June 19, 1951 J. W. CRIPE 2,557,374

DISPENSER FOR VISCOUS SUBSTANCE, WITH AN AXIALLY MOVABLE PISTON AND A MANUALLY-OPERATED ACTUATOR FOR SAID PISTON

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Fig. 1.

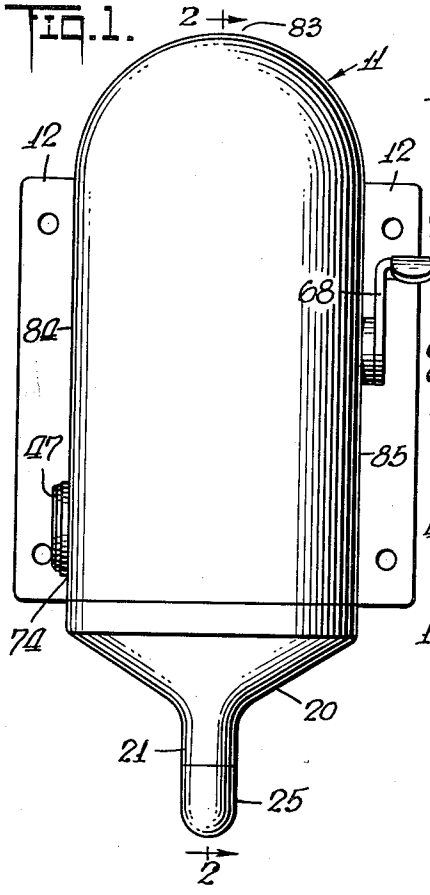



Fig. 2.

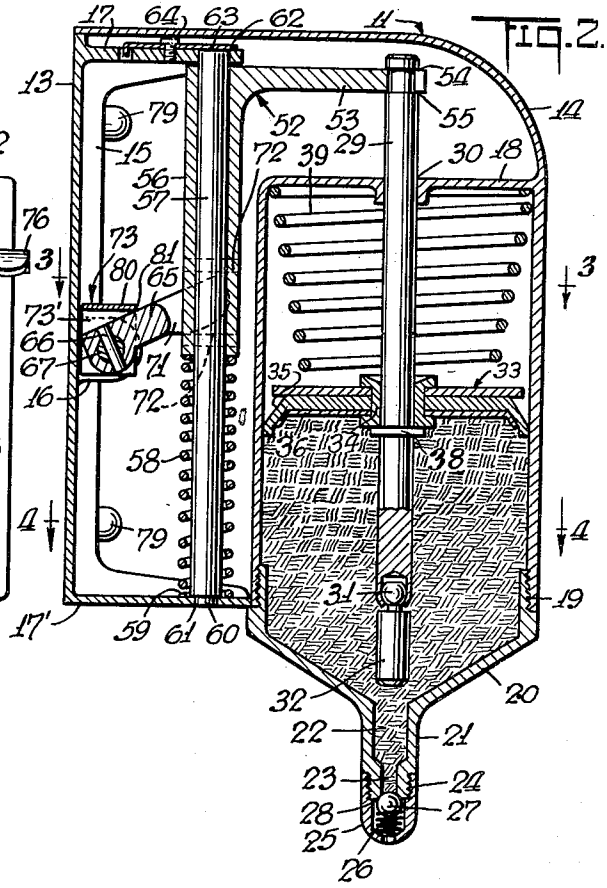



Fig. 3.

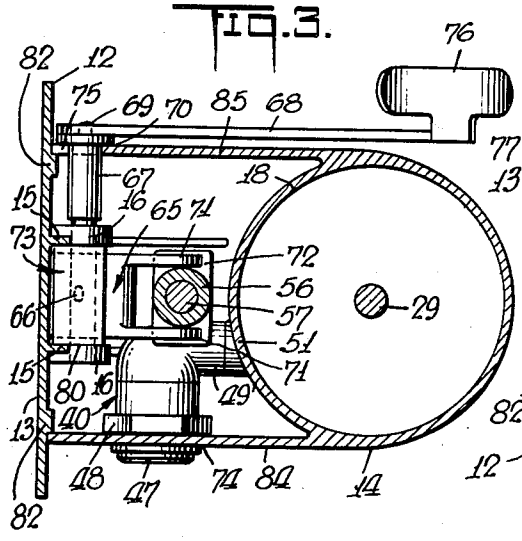
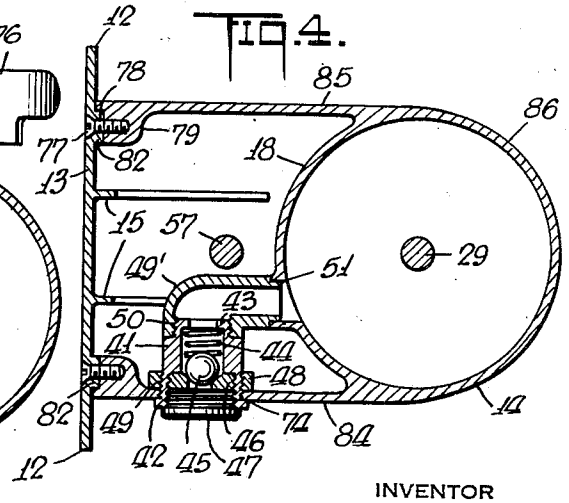



Fig. 4.




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## DISPENSER FOR VISCOUS SUBSTANCE, WITH AN AXIALLY MOVABLE PISTON AND A MANUALLY OPERATED ACTUATOR FOR SAID PISTON

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8 Claims. (Cl. 222—260)

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This invention relates to the art of dispensing devices and particularly to a device for dispensing measured quantities of cleansing cream, soap, grease, paste and other materials of a like consistency.

Where a dispenser for the above uses is not airtight and its interior is exposed to air during the filling thereof, the contents of the dispenser tend to harden and block the outlet, thereby preventing the dispenser from operating properly and causing the contents to become dusty and dirty due to the exposure.

It is among the objects of the invention to provide a rugged and compact device of neat appearance that will dispense measured quantities of material of a fairly thick consistency, that will keep the contents thereof clean and free from dust and dirt, that will not clog, that affords a clean and efficient method of filling, and that has few moving parts and is inexpensive and easy to construct and service.

In the accompanying drawing in which is shown one of the various possible embodiments of the several features of the invention,

Fig. 1 is a front view of the device,

Fig. 2 is a longitudinal sectional view taken along the line 2—2 of Fig. 1,

Fig. 3 is a transverse sectional view taken along line 3—3 of Fig. 2, and

Fig. 4 is a transverse sectional view taken along line 4—4 of Fig. 2.

Referring now to the drawings, the dispenser includes a housing 11 comprising two sections; a cover portion 14 substantially cylindrical in shape, having a rounded dome 83 and parallel side walls 84, 85, and open at the bottom and rear thereof, and a back panel 13, to which the cover portion is removably fitted, the lateral edges 12 of said back panel protruding beyond the cover for mounting purposes. A horizontal ledge 17, integral with and near the upper end of said back panel at the center thereof, extends forward from the inner wall. A base 17' is integral with the back panel and serves as the lower support for actuator guide rod 57 which is vertically mounted between said base 17' and ledge 17. Guide rod 57 has a shoulder at the lower end thereof forming a root portion 60 which fits into a corresponding hole 61 in base 17'. The upper end of rod 57 fits into a hole 62 at the end of ledge 17. Stop plate 63 superposed over and affixed to ledge 17 by screw 64 covers the upper end of guide rod 57 and prevents vertical displacement thereof.

Slidingly mounted on guide rod 57 is right

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angled actuator 52, having a horizontal portion 53 which has a yoke 54 at the end thereof and a vertical portion 56 forming a sleeve which surrounds a portion of said guide rod 57. A spiral spring 58 having its lower end in contact with base 17' of back panel 13 as at 59 surrounds the lower portion of guide rod 57 and reacts against the lower end of the vertical portion 56 of the actuator to exert an upward pressure thereon.

Longitudinally of the back panel 13 on the inner wall thereof are a pair of stiffening ribs 15. Integral with and at approximately the midpoint of said ribs are a pair of transversely aligned bearings 16 which rotatably carry rock shaft 67 mounted thereon. A yoke 65 is securely affixed by pin 66 to said rock shaft, the arms 71 of said yoke encompassing the lower end of the sleeve 56 of actuator 52 and fitting between flanges 72 thereon.

A stop 73 comprising a metal strip terminating in end portions or ears 73' bent at right angles to the base 80 thereof is superposed on said yoke and idly mounted on rock shaft 67 between bearings 16 so that the rock shaft passes through said ears. The width of the base of said strip that rests on the yoke is so selected that the base will become wedged between the inner wall of the back panel 13 and the top of the yoke as at 81 when the arms 71 of the yoke pivot upwardly to a predetermined position, thereby limiting such motion.

A handle 68 is affixed to the flanged end 70 of the rock shaft 67 by screw 69 and affords means by which the arms 71 of yoke 65 may be lowered.

Contained within and preferably integral with the front 86 of said cover portion 14 is cylindrical container 18. Affixed to the bottom of said container by means of engaging screw threads 19 is a funnel shaped portion 20, having a spout 21 at the lower end thereof. The inside of the spout is constructed so as to have a measuring chamber 22 feeding into an outlet 23.

Affixed to said spout by engaging screw threads 24, is nozzle 25. The nozzle includes a ball valve 27 resting on and seated by spring 26 against the mouth 28 of outlet 23 normally to close the latter.

Mounted to reciprocate in container 18 is vertical plunger rod 29 having a peripheral groove 55 near the upper end thereof. The upper end of said plunger rod passes through an axial opening 30 in the top wall of the cylinder 18. The lower end of the plunger rod preferably has a ball joint socket into which fits the correspond-

ing ball end 31 of plunger 32 of nearly the same diameter as the measuring chamber 22.

Located within the cylinder 18 and slidingly mounted on plunger rod 29 is floating piston 33, comprising a bearing 34 surrounding said plunger rod 29 and supporting a flexible cup 35 preferably of chloroprene rubber, but which may be of soft leather or other suitable material, a dished spring 36 beneath said flexible cup, and a support plate 37 on top of said flexible cup.

Opening 30 at the top of container 18 and bearing 34 are longitudinally aligned, thereby ensuring that plunger 32 will be substantially longitudinally aligned with measuring chamber 22. Ball joint 31 obviates the need for precise manufacturing alignment of the plunger with measuring chamber 22.

Floating piston 33 is proportioned to slide freely within container 18 and is limited in its downward movement by a lock ring 38 encompassing and firmly affixed to the plunger rod beneath the piston. Enclosed in container 18 and riding on the top of the piston is coil spring 39 preferably a conical spring as shown, which exerts a constant downward pressure on the piston. As the piston is forced against the contents of the container by spring 39, the periphery of the flexible cup will be urged outwardly, thereby making an airtight seal at the circumference thereof.

Mounted on side 84 of the housing 11 is filling assembly 40 feeding into an opening 51 near the bottom of container 18. The filler assembly comprises a valve fitting 41 having a flange 42 at the mouth end thereof and a lip 43 at the outlet end thereof. A spring 44 rests on lip 43 and holds ball 45 against ball retainer or seat 46 which is screwed into the mouth of valve fitting 41. A removable cap 47 is also screwed in the mouth securely to close the opening and prevent possible leakage. Valve fitting 41 is securely held in an opening 74 in the side of housing 11 by means of locknut 48, the threaded portion of which engages corresponding screw threads 49 at the flange end of said fitting, thereby clamping the fitting to the housing by virtue of the sandwiching effect of flange 42 and locknut 48.

An elbow 49' has one end affixed to the outlet of valve fitting 41 by means of engaging screw threads 50, and its other end securely affixed to opening 51 in container 18, thereby affording a path for the charging of material from the mouth of the valve fitting into the container.

Lock ring 38 heretofore mentioned is so placed on plunger rod 29 as to maintain the piston above the opening 51 in the side of the container even when plunger 32 has been pushed to the end of its downward stroke.

*Assembly*

For assembly, the root end 60 of actuator guide rod 57 is partially inserted through hole 62 in ledge 17 of back panel 13. Actuator sleeve 56 is then slid over the lower end of guide rod 57. Spring 58 is then fitted on the rod beneath the sleeve 56 and the root end 60 of the guide rod is then placed in hole 61 in the base 17' of the back panel 13. Cover plate 63 is then affixed upon ledge 17 by screw 64, thereby preventing rod 57 from moving vertically. Yoke 65 is affixed by means of pin 66 to rock shaft 67 mounted in bearings 16 so that the arms of the yoke fit between flanges 72 on the lower end of actuator sleeve 56. Stop 73 is also mounted on said rock shaft between bearings 16 so that the base 80 of said stop is resting on the top of yoke 65.



Plunger rod 29 is inserted upward through bearing 34 of the piston assembly 33 which is then introduced into cylinder 18, so that lock ring 38 affixed to said plunger rod is beneath said piston. Funnel 20 is now affixed to the bottom of the container 18 by means of engaging screw threads 19 with assembled nozzle 26 on the spout 21 of said funnel.

The assembled valve fitting 40 is inserted through an opening 74 on side wall 84 of the cover portion 14 of the housing and lock nut 48 is placed thereon. The valve fitting is then screwed into the threaded end 50 of elbow 49' previously affixed at 51 to said container. Lock nut 48 is then tightened, thereby clamping valve fitting 40 to the side of the housing.

Cover portion 14 is then fitted against back panel 13 so that the yoke end of actuator 52 encompasses the peripheral groove 55 on the upper end of plunger rod 29. The cover portion is guided into proper position by longitudinal guide ribs 82 integral with and on the inner wall of back 13 near the side edges thereof which are encompassed by the side walls of cover portion 14. A slot 75 in the side wall of said cover allows it to pass over the protruding end of rock shaft 67.

Cover portion 14 is securely affixed to back panel 13 by means of screws 77 which are inserted through holes 78 in said back panel and screwed into horizontal bosses 79 integral with the inner sides of said cover portion near the rear edges thereof.

Handle 68 is then affixed to rock shaft 67, and the dispenser is ready for filling and use.

*Operation*

The operation of the dispenser may be briefly summarized as follows: The material to be dispensed is forced into the filler assembly 40 by conventional means such as a grease gun fitted to the mouth of valve fitting 41 after removal of cap 47. The pressure caused by the material forced into valve fitting 41 will displace ball 45 from its seat 46, thereby affording a clear passage through the valve fitting and elbow 49' into container 18 by way of opening or port 51. The container is sealed at its nozzle end 25 by means of ball 27 held against its seat in the mouth of outlet 23 by the pressure of spring 26. The relative tensions of springs 26 and 39 are such that when the material is forced into the container, piston 33 will be forced upwards, thereby compressing spring 39 while spring 26 will still hold ball 27 on its seat.

When piston 33 has been forced to the limit of its upward movement by the injection of material into the container, any further filling will displace ball 27 from its seat with emission of cream, soap or grease, indicating that the container is full. When the pressure injection means are removed from the valve fitting 41, the tension of spring 44 will force ball 45 against its seat 46, thereby sealing said valve fitting, and cap 47 is screwed into the mouth of the valve fitting to prevent any possible leakage.

In the standby position, actuator 52 is forced by spring 58 to its uppermost position as limited by stop 73. The arms 71 of yoke 65 which coact with flanges 72 on the end of sleeve 56 also are raised as is the end 76 of handle 68. Plunger 32 mounted at the end of plunger rod 29 is positioned by the lifting of actuator 52, directly above measuring chamber 22. The downward pressure of piston 33 caused by spring 39 is sufficient to assist in the filling of measuring cham-

ber 22 and outlet 23 but not enough to depress spring 26 and open valve 27.

In use, the end 76 of handle 68 is depressed, causing rock shaft 67 to turn, so that its yoke 65 forces actuator 52 downward against the pressure of spring 58. Plunger 29 connected at its top end to horizontal portion 53 of actuator 52 is forced downward through bearing 34 in piston 33, thereby forcing the plunger 32 into measuring chamber 22 and thus exerting pressure upon the material in said chamber, forcing ball 27 from its seat, and ejecting the quantity of material contained in measuring chamber 22. The downward pressure of the piston on the contents of the container urges the periphery of flexible cup 35 outwardly, thereby making a tight seal against the walls of the container. The pressure upon the contents of the container will force any air out through the space between the inner walls of bearing 34 and plunger rod 29 and thereby keep the portion of the container below the piston substantially solidly packed, without air pockets.

When the plunger has reached the lower limit of its thrust, the compression of the material contained in measuring chamber 22 ceases and spring 26 forces ball 27 back onto its seat and closes the aperture in nozzle 22. When handle 68 is released, the tension of spring 58 will force the actuator upwards to the limit of stop 73, thereby raising plunger rod 29 and withdrawing plunger 32 from measuring chamber 22. As the plunger 32 has virtually an airtight fit in measuring chamber 22, when it is withdrawn, a partial vacuum is created in said measuring chamber, so that more material is drawn into the measuring chamber, aided by the pressure of conical spring 39 which causes piston 33 to descend and remain in contact with the paste and the dispenser is ready for its next use.

The dispensing unit is neat and compact, the entire mechanism being enclosed by the cover portion which keeps the parts free from dirt or injury. In the event the unit has to be serviced, it may be easily disassembled by unscrewing screws 77 and removing cover portion 14 thereby exposing the entire mechanism.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawings, shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A dispensing device comprising a housing, soid housing comprising a back panel and a cover portion, longitudinal supporting ribs integral with the inner face of said back panel and concealed by said cover portion, bearings mounted on said supporting ribs, a container within said cover portion, a plunger rod having an end adapted to be reciprocated in said container, means slidably mounted on said plunger rod in frictional engagement with the walls of said container and riding on the contents thereof for compressing the same, means extending from a side of said housing for actuating said plunger rod, means operatively connecting said actuating means and said plunger rod, said actuating means being carried by said bearings, a measuring chamber at the bottom of said container encompassing the end of said plunger rod when it is actuated, an outlet for said measuring chamber, and means for preventing the opening of said outlet except when the plunger rod is actuated.

2. A dispensing device comprising a housing, said housing comprising a back panel and a cover portion, longitudinal supporting ribs integral with the inner face of said back panel and concealed by said cover portion, bearings mounted on said supporting ribs, a container within said cover portion, a plunger rod having an end adapted to be reciprocated in said container, means slidably mounted on said plunger rod in frictional engagement with the walls of said container and riding on the contents thereof for compressing the same, a funnel shaped portion affixed to the base of said container, a spout at the end of said funnel shaped portion, said spout comprising a measuring chamber and an outlet therefrom, means journalled in said bearings and extending from a side of said housing for driving the end of said plunger rod into said measuring chamber, means operatively connecting said driving means and said plunger rod, a nozzle affixed to the end of said spout, and means for closing said nozzle.

3. A dispensing device comprising a housing, said housing comprising a back panel and a cover portion, longitudinal supporting ribs integral with the inner face of said back panel and concealed by said cover portion, bearings mounted on said supporting ribs, a container within said cover portion, a plunger having a plunger rod thereabove, means slidably mounted on said plunger rod in frictional engagement with the walls of said container and riding on the contents thereof for compressing the same, a spout at the base of said container, said spout comprising a measuring chamber and an outlet therefrom, a nozzle affixed to said spout, means for closing said nozzle, means journalled in said bearings and extending from a side of said housing for actuating said plunger rod and driving the plunger into said measuring chamber, means operatively connecting said actuating means and said plunger rod, and means for raising and holding said plunger rod with said plunger at a level above said measuring chamber.

4. A dispensing device for material of a thick consistency comprising a housing, said housing comprising a back panel and a cover portion, a container within said cover portion, a plunger rod therefor adapted to be reciprocated in said container, a plunger at the lower end thereof, a floating piston slidably mounted on said plunger rod and riding on the contents of said container, a spring reacting against the upper face of said piston, a stop affixed to said plunger rod and limiting the downward movement of said piston thereon, a filling inlet for said container, said filling inlet being located below said piston, a nozzle affixed to the base of said container, means extending from a side of said housing to actuate said plunger rod, means operatively connecting said actuating means and said plunger rod, thereby to actuate the plunger to discharge said material through said nozzle, and means to close said nozzle when said plunger is not actuated.

5. A dispensing device comprising a housing including a back panel and a cover portion having parallel side walls, said back panel having a base plate integral therewith, a horizontal ledge integral with and near the upper end of said back panel, a pair of longitudinal supporting

ribs integral with the inner face of said back panel, a bearing mounted on each of said supporting ribs, and a pair of longitudinal guide ribs integral with the inner side of said back panel near the outer edge thereof, said cover enclosing said back panel, the parallel sides thereof encompassing said longitudinal guide ribs, means to affix said cover portion to said back panel, a cylindrical container integral with and within said cover portion, a funnel shaped portion having a spout affixed to the bottom of said container, a plunger rod having a plunger mounted to reciprocate in said container, means slidably mounted on said plunger rod in frictional engagement with the walls of said container and riding on the contents thereof for compressing the same, reciprocating means supported by said bearings to drive said plunger into said spout and a transmission from said reciprocating means to said plunger rod supported by said base plate and said ledge.

6. A dispensing device comprising a housing, said housing comprising a back panel and a cover portion, longitudinal supporting ribs integral with the inner face of said back panel, bearings mounted on said supporting ribs, a container within said cover portion, a plunger rod having an end adapted to be reciprocated in said container, a funnel shaped portion affixed to the base of said container, a spout at the end of said funnel shaped portion, said spout comprising a measuring chamber and an outlet therefrom, means for reciprocating said plunger rod and driving the end thereof into said measuring chamber, said means comprising a vertical actuator guide rod between said back panel and said container, a right angled actuator having a horizontal and vertical portion, the horizontal portion being connected to the upper end of said plunger rod and the vertical portion riding on said guide rod, a rock shaft rotatably carried by said bearings, a yoke affixed to said rock shaft between said bearings, the arms of said yoke encompassing the vertical portion of said actuator and operatively connected thereto, means to limit the upward movement of said actuator, and a handle extending from a side of said housing and affixed to said rock shaft to depress the arms of said yoke, thereby lowering said plunger rod.

7. A dispensing device comprising a housing, said housing comprising a back panel and a cover portion, longitudinal supporting ribs integral with the inner face of said back panel, bearings mounted on said supporting ribs, a container within said cover portion, a plunger having a plunger rod thereabove, means slidably mounted on said plunger rod in frictional engagement with the walls of said container and riding on the contents thereof for compressing the same, a spout at the base of said container, said spout comprising a measuring chamber and an outlet therefrom, a nozzle affixed to said spout, means for closing said nozzle, means journalled in said bearings and extending from a side of said housing for actuating said plunger rod and driving the plunger into said measuring



chamber, said last named means comprising a vertical actuator guide rod, a right angled actuator having a horizontal and a vertical portion, the horizontal portion being conneced to the upper end of said plunger rod and the vertical portion having flanges at the lower end thereof, said vertical portion riding on said guide rod, a rock shaft rotatably carried by said bearings, a yoke affixed to said rock shaft between said bearings, the arms of said yoke encompassing the vertical portion of said actuator between said flanges, means to limit the upward movement of said actuator, and a handle extending from a side of said housing and affixed to said rock shaft to depress the arms of said yoke and means for raising and holding said plunger rod with said plunger at a level above said measuring chamber.

8. A dispensing device comprising a housing, said housing comprising a back panel and a cover portion, longitudinal supporting ribs integral with the inner face of said back panel, bearings mounted on said supporting ribs, a container within said cover portion, a plunger having a plunger rod thereabove, means slidably mounted on said plunger rod in frictional engagement with the walls of said container and riding on the contents thereof for compressing the same, a spout at the base of said container, said spout comprising a measuring chamber and an outlet therefrom, a nozzle affixed to said spout, means for closing said nozzle, means journalled in said bearings and extending from a side of said housing for actuating said plunger rod and driving the plunger into said measuring chamber, and means for raising and holding said plunger rod with said plunger at a level above said measuring chamber, said last named means comprising a vertical actuator guide rod, a right angled actuator having a horizontal and a vertical portion, the horizontal portion being connected to the upper end of said plunger rod and the vertical portion forming a sleeve and idly surrounding a portion of said actuator guide rod, a spring surrounding the lower portion of said actuator guide rod, the lower end of said spring resting on the base of said housing and the upper end of said spring pressing against the lower end of the sleeve, thereby forcing the actuator upwards and with it the plunger rod.

JOHN W. CRIPE.


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