J. F. CRAVEN.

RECEPTACLE FOR CONTAINING AND DISCHARGING SEMISOLID AND PASTY SUBSTANCES.

APPLICATION FILED APR. 1, 1912.

1,036,970.

Patented Aug. 27, 1912.

2 SHEETS—SHEET 1.

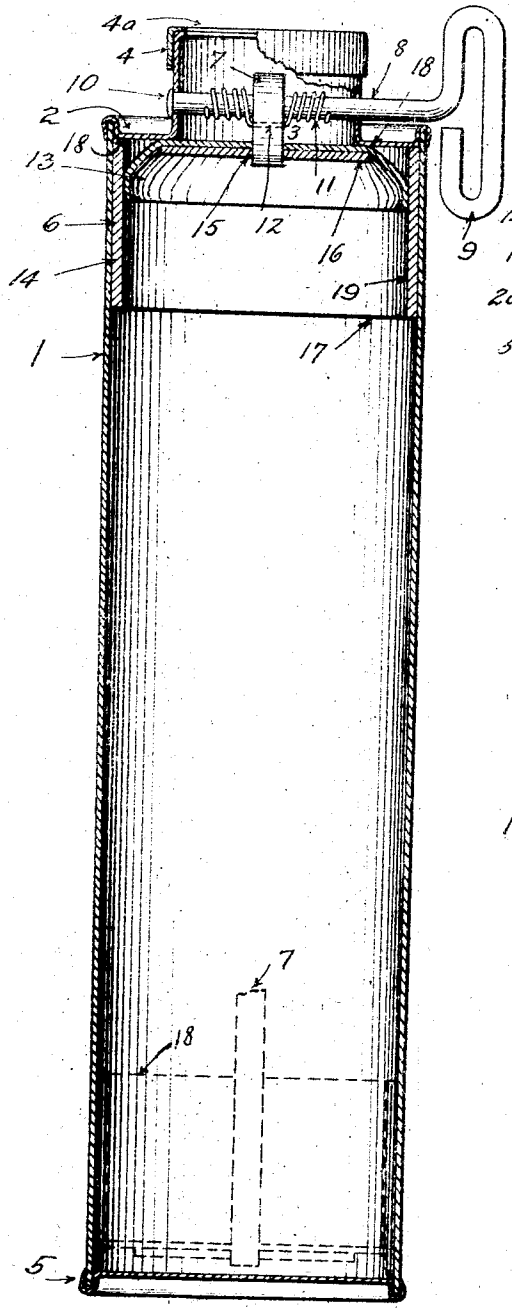


Fig. 1.

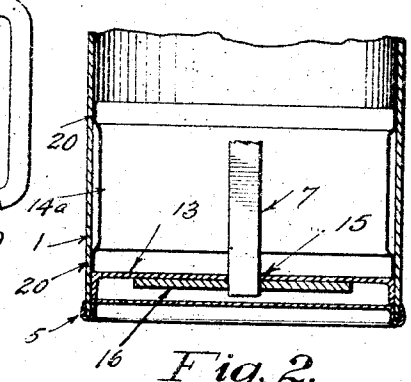
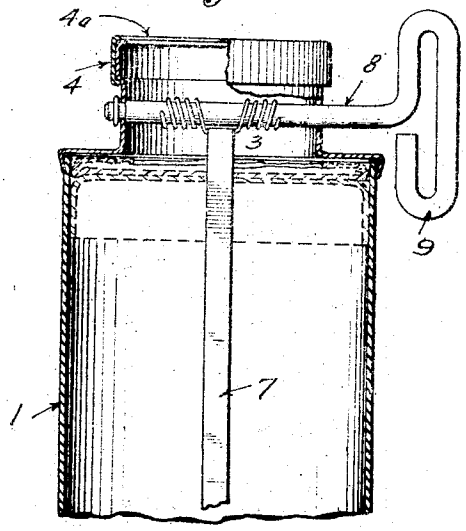


Fig. 2.



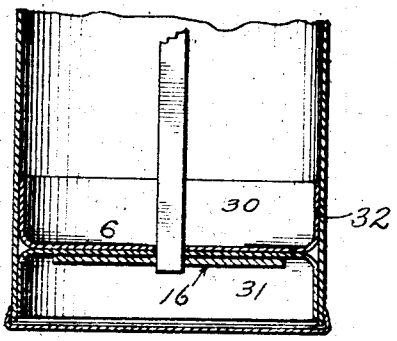


Fig. 5.

WITNESSES

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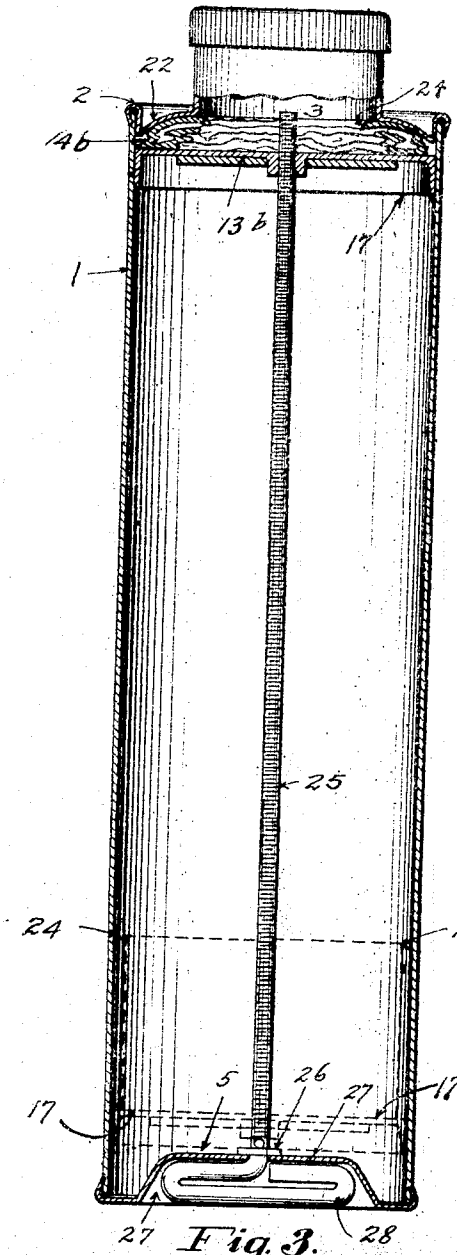

Fig. 3.

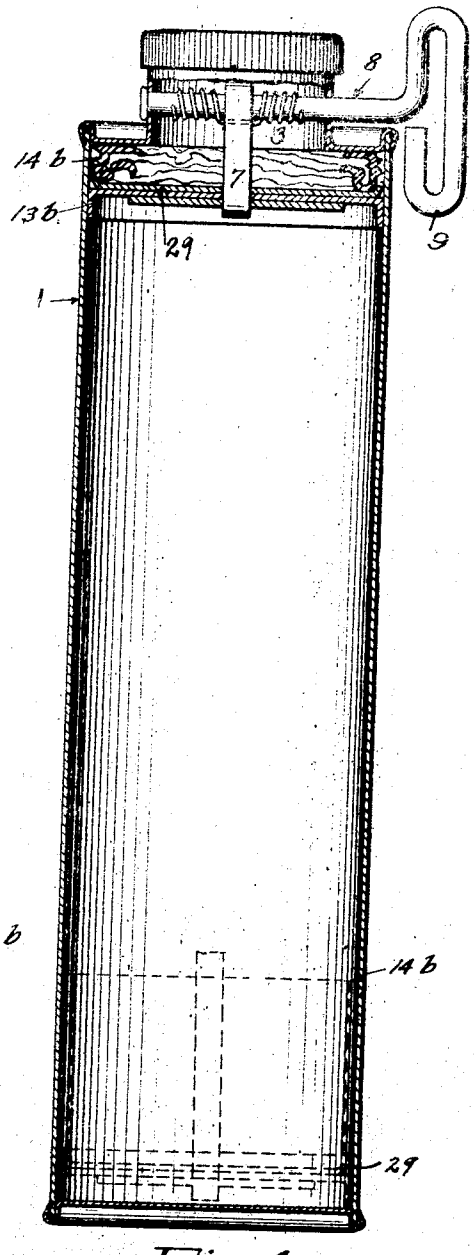

Fig. 4.

WITNESSES

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RECEPTACLE FOR CONTAINING AND DISCHARGING SEMISOLID AND PASTY SUBSTANCES.

1,036,970. Specification of Letters Patent. Patented Aug. 27, 1912.

Application filed April 1, 1912. Serial No. 687,712.

To all whom it may concern:

Be it known that I, JAMES F. CRAVEN, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Receptacles for Containing and Discharging Semisolid and Pasty Substances, of which the following is a specification.

This invention relates to receptacles for containing, storing, transporting and discharging semi-solid and pasty substances.

The device is intended more particularly for putting up lubricants in the forms of greases for the purpose of enabling grease to be supplied to bearings without the liability of dirt or grit entering the bearings with the grease and also prevent smearing or soiling the machinery or the hands of the workman. The invention, however, is not limited to this particular use but is adapted for putting up in substantially sealed condition any semi-solid or pasty substances, such as soap, vaseline, medicated greases, butter, cosmetics, etc., and for delivering the same from the container in any desired quantity or quantities.

In its broadest aspect, the invention is the same as that shown, described and claimed in my prior application filed January 29, 1912, Serial No. 674,039. The present application, however, includes more than the application referred to and, while a continuation thereof as to certain subject matter, illustrates and claims improvements on the construction there shown and described.

The object of the present invention is to provide an improved form of container of the character described which, for a given size of container, has a greater capacity than prior containers, and, to contain a given amount of material, may, therefore, be made smaller than prior containers.

Another object of the invention is to provide an improved form of container in which the piston or follower has extended bearing upon the interior wall of the container and is steadied and guided thereby, the piston or follower, or a part thereof, being collapsible at the end of its stroke to permit a more nearly complete discharge of the contents of the container.

The invention comprises the construction and arrangement of parts hereinafter described and claimed.

In the drawings, Figure 1 represents a longitudinal section through a receptacle or container constructed according to my invention, the piston or follower being shown in full lines at the end of its stroke, and in dotted lines at the beginning of its stroke; Fig. 2 is a detail view corresponding to Fig. 1, and showing a different form of the invention; Fig. 3 is a view corresponding to Fig. 1, and showing a modified form of piston or follower and moving means therefor; and Figs. 4 and 5 are similar views showing other modifications.

In receptacles or containers of the present type and employing a piston or follower for moving the contents endwise through the container and out of its discharge orifice, it is necessary to so form the piston or follower as to have extended bearing and close fit with the inner wall of the container to steady the piston and prevent its wabbling or displacement under conditions of use. Such a container is shown and described in my prior application above referred to. The extended bearing of such a piston, however, wastes valuable space within the container which, by the present invention is utilized for increasing the capacity of the container without increasing the size of the same.

The container illustrated in Figs. 1 and 2 is of the same general type as that described in my prior application. It embodies a casing 1 of tubular form and which may be constructed of glass, porcelain, black plate or tin plate or, if preferred, of some less expensive material such as paste or paper board and is shown as formed of the latter. One end of the receptacle is permanently closed by a head or cap 2, which may be of any desired shape and either flat or cupped and formed of suitable material, preferably thin sheet metal, and is shown as crimped at its rim or edge to the body of the receptacle. Preferably, centrally disposed in the closure 2 is a mouth or spout 3, covered by a suitable removable cap 4 which may be either threaded or otherwise formed for attachment to and detachment from the mouth or spout, or rotatable thereon to open and close the discharge orifice 4^a. The other end

of the receptacle may also be provided with a similar cap or closure 5, also crimped to the wall of the casing, but this may be omitted under some circumstances.

Mounted to move endwise through the length of the container, is a suitable piston or follower 6. This piston is moved longitudinally from end to end of the container by any suitable means. The means shown in Fig. 1 comprises a flexible connector 7 suitably secured to the piston and which may be either a cord, wire or flat band and of metal or other material, as desired. The flexible connector is wound upon a winding shaft 8 which extends transversely across the mouth or spout 3 of the receptacle and through the opposite walls thereof. One end of the winding shaft 8 is bent to form a suitable handle 9 for turning the same. The other end of the shaft 8 is upset or riveted, as at 10, to prevent endwise movement of the winding shaft in one direction through the container.

Suitable connection is provided between the flexible connector 7 and the winding shaft 8. In the form illustrated, this connection is of the type illustrated in my prior application referred to and comprises a spring member 11 having its end portions coiled in the same direction around, but in opposite directions along the shaft 8. The free end portion of the flexible connector 7 is passed through the middle portion or loop 12 of the spring 11 and secured to itself, as by riveting or in any other suitable manner. The spring 11 is so coiled about the shaft 8 that when the shaft is rotated in one direction, the coils of the spring open up and permit free rotation of the shaft therein. When, however, the shaft is rotated in the other direction, the coils of the spring grip the shaft and are rotated therewith.

The piston or follower 6 in the present construction comprises two members, namely, a disk, head or body 13 and an internal sleeve member or flange 14. These may either be secured together and operate as one, as in Fig. 5, or may be separate from each other. The disk or head 13 may be cup shaped, but preferably is of relatively inconsiderable depth lengthwise of the receptacle or container in order that it may be seated very close to the closure 5 at the end of the container and occupy but little space. The other member of the piston is in the form of an internal sleeve or flange, with its outer face closely fitting and sliding along the inner surface or wall of casing 1, and is of some length longitudinally of the container. Preferably, one or the other, or both, of the members of the piston is or are formed of some suitable collapsible material, as for example, paste or paper board. This material is so chosen and of such strength as to normally retain its shape, but nevertheless not to retain permanent form during the conclusion of the operation of removing or discharging the contents from the receptacle. One of the members will always be collapsible although both may be so formed, as will more fully hereinafter appear.

In the form shown in Figs. 1 and 2, the head or disk 13 is formed of collapsible material, as stated. The sleeve member 14 may be formed of wood, glass, porcelain, sheet metal or paste or paper board of such strength as to be practically rigid. It will be understood, however, that the head or disk 13 is made of such thickness and of such material as to retain its shape during the major portion of the movement of the piston along the receptacle, the resistance of the grease or other contents of the receptacle not being sufficient to cause it to be deformed or to collapse. The flexible connector 7 is secured to the piston in the manner illustrated in my prior application referred to, namely, by being passed through an aperture 15 in the center of the piston and through a washer 16 mounted against the undersurface of the piston. The flexible connector is then turned in upon itself and bent to prevent its being withdrawn through the piston. In practice, the washer 16 is made of relatively rigid material, as for example, thin sheet metal, and of substantially the same diameter as the spout or mouth 3 at the discharge end of the receptacle, but preferably slightly larger than the same, and is somewhat smaller in diameter than the inside diameter of the sleeve 14.

In use of the receptacle described, the winding shaft is rotated to wind the flexible connector upon the shaft and draw the piston longitudinally toward the discharge orifice. The head or disk 13 of the piston does not of itself have sufficient bearing lengthwise on the inner wall of the casing to prevent its wabbling during this movement. Its outer rim or periphery, however, engages the rear edge 17 of the sleeve member 14. Consequently, if one side of the head or disk 13 advances more rapidly than the other, it will strike the rear edge 17 of the sleeve 14 and be retarded until the head or disk contacts at all points on its periphery with the edge 17 of sleeve 14. Practically, the sleeve member 14, combined with head 13, has the effect of a rigid piston with extended bearing on the inner wall of the casing. When the piston reaches the end of its stroke, the forward edge 18 of the sleeve member 14 strikes against the end closure 2, and can move no farther. It, moreover, is of rigid material and will not collapse. At this point in the operation, further rotation of the winding shaft 8 draws the thin but rigid washer 16 toward the discharge ori-

fice. This causes the head or disk 13 of the piston to be drawn into the space within the inner sleeve member 14 and to assume the shape shown at the forward end of the receptacle in Fig. 1. The periphery of the head or disk 13 scrapes along the inner wall or surface 19 of the sleeve member 14 to clean the same, and at the conclusion of the operation substantially all of the grease within the receptacle is removed or discharged therefrom.

Fig. 2 illustrates a construction corresponding to that shown in Fig. 1, in which the sleeve member 14^a of the piston is formed as an annulus of thin sheet metal, of such strength and rigidity as to be non-collapsible. The annulus or sleeve 14^a is beaded or cupped at each end to form bearing portions 20 closely fitting and sliding along the inner wall of the container and affording extended bearing therein. Otherwise, this form of the invention is the same as that in Fig. 1.

Fig. 3 illustrates a modified form of the invention in which the head or disk member 13^b is formed of wood, sheet metal, porcelain or other comparatively rigid material. The sleeve member 14^b, in this form of the invention is formed of collapsible material of the same character as that used for the collapsible disk member 13 in the form heretofore described. The other parts of the receptacle or container may be of the same form illustrated in Figs. 1 and 2. The end closure may be flat, and of the same form as that shown in Fig. 1. Preferably, however, it is arched, curved or beveled around its periphery, as at 22, with the concave or beveled side of the curve inwardly. With such an arrangement of the end closure 2, the sleeve member 14^b is skived or beveled on the outside of its forward edge, as at 24, although this is not essential and may be omitted. When the piston approaches the end of its movement, the sleeve member 14^b strikes the end closure 2. Further movement of the piston compresses, squeezes or collapses the sleeve 14^b between the end closure 2 and the disk or head 13^b of the piston. Thus the head or disk member 13^b can be moved to a position very close to the spout or mouth 3, as in the forms heretofore described. In case the end closure in this form of the invention is flat, as illustrated in Figs. 1 and 4, the sleeve member 14^b is merely crumpled up between the end closure and the head or disk 13^b by direct compression. It is preferred, however, to curve, bend or concave the end closure and to skive the sleeve 14^b in the manner described. With this construction, the forward portion of the sleeve 14^b strikes against the curved portion 22 of the end closure 2, which causes it to be turned or directed inwardly toward the center of axis of the container. This construction renders collapsing of the sleeve member 14^b more certain and positive than with other forms of the invention. During the first and major portion of the movement of the piston along the container, the disk or head member 13^b moves along the casing and is steadied therein by its contact with the rear edge 17 of the sleeve member, which it moves in advance of itself, in the same manner as the forms previously described.

Fig. 3 also illustrates an arrangement for moving the piston, differing from that shown in Fig. 1. This is of the type illustrated and described in my prior application, Serial No. 608,591, filed February 14, 1911, and comprises a rod or shaft 25 disposed lengthwise in the receptacle or container and provided with threads throughout its length to engage with threads suitably formed in the piston. A collar 26 is pinned or otherwise secured to the rod or shaft at the end of its straight portion within the receptacle and bears against the inner wall of the end closure 5 to receive the thrust of the rod or shaft. In the form shown, the end closure or cap 5 is depressed inwardly to form a seat 27 within which is contained the bent or turned handle or key 28 on the end of the shaft or rod 25 and which is used for rotating the same. The construction described is peculiarly valuable in a receptacle embodying a collapsible piston of the type herein described. It permits the head or disk 13^b to be formed of wood, metal, or other rigid material with sufficient strength to be formed with screw threads to coöperate with the threads on the rod or shaft 25. Moreover, and as illustrated, the inner end of the rod or shaft is free and unconnected to the discharge end of the receptacle, leaving the space at this end of the receptacle free to receive the crumpled up sleeve member 14^b.

Fig. 4 illustrates a form of container in which the piston is moved by a winding shaft 8 and flexible connector 7 of the same type and arrangement as those illustrated in connection with Fig. 1. In addition, the head or disk is provided with a suitable cupped washer 29 formed of leather, fiber, or other like material, and the periphery of which is turned forwardly toward the discharge orifice and closely fits and slides along the inner wall of the casing. The pressure and resistance of the grease or other contents of the receptacle expand the cupped washer outwardly and cause it to hug and scrape the inner wall thereof to clean the same. Such a washer may also be used with the form shown in Fig. 3 where it is particularly advantageous for removing and carrying along such grease as may work in between the sleeve 14^b and the casing by reason of the skive 24. It may also be used with the forms illustrated in Figs. 1 and 2.

In the latter case, when the head or disk 13 is formed of collapsible material, the cupped washer is drawn into the sleeve member 14 at the end of the stroke and scrapes along the same to clean it and remove all grease from the container. The cupped washer, however, is not essential with any form of the invention and may be omitted if preferred.

Under some circumstances, it may be desirable to construct both members of the piston of the same kind of material and to also connect them together. Such an arrangement is shown in Fig. 5 which illustrates a container of the same construction and manner of operation as that illustrated and described in my prior application, Serial No. 674,039 referred to. In this type of receptacle, the piston is made of two members or cups 30, 31, arranged back to back and formed of paper, paste or paper board, or other collapsible material. The cup 31 and the flat or disk like portion of the cup 30 form a head or body to which is secured the sleeve or flange 32 of cup 30. The piston is moved by a winding rod or shaft and flexible connector connected to a washer on the rear face of the piston and all of the same type and construction as the same parts shown in Fig. 1. When the piston described reaches the end of its stroke, it collapses, in the manner shown in Fig. 5, between the rigid washer and the end closure 3.

The forms of container illustrated and described all conserve considerable space and save weight. Containers of this type are made as cheaply as possible, and the cheapest form of piston is probably that formed of a solid block of wood. In a container having a diameter of 10 inches, the piston, if formed to have sufficient bearing lengthwise of the casing, must be about 8 inches long, and if made of wood will weigh several pounds. With the construction described, not only is the volume or space occupied by the piston used to increase the capacity of the container, but the package is made lighter by decreasing the weight of the piston. The forms shown may be constructed and formed throughout of inexpensive material.

What I claim is:—

1. A device of the character described comprising, a receptacle having a discharge orifice and a piston or follower shorter than said receptacle and fitting and sliding along the interior wall thereof and having a portion formed of collapsible material.

2. A device of the character described comprising, a receptacle having a discharge orifice, a piston or follower movable in said receptacle and fitting its interior wall and having a member formed of collapsible material, and means for moving said piston.

3. A device of the character described comprising, a receptacle having a discharge orifice, a piston or follower movable in said receptacle, said piston or follower being provided with a cylindrical member traveling along the wall of said receptacle, said piston being partly formed of collapsible material, and means connected to said piston for moving the same.

4. A device of the character described comprising, a receptacle having a discharge orifice, a piston or follower shorter than said receptacle and movable therein, said piston or follower comprising a body and a sleeve and fitting the interior wall of the receptacle, one of said parts being formed of collapsible material and arranged to collapse as the piston reaches the end of its stroke.

5. A device of the character described comprising, a receptacle having a discharge orifice, a piston or follower movable in said receptacle and comprising a body and a sleeve, each traveling along the wall of the receptacle, a flexible connector for moving said piston, a winding shaft for said flexible connector, said piston being arranged to engage the end of the receptacle at the end of its stroke and one of its members being formed of collapsible material.

6. A device of the character described comprising, a receptacle having an end closure provided with a discharge orifice, a piston or follower bodily movable in said receptacle and comprising a body and a sleeve, said sleeve projecting in advance of said body toward the discharge orifice, said piston arranged to engage said closure at the end of its stroke, and one of said members being formed of collapsible material.

7. A device of the character described comprising, a receptacle having an end closure provided with a discharge orifice, a piston fitting the inner wall of and bodily movable in said receptacle and comprising a body and a sleeve, one of the piston members being formed of collapsible material, and arranged to collapse upon engagement of the piston with the end closure at the end of its stroke.

8. A device of the character described comprising, a receptacle having an end closure provided with a discharge orifice, a piston fitting the inner wall of and bodily movable in said receptacle and comprising a body and a sleeve, one of said members being formed of collapsible material, and arranged to collapse upon engagement of the piston with the end closure at the end of the stroke of the piston, and means for moving said piston.

9. A device of the character described comprising, a receptacle having an end closure provided with a discharge orifice, a piston movable in said receptacle and comprising a body and a sleeve, said body being

formed of collapsible material, said sleeve being arranged to engage said end closure at the end of the stroke of the piston, and said body being arranged to collapse and move through said sleeve.

10. A device of the character described comprising, a receptacle having an end closure provided with a discharge orifice, a piston or follower movable in said receptacle and comprising a body and a sleeve, said body being provided with a rigid washer on its rear surface and being formed of collapsible material, said sleeve arranged to engage said end closure at the end of the stroke of the piston, and means connected to said washer and arranged to collapse said body and move the same through said sleeve when the latter engages the end closure.

11. A device of the character described comprising, a receptacle having an end closure, a piston bodily movable through said receptacle and comprising a body and sleeve, one thereof being formed of collapsible material and arranged to collapse at the end of the stroke of the piston.

12. A device of the character described comprising a receptacle having an end closure, a piston bodily movable through said receptacle and comprising a body and a sleeve and having extended bearing lengthwise in said receptacle, one of said parts being formed of collapsible material, a substantially rigid washer seated against the rear face of said body, and means connected to said washer for moving said piston.

In testimony whereof, I have hereunto set my hand.

JAMES F. CRAVEN.

Witnesses:
ELBERT L. HYDE,
MARY E. CAHOON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."