No. 711,204. Patented Oct. 14, 1902.

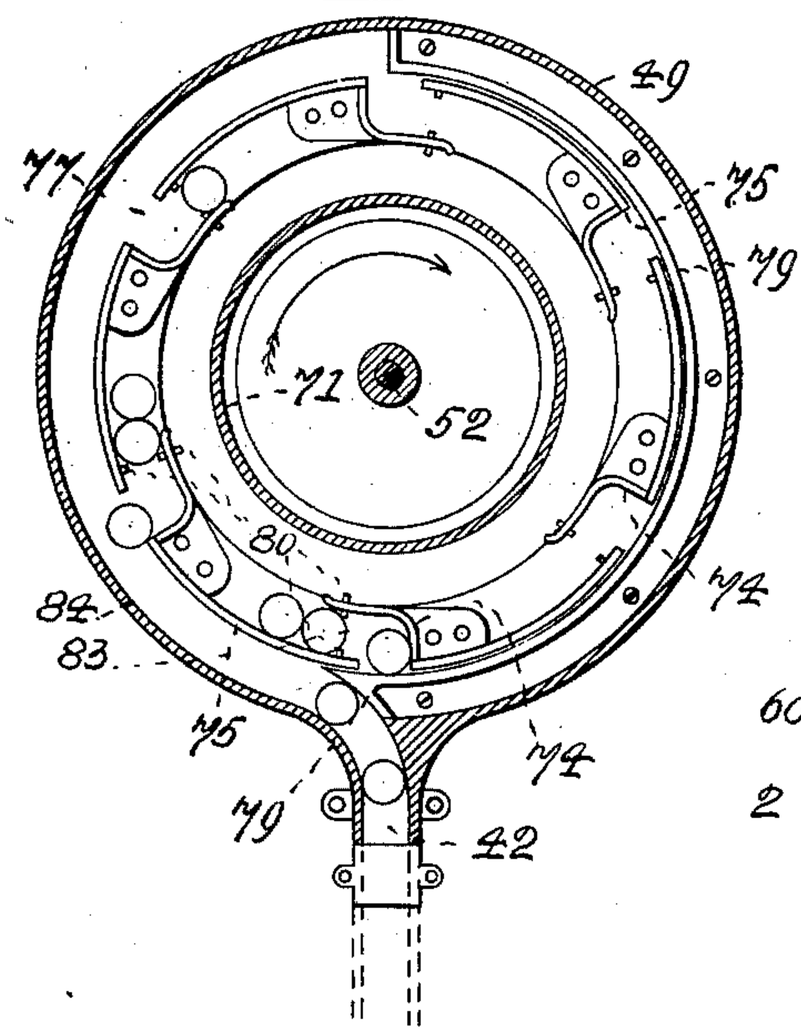
H. T. GAY.

BOTTLE SEALING MACHINE.

(Application filed Feb. 25, 1902.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 7.



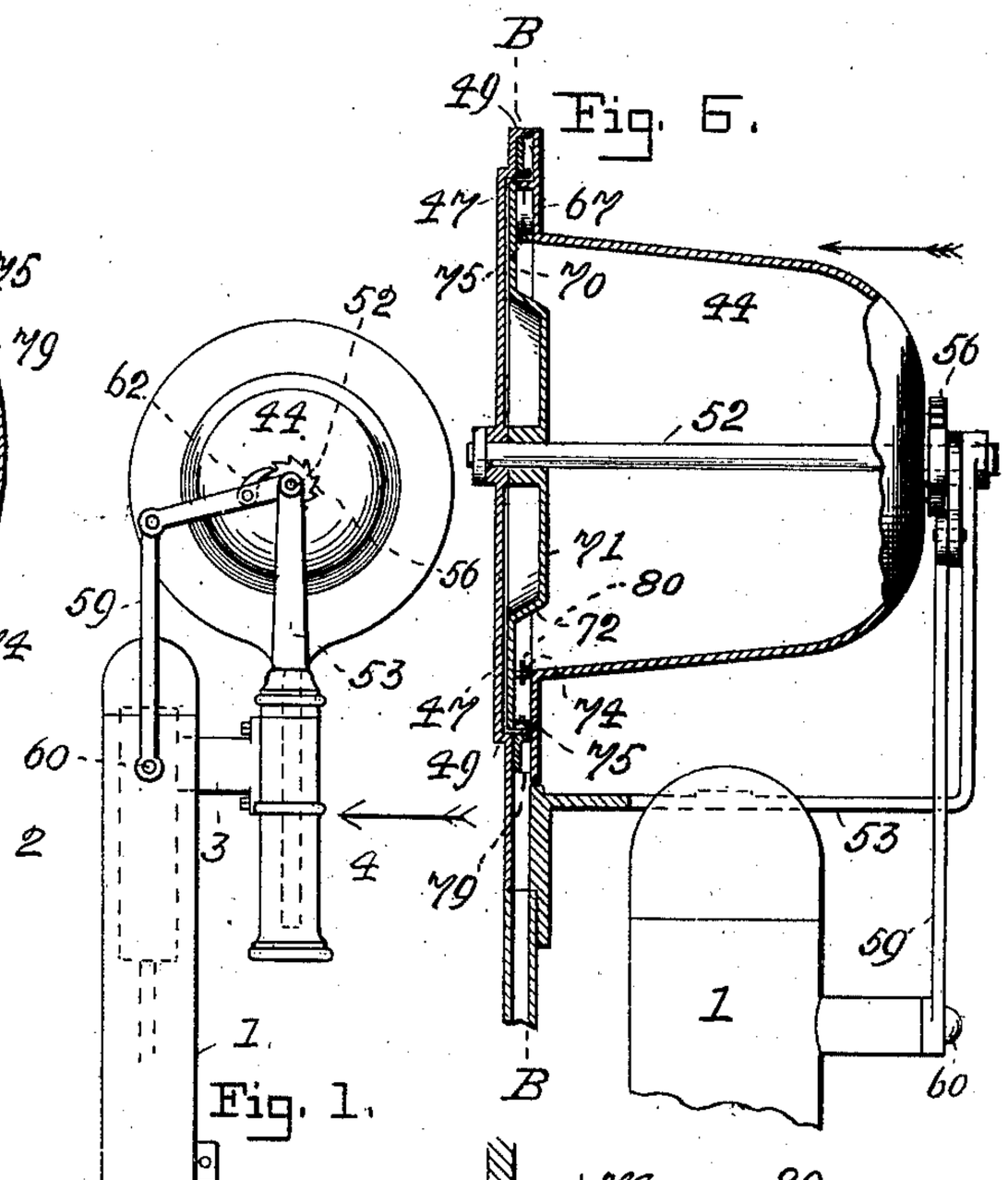


Fig. 6.

Fig. 1.

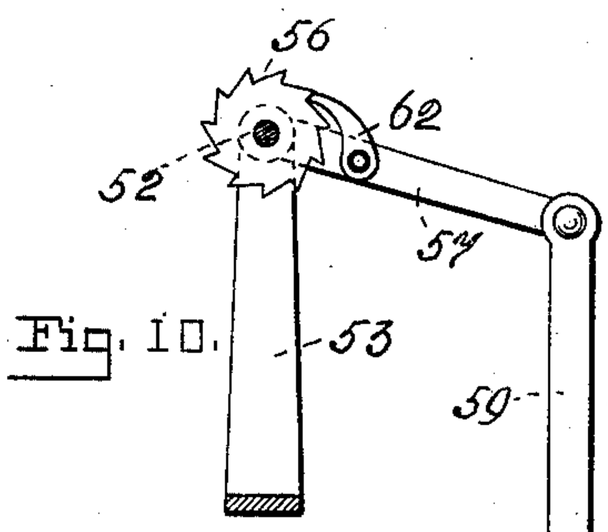
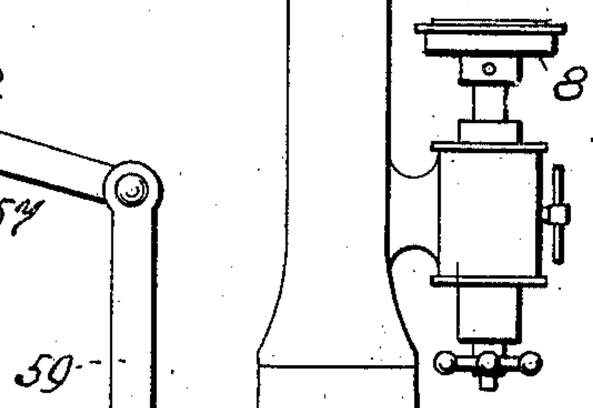


Fig. 10.



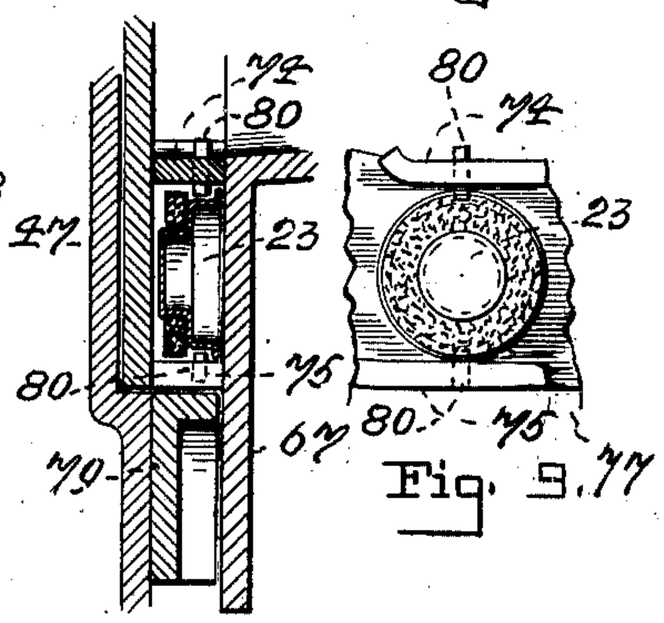
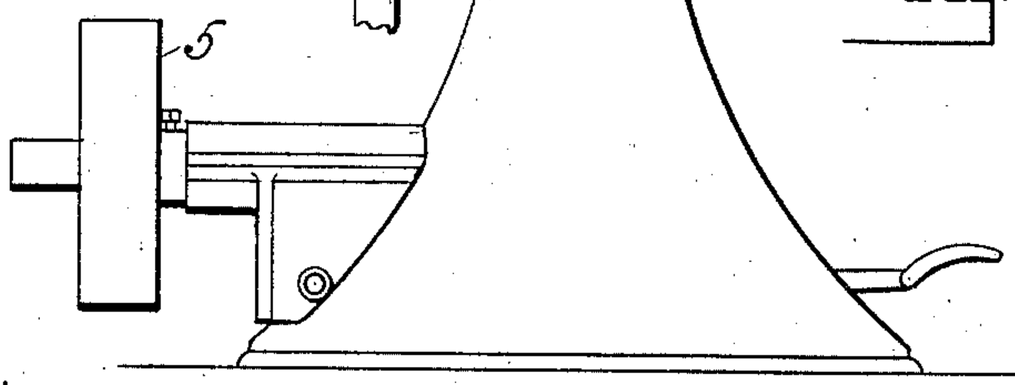


Fig. 8.

Fig. 9.



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No. 711,204. Patented Oct. 14, 1902.

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BOTTLE SEALING MACHINE.

(Application filed Feb. 25, 1902.)

(No Model.) 3 Sheets—Sheet 2.

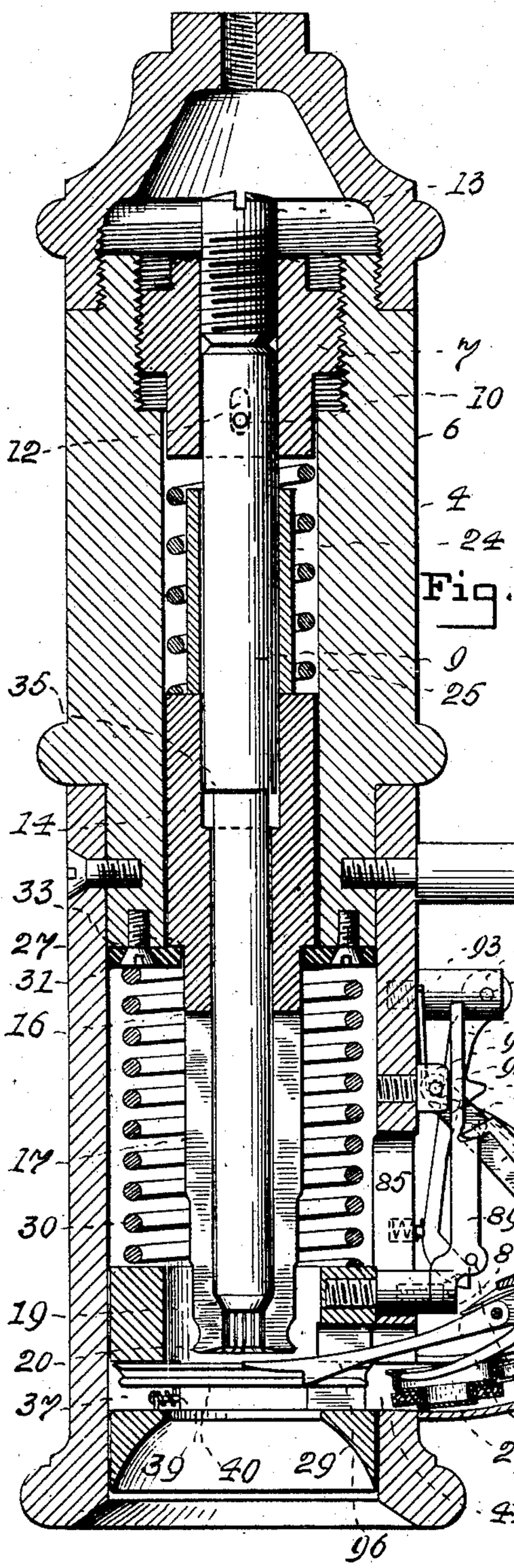

Fig. 2.

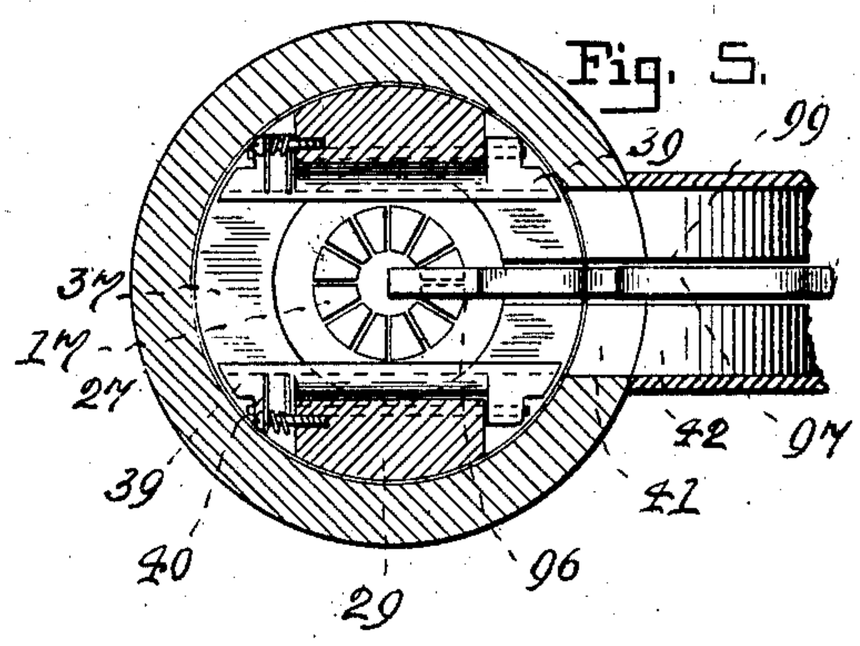

Fig. 5.

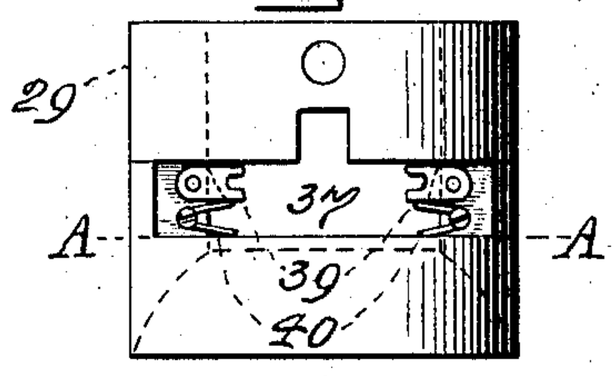

Fig. 4.

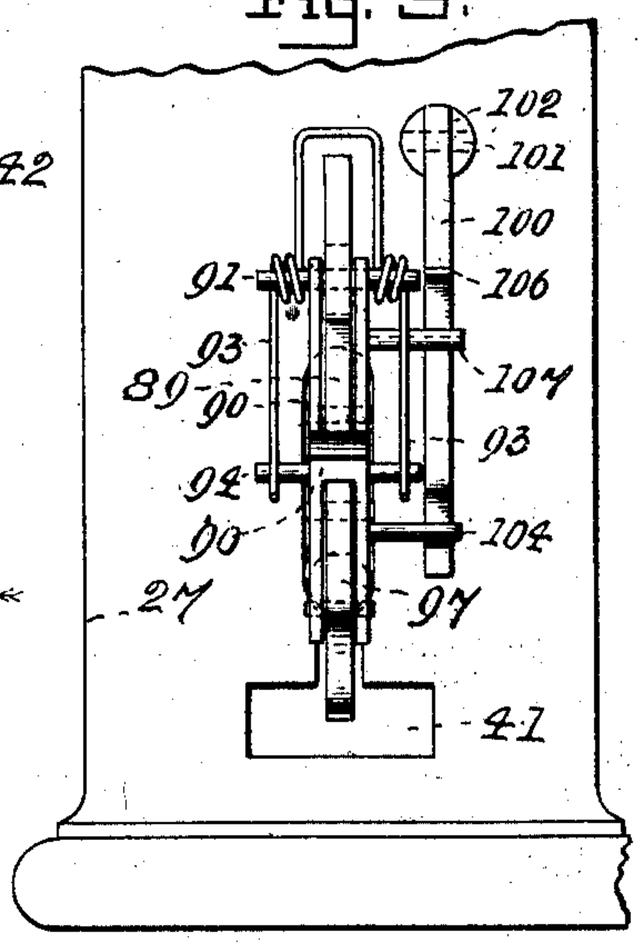

Fig. 3.

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No. 711,204. Patented Oct. 14, 1902.

H. T. GAY.

BOTTLE SEALING MACHINE.

(Application filed Feb. 25, 1902.)

(No Model.) 3 Sheets—Sheet 3.

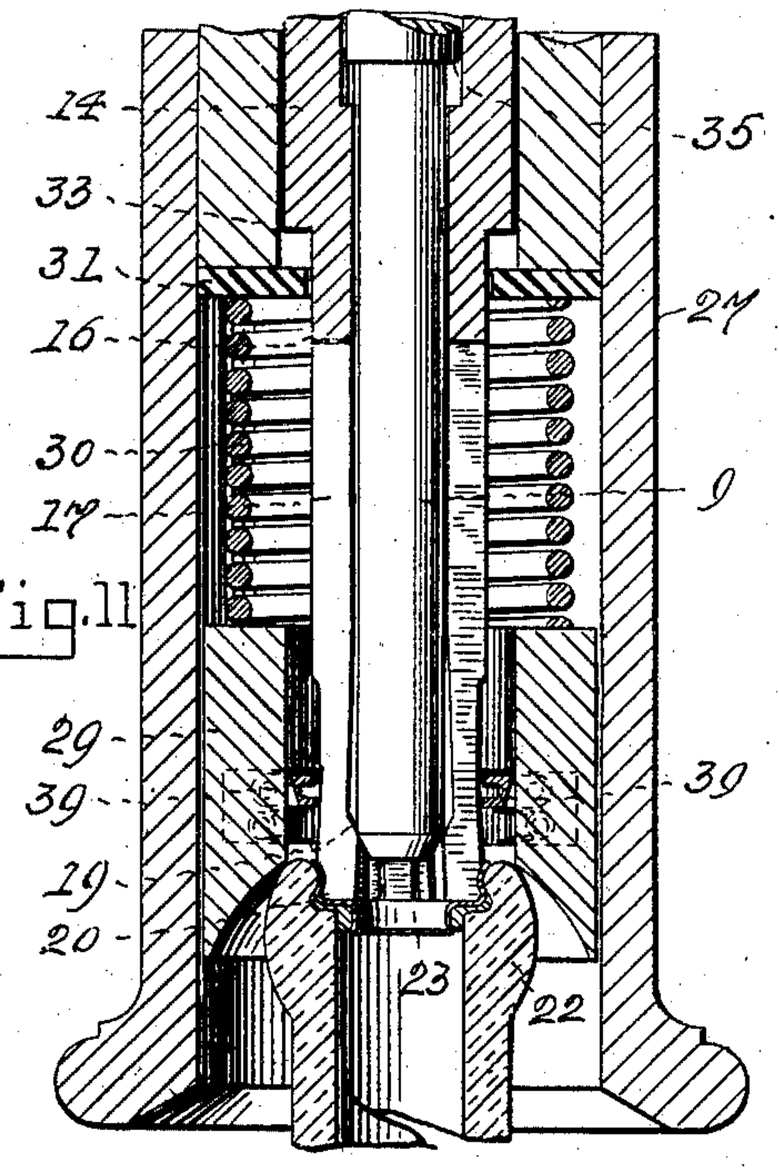

Fig. 11

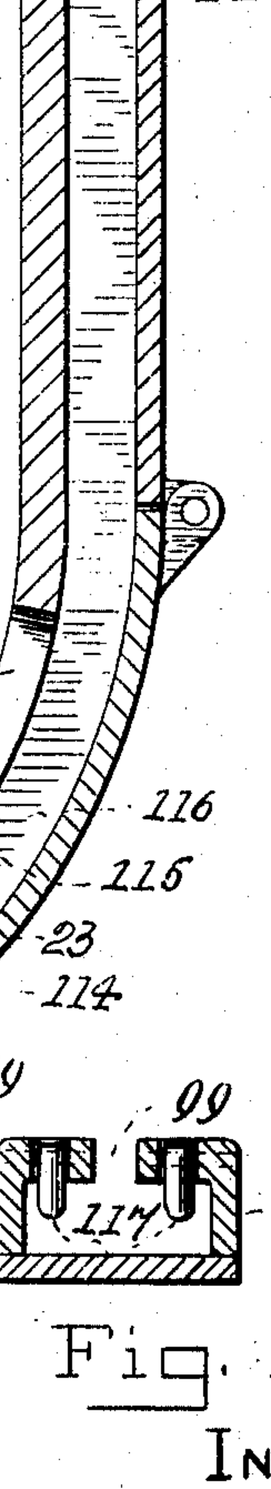

Fig. 12.

Fig. 13

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A. O. Babendreier

INVENTOR:—

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by G. H. & H. T. Howard,

Attys.

UNITED STATES PATENT OFFICE.

HERMAN T. GAY, OF BALTIMORE, MARYLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE ALUMINUM-CORK SEAL COMPANY, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

BOTTLE-SEALING MACHINE.

SPECIFICATION forming part of Letters Patent No. 711,204, dated October 14, 1902.

Application filed February 25, 1902. Serial No. 95,543. (No model.)

To all whom it may concern:

Be it known that I, HERMAN T. GAY, of the city of Baltimore, State of Maryland, have invented certain Improvements in Bottle-Sealing Machines, of which the following is a specification.

This invention relates to an improved machine for securing in a bottle-mouth a sealing device of the character shown and described in Letters Patent Nos. 662,263 and 669,254, granted to me on the 20th day of November, 1900, and the 5th day of March, 1901, respectively, for bottle-sealing devices, to which reference should be made. By reference to the said patents it will be seen that the said sealing device or plug consists of a sheet-metal flanged disk having stamped or drawn therefrom a downwardly-projecting extension, around which is placed a cork sealing-gasket.

The bottle which is adapted to receive the above briefly-described sealing device has a mouth which is considerably larger in diameter than the throat, in which is formed an annular seat for the gasketed sealing-plug, and immediately above the said seat is an annular groove into which the flange or body of the sealing-plug is expanded to hold the sealing device in place after the compression of its joint-forming gasket.

The office of the present machine is, therefore, to compress the cork gasket between the annular seat in the bottle and the under side of the sealing-plug and while the gasket is so held to expand the flange or body of the plug to hold the gasketed plug firmly in place within the bottle-mouth.

A secondary office of the present machine is to automatically feed the sealing-plugs in a proper position to the sealing-head, as will hereinafter fully appear.

In a further description of the said invention which follows reference is made to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is an exterior side view of the improved machine. Fig. 2 is an enlarged central side section of the sealing-head and certain of the sealing-plug-feeding attachments looking in the direction indicated by the arrow in Fig. 1. Fig. 3 is an exterior view of certain parts of Fig. 2 looking in the direction indicated by the arrow in that figure. Fig. 4 is an exterior side view of certain parts shown in section in Fig. 2 looking in the direction indicated by the arrow. Fig. 5 is a section of Fig. 4, taken on the dotted line A A, looking in the direction indicated by the arrow in that figure, together with certain parts of the machine shown in Figs. 2 and 3. Fig. 6 is an enlarged partly-sectional view of a rotary hopper into which are placed the sealing-plugs to be fed in a proper position to the sealing-head, together with certain of its attachments. Fig. 7 is a section of Fig. 6, taken on the dotted line B B, looking in the direction indicated by the arrow in that figure. Fig. 8 is an enlarged view of parts of Fig. 6, together with a sealing-plug, which is shown in its correct position. Fig. 9 is an under side view of a sealing-plug and a portion of the feeding apparatus, of which the hopper before alluded to is an element. Fig. 10 is an enlarged view of the ratchet-and-pawl mechanism shown in Fig. 1, whereby the hopper before referred to is rotated. Fig. 11 is a sectional view of the lower part of Fig. 2 looking in the direction indicated by the arrow, showing the bottle-head in the position which it occupies when the sealing-head is in its lowest position and the segmental expander distended within the sealing-plug. Fig. 12 is a view similar to Fig. 2, illustrating a different construction and arrangement of certain of the sealing-plug-feeding appliances. Fig. 13 is a section of Fig. 12, taken on the dotted line C and looking in the direction indicated by the arrow.

Referring now to the drawings, it will be seen that the stand 1 of the machine consists of a column. The upper part of the stand 1 is bored and fitted with the sliding bar 2, (shown only in dotted lines in Fig. 1,) having a bracket 3, which extends laterally therefrom through a slot in the wall of the stand in a manner substantially the same as that shown and described in my application No. 59,916, filed on the 13th day of May, 1901, to which reference should be made. To the bracket 3 is secured the sealing-plug-applying head, which

as an entirety is denoted by 4. The bar carrying the sealing-head is operated by the foot or by power through the medium of the pulley 5, as shown in the said application.

8 is a yielding bottle seat or stand such as is commonly employed in machines of this class.

The sealing-plug-applying head, which as an entirety is denoted by 4 in Fig. 1, consists of a hollow cylindrical block 6, (see Fig. 2,) into the upper end of which is screwed the threaded plug 7. The threaded plug 7 is bored to receive the upper end of the spindle 9, and the means of connection between these two devices consists of a pin 10, secured in and extending through the said spindle, with its ends resting in a slot 12 in the said threaded plug. By this means the said spindle is susceptible of a slight vertical movement independently of the threaded plug. The upward independent movement of the spindle 9 is limited by the screw 13 and its downward movement by the lower end of the slot 12.

The spindle 9 rests loosely in a sealing-plug expander consisting of a hollow cylinder 14, which from the point 16 to its lower end is sawed or otherwise divided into the spring-segments 17, (shown in Figs. 2 and 5,) and the end of the spindle is conical and bears against the inclined broken annular surface 19, formed by the segments 17, as shown in Fig. 2. The end of each of the segments, which collectively form the expanding device, has an exterior lip 20, of a diameter which is slightly less than that of the interior of the sealing-plug to be expanded within the bottle-mouth.

In Fig. 11 is shown a sectional view of the upper end of a bottle 22, containing a sealing-plug (denoted by 23) and certain portions of the sealing-head, together with the ends of the segments of the expander, illustrating their relative positions after the expanding operation.

24 is a sleeve loose on the spindle 9, and 25 a spring coiled around the said sleeve and extending endwise between the threaded plug 7 and the upper end of the expander.

27 is a cylindrical shell secured by set-screws to the cylindrical block 6. Within the lower end of this shell is a vertically-sliding hollow-faced ring 29, having a central hole which is smaller than the bottle-head, as shown in Fig. 11.

30 is a spiral spring within the shell 27, confined endwise between the ring 29 and an annular plate 31, held to the under side of the cylindrical block 6 by means of screws, as shown in Fig. 2. The said plate fits loosely around the reduced portion of the expander and is normally in contact with a shoulder 33 of the same. By reference to Fig. 2 it will be seen that the expander is counterbored, the upper part fitting the larger portion of the spindle and the lower part the reduced portion.

The bottom of the counterbore of the expander is some distance below the shoulder 35 on the spindle 9, formed by its differential diameters when the expander is in its lowest position with reference to the said spindle, as shown in Fig. 2.

37 is a slot extending transversely through the ring 29, and within it are the sealing-plug holders 39, which consist of longitudinally-channeled strips hinged to the ring 29, as shown in Figs. 4 and 5, and held yieldingly in a horizontal plane by means of the springs 40.

Referring now to Figs. 2 and 3, 41 is a lateral opening in the shell 27 for the passage of sealing-plugs to within the ring 29, the rim of the said plugs entering the channels in the holders 39, which support them.

42 is a conduit leading from the rotary sealing-plug-feeding hopper 44, hereinafter more particularly described, to the lateral opening 41 in the shell 27. The lower portion of this conduit is secured to the shell 27 by the stud 45. The said sealing-plug hopper consists of a bell-shaped box fastened to the shaft 52, one end of which is journaled in the fixed circular plate 47, a lower extension of which forms one plate or side of the conduit 42, and the other end of the shaft is journaled in a bracket 53, extending from the upper end of the said conduit, as shown in Fig. 6. 56 is a ratchet-wheel also fastened to the said shaft 52.

57 is an arm loose on the shaft 52 and connected at its free end by means of a link 59 to a stud 60, projecting from the frame 1. The said arm is provided with a hinged pawl 62, the point of which is adapted to engage with the teeth of the ratchet-wheel 56. With this construction when the sealing-head is lowered the pawl 62 pushes around the ratchet-wheel 56, carrying with it the shaft 52 and the hopper 44, and when this operation is performed rapidly the momentum of the hopper serves to rotate it to a greater extent than that effected directly by the pawl. In other words, with a limited movement of the pawl the hopper is made to perform at least one complete rotation, so that in the sealing of bottles, as hereinafter described, the hopper is continuously in rotation.

The hopper 44 is provided with an opening (not shown) at one side thereof, through which it is charged with sealing-plugs, and a suitable door to close the said opening, and so prevent the discharge of the plugs, except through the proper channel.

The fixed circular plate 47 has a flange 49 at its circumference, which flange is continuous, except at the bottom, where there is an opening leading to the conduit 42. (See Fig. 7.) The flange 67 of the rotary hopper 42 is in contact with the edge of the non-rotary flange 49 of the plate 47, as shown in Fig. 6. The rotary hopper 44 has also a rim 75 integral with and projecting from the face of the flange 67, and the said rim having a smaller diameter than the flange 49 there exists between them the annular passage 84.

70 is a disk with a certain inward projection 71, having a hub which, like the hopper 44, is secured to the shaft 52. The inner face of this disk is in contact with the rim 75, thus preventing the contents of the hopper entering the annular passage 84 except through the openings 77 in the rim 75. (Shown particularly in Fig. 7.)

74 74 are sealing-plug carriers held by screws to the inner surface of the disk 70. These carriers in the rotation of the hopper serve as guides to conduct the sealing-plugs from the hopper to the openings 77, and were there no assorting appliances provided to prevent the entrance of sealing-plugs while the same are in an improper position to the said openings all the sealing-plugs in the hopper would be conducted to them and thence by way of the annular passage 84 to the conduit 42.

79 is a semi-annular stop-plate. (Best shown in Fig. 7, but shown also in Figs. 6 and 8.) This stop-plate serves to close the openings 77 in the rim 75 as they reach the vertical central line of the hopper at the top and to retain them in a closed condition until they pass beyond the said vertical line at the bottom of the hopper, as will be readily understood by reference to Fig. 7.

The assorting appliances consist of the pins 80, which are in pairs, one pin of each pair being in the rim 75 and the other in the curved portion of the carrier 74, which adjoins it.

By reference to Figs. 8 and 9 it will be seen that these pins are of such length and are so situated with reference to each other and to the flange 67 and the disk 70 that they allow only sealing-plugs from the hopper which present themselves in the proper position to enter the passage 83 between the curved portion of the carrier and the rim 75 and thence by way of the opening 77 to pass to the semi-annular passage 84, exterior of the said rim and which leads to the conduit 42. To effect the result described, the distance between the approaching ends of the pins 80 of each pair is made less than the diameter of the cork gasket of the sealing-plugs 23 and greater than that of the body of the same, as shown in Figs. 8 and 9. In consequence of this construction the sealing-plugs which present themselves to the entrance of the passages 83 in a wrong position are stopped by their cork gaskets coming in contact with the pins 80. This assorting of the sealing-plugs will be more fully described in the description of the operation of the machine and particularly that part thereof which relates to the automatic feeding of the said plugs to the sealing-head.

The mechanism just described effects the supplying to the conduit of sealing-plugs in the position which they must necessarily occupy to admit of their insertion into the bottle-mouth, and I will now describe the devices whereby one sealing-plug at a time is forced into the opening 41 in the shell 27 and to a position directly over the head of the bottle 22, while the next sealing-plug is carried to the place just vacated by the one moved to the bottle, and also the means whereby the sealing-plugs which follow are held back, so as not to interfere with the movement of those directly operated upon in the feeding operation.

Referring now particularly to Figs. 2 and 3, it will be seen that the shell 27 is provided with the vertical slot 85, through which extends the stud 87, carrying the notched upright 89. 90 is a branched arm adapted to vibrate on the pin 91, extending through a stud 92, screwed into the shell 27 immediately above the slot 85. The spring 93, coiled about the pin 91, with its ends bearing against the pin 94 and its looped portion against the outer surface of the shell, operates to hold the said arm yieldingly in its lowest position. This arm carries the fingers 96 and 97, the former of which is spring-held. These fingers enter a slot 99 in the conduit 42 and are in the path of the sealing-plugs as the same pass to the sealing-head. 100 is another spring-held and angular arm hinged at 101 to a stud 102, projecting from the shell 27. This arm bears against a pin 104, extending laterally from the upright 89 on the stud 87. The said arm is provided with a projection 106, adapted to engage with the under side of a pin 107 on one side of the arm 90, so as to temporarily hold the said arm when the same is elevated. When the arm 90 is in its elevated position, the arm 100 is allowed to move outward upon the elevation of the pin 104 with the upright 89.

109 is a latch secured in a slot 110 in the arm 90, with its hook resting in the notch before alluded to as being in the upright 89, and is the means whereby a motion in an upward direction is imparted to the arm 90 and its fingers 96 and 97. The reverse motion of this arm and its attachments is effected by the coiled spring 93, before referred to.

111 is a plate-spring (shown partially dotted in Fig. 2) which passes through an aperture in the side of the conduit. This spring opposes the passage of sealing-plugs from the conduit and serves to hold back those not operated upon by the fingers 96 and 97 and the last one in a proper position for engagement with the finger 97, as hereinafter described more fully in the description of the operation of the machine.

Supposing the sealing-plug hopper to be supplied with an aggregation of the patented sealing-plugs, the first step toward preparing the machine for operation consists in rapidly rotating the said hopper by hand in the direction indicated by the curved arrow in Fig. 7, when some of the sealing-plugs which are in a correct position pass between the pins 80 to the passages 83 and escape therefrom through the openings 77 before they have

reached a point above the horizontal central line of the hopper. The stop-plate 79 prevents the discharge of the sealing-plugs before they have passed the vertical central line at the bottom of the hopper, thus confining the discharge to the semi-annular space between the ends of the stop-plate. Those sealing-plugs which cannot pass between the said pins for the reason that they (the plugs) are in an incorrect position are by the said pins carried upward through the mass of plugs in the hopper, and as they rest on the inclined surface 72 of the inward projection 71 of the disk 70 they fall to the surface of the mass. In the rotation of the hopper the sealing-plugs are thus shaken up and made to constantly change their positions. The conduit being supplied with sealing-plugs with the lowest one bearing against the plate-spring 111, the arm 90 is vibrated by hand twice. In the first vibration the stopped sealing-plug is carried to the position in which it is shown in Fig. 2 and in the second conducted to the interior of the ring 29, where it is supported by the channeled strips 39 directly over the bottle-mouth. At the same time another plug is brought to the position in which it is shown in the said figure. A bottle is now placed on the spring-held or yielding seat 8, and if foot-power is to be used in the sealing operation the attendant forces the treadle down, thereby causing the sealing-head to descend and bring the hollow-faced ring 29 in contact with the bottle-head, when the further downward movement of the said ring is suspended. In the further descent of the sealing-head the spiral spring 30 is compressed, and the expander 14, entering the sealing-plug, pushes it from the channeled strips 39 into the bottle-mouth, where its corked gasket is forced tightly in contact with the annular seat therein, as shown in Fig. 11. When the resistance of the coiled spring 25 is overcome, which takes place when the cork gasket is sufficiently compressed on the seat in the bottle-mouth, a downward movement of the spindle 9 independently of the expander takes place, and the conical end of the spindle acting upon the inclined inner surface of the segments 17 causes the said segments to distend and the wall or body of the sealing-plug to be thereby expanded in the annular groove in the bottle-mouth, as shown in Fig. 11. The distension of the segments is limited by the resistance offered by the yielding bottle-seat 8, thus preventing a dangerous lateral strain on the bottle-head. It is during the descent of the sealing-head or that part thereof wherein the distance between the plate 31 and the ring 29 is decreased that the upward movement of the arm 90, carrying the fingers 96 and 97, takes place and wherein the said fingers engage with the two sealing-plugs next to the one which is directly inserted and expanded within the bottle-mouth in the manner hereinbefore described, and it is upon the release of the treadle when the sealing-head ascends and assumes its original position and the sealed bottle is left on the seat that the feeding forward of the two sealing-plugs takes place and the machine is placed in condition for the next sealing operation.

It will be understood that the interlocking of the pin 107 with the projection 106 is only of a temporary character, as the pin is almost immediately released by the action of the pin 104 upon the lower inclined surface of the arm 100, of which the said projection is an integral part.

In the foregoing description I have described a certain combination of devices for feeding the sealing-plugs from the conduit 42 to the channeled strips 39 in the ring 29. I will now describe another construction and arrangement, which is illustrated in Figs. 12 and 13. In this alternate construction the arm 90 is provided with the fingers 96 and 97, and the latter is furnished with the pin 112, which in the retrograde or upward movement of the said arm rides up the flanged incline 114, which is hinged at 115 to the inner plate of the conduit. This construction prevents the finger 97 being dragged over the sealing-plug, which in the forward movement of the said finger has to be carried to the position in which it is shown in Fig. 2. In other words, it serves to lift the finger 97 as it passes backward over the said sealing-plug. As the arm 90 reaches its extreme backward or its highest position, or where the point of the finger 97 is above the said sealing-plug, the pin 112 falls and in its downward motion passes under the flange 116 of the incline 114. The said finger passes within the sealing-plug and engages with the inner surface of its body, so that in the next forward motion of the finger the sealing-plug is carried with it to the position shown in Fig. 2. Instead of the plate-spring 111, (illustrated in Fig. 2,) which serves as a yielding obstruction to the forward movement of the sealing-plugs in the conduit, I show in Figs. 12 and 13 hinged stops 117 and 119. The ones 117 are shown in Fig. 13, which, as before stated, is a section of Fig. 12 taken on the dotted line C. In the modified construction the lower portion of the outer plate of the conduit is illustrated as hinged to give access to the interior of the conduit at a point where the active feeding mechanism is situated, and this hinged portion is held in a closed condition by means of a hook 120. (Shown only in the dotted lines in Fig. 12.) The notched upright 89 is practically the same as that shown in Figs. 2 and 3, and it serves the same purpose—viz., that of elevating the arm 90—and the spring-held arm 100, like the one before described in connection with Fig. 2, has the projection 106, with which the pin 107 on the arm 90 engages to hold the latter arm temporarily in its highest position and until it is released by the inclined surface on the arm 100 being forced in by the pin 104. The spring 93 in

the modified construction consists of a plate instead of a bent wire, but its office is the same—viz., to yieldingly retain the arm 90 in its normal or lowest position.

It will be understood that although I have described two satisfactorily operating constructions of the active feeding mechanism I do not limit my invention to either of them, as others may be devised, the important elements being the dual fingers, which, in connection with their coöperating devices, serve to feed two sealing-plugs toward the sealing-head at each forward movement, one sealing-plug being seated in the sustaining devices in the sealing-head and the other, which follows it, being carried to the position formerly occupied by the first or to the one just vacated by it.

I claim as my invention—

1. In a bottle-sealing machine, a sealing-head which comprises a shell having a lateral opening therein for the introduction of sealing-plugs thereto, combined with a spring-held ring situated within the said shell having an inner diameter which is less than that of the head of the bottle to be sealed, and having a lateral aperture leading to the lateral opening in the said shell, spring-held sealing-plug holders situated within the said ring and in alinement with aperture leading to the lateral opening in the said shell, a slotted conduit having its discharge end in communication with the lateral opening in the shell, stop mechanism to yieldingly hold back the column of sealing-plugs in the conduit, a pivoted finger with means to vibrate it longitudinally of the aperture in the spring-held ring and the slot of the conduit to force a sealing-plug from the stop mechanism to the sealing-plug holders, means to push the sealing-plug from the holders into the mouth of the bottle while the head of the same is in contact with the said spring-held ring, and appliances to secure the said sealing-plug within the mouth of the bottle, substantially as specified.

2. In a bottle-sealing machine, a sealing-head which comprises a shell having a lateral opening therein for the introduction of sealing-plugs thereto, combined with a spring-held ring situated within the said shell, having an inner diameter which is less than that of the head of the bottle to be sealed, and provided with a lateral aperture leading to the lateral opening in the said head, spring-held sealing-plug holders situated within the said ring and in alinement with the aperture leading to the lateral opening in the said shell, a slotted conduit having its discharge end in communication with the lateral opening in the shell, stop mechanism to yieldingly hold back the column of sealing-plugs in the conduit, a system of pivoted fingers with means to vibrate them longitudinally of the aperture in the spring-held ring and the slot of the conduit, to force sealing-plugs from the stop mechanism to the sealing-plug holders, means to push the sealing-plug supported by the holders into the mouth of the bottle while the head of the same is in contact with the spring-held ring, and to expand the said sealing-plug within the mouth of the bottle, substantially as specified.

3. In a bottle-sealing machine, the combination of a shell having in its lower end a loose ring with an inner diameter which is less than that of the head of the bottle to be sealed and which is yieldingly held in its lowest position with reference to the said shell, combined with a sealing-plug-expanding device having an up-and-down movement independently of the said ring, which expanding device embodies a hollow cylinder the lower portion of which is divided into segments, and its extreme end provided with a lip, and the said segments having inclined inner surfaces, a central spindle having a fixed position with respect to the said shell and provided with a conical point adapted to bear against the inclined surfaces of the segments, and means whereby the said spindle is forced tightly against the inclined surfaces of the segments to force them apart and thereby expand the terminal lip when the same is seated in a bottle-sealing plug susceptible of distention or expansion in a bottle-mouth, substantially as specified.

4. In a mechanism to assort bottle-sealing devices, and feed the same to a conduit leading to a bottle-sealing head, an exteriorly-flanged rotary hopper having a ported rim carrying sealing-plug-assorting pins, which ported rim projects from the flange, and a fixed covering plate or head with which the said rim forms an annular space in communication with the conduit leading to the sealing-head, combined with a disk situated between the flanged hopper and the stationary head thereof, adapted to rotate with the said hopper the said disk having an inward projection and sealing-plug-assorting-pins which coöperate with the pins in the ported rim to admit of the discharge of such sealing-plugs as will pass between the said assorting devices through the said rim-ports to the annular space around the said rim, and thence to the conduit, substantially as specified.

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Witnesses:
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WM. T. HOWARD.