

P. CONRAD.
MECHANISM FOR SEALING BOTTLES.
APPLICATION FILED APR. 18, 1908.

963,210.

Patented July 5, 1910.

3 SHEETS—SHEET 1.

FIG. 2

FIG. 1

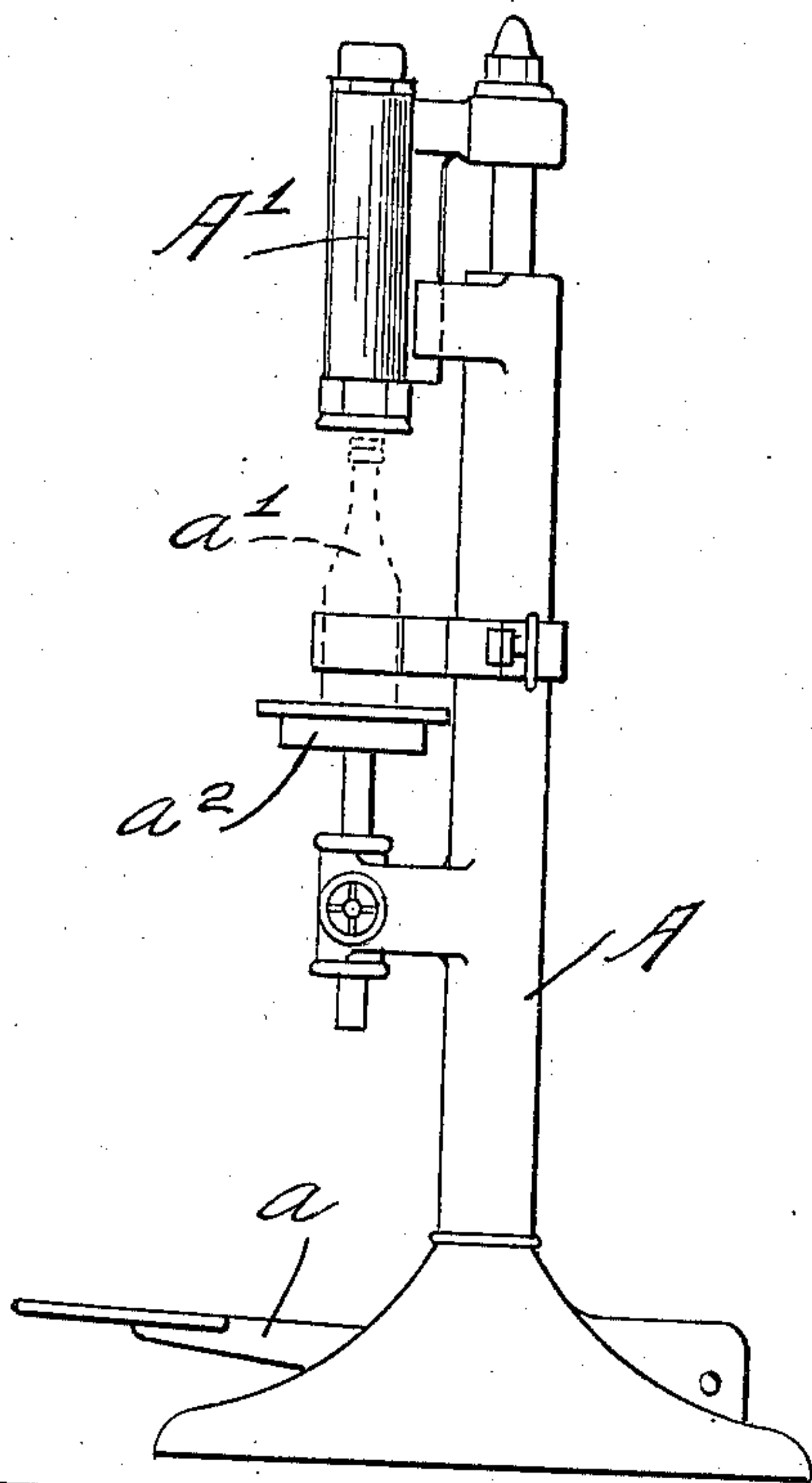
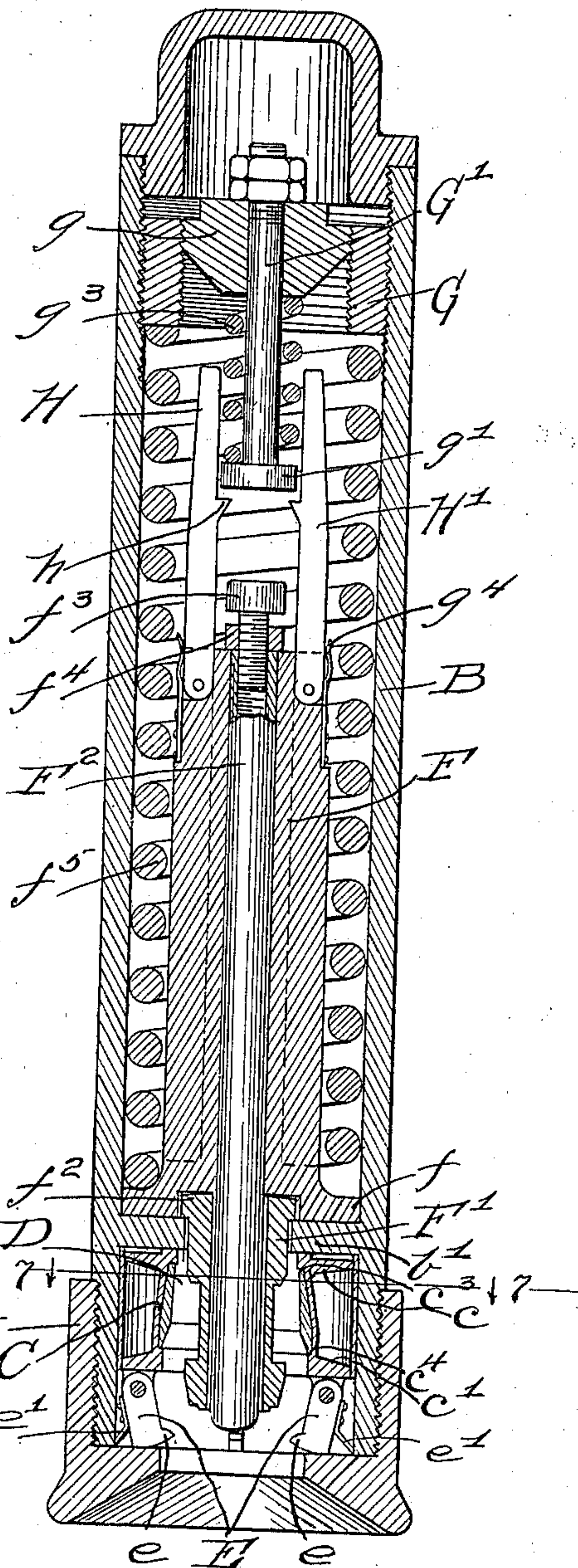
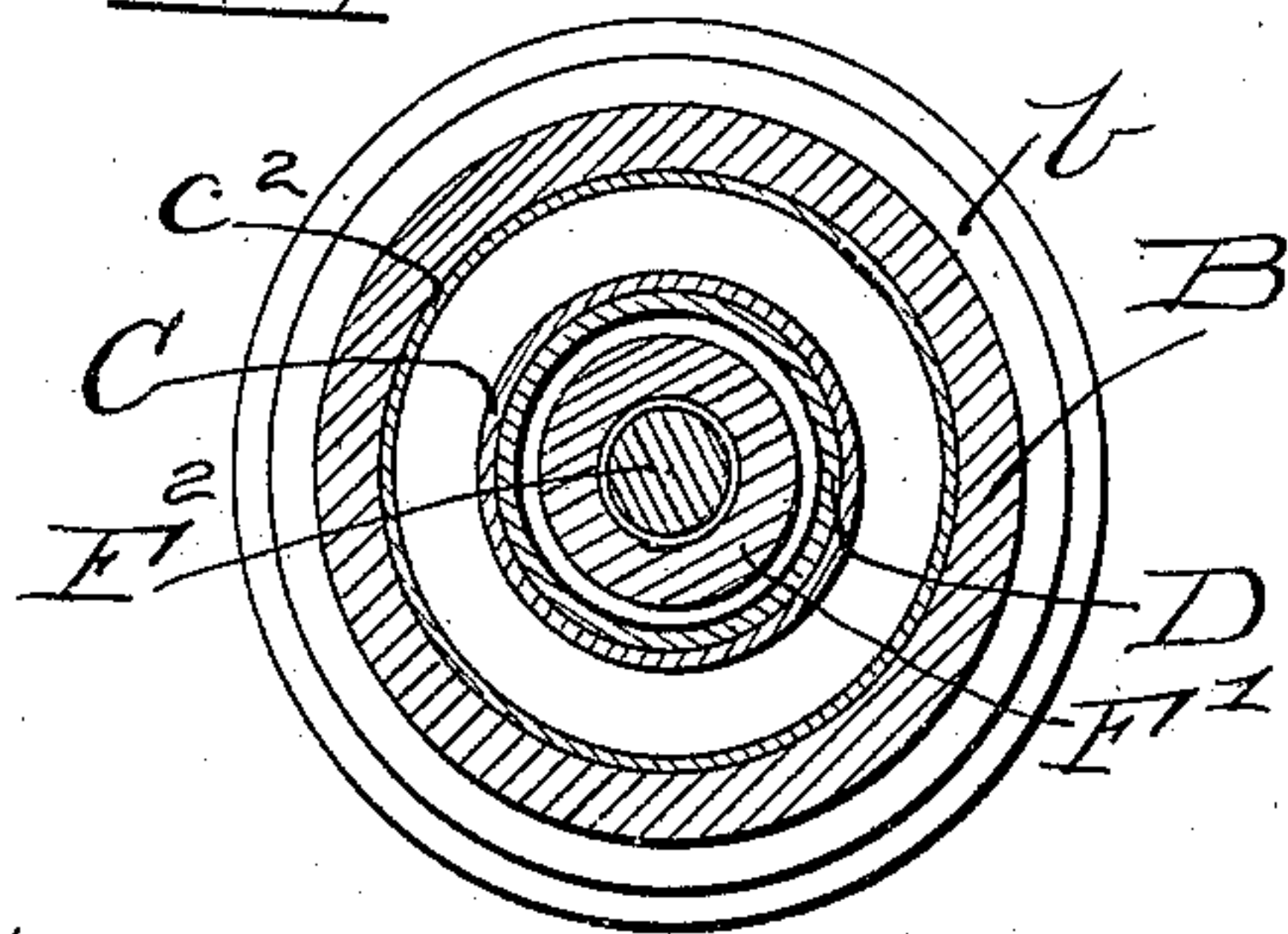


FIG. 7



WITNESSES

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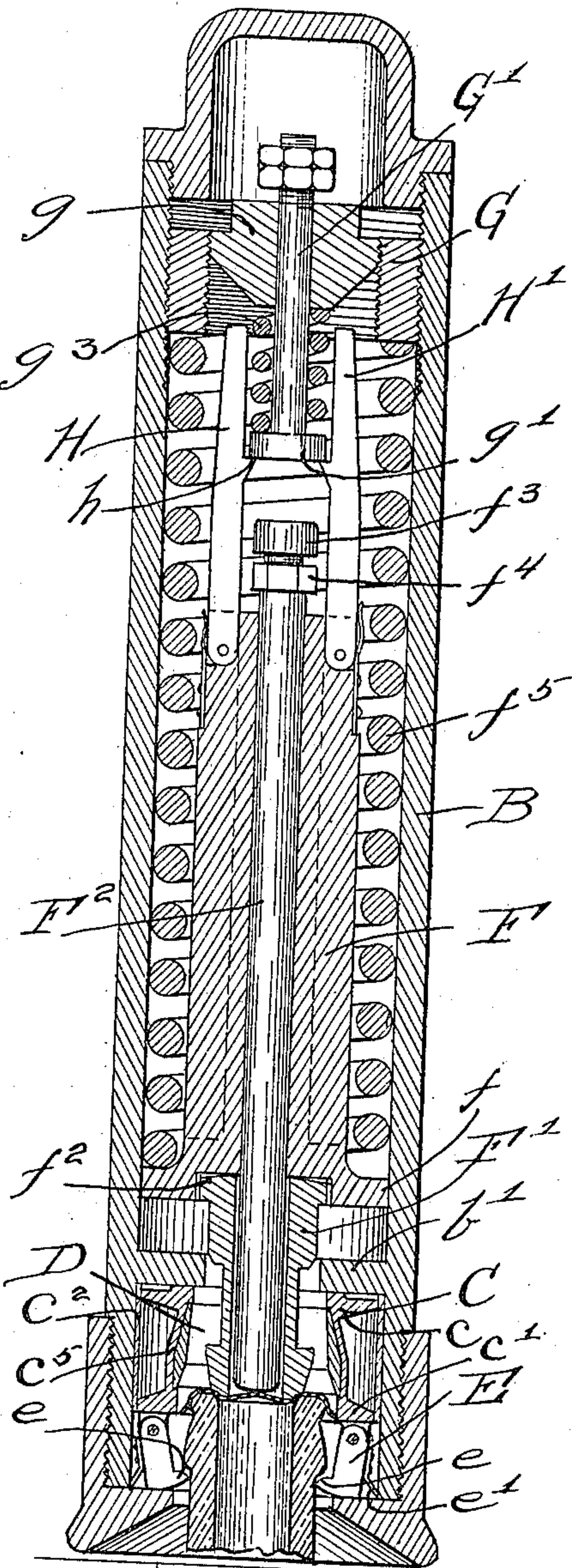
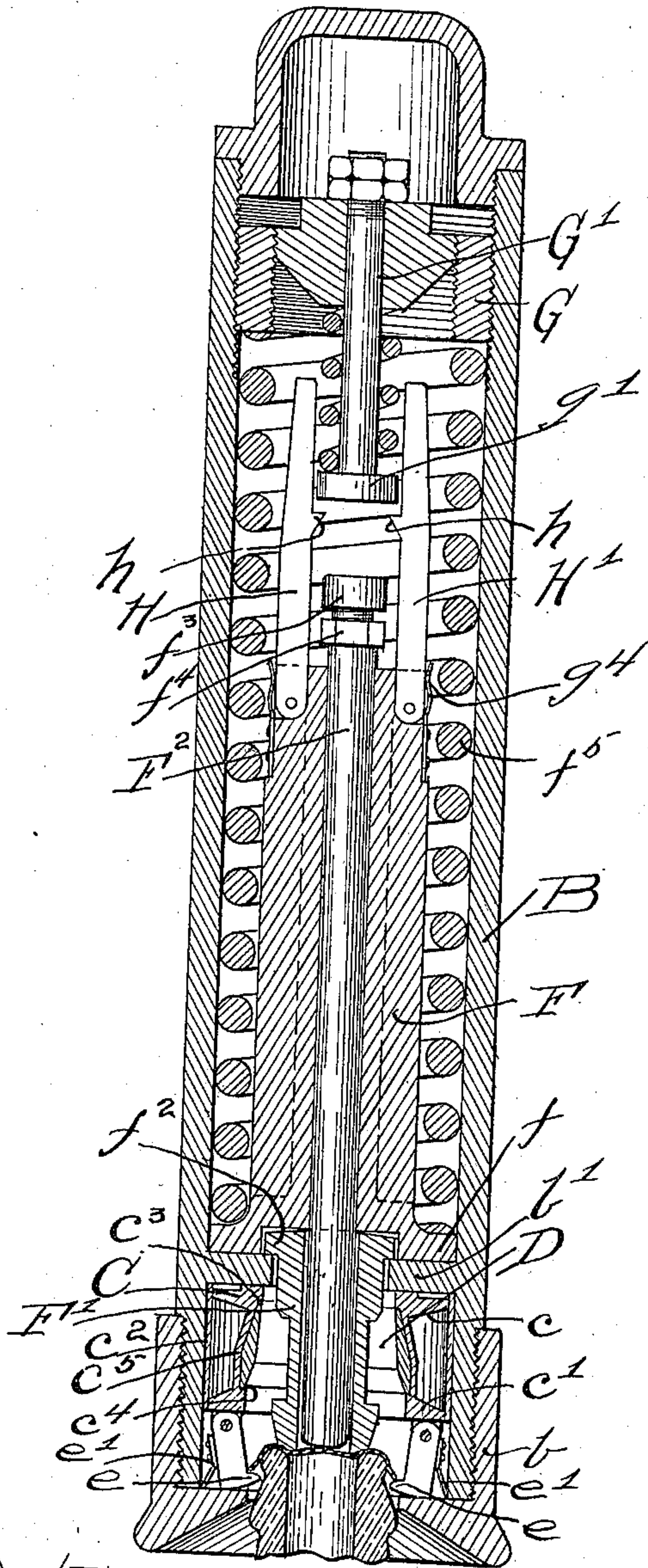
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Fig 3

Fig 4



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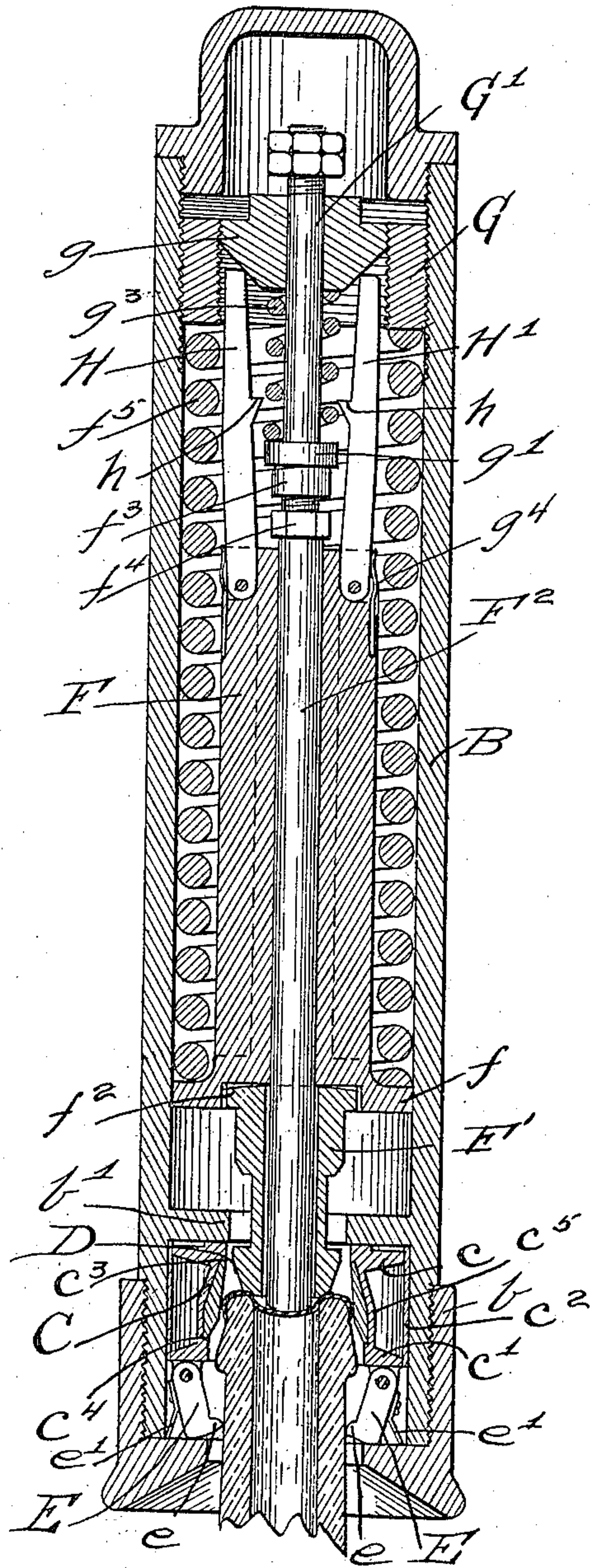
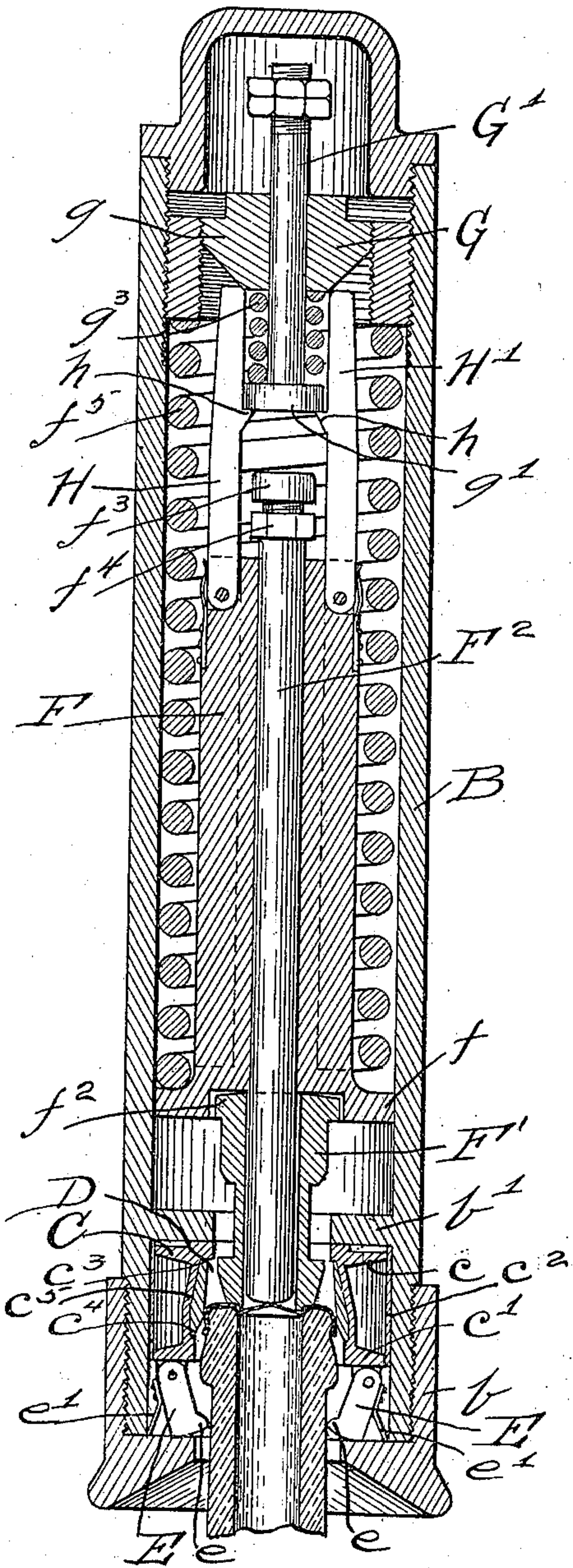
963,210.

Patented July 5, 1910.

3 SHEETS—SHEET 3.

F 1 5

F 1 6



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UNITED STATES PATENT OFFICE.

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MECHANISM FOR SEALING BOTTLES.

963,210.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed April 18, 1908. Serial No. 427,947.

To all whom it may concern:

Be it known that I, PAUL CONRAD, a subject of the Emperor of Germany, and a resident of the city of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Mechanism for Sealing Bottles; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of the invention is to provide mechanism for sealing bottles by the application of the bottle seal set forth in my application for United States Letters Patent filed on the 13th day of March, 1908, Serial No. 420,862. The bottle seal shown and described in said application for patent comprises a specially constructed sealing cap provided with an internal packing material, said cap being applied with pressure to the bottle and at the same time the metal composing the same being drawn into conformity with any irregularities in the bottle neck, the central portion thereof being dished inwardly to afford both an inward and an outer grip on the bottle neck. To accomplish this special mechanism is required to carry out and perform the successive steps desirable in applying the seal to secure the most efficient application thereof in sealing.

The invention consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a side elevation of any sealing machine provided with a sealing head embodying my invention. Fig. 2 is an enlarged vertical section of a sealing head showing the parts in normal position. Fig. 3 is a similar view showing the bottle neck with the sealing cap inserted, and at the moment of first applying pressure on the cap to hold the same in place. Fig. 4 is a similar view illustrating the form the parts assume as the pressure increases either as the sealing head descends or the bottle rises. Fig. 5 is a similar view showing a further stage of the compression applied on the sealing cap, the flanges crimped inwardly and the plunger raised preparatory to release. Fig. 6 is a similar view showing the final step in the method, namely, the release of the spring plunger

and the inward dishing or springing of the central portion of the cap. Fig. 7 is a section on line 7—7 of Fig. 2.

As shown in the drawings: A indicates the standard or frame of any suitable sealing machine, but which in this instance, is provided with a vertically movable sealing head, indicated as a whole by A', and which is operated vertically by means of the foot lever *a*, and any suitable operative connections to move said sealing head downwardly upon the bottle *a'*, shown in dotted lines and which is supported upon the adjustable table *a*². Said bottle may be of the usual or any suitable kind adapted to be sealed by engagement thereon of spring or friction caps and is provided at the upper end of the neck with an external bead, as is usual. Said sealing head comprises a cylindric shell B, of suitable length, which is externally threaded at its lower end to receive the centering end piece *b*, which, as shown, is provided with a central bore materially larger than the size of the neck of the bottle, and to which, from the periphery, the bottom of said centering end tapers upwardly. Said shell or casing B, is provided near its lower end with an internal peripheral rib *b'*, affording an aperture therethrough at the axis of the shell and dividing the casing into a relatively small lower, and a larger upper chamber.

Within the lower chamber and bearing against the rib *b'*, is a cage C, provided at each end with a peripheral rib *c—c'*, which extends outwardly to, and fits into the cylindric shell *c*², fitted in said lower chamber of the casing. Said peripheral ribs are connected by a sleeve *c*⁵. Said sleeve *c*⁵ on its inner side extends upwardly approximately in cylindric form for a short distance and thence tapers inwardly to a peripheral inner shoulder, as shown in Figs. 3 to 6, and indicated by *c*³. At the bottom of said sleeve of the cage is also provided a shoulder indicated by *c*⁴, and within the cage is provided a drawing ring D, which is fitted between the shoulders *c*³—*c*⁴, and at its lower end from said shoulder tapers somewhat abruptly inwardly to a diameter approximating that of the bottle neck at the bead plus the thickness of the sealing cap and from thence tapers upwardly at a somewhat slighter inclination.

Pivotaly engaged to the bottom of the

cage C, are a plurality of radially acting, inwardly pressed spring fingers E. These, as shown, comprise depending blades each provided with an inwardly projecting point
 5 e at the lower end adapted to bear against the sides of the bottle neck and taper upwardly and inwardly on the lower end and tapering upwardly and outwardly on the upper side to permit the bottle neck to be
 10 inserted and withdrawn. At the rear and on the outer side of each of said fingers is provided a leaf spring e', which serves to bear the same at all times against the bottle neck to center the same exactly and to afford in effect a resilient guide therefor.

Above the rib b', and extending upwardly in the upper chamber is a follower F, which is provided with a cylindric axial aperture therethrough and at its lower end is provided with a peripheral flange f, adapted to seat on the rib b', between the chambers. Also provided in the lower end of the follower is a central recess adapted to receive the enlarged end of the presser foot F', which is provided at its upper end with a flange f', of greater diameter than the aperture through the flange or rib b', so that normally, said presser foot is supported by said flange with the end thereof depending
 25 into the lower chamber. Said presser foot is provided with an axial aperture therethrough corresponding with the aperture in the follower F, and at its lower end is shaped to fit partly upon the top and inner portion
 30 of the bottle neck and partly on the seal within the bottle neck.

Slidably secured in the follower and presser foot is a plunger F², of a length to extend below the presser foot normally, or,
 40 in other words, when a bottle is not engaged in place adapted for adjustment relative the follower and presser foot by means of a set screw f³, and jam nut f⁴, as shown more fully in Fig. 2. Fitted in the upper end of the casing B, is an internally threaded bearing ring G, and bearing against said ring and against the flange f', at the lower end of the follower is a strong pushing spring f⁵, herein shown as a spiral spring and acting normally to hold said follower and presser foot at the lower limits of their travel in said casing, but adapted to be graduated to vary the pressure to suit the pressure requirements in sealing by threading the ring G upwardly or downwardly in the casing, thus enabling a wide range of pressure to be secured by such adjustment. Threaded within the ring is a downwardly directed conical trip g, provided with a central aperture
 55 therethrough in which is slidably engaged a spring hammer comprising a rod or shaft G', having an enlarged head g', adapted to strike the head of the plunger F² (formed by the head of the set screw f³), to drive
 60 the plunger downwardly as the last stage in

the process. A pushing spring g³, bears against the lower end of the conical trip and against the upper side of the head g'.

Means are provided for retracting or elevating the hammer with the relative movement of the sealing head and bottle. For this purpose upwardly directed arms H—H' are pivotally engaged on each side of the follower and are of a length to extend upwardly and past the head g' of the spring hammer and to a point intermediate the same and the conical trip. A leaf spring g⁴, is suitably secured on the side of the follower and bears against each of said arms to press the same inwardly in substantially parallel relation. On the inner side of the arms at a point slightly below the head g' of the spring hammer when the follower is at its lowest point, is an inwardly directed detent h, adapted to engage beneath the head
 75 g', of the hammer, and to press the same upwardly as the follower rises, such upward movement relative the sealing head continuing until the upper ends of said arms strike the inclined faces of the conical trip, as
 80 shown in Figs. 5 and 6, to press said arms outwardly releasing the hammer to impart a hammer blow upon the plunger F².

The operation is as follows: The bottle is placed upon the table a² in position for its neck with the sealing cap in place, to enter the lower end of the sealing head and as the sealing head descends, or the bottle rises, as the case may be, the neck of the bottle is first accurately centered in the sealing head
 95 by means of the spring pressed fingers E, and continued movement of the sealing head or bottle forces the presser foot firmly upon the seal and partly within the neck of the bottle, as shown in Fig. 3. In this position
 100 the plunger being free to move upwardly, rests lightly upon the central, slightly crowned portion of the sealing cap and continues to ride thereon as the bottle ascends or the sealing head descends as the case may
 105 be. Further relative movement of the sealing head and bottle forces the presser foot and follower upwardly against the tension of the spring f⁵, which may be as before stated, graduated to suit the necessities or
 110 the conditions arising, it being the purpose to maintain sufficient pressure on and within the top of the sealing cap to permit the flange thereof when engaged in the tapered ring D, as shown in Fig. 5, to be firmly
 115 drawn and closed beneath the bead on the bottle neck. This drawing effect is sufficient to firmly press the packing material within the seal into any inequalities in the end of the bottle neck, positively closing the same
 120 and to some extent stretching or drawing the metal. This drawing effect is continued as the relative movement progresses until the upper ends of the arms or levers H—H' contact the outwardly tapered sides of the
 125 130

trip member *g*. Continued relative movement now forces said arms outwardly, releasing the hammer which, under the impulse of its spring, is thrown downwardly, and strikes the plunger F^2 , springing the previously upwardly dished or projecting center of the sealing cap inwardly, as shown in Fig. 6, the presser foot and the crimping ring *D*, rigidly holding the peripheral portion of the cap, meanwhile completing the drawing or stretching of the metal affording the cap to fill every inequality in the bottle neck and to afford within the bottle neck an inwardly dished portion on the cap, which, owing to its form, exerts constantly a peripheral or outer pressure which augments, of course, with any pressure from within. The sealing having been completed, the reverse movement takes place, as usual, and the bottle with the seal intact, is released and another inserted to undergo the same operation.

While I am confident that the invention is applicable to other forms of caps than those provided with a raised central portion before described, nevertheless I have shown the same more particularly in connection with such a cap, although well knowing that a similar effect may be obtained by applying any other style of sealing cap to afford first, a firm holding pressure on the bottle neck and partly within the same, second, while so firmly holding the sealing cap in place to crimp and draw the flange under the bead, and third, while so holding the cap and also firmly holding the crimp to press or drive the central portion of the cap inwardly to concave the same more or less and maintaining pressure on the cap as the opposite movement begins until pressure at the center of the cap is released.

Of course, many details of the particular construction of the sealing head may be varied and I therefore do not purpose limiting this application for patent otherwise than necessitated by the prior art.

I claim as my invention:

1. In a device of the class described a casing, a reciprocable follower therein, a plunger extending axially through the follower and supported loosely by the follower and a reciprocating hammer adapted to strike the plunger.

2. In a device of the class described a casing, a follower therein adapted to be elevated, a plunger extending through the follower adapted to be elevated a predetermined distance independently thereof and then with the follower and a hammer adjusted to striking position by the elevation of the follower adapted to be released to strike the plunger at the highest point of elevation of the plunger.

3. In a device of the class described a casing, a follower therein adapted to be ele-

vated, a plunger extending through the follower adapted to be elevated a predetermined distance independently thereof and then with the follower, a hammer adjusted to striking position by the elevation of the follower adapted to be released to strike the plunger at the highest point of elevation of the plunger, a spring resisting elevation of the follower and a spring resisting adjustment of the hammer.

4. A bottle sealing machine embracing a casing, a spring pressed follower supported therein, a spring pressed hammer above the follower, a plunger loosely supported by the follower adapted to be elevated, and means for elevating the hammer and releasing the same to strike the plunger when elevated.

5. A bottle sealing mechanism embracing mechanism for bearing a sealing cap against the top of a bottle, a cage, a die rigidly engaged thereto adapted to crimp the flange of the cap against the outer side of the neck of the bottle and mechanism for reversing the center of the cap to afford an inner seal.

6. In a device of the class described a casing having an internal seat, a follower loosely supported thereon, a plunger extending through the follower and loosely supported thereon, a presser foot around the plunger below the follower and means for actuating the plunger.

7. In a device of the class described a casing having an internal seat, a follower loosely supported thereon, a plunger extending through the follower and loosely supported thereon, a presser foot around the plunger below the follower, means for actuating the plunger, a chuck secured to the casing below the seat forming a chamber and a mechanism therein for forming the outer seal.

8. In a device of the class described a casing divided into an upper and lower chamber, mechanism in the lower chamber for forming the outer seal, a plunger supported in the upper chamber and extending axially into the lower chamber and mechanism inclosed in the upper chamber for actuating the plunger.

9. In a device of the class described a casing having an internal rib, a member loosely supported therein, a spring for normally holding the member on the rib, a plunger extending through the member and supported thereby, an actuating member, levers pivoted to the first named member adapted to adjust the actuating member into actuating position and a cam member adjustably secured in the casing adapted to release the levers from the actuating member.

10. In a device of the class described a casing having an internal rib, a member loosely supported therein, a spring for normally holding the member on the rib, a plunger extending through the member and

- supported thereby, an actuating member, levers pivoted to the first named member adapted to adjust the actuating member into actuating position, a cam member adjust-
 5 ably secured in the casing adapted to release the levers from the actuating member, a presser foot supported by said rib and surrounding the end of the plunger and mechanism around the plunger for forming
 10 the outer seal.
11. A bottle sealing mechanism comprising a casing, means therein for forming an inner seal, mechanism surrounding said means for forming an outer seal, a hammer
 15 in the casing, a reciprocating member in the casing, and means movable with the reciprocating member for adjusting the hammer to actuate the means for forming the inner seal.
12. A bottle sealing mechanism comprising
 20 ing a casing, means therein for forming an inner seal, mechanism surrounding said means for forming an outer seal, a hammer in the casing, a reciprocating member in the casing, means movable with the reciprocating
 25 ing member for adjusting the hammer to actuate the means for forming the inner seal, a spring for moving the reciprocating member in one direction and a pushing spring for actuating the hammer.
- 30 13. In a machine of the class described a plunger adapted to rest loosely upon the middle of the sealing cap until near completion of the sealing operation, a hammer adapted to strike said plunger downwardly
 35 to dish the middle of the cap as one of the final steps in completing the seal and levers for elevating the hammer prior to striking the plunger.
- 40 14. In a machine of the class described a plunger adapted to rest loosely upon the middle of the sealing cap, means for centering a bottle for the plunger to rest on said center of the cap, means for forming the
 45 plunger downwardly to dish the middle of the cap to complete the sealing operation, means for adjusting said means to actuating position prior to striking the plunger and an adjustable member for releasing said adjust-
 50 ing means.
15. In a machine of the class described mechanism for forming the cap to provide an outer seal, a plunger for forming an inner seal, a hammer adapted to strike said
 55 plunger downwardly to form said inner seal prior to withdrawal of the bottle and reciprocating levers for raising the hammer pivoted to swing outwardly to release the hammer.
- 60 16. In a machine of the class described a plunger adapted to rest loosely upon the middle of the sealing cap until near completion of the sealing operation, a spring operated hammer adapted to strike said
 65 plunger downwardly to dish the middle of the cap, mechanism movable with the plunger adapted to automatically actuate the hammer to increase the tension of the spring prior to the hammer striking the plunger and an adjustable cone member for
 70 releasing said mechanism from the hammer.
17. In a bottle sealing machine a cylindrical casing, a cam member threaded in the top thereof, a hammer projecting through
 75 the cam member having its head on the under side, a spring interposed between the hammer head and cam member, a follower in the casing, a spring for holding the same at its lowest limit of movement, means carried by the follower for engaging and ele-
 80 vating the hammer against its spring, and said means adapted to engage the cam member and release from the hammer and a plunger actuated by the hammer.
18. In a bottle sealing machine a cylindrical casing, a cam member threaded in the
 85 top thereof, a hammer projecting through the cam member having its head on the under side, a spring interposed between the hammer head and cam member, a follower
 90 in the casing, a spring for holding the same at its lowest limit of movement, means carried by the follower for engaging and elevating the hammer against its spring, and said means adapted to engage the cam mem-
 95 ber and release from the hammer, a plunger actuated by the hammer, a cage in the casing for closing the flange of the seal and pivotally supported members for holding the
 100 bottle seal prior to sealing.
19. A bottle sealing mechanism comprising a plunger, a hammer, pivotally supported reciprocating members adapted to engage and elevate the hammer, means for releasing said members from the hammer, a
 105 spring for actuating the hammer when released, means for adjusting the length of the plunger, a presser foot concentric with the lower end of the plunger and a sealing cage supported at the lower end of the plunger.
20. In a bottle sealing device mechanism for forming the outer seal, upwardly yielding means exerting pressure on the top of the cap to hold the same tightly against the
 115 top of the bottle, means resisting upward yielding of the same, a plunger extending axially through the pressure exerting means, and means elevated by upward movement of said pressure exerting means and automatically released to actuate the plunger to aid in
 120 sealing the cap.
21. In a device of the class described a plunger for forcing the central part of the cap into the mouth of a bottle and an automatically reciprocating member adapted to
 125 strike the plunger to actuate the same.
22. In a device of the class described a plunger for forcing the central part of the cap into the mouth of a bottle, an automatically reciprocating member adapted to
 130

strike the plunger to actuate the same and means adapting the member to yield.

23. In a device of the class described a plunger rounded on its lower end for sealing the central portion of a cap in a bottle neck, means for extending the plunger and a reciprocating member adapted to actuate the plunger to force the central portion of the seal inwardly.

24. In a sealing mechanism a plunger for engaging and forcing the central part of a cap in the bottle mouth, means in alignment therewith for engaging and actuating the plunger, and means for lengthening the plunger to vary the distance the central portion of the cap is forced into the bottle.

25. In a bottle sealing mechanism means for firmly pressing a cap on the bottle mouth, a plunger extending therethrough to strike the center of the cap and force it into the bottle neck, means for striking the plunger, pivotal means for elevating the striking means and means for spreading the pivotal means for releasing the striking means when elevated.

26. In a device of the class described a presser foot, a follower bearing thereon, a strong spring bearing on the follower, a plunger extending through the follower and presser foot, a hammer adapted to actuate the plunger, means pivoted to the follower

for elevating the hammer and means for releasing the hammer from the pivoted elevating means.

27. In a device of the class described a presser foot, a follower bearing thereon, a strong spring bearing on the follower, a plunger extending axially through the follower and presser foot, a hammer adapted to actuate the plunger, means pivoted to the follower for elevating the hammer, means for releasing the hammer from the pivoted elevating means, means for centering the bottle and cap for the plunger to strike the central portion of the cap and means for crimping the flange of the cap against the outside of the bottle.

28. In a device of the class described a presser foot, a spring pressed follower thereon, a plunger loosely supported by the follower and extending through the same and presser foot, means for engaging the plunger and means for forcing said means against the plunger.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

PAUL CONRAD.

Witnesses:

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