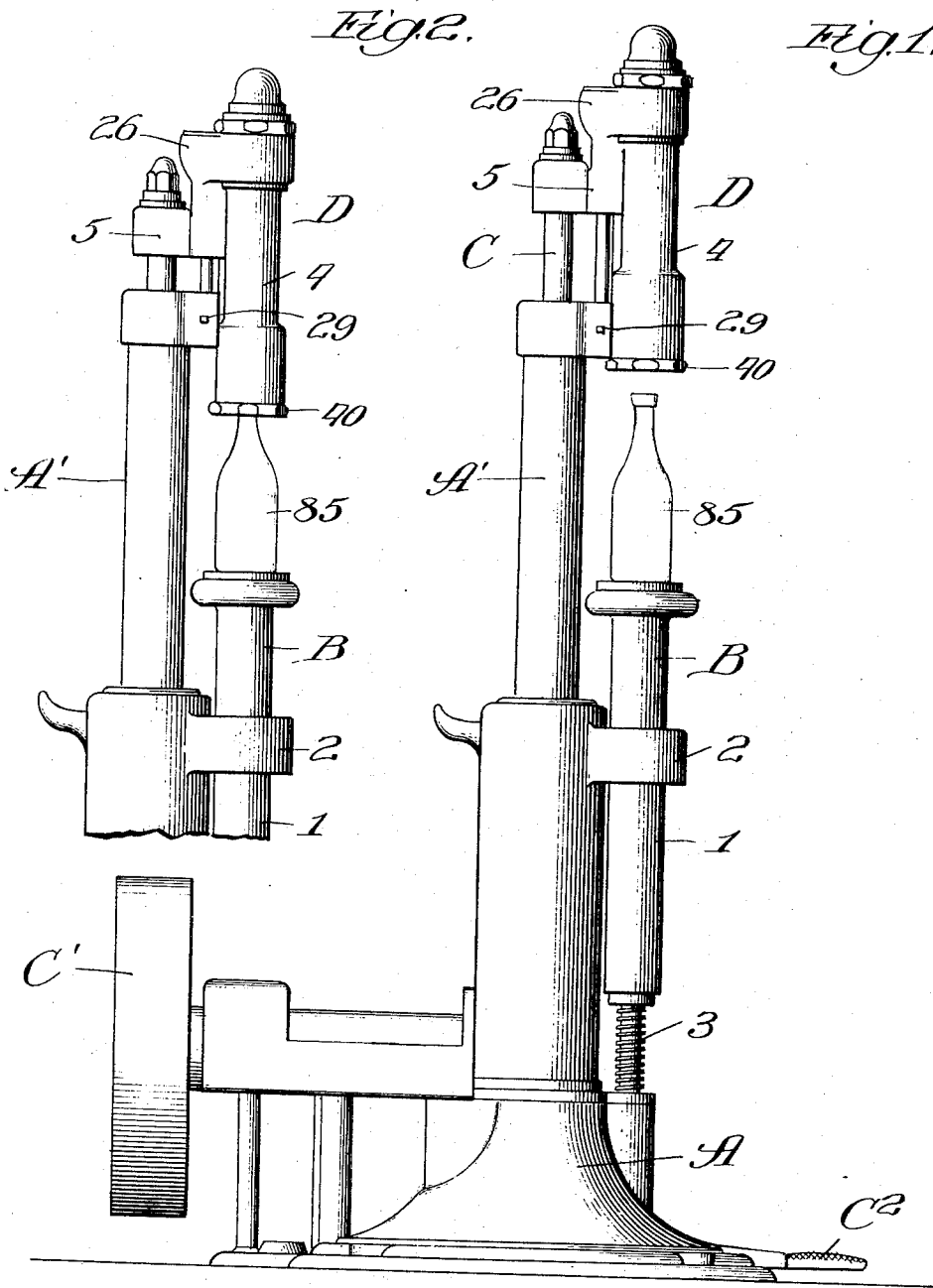


H. M. BROWN.
 MACHINE FOR APPLYING STOPPERS OR SEALING DEVICES.
 APPLICATION FILED OCT. 19, 1909.

1,002,559.

Patented Sept. 5, 1911.

6 SHEETS—SHEET 1



Witnesses:
 Carl O. Taylor.
 Chas. H. Bull.

Inventor:
 Harry M. Brown,
 By Deane Fort Lee, Crittenden Miles
 Attys.

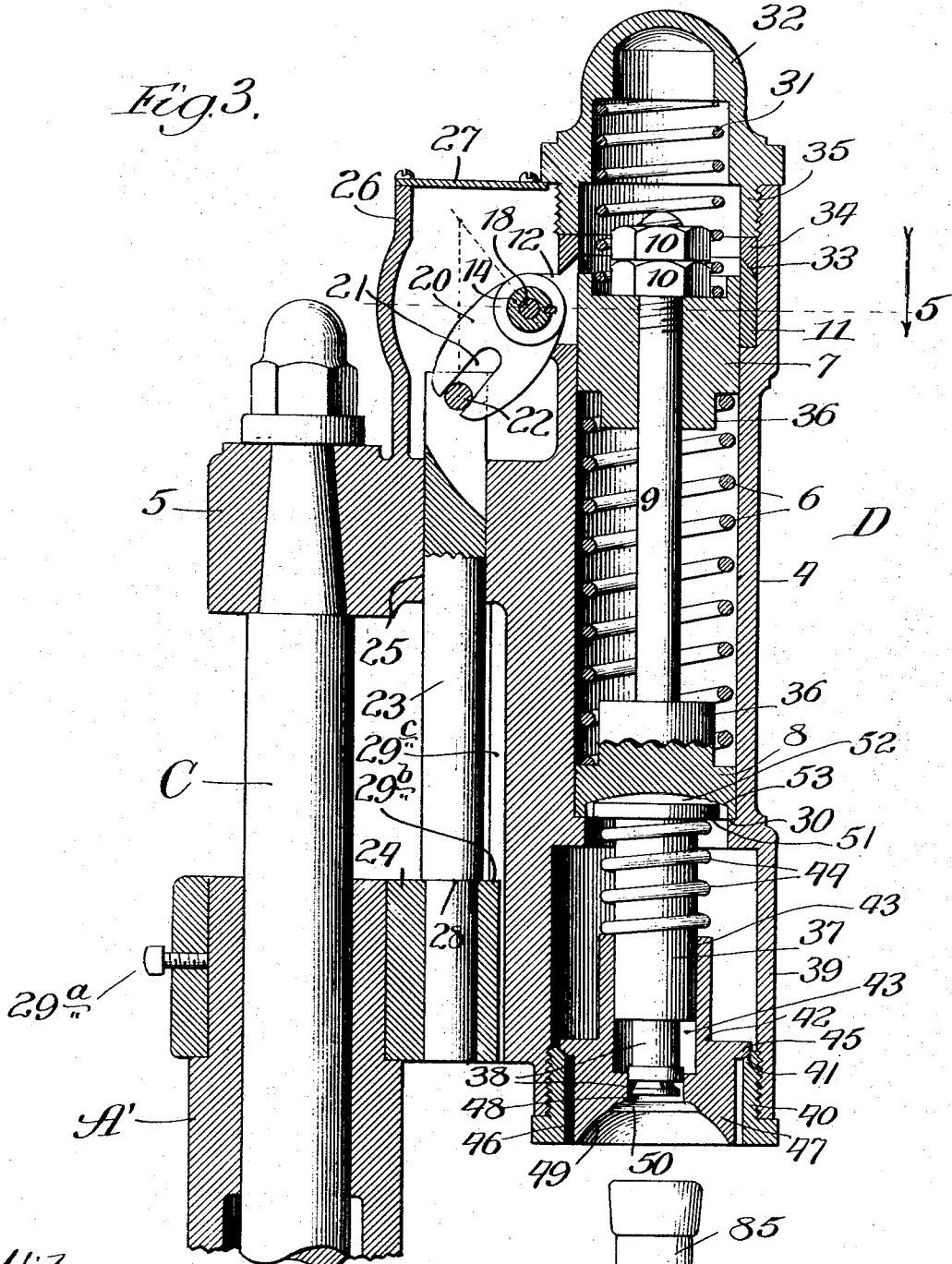
H. M. BROWN.
 MACHINE FOR APPLYING STOPPERS OR SEALING DEVICES.

1,002,559.

APPLICATION FILED OCT. 19, 1909.

Patented Sept. 5, 1911.

6 SHEETS—SHEET 2.



Witnesses:
 E. C. Taylor.
 Chas. H. Burr.

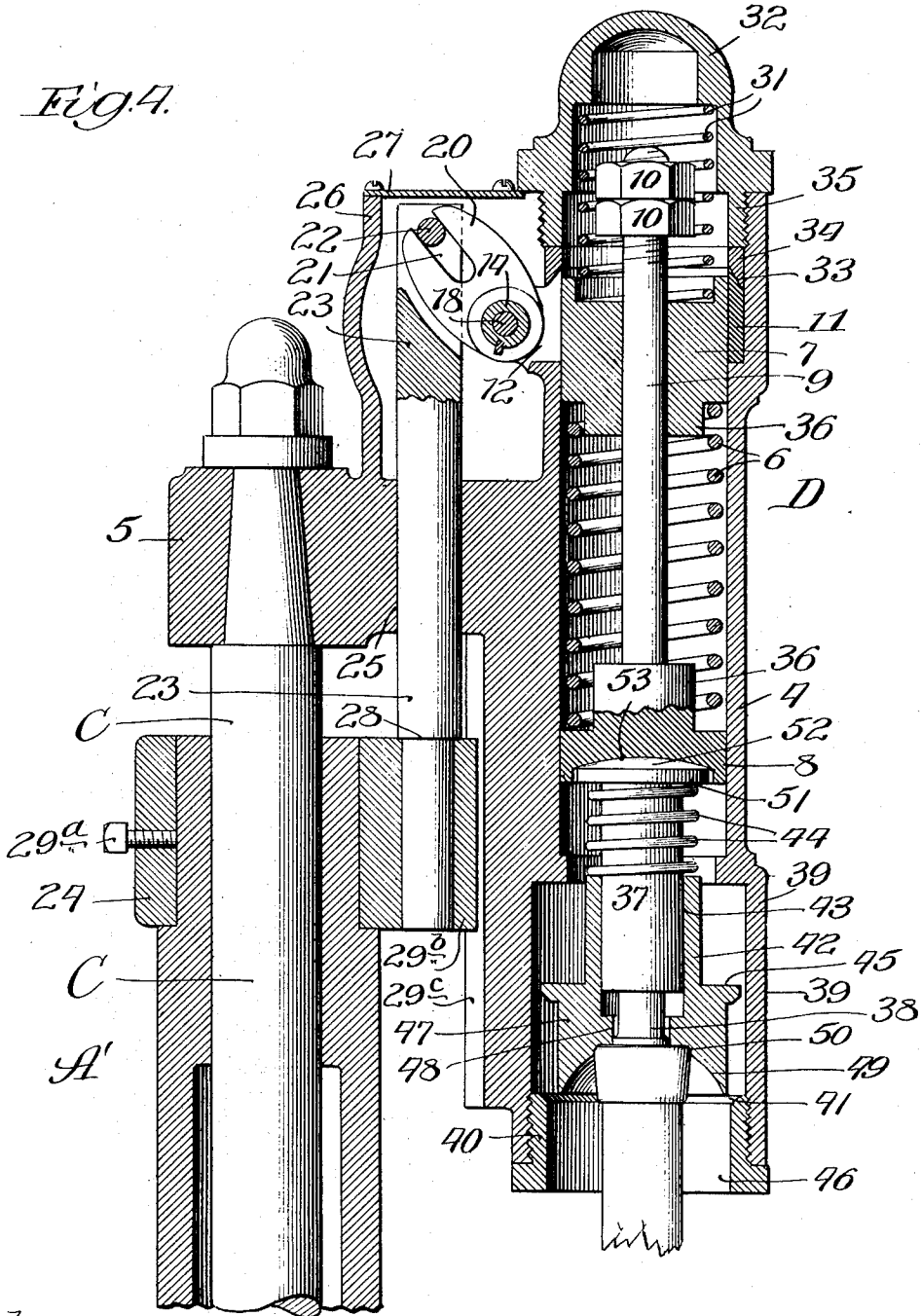
Inventor:
 Harry M. Brown,
 By *Dunsmuir, De, Chittor & Niles,*
 Attys.

H. M. BROWN.
 MACHINE FOR APPLYING STOPPERS OR SEALING DEVICES.
 APPLICATION FILED OCT. 19, 1909.

1,002,559.

Patented Sept. 5, 1911.

6 SHEETS—SHEET 3.



Witnesses:
 Geo. C. Gaylord,
 Chas. H. Bull.

Inventor:
 Harry M. Brown,
 By *Dunphy, Lee, Crittore & Miles,*
 Attys.

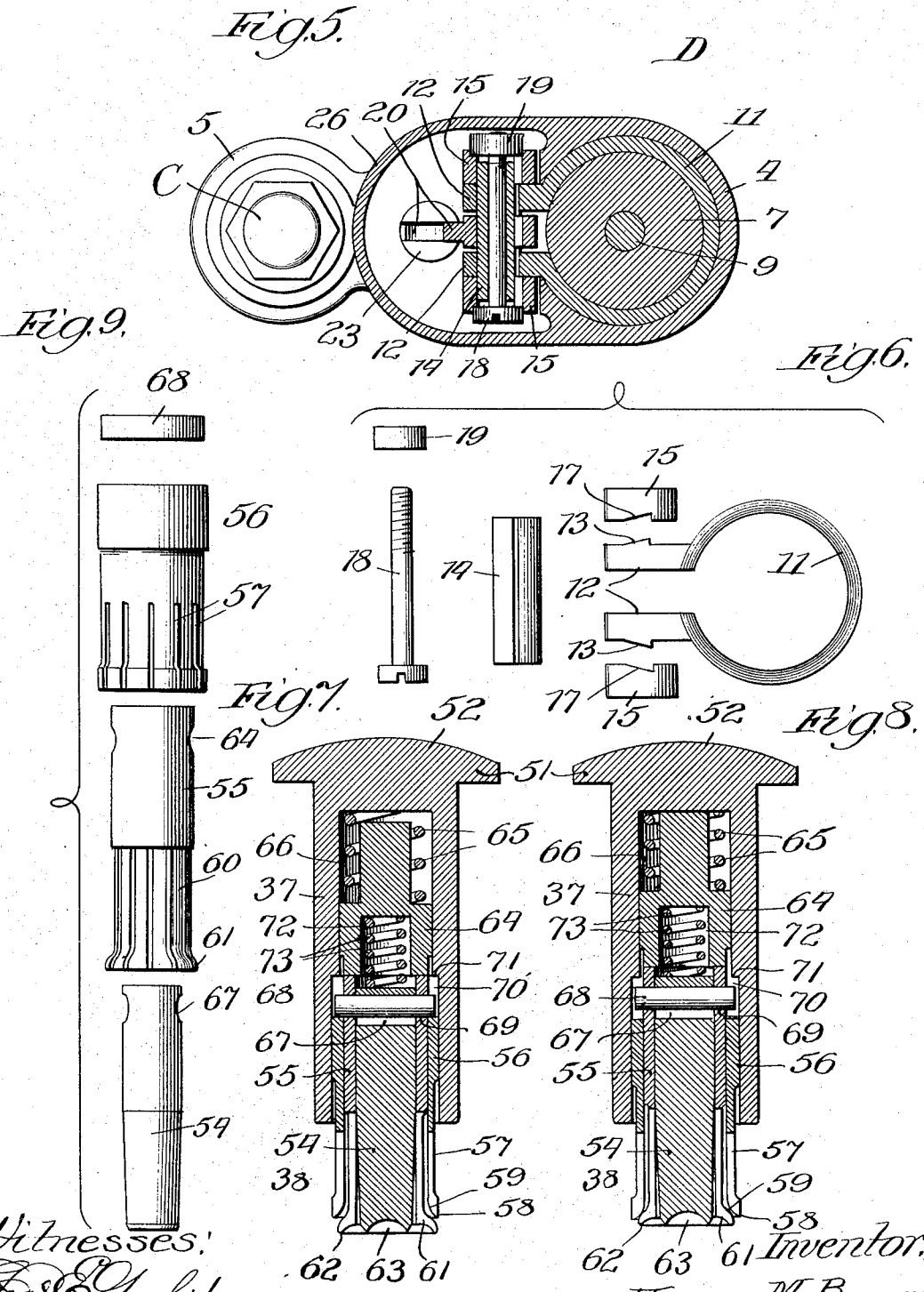
H. M. BROWN.
 MACHINE FOR APPLYING STOPPERS OR SEALING DEVICES.

1,002,559.

APPLICATION FILED OCT. 19, 1909.

Patented Sept. 5, 1911.

6 SHEETS—SHEET 4.



Witnesses:
Edw. J. Taylor
Chas. H. Buell

Inventor:
 Harry M. Brown,
 By *Dunsmuir, Lee, Crittore & Miles*,
 Attys.

UNITED STATES PATENT OFFICE.

HARRY M. BROWN, OF BROOKLYN, NEW YORK, ASSIGNOR TO RICHARD ALBERT
CANFIELD, OF PROVIDENCE, RHODE ISLAND.

MACHINE FOR APPLYING STOPPERS OR SEALING DEVICES.

1,002,559.

Specification of Letters Patent.

Patented Sept. 5, 1911.

Application filed October 18, 1909. Serial No. 523,506.

To all whom it may concern:

Be it known that I, HARRY M. BROWN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Machines for Applying Stoppers or Sealing Devices, of which the following is a specification.

My invention relates particularly to bottle-stoppering, or bottle-sealing, machines; and my primary object is to provide an improved machine of the character indicated, adapted, without readjustment to the purpose of applying stoppers, or sealing devices, to bottles of varying length.

A further object is to provide a machine of the character indicated, which is adapted to operate in an improved manner in applying to bottles stoppers, or seals, of the character shown, for instance, in William S. Dorman's Patent No. 881,780, granted March 10th, 1908.

The invention is illustrated in its preferred embodiment in the accompanying drawings in which:—

Figure 1 represents a side elevational view of my improved bottle-stoppering machine; Fig. 2, a broken elevational view of the same, showing the position of the parts during the stoppering operation; Fig. 3, a broken sectional view on an enlarged scale showing the upper portion of the machine with the tool-head at the upper end of its travel; Fig. 4, a similar section showing the tool-head at the lower end of its travel; Fig. 5, a horizontal section taken as indicated at line 5 of Fig. 3, and illustrating the means employed for gripping a shiftable spring-bearing, or block, employed; Fig. 6, a view showing, in detached relation, parts of the gripping-device shown in Fig. 5; Fig. 7, a sectional view illustrating a tool-holder and a composite stoppering-tool employed, the parts being shown in the normally inactive position; Fig. 8, a similar section showing the parts in the position they assume during the stoppering operation; and Fig. 9, a view showing, in detached relation, the parts of the composite stoppering tool employed; Figs. 10 and 11, plan and side elevational views of a stopper which my improved machine is adapted to apply; and Fig. 12, a broken sectional view illustrating the application of such a stopper to a bottle.

It may be stated preliminarily, that in the preferred construction which is illustrated in the accompanying drawings, there are employed an adjustable stationary bottle-support; a reciprocating tool-head; a bodily shiftable main-spring located within said tool-head and confined between bearings which are vertically slidable in the tool-head; means for gripping the upper main-spring bearing during the descent of the tool-head; a tool-holder having a universal bearing in the lower main-spring bearing; a compound stoppering-tool carried by said holder; and a bottle centering and guiding device slidably connected with said tool-holder.

In the form in which the invention is illustrated, A represents a frame provided with a standard A¹; B, a stationary bottle-support adjustably connected to said frame; C, a vertically reciprocating-shaft to which motion is communicated from a pulley C¹, the reciprocation of the shaft C being controlled by a foot pedal C² in any usual or desired manner; and D, a reciprocating tool-head in which are mounted the stoppering-tool and attendant parts.

The main-frame A may be of any suitable construction as may also be the mechanism for communicating reciprocatory motion to the vertically disposed shaft C, which carries the tool-head.

The bottle-support D may be of any desired construction. As shown, the bottle-support is provided with a shank 1, which is vertically movable in a bearing 2, being adjustable by means of a screw 3.

The tool-head D comprises a vertically disposed tubular member 4, provided with a rearwardly extending bracket 5, which is firmly secured to the upper end of the shaft C, so that the tool-head will reciprocate with said shaft. Within the tubular member 4 is a comparatively heavy main-spring 6 which is in the form of a coil spring. The spring is confined between an upper, or base bearing 7 and a lower bearing 8, the lower bearing being equipped with a stem or shaft 9 which extends through the upper bearing 7, and is equipped above said upper bearing with nuts 10. By adjusting the nuts 10 any desired tension may be placed on the spring 6.

The main-spring 6 and its bearings 7 and 8 are slidable within the tubular member 4.

The upper bearing 7 is encircled by a split collar 11 having rearwardly projecting perforate lugs or ears 12, whose non-adjacent surfaces are equipped (Fig. 6) with cams 13. Through the ears 12 extends a sleeve 14, keyed upon the ends of which are cam rings 15 having their surfaces which are turned toward each other equipped with cams 17 adapted to cooperate with the cams 13. A bolt 18 extends through said sleeve, and is equipped with a nut 19, by means of which the cam-rings may be adjusted with relation to each other, so that provision is thus made for causing the split ring or strap 11 to securely grip the spring block 7. Keyed to the central portion of the sleeve 14 is an actuating rock-arm 20, which is provided at its free extremity with a slot 21. Engaging said slot is a stud 22 carried by a vertically disposed post 23 supported by a bracket 24 fitted on the upper end of the standard A¹. Said post 23 extends through a guide perforation 25 in the bracket 5, said post 23 being located between the shaft C and the tubular member 4. Cast integrally with the upper portion of the member 4 is a housing 26 for the cams and attendant parts, the upper portion being closed by a removable plate 27. The small post 23 is provided with a shoulder 28 which bears upon the upper surface of the bracket 24. The shaft, or standard, 23 is secured against vertical withdrawal by means of a set-screw 29, as shown in Fig. 1. The bracket 24 is secured on the top of the standard A¹ by a set-screw 29^a, and said bracket is provided with a guide tongue 29^b, which is received in a guide-groove 29^c with which the tubular-member 4 of the reciprocating tool-head D is provided. As the tool-head descends in the operation of the machine, the stud 22 carried by the small post, or shaft, 23 causes the arm 20 to rotate, thereby actuating the sleeve or tubular-member 4 and causing the cam-rings 15 mounted thereon to contract the ring 11 and cause it to securely grip the spring-bearing 7.

The lower spring-bearing 8 normally rests upon an internal shoulder 30 with which the tubular-member 4 is equipped near its lower end. The main-spring and its bearings are normally maintained in their lowermost position by means of a relatively light spring 31 which is confined between the bearing 7 and a cap 32 which has screw connection with the upper end of the tubular-member 4. The spring 31 will yield readily, however, to enable the main-spring to shift its position bodily to accommodate a bottle of greater length than that for which the bottle-support B may happen to be adjusted. The split-ring 11 has its upper end tapered as indicated at 33 and is surmounted by a bearing-ring 34 having a corresponding internal taper at its lower end, said bearing-

ring 34 being secured in place by a flange 35 on the cap 32.

The bearings 7 and 8 are equipped with extensions 36 which serve to center the main-spring. The upper surface of the bearing 7 is recessed to receive the lower end of the spring 31, and the cap 32 is recessed to receive the upper end of said spring so that the spring 31 will remain properly centered under all conditions.

Having a universal bearing against the lower surface of the main-spring bearing 8 is a tubular tool-holder 37 in which is carried a compound tool 38. The lower end of the tubular member 4 is enlarged, as indicated at 39, and is fitted with an annular externally threaded nut 40 which affords a bearing or stop 41 for a bottle centering and stoppering device 42. The device 42 comprises a tubular member whose shank is provided with a bore 43 which receives the lower end of the tool-holder 37. A spring 44 normally maintains the device 42 in its seated position, said spring being confined between the shank of the member 42 and upper end of the holder 37. The device 42 is equipped with an external flange 45 which tapers at its lower side and bears in the tapered bearing 41. A space 46 is provided between the lower end of the member 42 and the internal surface of the nut 40, thus allowing universal movement to the stoppering-tool and bottle-centering and guiding device. The head 47 of the member 42 has a bore 48 into which the stoppering-tool extends, and the bore 48 opens at a flaring mouth 49, which is recessed at 50 to accommodate the upper surface of the lip of the bottle.

The tool-holder 37 has its upper end equipped with a head 51 which is provided with a rounded or part-spherical surface 52 which is received in a correspondingly grooved recess 53 with which the lower main-spring bearing 8 is provided. The compound tool 38 comprises (Figs 7, 8 and 9) a central stopper engaging plunger 54, an encircling stopper engaging sleeve 55, and an external seal-securing sleeve 56. The sleeve 56 is fixedly secured within the lower portion of the holder 37 in any desired manner. This lower end is provided with vertical slits 57 which thus afford resilient fingers, which are provided with operative extremities 58 which are rounded at their inner surfaces, as indicated at 59. The sleeve 55 is provided with vertical slits 60, which thus provide fingers with operative extremities 61 which curve outwardly at points beneath the ends of the operative extremities 58 of the fingers on the sleeve 56. The arrangement of the operative ends 61 of the fingers on the sleeve 55 is such as to provide a substantially annular bearing 62. The central plunger 54 tapers downward at its lower end, and the lower end surface of said plunger is pro-

vided with a cavity or recess 63. As thus described, the fingers of the tubular plungers 55 and 56 are capable of yielding inwardly to contract the operative ends of the
 5 plungers in the operation of forcing the sealing-disk upon its seat in the mouth of the bottle. The resiliency of the finger tends to force the resilient retainer ring on the sealing-device into the annular internal
 10 groove with which the mouth of the bottle is provided for the reception of said retainer ring.

As shown in Figs. 7 and 8, the upper end of the sleeve 55 abuts against a plunger 64,
 15 which is pressed by a spring 65 between the plunger and the upper end of the bore 66 of the holder 37; and the upper end of the inner plunger 54 is provided with a transverse slot or perforation 67, through which
 20 extends loosely a pin 68, whose ends project through perforations 69 in the sleeve 55. The extremities of the pin 68 are located above the upper end of the sleeve 56 and
 25 move within the space 70 between the upper end of said sleeve and an internal shoulder 71 with which the holder sleeve 37 is provided. The lower end of the
 30 plunger 64 is provided with a bore 72 which contains a spring 73, which bears against the upper end of the central plunger 54. It will thus be understood that the central
 35 plunger 54 and the intermediate sleeve 55 are capable of independent action with relation to each other and also with relation to the holder 37.

My improved machine is peculiarly adapted to the purpose of compressing a stopper of the character shown in Figs. 10
 40 and 11 upon its seat in the neck of a bottle and locking the retaining ring on said stopper in the manner illustrated in Fig. 12. The stopper illustrated comprises a
 45 sealing-disk 74, which usually is of cork; a metal cap-piece 75 connected therewith, and a retainer ring 76 connected with said cap-piece. The retainer ring is usually formed integral with the cap-piece
 50 75, the connection being as indicated at 77. The retainer ring has a horizontal flange, 78, an upwardly flaring portion 79 and an outturned locking flange 80. The disk
 55 portion of the cap-piece 75 is provided with curcular corrugations affording a groove 81 which is concentric with the axis of the stopper. Connected with the free end of the retainer-ring 76 is a centrally disposed tab 82, which is in the form of a disk bowed at its center and formed
 60 with an annular seat-portion 83 adapted to enter the annular groove 81 on the cap and thereby center the retainer-ring with relation to the cap-piece 75. The lower portion of the central plunger 54 is adapted to engage the tab 82 and center the retainer-
 65 ring, while the lower portion of the inter-

mediate tubular plunger 55 is adapted to engage the horizontal flange 78 of the retainer-ring and to compress the sealing-disk 74 on its seat 84 in the mouth of the
 70 bottle 85. The outer tubular plunger 56 is adapted to force the retainer-ring through the contracted portion of the mouth of the bottle and cause the retainer-ring to enter the internal annular groove 86, with which
 75 the bottle-mouth is provided

From the description given, the operation of the machine will be readily understood. The bottle to be stoppered is placed upon the bottle-support B, the stopper being pre-
 80 liminarily seated in the upper portion of the bottle-mouth, either by hand, or by the operation of mechanism adapted for the purpose. The operator then depresses the foot-treadle C² thereby causing the shaft C to reciprocate. As the shaft descends, it
 85 carries with it the tool-head D and the mechanism therein contained. As the tool-head descends, the lip of the bottle-neck is received in the flaring mouth 49 of the bottle centering and guiding device 42, the
 90 lip of the bottle being guided to the recess 50. As the tool-head continues its descent, the spring 44 yields, permitting the device 42 to telescope with relation to the tool-holder 37, the seat 41 of the member 42,
 95 being withdrawn from engagement with the flange 45. As the stoppering-tool continues its downward movement through the member 42, the central plunger 54 of the compound tool engages the convex disk 82 and
 100 centers the retainer-ring 76 in relation to the stopper, the plunger 54 yielding as the spring 73 is compressed. Almost at the same instant, the operative end of the intermediate tubular plunger 55 engages the
 105 horizontal flange 78 of the retainer-ring, and, the tool-head continuing to descend, compressive force is applied to the sealing-disk, so that the latter is seated with sealing force upon its seat 84 in the bottle-neck.
 110 In this operation the spring 65 yields, according to necessity and, during the further descent of the tool-head the lower, or operative, end of the member 56 forces the retainer-ring to the locking position in the
 115 internal groove 86 within the mouth of the bottle. As indicated above, the fingers on the tool-sections 55 and 56 will yield to prevent breakage of the bottle, while their resiliency will at the same time aid in forcing
 120 the retainer-ring to its locking position after the sealing-disk has been sufficiently compressed upon its seat to enable this locking action to occur.

It is noteworthy that the tool-holder 37
 125 is free to turn, as in a universal bearing, so that the bottle will be properly centered and alined even though its position on the bottle-support B varies somewhat. It is to be noted also that the seal-compressing and
 130

seal-locking force is transmitted through the main-spring 6. As has been noted the spring-bearing 7 is movable within the reciprocating tool-head; and for the purpose of automatically adjusting the tension upon the main spring to suit the length of the bottle which is to be operated upon, the clamping or gripping device 11 is caused to operate only after the tool-head has descended a sufficient distance to cause the shortest bottle to tend to lift the bearing 7 from its normal position illustrated in Fig. 3. The clamping action occurs after the tool-head has descended through approximately three-quarters of its travel, whereupon the device 11 is caused to effectually grip the bearing 7, so that said bearing will, during the remainder of the stroke, be carried downward with the tool-head and the compressive and retainer-locking force will be transmitted through the spring 6. The gripping action is caused, as has been explained, by the rock-arm 20 engaging the stud 22 during the descent of the tool-head, thereby causing the cam rings 15 to contract the split ring 11. It is to be noted that the spring 31 yields to permit the bearing 7 to move upward freely prior to the clamping action, and after the release of the clamping action, the spring returns the bearing 7 to its normal position. It may be added that the spring 6 may be depended upon to yield to a greater or less degree, and will thus in itself tend to compensate for varying lengths in the bottles; but any added compression of said spring causes the exertion of a greater compressive force upon the tool, and is to be avoided in the main. The bottle-holder B is, therefore, primarily set at the proper point to accommodate bottles varying within certain limits. For instance, it is perfectly feasible to provide for a variation of say, one and one-half inches in the length of bottles without readjustment of the support B, the automatic adjustment of the automatic tension of the main-spring being depended upon to prevent the transmission of undue force through the main-spring.

In the illustration given, the tool-head reciprocates, while the adjustable bottle-support remains stationary. This is a matter which can be varied according to convenience, necessity or desire, however.

The foregoing detailed description has been given for clearness of understanding only and no undue limitation should be understood therefrom but the appended claims should be construed as broadly as permissible in view of the prior art.

What I regard as new, and desire to secure by Letters Patent, is:—

1. In a machine of the character set forth, the combination with a bottle-support, tool-head, and means for imparting relative reciprocation thereto, of a stopper-applying

tool carried by said tool-head, a spring in said tool-head for exerting a pressure on said tool, a movable spring-bearing above said spring, and means for securing said spring-bearing to said tool-head after limited movement of reciprocation in one direction has occurred. 70

2. In a machine of the character set forth, the combination of a bottle-support and tool-head mounted for relative reciprocation, means for reciprocating said members with relation to each other, a stopper-applying tool, a main-spring therefor provided with a movable bearing, and means carried by said tool-head for clamping said bearing to the tool-head during the movement of reciprocation of the machine. 75 80

3. In a machine of the character set forth, the combination with a tool-head, of a tool therein, a pair of slidable main-spring bearings, one of which is a base-bearing, a main-spring fitted between said bearings, means connecting said bearings and permitting movement of the same with relation to each other, and means for limiting the movement of the base bearing. 85 90

4. In a machine of the character set forth, the combination of a tool-head, a pair of slidable main-spring bearings, a main-spring confined between said bearings, an auxiliary spring for returning said main-spring to normal position, a stoppering-tool, means for reciprocating said tool-head, and means for limiting the movement of one of said bearings during the movement of reciprocation of said tool-head. 95 100

5. In a machine of the character set forth, the combination of a support for the article to be stoppered, a reciprocating tool-head, a stoppering-tool, a pair of slidable main-spring bearings, a main-spring confined between said bearings, a clamping-ring encircling one of said bearings, and a cam-device adapted to contract said clamping-ring during the movement of reciprocation of said tool-head. 105 110

6. In a machine of the character set forth, the combination of a bottle-support, a reciprocating tool-head, a pair of main-spring bearings slidable therein, a main-spring confined between said bearings, a stoppering-tool, a clamping-ring encircling one of said bearings, a rock-shaft equipped with cams serving to contract the clamping-ring, and a stationary device serving to actuate said rock-shaft during the descent of the tool-head. 115 120

7. In a machine of the character set forth, the combination of a frame having a standard, a vertically reciprocating shaft in said standard, a tubular tool-head carried by said shaft, a post carried by said standard in the rear of said tool-head, a pair of main-spring bearings slidably mounted in said tool-head, a spring confined between said bearings, a 125 130

clamping ring encircling one of said bearings and equipped with ears projecting through said tubular tool-head and provided with cams, and a rock-shaft equipped with cooperative cams and with an actuating arm adapted to be actuated through the medium of said post during the descent of said tool-head.

8. In a machine of the character set forth, the combination with a bottle-support, tool-head and means for imparting relative reciprocation thereto, of a main-spring equipped with a bearing, a tool-holder adapted to universal movement, and a pair of relatively movable stopper-engaging plungers carried by said tool-holder.

9. In a machine of the character set forth, the combination with a bottle-support, tool-head, and means for imparting relative reciprocation thereto, of a main-spring equipped with a bearing, a tool-holder adapted to universal movement, a pair of relatively movable stopper-engaging plungers carried by said tool-head, and a stopper centering and guiding-device having telescopic connection with said tool-holder.

10. In a machine of the character set forth, the combination with a bottle-support, tool-head, and means for imparting relative reciprocation thereto, of a main-spring equipped with a bearing having a socket with a concave surface, a tool-holder having a convex surface bearing in said concave surface, a bottle guiding device having telescopic connection with said holder, a spring confined between said holder and said bottle guiding device, and a compound stoppering-tool comprising relatively movable plungers carried by said holder.

11. In a machine of the character set forth, the combination with a bottle-support, tool-head, and means for imparting relative reciprocation to said members, of a main-spring equipped with a bearing, a tubular tool-holder having universal connection therewith, a tubular bottle-centering device provided with a seat in the lower portion of said tool-head and having freedom of lateral movement when withdrawn from said seat, and a compound tool carried by said holder and comprising relatively movable plungers having their operative ends depending from said holder.

12. In a machine of the character set

forth, the combination of a tubular tool-head, a main-spring therein, a spring-bearing, a tool-holder having universal connection with said bearing, a bottle-centering and holding device having telescopic connection with said tool-holder, said device having a seat in the lower portion of said tubular tool-head and having freedom of movement with the tool-holder when withdrawn from said seat, and a compound tool comprising plungers movable with relation to each other and having operative ends depending from said holder.

13. A machine of the character set forth having a compound stoppering tool comprising a central plunger and a surrounding sleeve relatively movable with relation to each other and adapted to force a stopper on to its seat in the mouth of a bottle, and an external sleeve adapted to force the retainer-ring of the stopper into locking engagement with the retaining groove in the bottle-mouth.

14. A machine of the character set forth having a compound stoppering tool comprising a central plunger, an external fingered sleeve, an intermediate fingered sleeve, and springs normally projecting said central plunger and said intermediate sleeve, in combination with a tubular holder for said parts.

15. In a machine of the character set forth, the combination with a tubular tool-head, of a main spring and bearing for said main-spring, a tubular holder mounted to swing with relation to said bearing, a bottle-centering device having telescopic connection with said tubular holder, a spring confined between said tubular holder and said bottle-centering device, a plunger within said tubular holder, a spring confined between said plunger and the end-wall of the bore in said tubular holder, a sleeve abutting against said last-named plunger, a central plunger in said sleeve mounted to move with relation to said sleeve, a spring confined between said central plunger and the first-named plunger in said tubular holder, and an external sleeve rigidly connected with said tubular holder.

HARRY M. BROWN.

In presence of—
ROBERT L. SHRINER,
F. L. COOK.