Nov. 26, 1935. C. H. BRINTON ET AL 2,022,633

MEANS FOR APPLYING SEALING MEANS TO CONTAINERS

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Fig. 1.

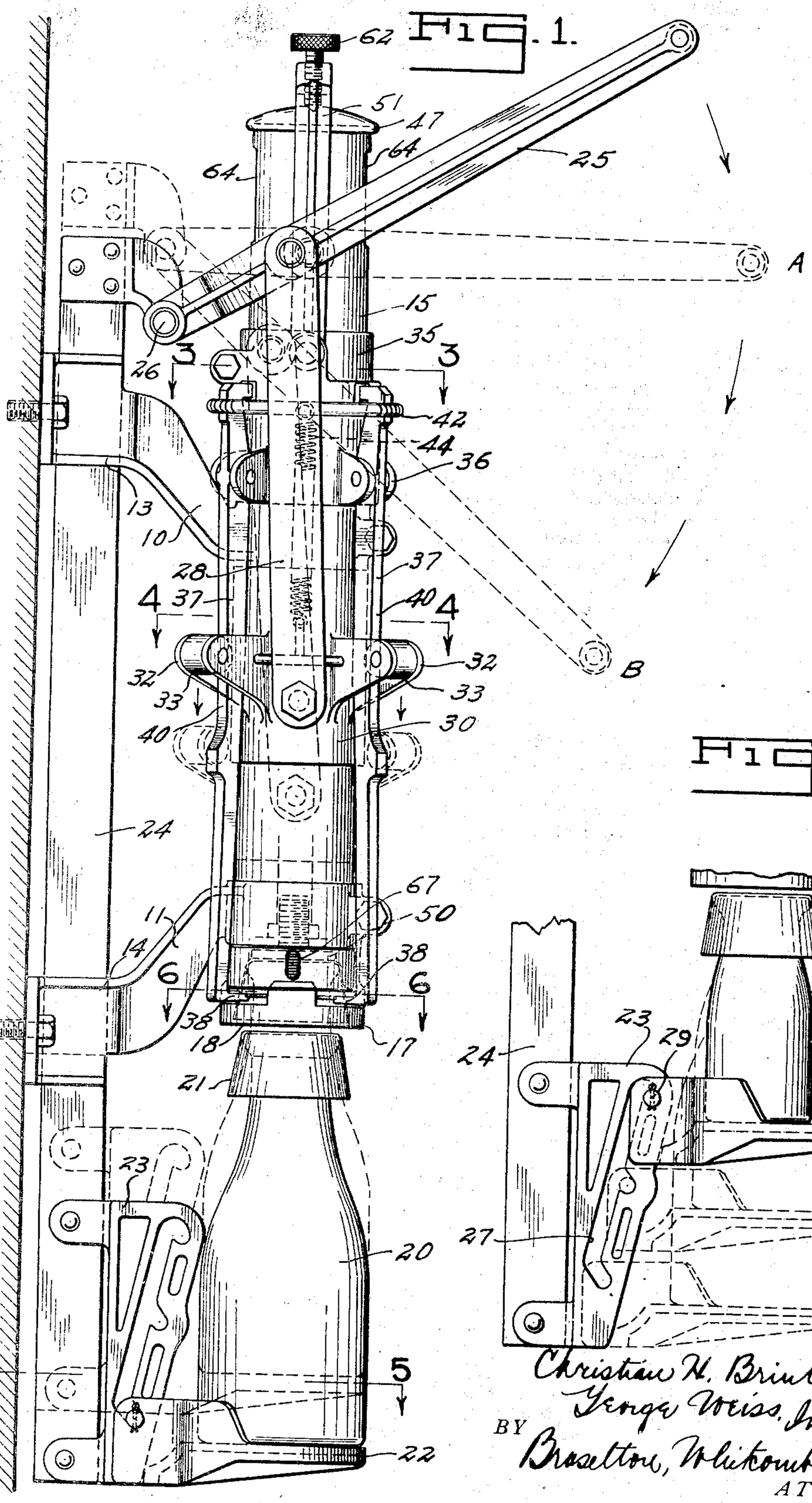
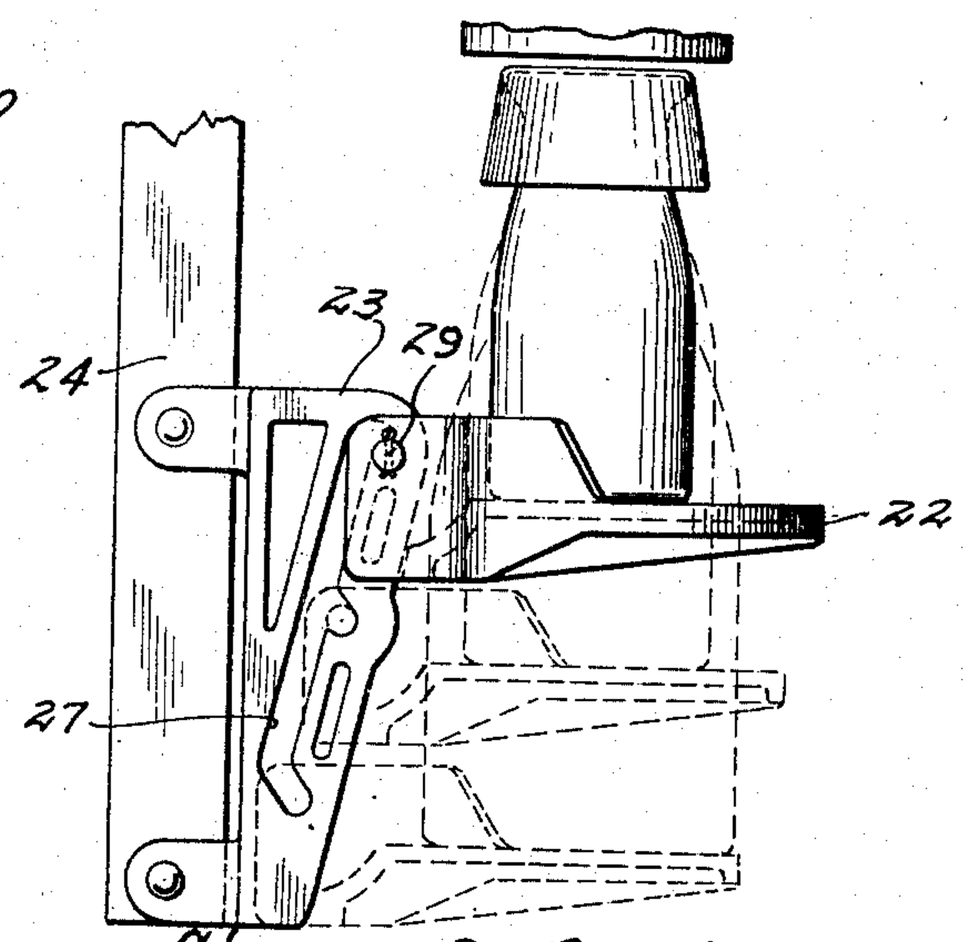


Fig. 2.



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MEANS FOR APPLYING SEALING MEANS TO CONTAINERS

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Fig. 3.

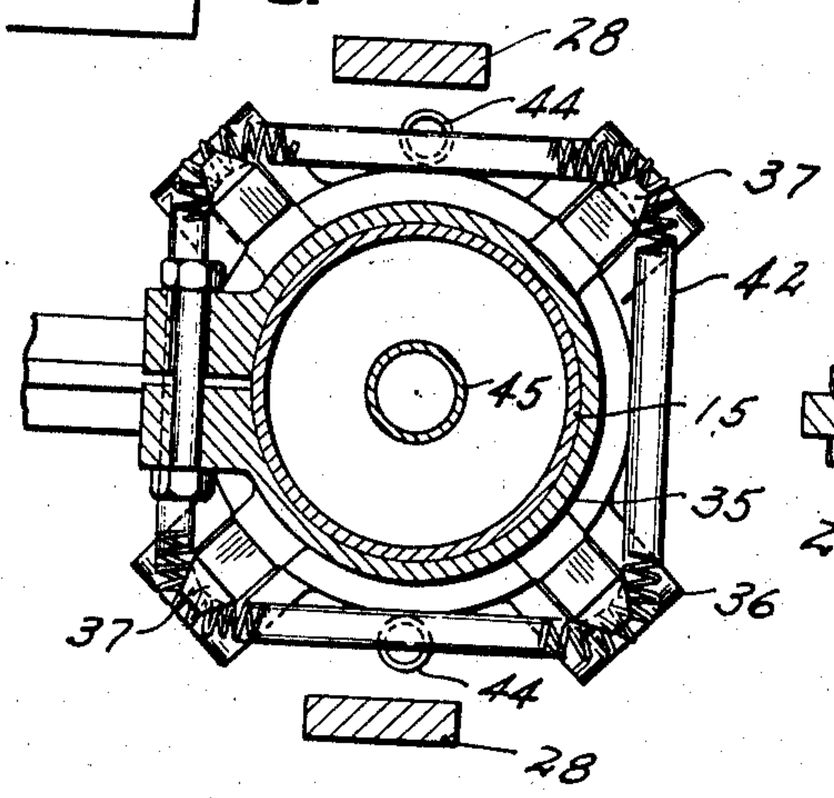


Fig. 5.

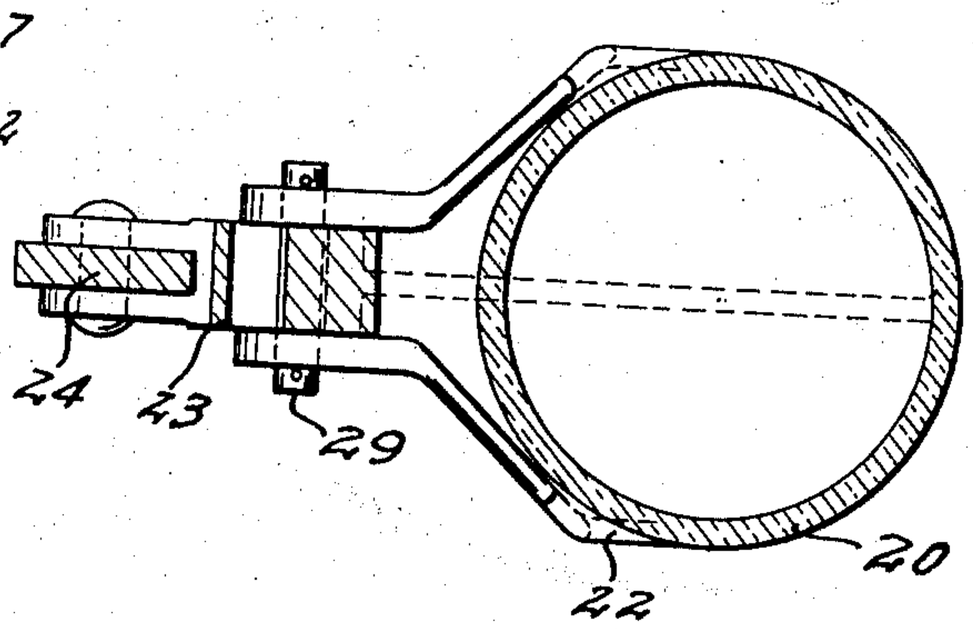


Fig. 4.

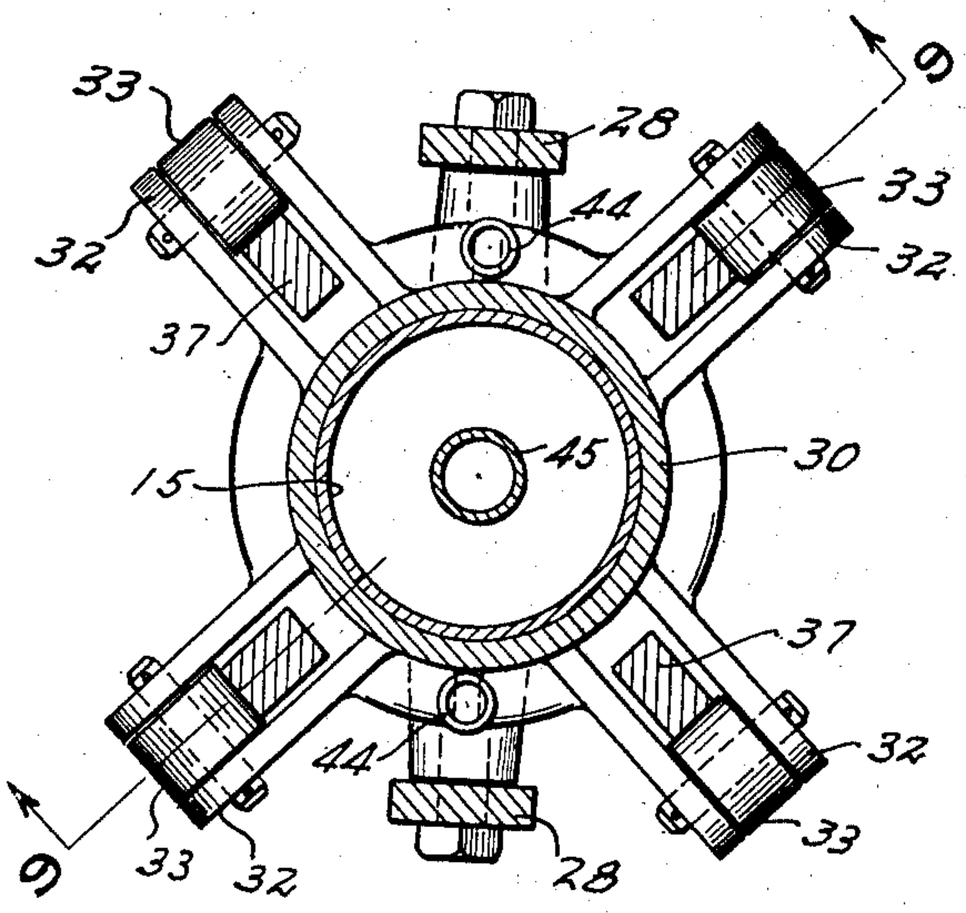


Fig. 6.

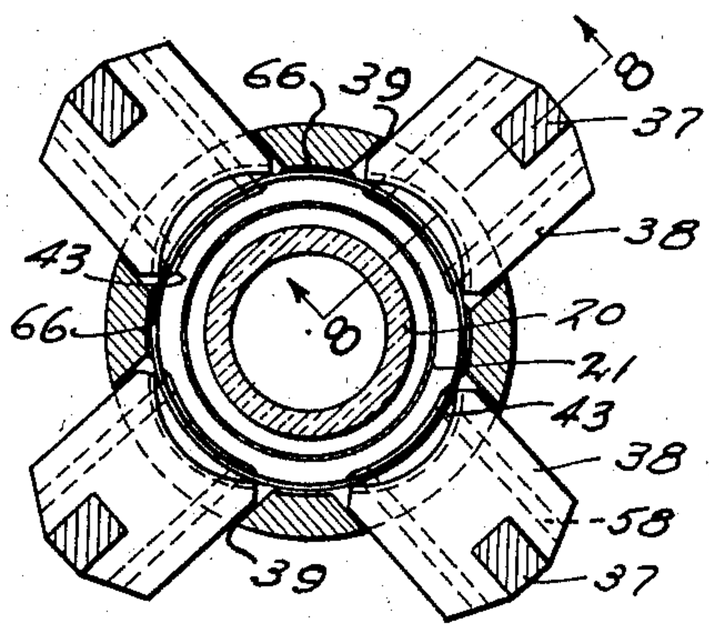


Fig. 7.

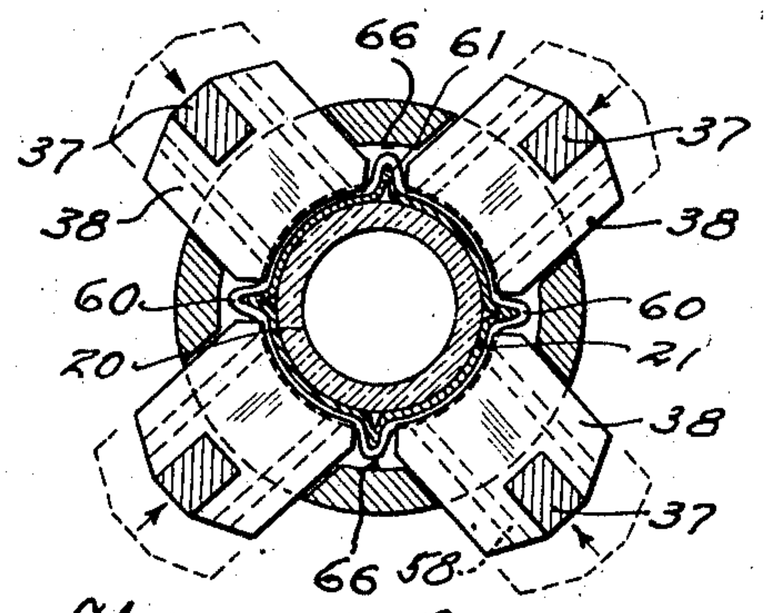
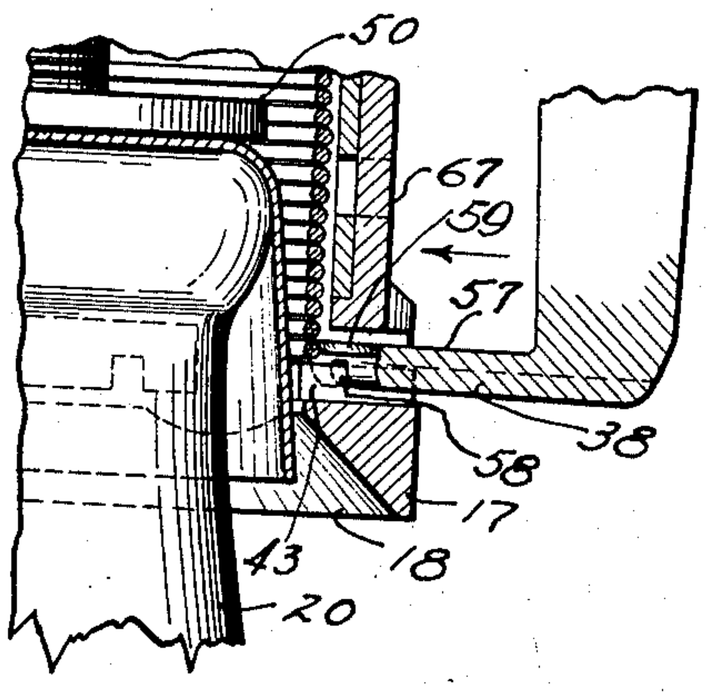


Fig. 8.



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MEANS FOR APPLYING SEALING MEANS TO CONTAINERS

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Fig. 9.

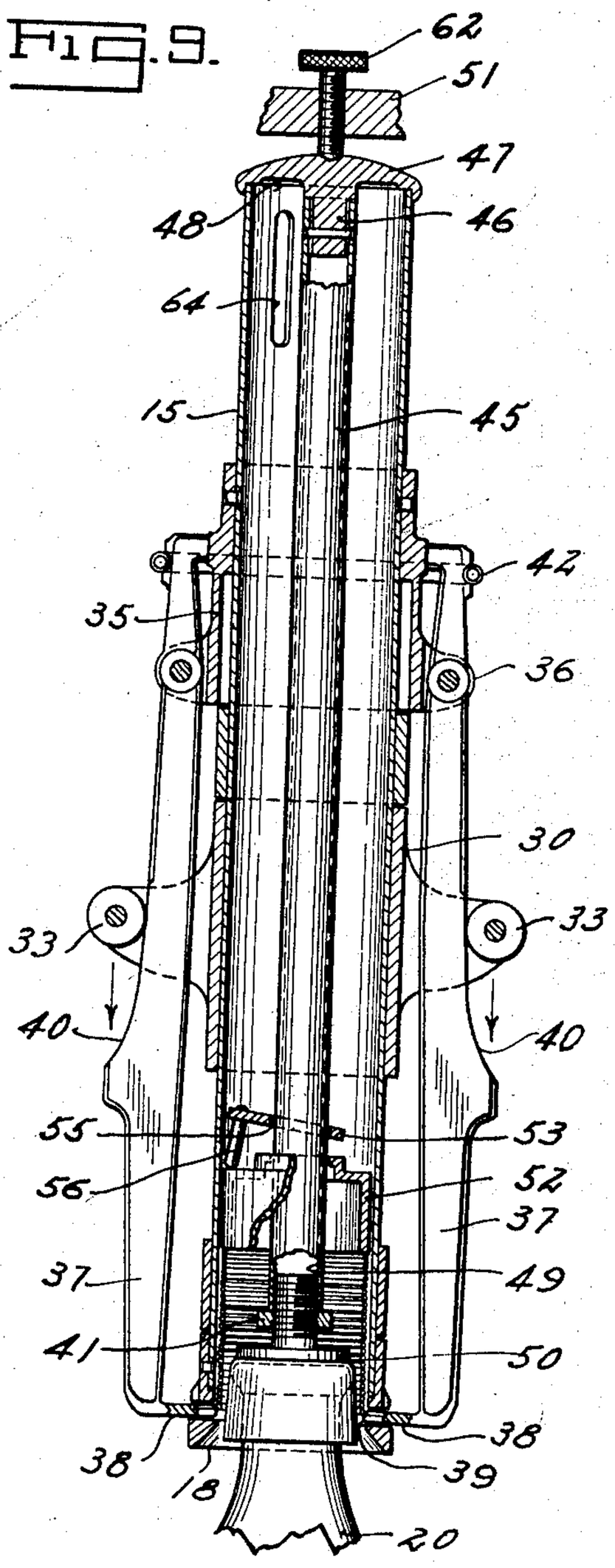


Fig. 10.

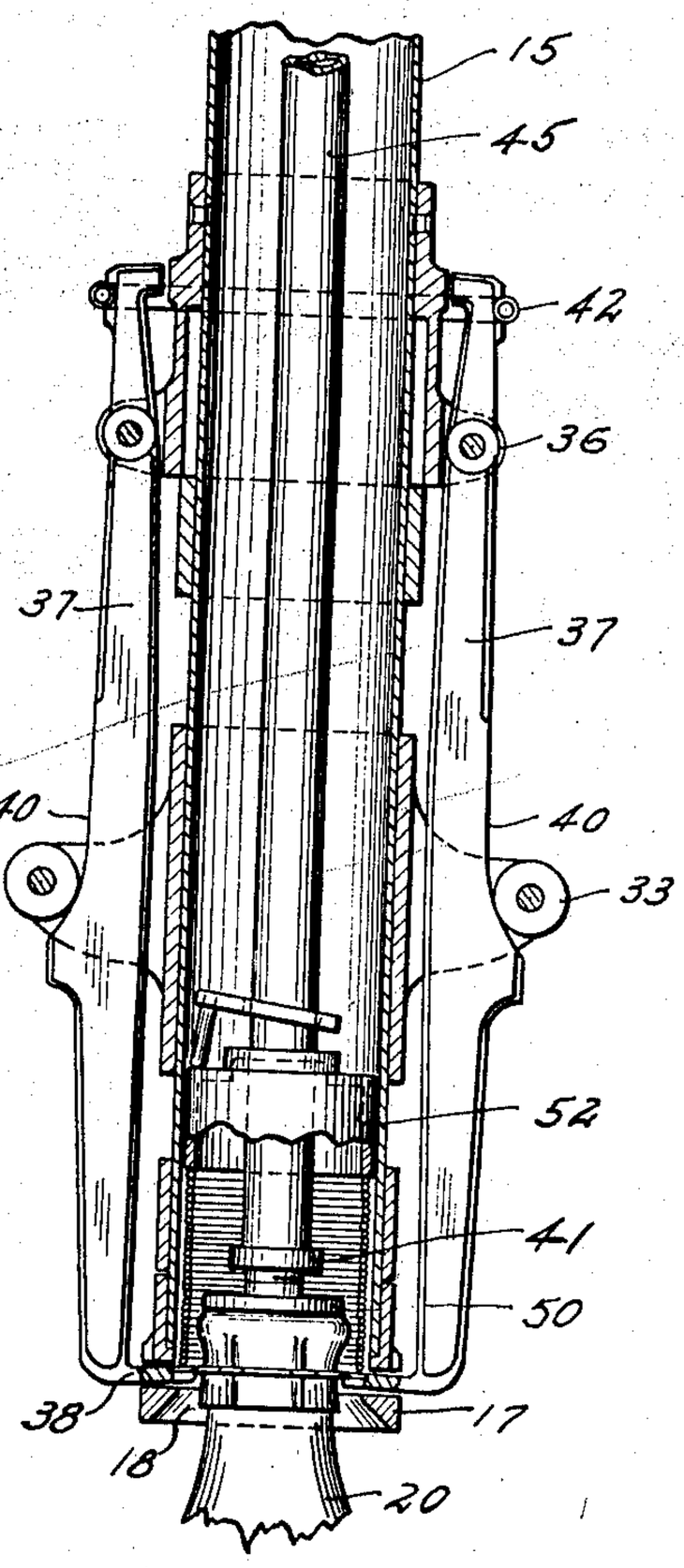
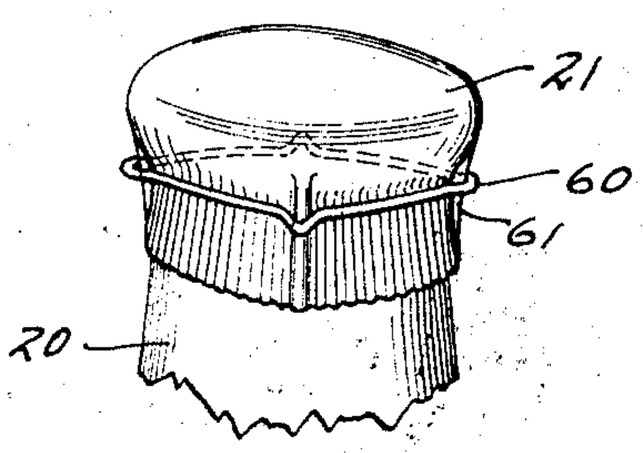


Fig. 11



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MEANS FOR APPLYING SEALING MEANS TO CONTAINERS

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FIG. 12.

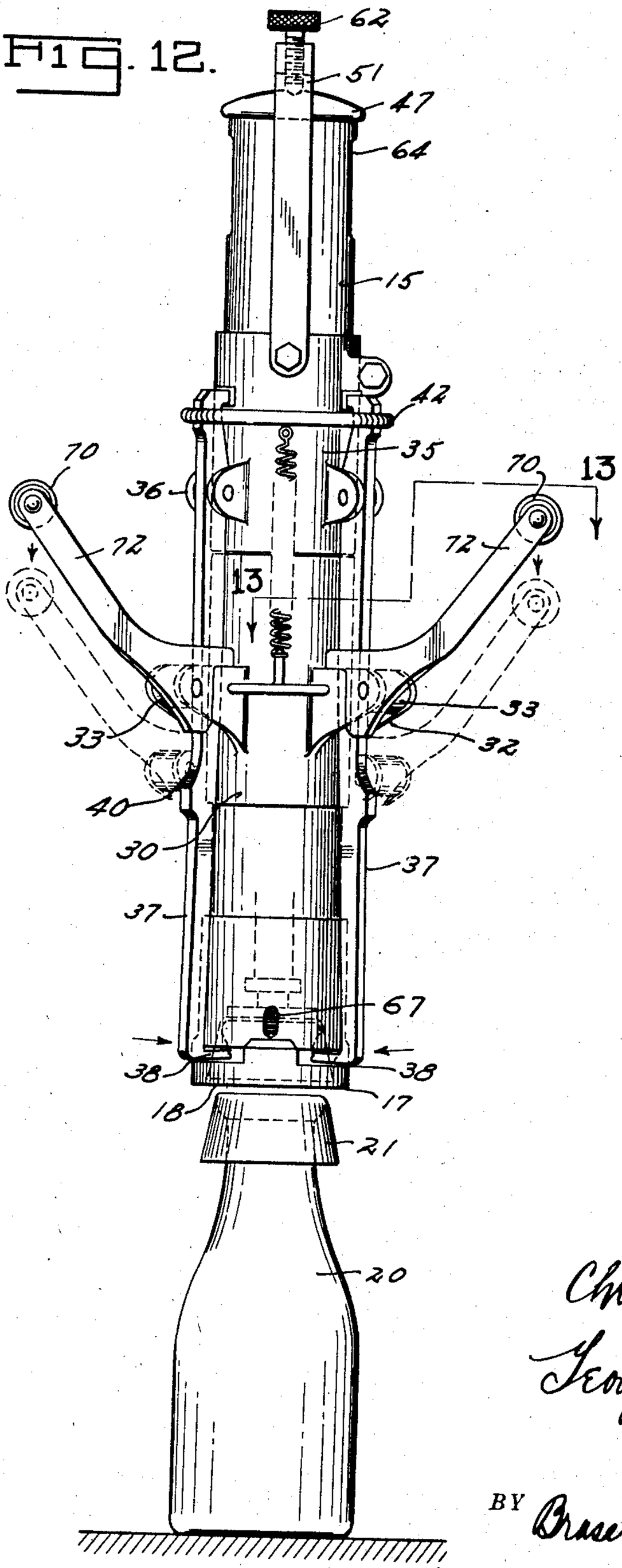
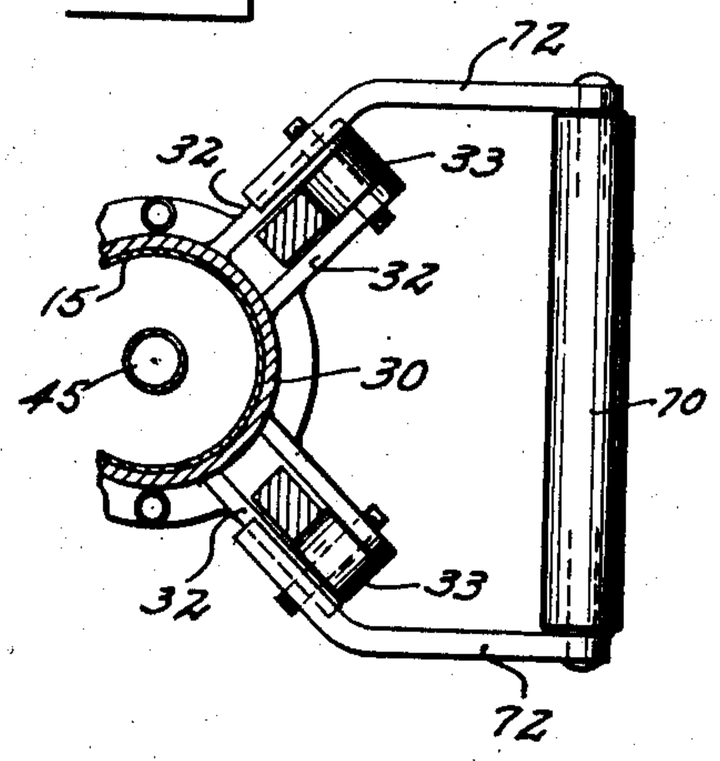


FIG. 13.



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Patented Nov. 26, 1935

2,022,633

UNITED STATES PATENT OFFICE

2,022,633

MEANS FOR APPLYING SEALING MEANS TO CONTAINERS

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Application August 16, 1932, Serial No. 629,062

19 Claims. (Cl. 226—80)

This invention relates to a method and means for periodically delivering or serving objects and particularly to a method and means for selectively positioning and contracting such objects to produce a seal.

The invention contemplates the provision of means and apparatus for selectively positioning and contracting rings or bands on containers which has particular utility in providing a seal for milk bottles.

The invention embraces the provision of a mechanism of this character in which a non-resilient bond is distorted at intervals for crimping the container closure adjacent to the distorted portions.

An object of the invention is the provision of a mechanism of this character which is adapted and readily adjustable for use in applying rings to various types of containers.

A further object of the invention is the provision of improved and reliable means for manipulating rings or other objects from a source of supply whereby the same are subsequently and automatically applied to containers.

A still further object of the invention embraces a mechanism wherein a minimum of operating parts of rugged construction are utilized and wherein a single operation is required to effectively seal a container.

Further objects and advantages are within the scope of the invention such as relate to the arrangement of the elements of the structure, to various details of construction, economies of manufacture and numerous other features as will be apparent from a consideration of the drawings, and related description of a form of the invention which may be preferred, in which:

Figure 1 is a side elevational view of a form of a mechanism for carrying out my invention;

Figure 2 is a side elevational view showing the adjustable container support of the invention;

Figure 3 is a sectional detail view taken substantially on a line 3—3 of Figure 1;

Figure 4 is a sectional detail view taken substantially on a line 4—4 of Figure 1;

Figure 5 is a sectional detail view taken substantially on a line 5—5 of Figure 1;

Figure 6 is a sectional detail view taken substantially on a line 6—6 of Figure 1;

Figure 7 is a view similar to Figure 6 showing portions of the mechanism in effective position;

Figure 8 is an enlarged fragmentary sectional detail taken substantially on a line 8—8 of Figure 6;

Figure 9 is a vertical sectional detail taken substantially on a line 9—9 of Figure 4;

Figure 10 is a fragmentary view similar to Figure 9 showing portions of the mechanism in effective position;

Figure 11 is a fragmentary view of a container sealed by the method and means of this invention;

Figure 12 is a side elevational view of a modified form of the invention;

Figure 13 is a sectional detail view taken substantially on a line 13—13 of Figure 12.

Referring to the drawings in detail and more particularly to Figures 1 and 2 thereof, in which a machine is shown as illustrating a practical embodiment of the invention, the machine shown being capable of being removably supported to a relatively fixed object by means such as brackets 10 and 11 carried by a housing 15 serving as a magazine or container for a plurality of sealing elements. Housing 15 is preferably made of tubular formation and of a diameter closely approximating the diameter of a metallic band or ring suitable for use in sealing containers, such as the mouths of milk bottles upon which a closure has been placed such closures being preferably of the skirted or hooded type. Positioned adjacent one end of the magazine 15 and preferably carried thereby is a ring support 17 having bore 18 therein adapted to receive the mouth of a container. A container 20 in the form shown is provided with a closure 21, and may be placed in effective position adjacent the ring support 17 by means of an adjustable and movable bracket or support 22 carried by a movable bar 24 slidably positioned in guides 13 and 14 provided in the brackets 10 and 11. Adjacent the extremity of bar 24 opposite the bracket 22 is pivotally secured as at 26 an operating lever 25.

The lever 25 is provided with bifurcated portions forming actuating arms. To each arm of lever 25 is pivotally connected, on diametrically opposite sides of the magazine 15, a bar or link 28, which links are also pivoted to a slidable collar 30. The collar 30 mounted to have slidable engagement on the outer wall of magazine 15 is provided with a plurality of sets of ears or projections 32 between each set is journalled a roller 33. Fixedly secured to the magazine 15 adjacent the bracket 10 is a second collar 35 which also supports a plurality of ears or projections 36 which pivotally support a plurality of elongated cam members 37 having a seal distoring portion or jaw member 38 formed at their extremities which cooperate with openings 39 in

the ring support or seal positioner 17. The rollers 33 cooperate with cam surfaces 40 provided on the cam members 37 for a purpose hereinafter more fully described. A substantially continuous spring ring 42 is positioned adjacent the extremities of cam members 37 to resiliently hold the jaw members 38 outwardly with respect to the ring support 17; and also serve to urge the cam surfaces 40 of member 37 against the rollers 33 carried by collar 30. To resiliently resist downward movement of collar 30 upon movement of bars 28 by lever 25, springs 44 have been provided between collar 35 and slidable collar 30, which springs 44 tend to normally return the mechanism to inoperative position, and present sufficient resistance to prevent the movement of collar 30 until a container is in engagement with stop member 50.

Mounted interiorally of magazine 15 and substantially centrally thereof is a container positioner in the form of a tube or hollow element 45 loosely connected or otherwise secured to a projection 46 in a cover element 47, the cover 47 being provided to enclose the open end 48 of magazine or seal container 15. The tube 45 is preferably screw threaded as at 49 to receive a stop or positioner 50 having a screw threaded portion coacting with the threaded portion 49 of element 45. The stop or positioner 50 may be of a desirable configuration capable to firmly position a closure on a container in order that a sealing ring or element may be correctly positioned with respect to the closure and container opening. The threaded portions of stop member or positioner 50 and the coacting screw threaded portion 49 of element 45 permits the adjustment of stop member 50 relative to the openings 39 in the ring positioner 17 which accommodates the seal distorting members 38. This adjustment serves for the purpose of properly sealing different sized containers or containers having different beads or enlarged mouth portions, as in the case of milk bottles. We have provided means for retaining such adjustment, in the form illustrated this means being a lock nut 41. Slidably positioned on tube 45 is a weight member 52 contacting the interior of magazine 15 and with which cooperates a lock member 53 permitting movement of weight member 52 in one direction and resisting movement thereof in another direction, thus positively holding the sealing means in a fixed predetermined position.

The weighted member 52 and its lock member 53 urge the sealing means contained within magazine 15 against stop members 43 which also serve as guiding elements for the seal distorting portion 38 of members 37 as hereinafter more fully described. The weighted member 52 and lock element 53 act as weight and gravity feeding means for the sealing elements, in the form shown of a ring like formation. The lock element 53 may preferably be of a flat metallic washer 54 having an opening 55 of a predetermined size adapted to snugly engage the tube 45. Washer or lock member 54 carries a pin 56 suitably secured to one extremity, the pin contacting with a portion of the weight member 52 and angularly displacing washer 54 with respect to the longitudinal axis of tube 45, this arrangement serving to aid in feeding the sealing means and at the same time provide an automatic stop preventing upward displacement of the sealing means when the lowermost ring is in engagement with the distorting portions 38 of members 37.

The loose connection between element 45 and cover element 47 permits the hollow element to be free to centrally adjust itself with respect to the walls of the stationary tube or magazine 15 and thus allow the weight member 52 and its cooperating automatic locking stop means 53 to slide freely within the walls of magazine 15 and prevent any binding action therebetween.

In order to fixedly secure cover 47 and to prevent the ingress of foreign matter or dirt to the magazine 15 we provide a U-shaped member 51 pivoted as at 59 to collar 35. The bight of the U-shaped member is provided with a thumb screw 62 which engages a recess of cover 47. It can be seen that manipulation of the thumb screw 62 will secure the cover 47 closing the open end of magazine 15.

Adjacent the end of the magazine 15 closed by member 47 we provide slots 64 which aid materially in properly loading sealing means or rings within the magazine 15. By means of these slots 64 the magazine can be loaded direct from a supply tube which is used for retaining the sealing bands during transportation.

The ring positioner 17 is provided with a plurality of openings 39 adapted to accommodate the ring distorting portions 38 of the members 37. Each of the members 37 is provided with grooves 58 adapted to be snugly engaged with the guides 43 of the ring positioner 17. These guides serve to properly direct the distorting portions 38 of members 37 so that the configuration of the ring or sealing means or its diameter will be materially reduced to engage the portion of the container and retain the closure to which the seal is applied in a fixed and proper relation thus providing a highly efficient seal.

The ring positioner 17 is also provided with a plurality of recessed portions 66 preferably located between the distorting portions 38 of members 37 for the purpose of uniformly crimping the ring and regulating the size of the projections 69 serving to grip or engage a closure.

In order to prevent the ring distorting means from engaging the weight member 52 when the supply of sealing means is exhausted within the magazine 15 the ring positioner 17 is provided with a side opening 67 for the purpose of permitting the operator to visually see if rings are within magazine 15 or if the weight member 52 is visible through said opening.

We have provided a structure capable of applying sealing rings or bands to containers of various sizes in which the bracket 22 is adjustable with respect to the bar 24 as particularly illustrated in Figure 2. Bracket 22 is connected to the bar 24 by means of a plate 23, having an aperture or slot 27 of irregular contour therein, a pin 29 being provided in the bracket 22 cooperating with the slot 27. Thus we have provided a structure which may be adjusted to seal milk bottles for example, of one-half pint, pint or quart sizes.

As illustrated in detail in Figure 8, the jaws 38 project inwardly with respect to the ring positioner 17 and are provided with a flat top surface 57 and a groove 59, which groove contacts the lowermost ring in magazine 15 to contract the same about the closure and the bottle neck. It will also be noted that as the ring is contracted the next succeeding ring rests on the upper flat surface of the ring contracting element 38 to automatically retain the next succeeding rings in position while the lowermost ring is being operated upon. Thus as the jaws move inwardly the next ring remains in substantially

the same relative position until the paws are retracted, at which time the next succeeding ring is placed upon the guides 43 by the action of weight 52.

Figures 6 and 7 illustrate the method of contracting the ring about a closure the same being of the skirted or hood type and it will be noted in this respect that four jaws have been provided though we contemplate the use of any other desirable number, which cooperate to form the ring with four projections 60 which number we have found very effective in producing a satisfactory and efficient seal on the bottle mouth, serving to hold the closure in proper position. It will also be noted that the projections 60 clamp therebetween a portion of the closure as at 61 which prevents slippage of the ring on the closure, and provides a seal that in case the closure of ring is tampered with will render the same ineffective for a subsequent use.

The members 37 are provided with cam surfaces 40 which are so arranged with respect to the ring distorting portions 38 that a slow or gradually increasing crimping force is applied to the sealing element, as the collar 30 is actuated, and members 37 are removably supported by collar 35 so that the same may be replaced with members having cam surfaces of various curvature or which may have distorting portions of different sizes which permit the use of this mechanism in sealing a large number of different containers.

In the operation of this form of the invention the hooded caps or closures may be placed on the bottle mouths in any manner, as by hand or suitable mechanism. The bottles are then placed upon the support or bracket 22 and lever 25 moved downwardly through its full operating range. As the lever is moved to position A indicated in dotted lines, the bar 24 is moved upwardly and thus the bracket 22 is also moved toward the magazine, carrying the bottle upwardly so that the mouth portion thereof enters the bore 18 in the ring support 17 and the bottle contacts with the adjustable stop or positioner to hold the hood in place on the bottle mouth and to position the bottle neck and the closure in proper relation to the distorting elements 38. Continued downward movement of the lever moves the slidable collar 30 downwardly by means of the bar 28 and causes rollers 33 to ride the cam surfaces on the elements 37 which pivots the jaws about their fulcrums, and contracts the ring carried in the grooved portions of the distorting elements which action securely binds the ring element about the closure and the bottle neck to form a tight seal. Upward movement of lever releases the distorting elements and the next ring is placed in the grooves due to the action of weight member 52 which continuously applies sufficient force to the uppermost ring to cause downward movement thereof. Further upward movement of lever lowers the sealed bottle from the ring support.

The modified arrangement shown in Figures 12 and 13, is of the portable type particularly suitable for use in sealing containers which may be in cartons, boxes or the like and which mechanism is provided with operating handles 70, the arms 72 of which are secured to the projections 32 of collar 30 in a suitable manner. In this structure downward movement of the handles 70 actuates the collar 30 causing rollers 33 to contact with cam surfaces 40 of members 37 to distort the sealing element or ring in a manner similar to that previously described. Upward movement of handles 70 immediately releases the distorting portions 38 of members 37 from the distorted ring and the next succeeding ring is placed in a position to be operated upon. Due to the fact that four jaws or distorting elements 38 have been found effective to seal containers, the mechanism herein illustrated may be operated in a small space, for example, milk bottles may be placed in suitable crates and the closures sealed thereon without removal from such crates.

What we claim is:

1. In a bottle sealing mechanism, the combination of a magazine for receiving and supporting a plurality of seals; a collar; a bottle support; means for moving such support toward said magazine, said means cooperating with said collar to move the same with respect to said magazine upon continued operation of said means; and a plurality of deforming members actuated by said collar and engageable with a seal to contract said seal about a bottle.

2. In a bottle sealing mechanism, the combination of means for receiving a plurality of sealing elements; a member surrounding and movable longitudinally of said receiving means; a plurality of sealing element deforming members cooperating with said movable member to successively engage and deform said sealing elements; and means between said receiving means and said movable member to resist movement of said deforming members.

3. In a mechanism the combination of a magazine for supporting a plurality of sealing means; a removable cover for said magazine; a seal positioner associated with said magazine; a plurality of members cooperating with said seal positioner, said members having a cam surface; a movable collar carried by said magazine and having means engaging the cam surface of said members; means to move said collar whereby said members engage a seal in said seal positioner and apply the same to a container.

4. Mechanism for sealing containers; means including an elongated tubular magazine having a removable cover at its upper end for receiving a plurality of sealing elements; a member supported by and relatively movable with respect to said receiving means; a plurality of instrumentalities coacting with said member for applying and distorting sealing elements to containers; said instrumentalities having cooperating means for preventing escapement of sealing elements when one element is distorted.

5. In combination, a magazine for supporting sealing means; a removable cover for said magazine; a plurality of sealing means contracting members, said members having cam surfaces; a movable collar surrounding said magazine, said collar having antifriction means adapted for cooperative engagement with said cam surfaces; means to actuate said collar for causing said antifriction means to engage the cam surfaces of said members to engage and contract the sealing means; said members preventing escapement of uncontracted sealing means.

6. A mechanism for applying sealing means to containers in combination, a magazine for receiving a plurality of sealing elements; locking means within said magazine to position said sealing elements; a member supported by and relatively movable with respect to said magazine; a plurality of instrumentalities coacting with

said member for applying and deforming said sealing means upon a container upon movement of said member, and container positioning means removably mounted within said magazine.

7. A mechanism for applying sealing means to containers in combination, means for receiving a plurality of sealing elements; a collar surrounding said receiving means and relatively movable with respect to said receiving means; a plurality of sealing element distorting members having a surface coacting with said movable element for changing the configuration of a sealing element upon movement of said collar, and adjustable means adjacent said receiving means to position a container with respect to said sealing element.

8. In a mechanism the combination of a magzine for supporting a plurality of sealing means; a seal positioner associated with said magazine; a plurality of members cooperating with said seal positioner, said members having a cam surface; a movable collar carried by said magazine and having means engaging the cam surface of said members; means to move said collar whereby said members engage a seal in said seal positioner and apply the same to a container, and an automatically adjustable member to position said sealing means with respect to said seal positioner.

9. In a mechanism the combination of a magazine for supporting a plurality of sealing means; a seal positioner associated with said magazine; releasable means to hold said sealing means in engagement with said seal positioner; a plurality of members cooperating with said seal positioner, said members having a cam surface; a movable collar slidably supported on said magazine and having antifriction means engaging the cam surface of said members; means to move said collar whereby said members apply a seal to a container and change the configuration of said seal, resilient means to retard movement of said collar and a member to position a container with respect to said seal positioner.

10. In a mechanism the combination of a magazine for a plurality of sealing means; a seal positioner; a plurality of members cooperating with said seal positioner, said members having cam surfaces associated therewith; a collar carried by said magazine and having engagement with said cam surfaces; means to actuate said collar to cause said members to engage a seal in said seal positioner; means to resist movement of said collar actuating means; and an adjustable stop within said magazine to position a container to be sealed relative to said seal positioner.

11. In a mechanism for applying sealing elements to containers the combination of a magazine for supporting a plurality of sealing elements; a cover for said magazine; an adjustable support for a container having a closure thereon; a container positioner carried by said cover; means to cause relative movement between said support and said magazine; means to distort a sealing element adjacent said closure including a plurality of pivoted members and antifriction means surrounding said members.

12. In a mechanism for applying sealing elements to containers the combination of a magazine for supporting a plurality of sealing elements; a support for a container having a closure thereon; means to cause relative movement between said support and said magazine; means including a collar engaging and movable longitudinally of said magazine to distort a sealing element adjacent said closure, said means including four distorting members.

13. In a mechanism for applying sealing elements to containers the combination of a magazine for supporting a plurality of sealing elements; means to automatically stop upward movement of said elements; a support for a container having a closure thereon; means to cause relative movement between said support and said magazine; means to deform a sealing element adjacent said closure, said means including four deforming members and means to actuate said deforming members.

14. In a mechanism for applying sealing elements to containers the combination of a magazine for supporting a plurality of sealing elements; releasable means for positioning sealing elements within said magazine; a support for a container having a closure thereon; means to cause relative movement between said support and said magazine; means to distort a sealing element adjacent said closure, said means including four distorting members, a collar having portions cooperating with said members and manually operated means to actuate said members.

15. In a bottle sealing mechanism, the combination of a magazine for supporting a plurality of seals; adjustable means within said magazine for positioning a container having a hooded closure thereon adjacent said magazine; means for distorting a seal whereby the distorted portions grip portions of said closure, said means including a plurality of elongated cam members having portions engageable with said seals, a collar surrounding and movable longitudinally of said magazine, and resilient means between said magazine and said collar to retard the movement of said distorting means.

16. In a mechanism for applying sealing elements to containers the combination of an elongated magazine for receiving and supporting a plurality of sealing elements; a cover for the receiving end of said magazine; means within said magazine for positioning a container having a hooded closure thereon adjacent said magazine; means for distorting a sealing element whereby the distorted portions grip portions of said closure, said means including a plurality of sealing element distorting members having cam surfaces thereon and being pivoted to the upper proportion of said magazine.

17. In a mechanism for applying sealing elements to containers the combination of a magazine for supporting a plurality of sealing elements; means within said magazine for positioning a container having a hooded closure thereon adjacent to said sealing elements; means for deforming a sealing element whereby the deformed portions grip portions of said closure, said means including a plurality of members having cam surfaces thereon and manually operated means including a collar supporting a plurality of rollers engageable with said cam surfaces for moving said members toward said container; and means between said magazine and collar for resisting the movement of said manually operated means.

18. In a mechanism for applying sealing elements to containers the combination of a magazine for supporting a plurality of sealing elements; a support for a container having a closure thereon; means to cause relative movement between said support and said magazine; means to deform a sealing element adjacent said closure, and means including a weight to automati-

cally stop upward movement of said sealing elements.

19. In a mechanism the combination of a magazine for a plurality of sealing means; a seal positioner; a plurality of members cooperating with said seal positioner; said members having cam surfaces associated therewith; a collar carried by said magazine and having engagement with said cam surfaces; means to actuate said collar to cause said members to engage a seal in said seal positioner; a container support; means to stop upward movement of said sealing means, and an adjustable stop within said magazine to position a container to be sealed relative to said seal positioner.

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