container, a spring plunger slidable in the sleeve member to engage the
 25 closure top at the marginal portion, a set of arms pivotally supported to close under said sleeve member, and also arranged to be carried bodily around the said member to bend the cap end portion inwardly, means operatively connected with the plunger to cause
 30 the arms to swing inward during rotation of the arms from the recession of the plunger in the sleeve, and means for rotating the arms around the head.

5. A cap sealing machine, comprising a head, a sleeve rigidly depending from the head, a plunger slidable in said sleeve, a collar slidable above the sleeve and rigidly connected with said plunger, a spring to force the
 40 plunger downwardly in the sleeve, a bearing ring rotatably mounted on said collar to be advanced therewith, a pulley rotatable on said head, a slotted supporting sleeve secured to said pulley and surrounding the
 45 inner sleeve, a set of arms pivoted on said supporting sleeve to swing thereon and to be bodily rotated by the pulley around said inner sleeve, a roller on the lower end of each arm arranged to move inward with the
 50 arm to engage the closure, said arms having their upper ends projecting inwardly through the slotted sleeve for engagement with said bearing ring on movement of the plunger and bearing ring relative to the
 55 inner sleeve, whereby the arms and rollers are swung inwardly during their rotation by the pulley.

6. A cap sealing machine comprising a head, a stem depending from the head, an
 60 apertured disc on the stem, a sleeve depending from the disk, a plunger slidable in said sleeve, a collar slidable on the stem, rods passing through the disc and rigidly connecting the collar with the said plunger, a
 65 spring to force the plunger downwardly in

the sleeve, a bearing ring rotatably mounted on said collar to be advanced therewith, a pulley rotatable on said head, a slotted supporting sleeve secured to said pulley and surrounding said inner sleeve, a set of arms
 70 pivoted on said supporting sleeve to swing thereon and to be bodily rotated by the pulley around said inner sleeve, a roller on the lower end of each arm arranged to move inward to engage the closure, said arms having
 75 their upper ends projecting inwardly through the slotted sleeve for engagement with said bearing ring on movement of the plunger and bearing ring relative to the inner sleeve, whereby the arms and rollers are
 80 swung inwardly during their rotation by the pulley.

7. In a cap sealing machine, the combination of supporting means, a depending member adapted to closely encircle the side walls
 85 of a cap, a spring-pressed plunger therein and in position to engage the top of the cap adjacent to the upper end of said depending member, and a plurality of swinging arms in position to be engaged by said
 90 spring-pressed plunger and operative to bend the lower edge of the cap inwardly on the movement of said spring-pressed plunger in one direction.

8. In a cap sealing machine, the combination of supporting means, a depending member adapted to closely encircle the side walls
 95 of a cap, a spring-pressed plunger therein and in position to engage the top of the cap adjacent to the upper end of said depending member, a plurality of swinging arms in position to be engaged by said
 100 spring-pressed plunger and operative to bend the lower edge of the cap inwardly on the movement of said spring-pressed
 105 plunger in one direction, and means for rotating said swinging arms.

9. In a cap sealing machine, the combination of supporting means, a depending member adapted to closely encircle the side walls
 110 of a cap, a spring-pressed plunger therein and in position to engage the top of the cap adjacent to the upper end of said depending member, a second depending member enclosing said first depending member,
 115 and a plurality of swinging arms carried by said last depending member in position to be engaged by said spring-pressed plunger and operative to bend the lower edge of the cap inwardly on the movement of said
 120 spring-pressed plunger in one direction.

10. In a cap sealing machine, the combination of supporting means, a depending member adapted to closely encircle the side walls of a cap, a spring-pressed plunger
 125 therein and in position to engage the top of the cap adjacent to the upper end of said depending member, a second depending member enclosing said first depending member, a plurality of swinging arms carried
 130

by said last depending member in position to be engaged by said spring-pressed plunger and operative to bend the lower edge of the cap inwardly on the movement of said spring-pressed plunger in one direction, and means for rotating said last depending member and thereby the swinging arms.

11. In a cap sealing machine, the combination of supporting means, a fixed depending member adapted to closely encircle the side walls of a cap, a spring-pressed plunger movable within said depending member and in position to engage the top of the cap, a slotted rotary depending member surrounding said fixed depending member, a plurality of swinging arms carried by said rotary depending member in position to have the upper ends thereof project through the slots of said member and engaged by said spring-pressed plunger and operative to have the lower ends thereof bend the lower edge of the cap inwardly on the movement of said spring-pressed plunger in one direction, and means for rotating said rotary depending member and arms.

12. In a cap sealing machine, the combination of supporting means, a depending member adapted to closely encircle the side walls of a jointed cap, a spring-pressed plunger therein and in position to engage the top of the cap adjacent to the upper end of said depending member, a plurality of swinging arms in position to be engaged by said spring-pressed plunger and operative to bend the lower edge of the cap inwardly on the movement of said spring-pressed plunger in one direction, said depending member having means adjacent to

the lower edge thereof for engaging the joint of said cap.

13. In a cap sealing machine, the combination of supporting means, a depending member adapted to closely encircle the side walls of a jointed cap, a spring-pressed plunger therein and in position to engage the top of the cap adjacent to the upper end of said depending member, a second depending member enclosing said first depending member, a plurality of swinging arms carried by said last depending member in position to be engaged by said spring-pressed plunger and operative to bend the lower edge of the cap inwardly on the movement of said spring-pressed plunger in one direction, said first depending member having means adjacent to the lower edge thereof for engaging the joint of the cap.

14. In a cap sealing machine, the combination of supporting means, a depending member adapted to closely encircle the side walls of a jointed cap, a spring-pressed plunger therein and in position to engage the top of the cap adjacent to the upper end of said depending member, a plurality of swinging arms in position to be engaged by said spring-pressed plunger and operative to bend the lower edge of the cap inwardly on the movement of said spring-pressed plunger in one direction, means for rotating said swinging arms, said depending member having means adjacent to the lower edge thereof for engaging the joint of the cap.

Signed at New York city, N. Y., on June 23rd, 1920.

CHARLES HAMMER.