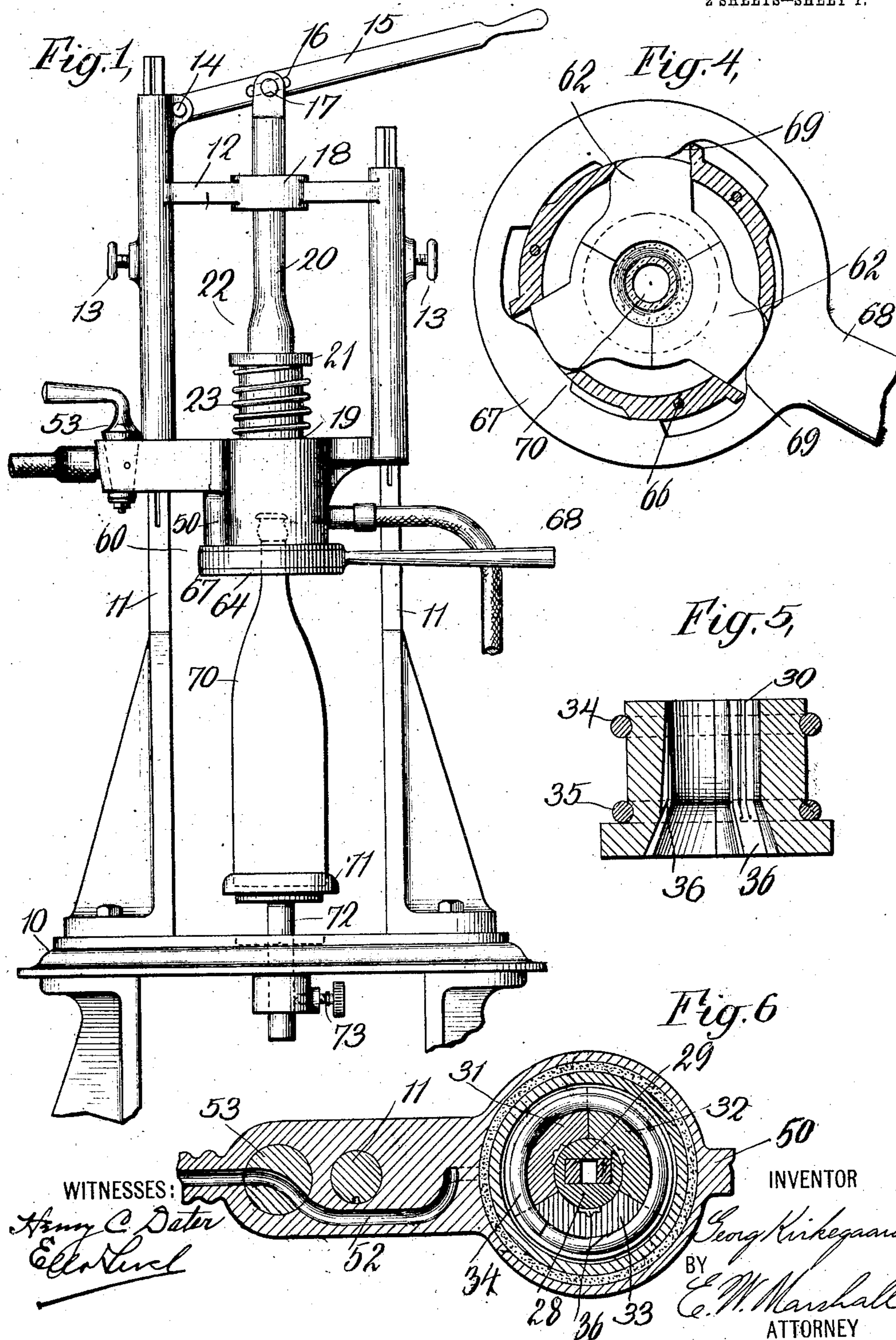


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2 SHEETS--SHEET 1.

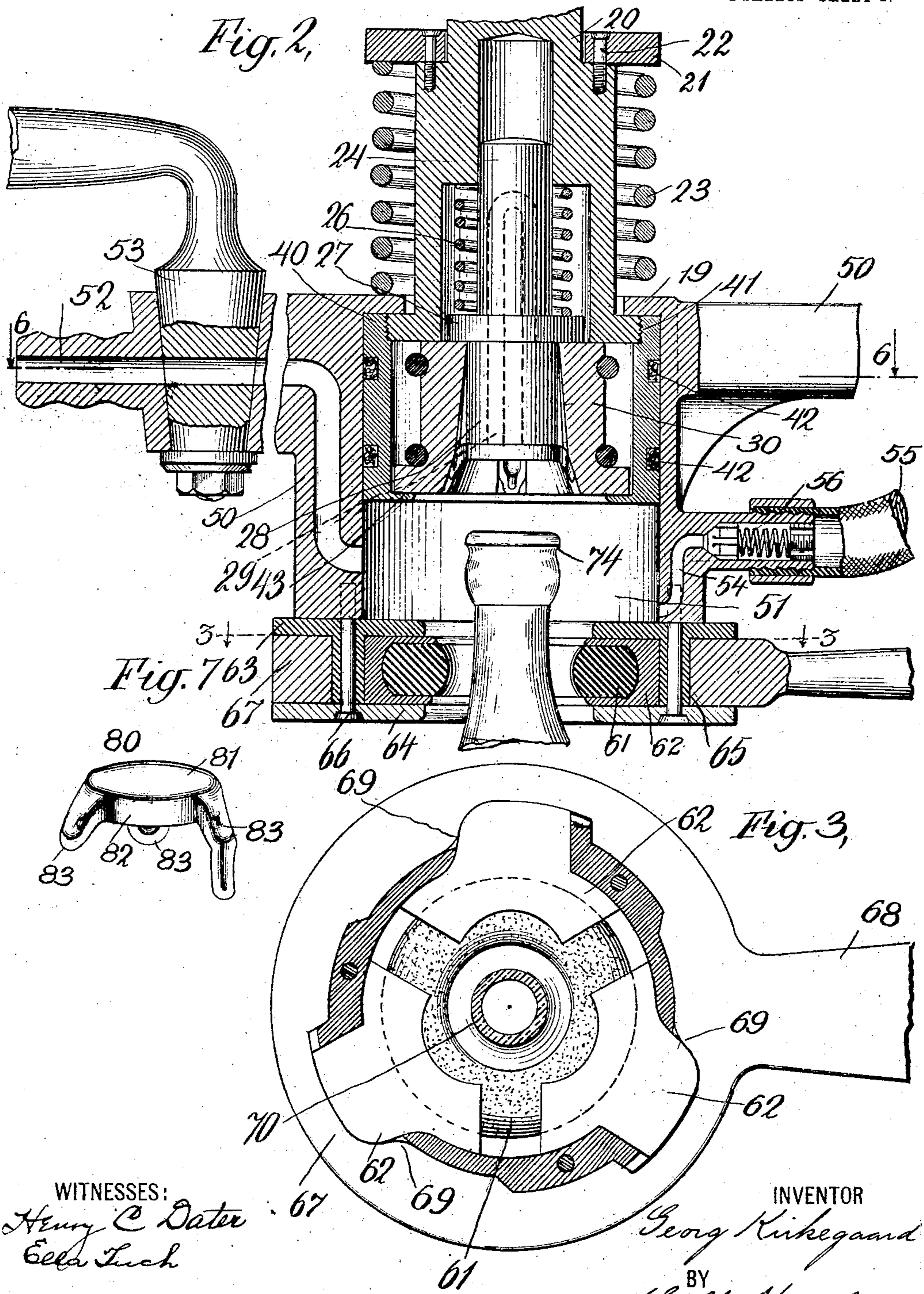


G. KIRKEGAARD.
BOTTLE FILLING AND CAPPING HEAD.
APPLICATION FILED FEB. 20, 1907.

931,624.

Patented Aug. 17, 1909.

2 SHEETS—SHEET 2.



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GEORG KIRKEGAARD, OF NEW YORK, N. Y., ASSIGNOR TO IMPERIAL STOPPER COMPANY, A CORPORATION OF MAINE.

BOTTLE FILLING AND CAPPING HEAD.

No. 931,624.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed February 20, 1907. Serial No. 358,476.

To all whom it may concern:

Be it known that I, GEORG KIRKEGAARD, a citizen of the United States, and a resident of the city of New York, in the county of New York and State of New York, United States of America, have invented certain new and useful Improvements in Bottle Filling and Capping Heads, of which the following is a specification.

My invention relates to new and useful improvements in bottle filling and capping heads and its object is to provide an efficient apparatus for use in conjunction with machines for applying caps to bottles under pressure.

I will describe my invention in the following specification and point out the novel features thereof in claims.

Referring to the drawings, Figure 1 is a side elevation of a bottle capping machine which embodies my invention. Fig. 2 is an enlarged sectional side elevation of my improved bottle capping head. Fig. 3 is a sectional plan view showing a packing device which I use in carrying out my invention, the section being taken through the line 3—3 of Fig. 2. Fig. 4 is a similar sectional plan view of the same parts as are shown in Fig. 3, this view showing the parts in different relative position. Fig. 5 is a sectional side elevation of a forming-head or collar which I use for locking the caps to bottles. Fig. 6 is a sectional plan view of certain parts of my apparatus, the section being taken through the line 6—6 of Fig. 2. Fig. 7 is a perspective view of the bottle cap which I have invented and which may be used to advantage with the apparatus herein shown and described.

Like characters of reference designate corresponding parts in all of the figures.

10 designates a supporting base.

11, 11 are vertical standards which are attached to this base and arranged to support certain of the parts.

12 designates a supporting-carriage splined upon these standards and arranged to be held thereon by means of hand screws 13, 13. At a point 14 on this supporting-carriage is pivoted a hand lever 15.

16 designates a slot in this hand lever.

20 designates a spindle which is vertically guided in the carriage 12 at 18. The upper part of this spindle is connected with a lever 15 by means of the pin 17. A collar 21 is

attached to the spindle 20 by means of screws 22, and a compression spring 23 placed between this collar and the portion 19 of the supporting carriage is arranged to hold the spindle and its connected parts normally in their raised position in which position they are shown in Figs. 1 and 2.

The spindle 20 is arranged to carry a compression shaft 24 which is pressed outward from the spindle by a compression spring 26. This compression shaft 24 is constructed to form a shoulder 27 and a plunger 28 which extends below it and which is somewhat smaller in diameter than the shoulder 27. The lower end of the compression shaft may be provided with a recess and a permanent magnet 29 may be placed within this recess if desired.

30 designates a forming-head which is constructed of three sectors 31, 32 and 33 which are substantially alike in construction and which are held together by means of springs 34 and 35. The inner surface of each of these sectors is provided with a cam groove 36. The construction and operation of this forming-head is specifically described in a former application for patent Serial Number 336,831, filed by me October 1st, 1906.

40 designates a piston which is attached to the lower end of spindle 20 as is shown at 41. This piston is arranged to carry two packing-rings 42, 42. The lower portion of the piston is provided with an annular rim 43 which extends inward under the forming-head 30 and thereby holds the latter between this rim and the lower end of the spindle. This rim also prevents the compression spring 26 from forcing the compression shaft and forming-head out of the spindle 20. The vertical distance between the rim 43 and the bottom of the spindle 20 is preferably somewhat greater than the vertical height of the forming-head 30 so that the latter is held somewhat loosely in place between these parts.

50 designates a portion of the frame or carriage 12 which is arranged to form a cylindrical filling chamber 51. The upper portion of this part of the frame or carriage extends over the lower end of the spindle 20 and its attached piston 40 and thereby limits the upward movement thereof.

52 designates an inlet port to which a supply pipe may be connected. 53 is a valve which controls this inlet port and connects it with the cylindrical filling chamber 51.

54 is an outlet passage from the cylindrical filling chamber which is connected with the discharge pipe 55 through a safety valve 56 which may be of any well known construction.

5 60 designates a packing device which comprises an annular ring 61 of rubber or other suitable resilient material which is arranged to be held within clamping pieces 62, 62. These clamping pieces are held between a 10 supporting-sleeve 63 and a ring 64. The supporting sleeve is provided with depending ribs 65 and these ribs serve the purpose of holding the ring 64 at a suitable distance from the main portion of the sleeve 63. 15 These parts may be held together and attached to the portion 50 of the supporting-head or carriage by means of screws 66.

67 designates a locking wrench which is 20 provided with a handle 68 and which is rotatably supported and guided by the sleeve 63 and ring 64. This locking wrench is provided with cam surfaces 69, 69 which are arranged to engage with similar cam sur- 25 faces upon the clamping pieces 62. The inner surface of the clamping pieces 62 are grooved and arranged to partly inclose the clamping ring 61. When these parts are in the position in which they are shown in Figs. 2 and 3 the packing ring 41 is sufficiently 30 large to permit of the insertion of the neck of a bottle 70. When the clamping wrench 67 is rotated through a portion of a revolution by means of its handle 68 its cam sur- 35 faces 69 engaging with the similar cam surfaces upon the locking pieces 62 will cause the latter to be moved inward and this will in turn compress the packing ring until it tightly surrounds the neck of the bottle 70. 40 The bottle 70 may be supported by a suitable standard 71 which is adjustably connected to the base 10 by means of a rod 72 and a clamping-screw 73.

In operating this device it is necessary to 45 set the bottle standard or support 71 in a suitable position to support a bottle 70 so that its neck will come within the packing device 60 which I have just described. After a bottle has been placed upon this standard 50 or support the locking wrench may be turned to cause the packing ring to be squeezed against the neck of the bottle after which the valve 53 may be opened to admit suitable liquid under pressure to the filling 55 chamber 51 and thus to the bottle.

80 designates a bottle cap which I have invented and which may be used to advantage with this apparatus. This bottle cap comprises a flat disk 81 having an annular 60 depending flange 82 and depending fingers or lugs 83, 83.

A cap 80 may be placed upon the lower end of the compression shaft and will be held in place by the magnet 29. Now, when 65 the lever 15 is depressed to move the spindle

20 the various associated parts will move together until the cap 80 meets the top of the bottle and this will arrest the further movement of the compression shaft. These caps are preferably provided with a packing of 70 cork or other suitable material and this will be firmly compressed against the top of the bottle through the action of spring 26. A further movement of the spindle 20 will push the forming-head 30 down by the 75 mouth of the bottle and the cam grooves 36 in this forming-head, which are arranged to operate with the projecting lugs or fingers 83, 83 on the cap, will cause these lugs to be pressed inward against the neck of the bot- 80 tle and under the annular rim or bead 74 at the top of the bottle neck. This will securely lock the cap to the bottle. After the bottle has been filled the valve 53 may be turned to close the passage from the source of supply 85 to the filling chamber, in which case the movement of the parts which I have just described for applying the cap to the bottle will cause the pressure to increase.

The filling of the bottle has of course been 90 accomplished before the descent of the spindle 20 and the piston 30 which effects the capping of the bottle as above described. At the instant prior to the descent of the capping head there is a considerable body of 95 the liquid in the chamber 51 and it is desirable to save this liquid so far as possible. It is the purpose of the valve 56 to open at this time and permit the discharge of the liquid in the chamber 15 into the pipe 55. When 100 the piston 30 has wholly descended to complete the capping operation, substantially all of the liquid in the chamber 51 has been expelled into said discharge pipe 55. If the operator is sufficiently skilful the capping 105 head may be made to descend just before the filling of the bottle is completed, in this way expelling the liquid in the chamber 51 into the bottle to complete the filling thereof instead of expelling it into the discharge pipe 110 55. However, it is not objectionable to wait until the bottle has been entirely filled before the capping operation is caused to take place. It will be observed that after the bottle is filled and the capping completed, that 115 the bottle can be removed without raising the carriage 12, since it can be slipped out by moving the capping head upward slightly and then pulling the bottle laterally at its base. The bottle is then dropped out of the 120 cavity in the filling chamber and removed.

The forming-head 30 is constructed, in the manner I have pointed out, of three parts resiliently held together by means of springs 34 and 35 for the purpose of preventing un- 125 due pressure on this head from breaking the bottle neck.

When the cap has been secured to the bottle the lever 15 may be released and the spring 23 will then cause the spindle and its 130

connected parts to be moved upward. The packing device may then be released by returning the clamping wrench back to its initial position after which the bottle may be released and the operation repeated indefinitely.

I have shown a bottle cap which I have invented as used in conjunction with this invention in order to illustrate the present apparatus. This apparatus is, however, applicable to other forms of bottle caps and may be used to apply caps of other construction with very slight modifications of the parts.

What I claim is.—

1. In combination, a vertically guided carriage having an interiorly formed cylindrical bore, a depressible spindle having a piston working in said bore, a sleeve at the lower open end of said bore, clamping pieces guided by said sleeve, a flexible ring contained within said clamping pieces, a clamping lever acting to contract said clamping pieces, a forming head on said spindle, and means for supplying fluid to said bore.

2. In combination, a part having a cylindrical bore, a spindle having a piston movable in said bore, a forming device carried by said piston, a sleeve at the open end of said bore, a ring carried by said sleeve, clamping pieces guided by said sleeve and ring, a flexible ring contracted by said clamping pieces, a clamping lever for contracting said clamping pieces, means for admitting fluid to the cavity of said bore, and means for preventing the escape of fluid from said cavity, said latter means having a safety valve.

3. In combination, a vertically depressible frame having a cylindrical bore, a spindle

having a piston working in said bore, a spring for moving said piston to one limit of its stroke, means at the other end of said piston adapted to contract about the neck of a bottle, means for admitting fluid to the cavity of said bore, and means for permitting the escape of fluid from said cavity.

4. In combination, a main supporting frame having a vertically depressible carriage thereon, said carriage having an interior cylindrical bore and passages communicating with said bore, a turn cock controlling one passage, and means in the other passage to relieve excessive pressure in the cavity of said bore, a spindle having a piston working in said bore, a forming device carried by said spindle, and means at the open end of said bore and adapted to contract about the neck of a bottle to prevent the escape of fluid from said cavity.

5. In combination, a carriage having a cylindrical bore, a spindle having a piston working in said bore, a forming device carried by said piston, a sleeve fixed to said carriage at the open end of said bore and having depending ribs carrying a ring, clamping pieces guided between said sleeve and said ring, a clamping wrench also guided between said sleeve and said ring, and a flexible ring within said clamping pieces and adapted to be contracted upon the neck of a bottle thereby.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE KIRKEGAARD.

Witnesses:

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ELLA TUCH.