

No. 672,671.

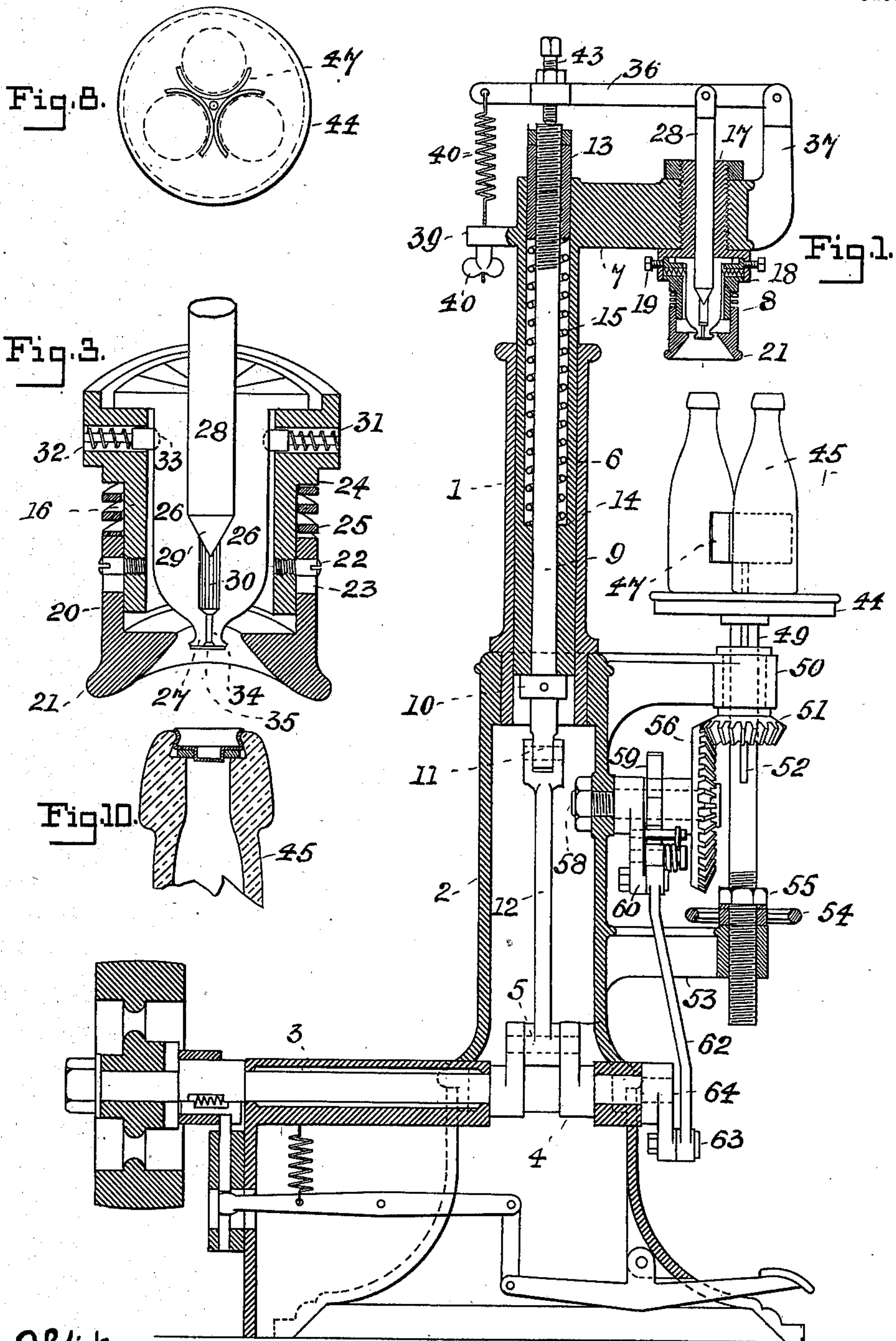
Patented Apr. 23, 1901.

H. T. GAY.
BOTTLE SEALING MACHINE.

(Application filed Oct. 4, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:-

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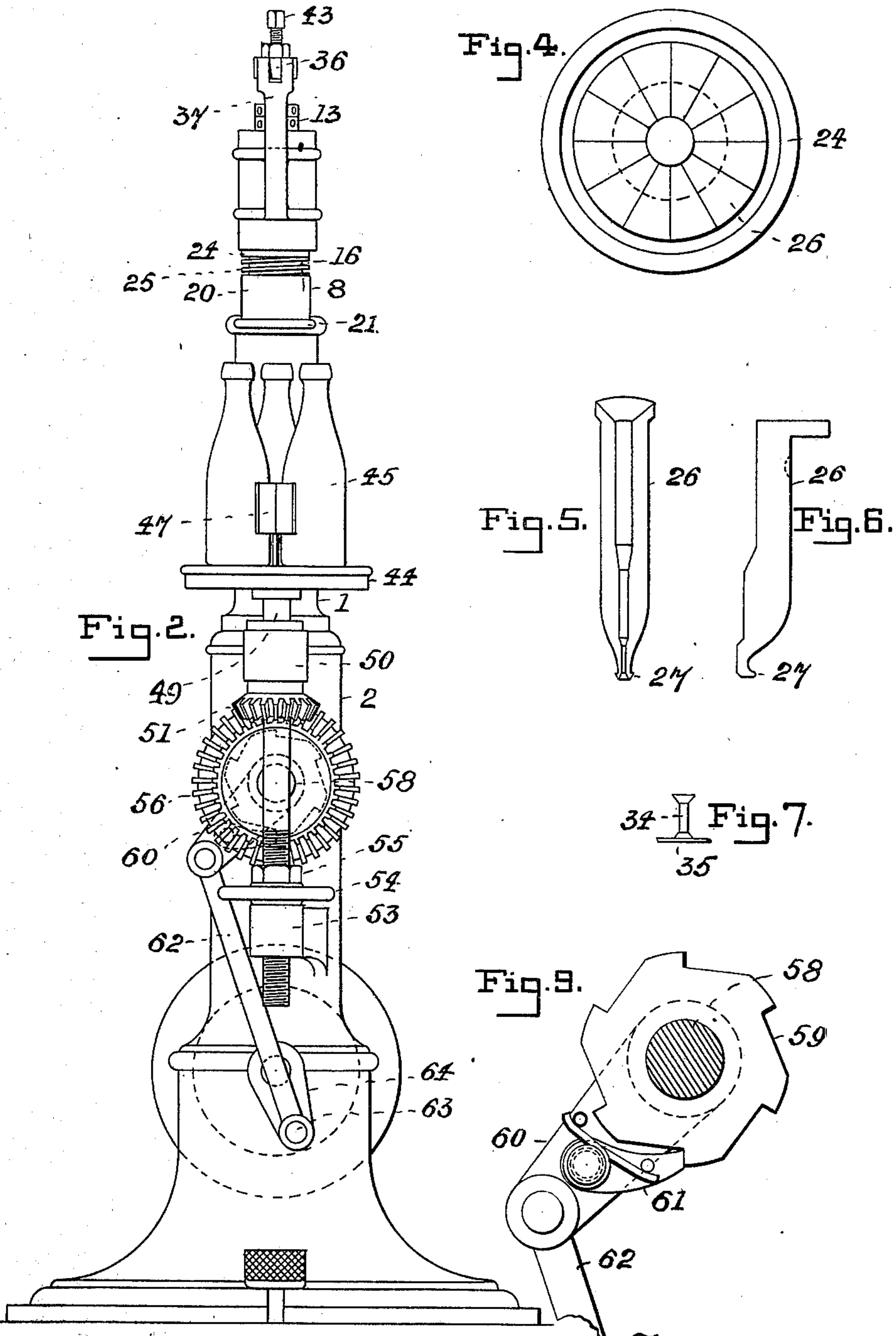
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2 Sheets—Sheet 2



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UNITED STATES PATENT OFFICE.

HERMAN T. GAY, OF BALTIMORE, MARYLAND.

BOTTLE-SEALING MACHINE.

SPECIFICATION forming part of Letters Patent No. 672,671, dated April 23, 1901.

Application filed October 4, 1900. Serial No. 31,961. (No model.)

To all whom it may concern:

Be it known that I, HERMAN T. GAY, of the city of Baltimore, in the 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 within a bottle-mouth a sealing device of the character shown and described in my application originally filed on the 26th day of August, 1898, under Serial No. 689,551, and renewed on the 2d day of April, 1900, under Serial No. 11,261, to which reference should be made. By reference to the said application 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, over 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 of the sealing-plug is expanded or distended 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 device is so held to expand the flange of the disk to hold the gasketed plug firmly in place.

In the 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 a partly sectional side elevation of the improved machine. Fig. 2 is an exterior front view. Fig. 3 is a perspective central section of the principal parts of the sealing-head of the machine, on an enlarged scale. Fig. 4 is a top view of Fig. 3. Figs. 5, 6, 7, 8, and 9 are details of the machine. Fig. 10 is a sectional side view of a bottle-head and its sealing-plug, on an enlarged scale.

Referring now to the drawings, it will be seen that the stand of the machine is constructed of columnal form and in two sections 1 and 2. Passing laterally through the lower

section 2 is the driving-shaft 3, having a crank 4, the pin 5 of which is central of the stand. Within the upper section 1 of the frame is a vertically-sliding sleeve 6, having at its upper end the branch 7, carrying the sealing-head, which as an entirety is denoted by 8. 9 is a bar inclosed within and adapted to slide vertically of the sleeve 6, having at its lower end a collar 10 and below the collar an eye 11, which is connected to the crank-pin 5 by the rod 12. The upper end of the bar 9 is threaded and provided with the cylindrical nut 13, which is fitted to slide in the sleeve 6. Confined endwise between the under side of the nut 13 and a shoulder 14, formed in the sleeve 6, is a coiled spring 15. With this construction when the crank is performing its downward stroke the sleeve carrying the head 8 is drawn down by the compression of the coiled spring 15 through the medium of the bar 9 and the connecting-rod 12. The return movement of the head is effected by the extension of the coiled spring 15 in the upward stroke of the crank-pin 5.

The sealing-head 8 consists of the inner cylindrical shell 16, held to the branch 7 by the exteriorly-threaded hollow plug 17, having the enlargement 18, which fits over the upper end of the said inner cylindrical shell and is secured by set-screws 19 or by any other means.

20 is the outer cylindrical shell, adapted to slide longitudinally of the inner one 16, having the flaring lips 21. The outward movement of the outer cylindrical shell 20 is limited by the screws 22, which pass through slots 23 in the outer cylindrical shell, as shown particularly in Fig. 3.

Coiled about the inner cylindrical shell 16 and confined endwise between a collar 24 and the end of the outer cylindrical shell is a coiled spring 25, which is normally extended.

Within the inner cylindrical shell 16, with their lower ends projecting below the contracted portion of the mouth of the outer cylindrical shell, are expansible jaws 26, one of which is shown in Figs. 5 and 6, which are respectively a perspective view of a jaw as seen from the inside and a side view of the same. The jaws are segmental in shape, as seen from the top or bottom, (see Fig. 4, which is a top view of Fig. 3,) and their upper ends have lateral projections which extend over

the upper edge of the inner cylindrical shell to support them, as shown particularly in Fig. 3. The jaws as a body fit loosely in the inner cylindrical shell 16, and they may therefore be expanded, for a purpose hereinafter described. The lower ends of the segmental jaws 26 are hooked and together form a distensible button 27 for expanding the flange of the sealing-plug in the annular groove in the bottle-mouth in a manner hereinafter described.

28 is a stem with a conical end 29 inclosed within the body of segmental jaws, and 30 a cylindrical opening into which the point of the cone enters. (See Fig. 3.) It will be seen that if the stem 28 is pushed down from its normal position (shown in Fig. 3) the lower ends of the jaws 26 will be distended, and should the button 27, formed by their hooked ends, rest in a closely-fitting sealing-plug the flange of the same will be expanded.

31 31 are spiral springs confined in holes 32 in the inner cylindrical shell 16 of the head 8, which serve to yieldingly hold the bolts 33 against the outer surface of the segmental jaws 26. These springs are normally inactive and are only further compressed when undue resistance is offered to the distention of the button 27 at the end of the jaws, as hereinafter described.

The extreme ends of the jaws 26, which form the button 27, close on the shank 34 of a disk 35. (Shown on an enlarged scale in Fig. 7.) This disk is made of some hard smooth material, such as steel, and the ends of the jaws in their distention in the sealing operation rub against the upper surface of the disk instead of the inner surface of the comparatively soft sealing-plug, which would abraid it.

The upper end of the stem 28 is hinged to a lever 36, fulcrumed to an arm 37, extending from the branch 7. (See particularly Fig. 1.) The free end of the lever 36 is attached to a lug 39 on the sliding sleeve 6 by means of a spiral spring 40, and the lower end of the said spring is provided with an adjusting thumb-nut 41 for regulating the tension on the lever.

43 is a set-screw which passes through the lever 36 and bears against the upper end of the bar 9.

44 is a stand adapted to hold three bottles which are grouped together and at equal distances from the center of the stand. This uniformity in position of the bottles, which are denoted by 45, with reference to the center of the stand is effected by the spacing and centering device 47, a top view of which is shown in Fig. 8.

It will be understood that the center of the bottle-stand 44 has such relation to the center of the head 8 that by turning the stand around any bottle thereon may be brought directly under the head.

The bottle-stand is secured to the upper end of the shaft 49, which passes through the hub

of a beveled spur pinion-wheel 51, hereinafter referred to, which hub is adapted to rotate in the bracket 50, projecting from the lower section 2 of the stand of the machine. The beveled spur pinion-wheel just referred to is seated on a feather 52 on the shaft 49, which passes loosely through a bracket 53, extending from the section 2 of the stand, and is threaded and provided with a nut 54 in the form of a hand-wheel and a locking-nut 55. By means of the said hand-wheel the position of the bottle-stand may be adjusted to suit bottles differing in height.

56 is a master beveled gear-wheel arranged to turn loosely on the stud 58, with its teeth in mesh with those of the pinion 51, and on the hub of the wheel 56 is a ratchet-disk 59, which is shown dotted in Fig. 2 and fully in Fig. 9.

60 is an arm loose on the stud 58, carrying a spring-held pawl 61, with its end resting on the teeth of the ratchet-disk 59. (See Fig. 9.) The end of the arm 60 is connected by the rod 62 to the pin 63 of the crank 64, secured to the end of the driving-shaft 3. Consequently at each revolution of the shaft 3 the ratchet-disk 59 is moved circumferentially a distance which is in proportion to the stroke of the crank-pin 63 as the distance the pawl 61 from the center of the stud 58 is to the full length of stroke of the crank, and the relative diameters of the gear-wheels 51 and 56 are such that at each revolution of the driving-shaft the bottle-stand performs one-third of a revolution and a bottle is brought directly under the head 8.

Supposing the various parts of the machine to be in the relative positions shown in the drawings and the bottle-stand provided with three bottles, with sealing-plugs seated loosely in their mouths, the sealing operation is as follows: During the downward stroke of the crank 4 the head 8 is pulled down until it passes over the bottle-head beneath it, the distensible button of the combined jaws entering the sealing-plug and forcing it down, so as to compress the cork gasket tightly in contact with the annular seat in the bottle-mouth. When the proper pressure to effect this result is obtained, the downward movement of the head is stopped, and the spring 15, which has been somewhat compressed in the operation, is further compressed, but inoperatively. The movement of the bar 9 subsequent to the stoppage of the head 8 is, however, availed of to set out or expand the flange of the sealing-plug into the annular groove in the bottle-mouth in the following manner: When the head 8 stops and the bar 9 continues its downward course, the upper end of the said bar is drawn from the screw 43, and the lever 36, being then unsupported, is forced down by the action of the spiral spring 40 and the stem 28 driven between the lower ends of the jaws 26. The jaws are thus spread apart, and the button 27, formed by their ends, expanded, which effects the re-

quired expansion of the flange of the sealing-plug in the annular groove in the bottle-mouth, a result which is accomplished while the cork gasket is held in a compressed condition. In the return or upward movement of the crank 4 the head 8 is lifted from the sealed bottle and the bottle-stand rotated one-third of a complete revolution, which brings a new unsealed bottle under the said head, and the sealing operation just described is repeated.

Should the diameter of the annular groove in the bottle-mouth be considerably smaller than that prearranged for or one which would likely cause the breakage of the bottle-neck in the distention of the flange of the sealing-plug, the upper ends of the jaws will move outward, thus reducing the degree of distention of the button, as will be readily understood.

I claim as my invention—

1. In a machine for expanding a sealing-plug of substantially the character described, in the mouth of a bottle and compressing a joint-forming gasket between the said plug and a seat formed in the bottle-mouth, a vertically-moving head comprising a central stem with a conical end, a system of distensible jaws arranged radially around the said stem so as to inclose it, and terminating at their lower ends in segments of a distensible button, independent and separate spring-supported devices which are applied to the said segmental jaws exteriorly thereof, whereby the jaws are held to the central stem with a yielding pressure, and which admit of the outward radial movement of the said jaws at either end thereof, and means to force the said stem downward independently of the said jaws, to effect the distention of the said button, substantially as specified.

2. In a machine for expanding a sealing-plug of substantially the character described, within the mouth of a bottle and compressing a joint-forming gasket between the underside of the sealing-plug and a seat for the same formed within the bottle, a vertically-moving head comprising a central stem having a pointed end, a system of segmental jaws arranged radially around the said stem, the said jaws terminating at their lower end in segments of a distensible button, independent and separate spring-supported devices which are applied to the said segmental jaws exteriorly thereof, whereby the jaws are held to the said central stem with a yielding pressure, and which admit of an outward radial movement of the said jaws at either end thereof, means to effect the joint downward movement of the head and jaws, together with the central stem, and other means to effect the independent downward motion of the said central stem whereby the said jaws are distended and the button increased in diameter, substantially as specified.

3. In a machine for affixing within a bot-

tle-mouth a distensible sealing-plug consisting of a flanged disk, a downwardly-moving head having the following elements in combination, viz., an inner cylindrical shell carrying a central stem with a conical end, a system of jaws arranged exteriorly of the said stem, the said jaws terminating at their lower end in segments of a distensible button, an outer cylindrical shell adapted to slide longitudinally of the inner one, a coiled spring on the inner cylindrical shell, confined endwise between the upper edge of the outer shell and a collar on the inner one, the said outer shell having flaring lips which serve to guide the bottle to be sealed within the head, and radially-extending spring-held bolts which yieldingly sustain the upper ends of the jaws against distention and means to effect the independent downward movement of the central stem independently of the jaws and thereby distend them, substantially as specified.

4. In a machine for expanding the flange of a sealing-disk within a bottle-mouth, the combination of a central stem, a system of segmental jaws which at their lower ends form a distensible button, and means to separate radially the said jaws to effect such distention, a disk situated under and in contact with the said button and a supporting-stem for the said disk which is inclosed by the said jaws, substantially as, and for the purpose specified.

5. In a machine for expanding the flange of a sealing-disk within the mouth of a bottle, a series of segmental jaws terminating collectively in a distensible button at their lower ends, means to effect the distention or separation of the said jaws, a stem inclosed within or by the portion of the jaws forming the button, and a disk connected to the lower end of the said stem, substantially as, and for the purpose specified.

6. In a machine for securing a sealing-plug in a bottle-mouth, the following elements in combination, viz., a stand, a driving-shaft carrying a crank, a sealing-head which is vertically reciprocated from the said crank, a rotary bottle-stand attached to the upper end of a shaft, a beveled pinion-wheel on the said vertical shaft, a horizontally-extending stud projecting from the stand, a master bevel-wheel adapted to turn loosely on the said stud and in mesh with the said pinion, a ratchet-disk secured to the said master-wheel, an arm loose on the said stud, a pawl on the said arm adapted to engage with the teeth of the ratchet-disk, a crank on the end of the driving-shaft and a rod to connect the pin of the second crank with the end of the said arm, whereby an intermittent rotation of the said bottle-stand is effected in the rotation of the main driving-shaft, substantially as specified.

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