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L. GAGNE

DISPENSING DEVICE

Filed May 6, 1926

2 Sheets-Sheet 1

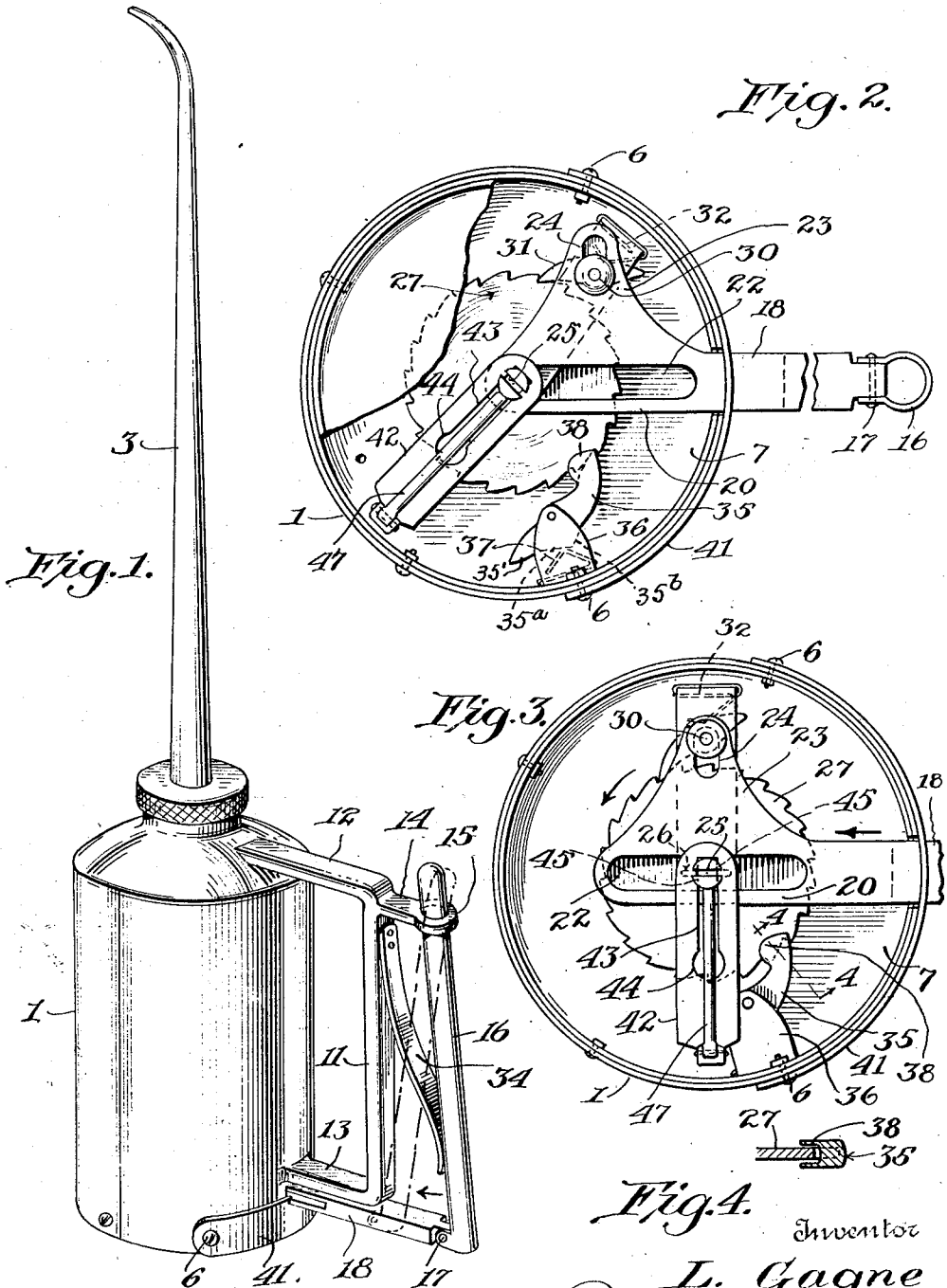


Fig. 4.
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March 20, 1928.

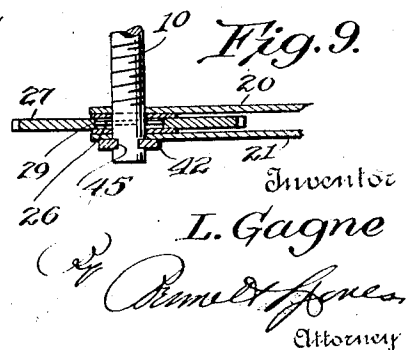
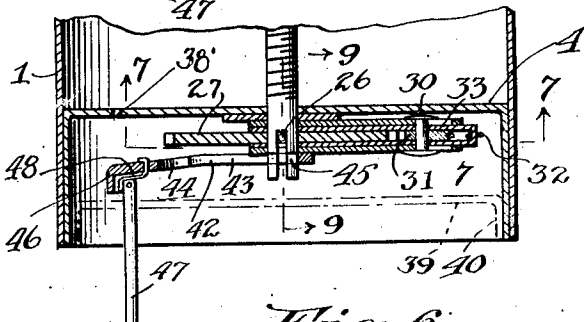
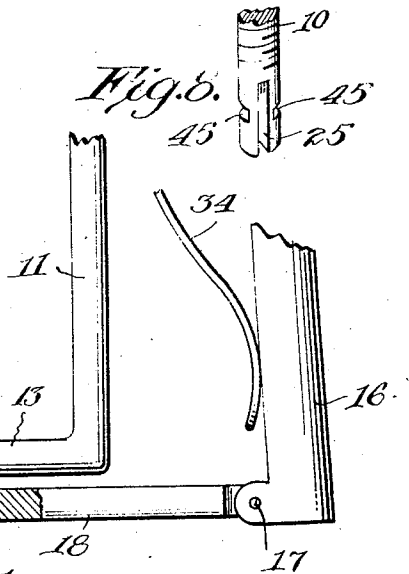
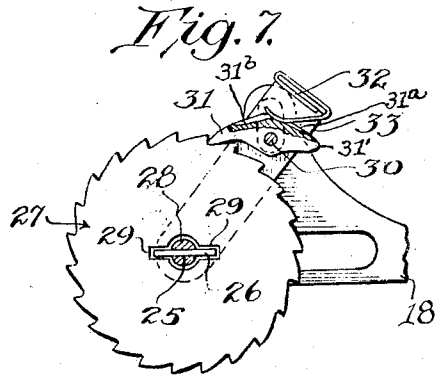
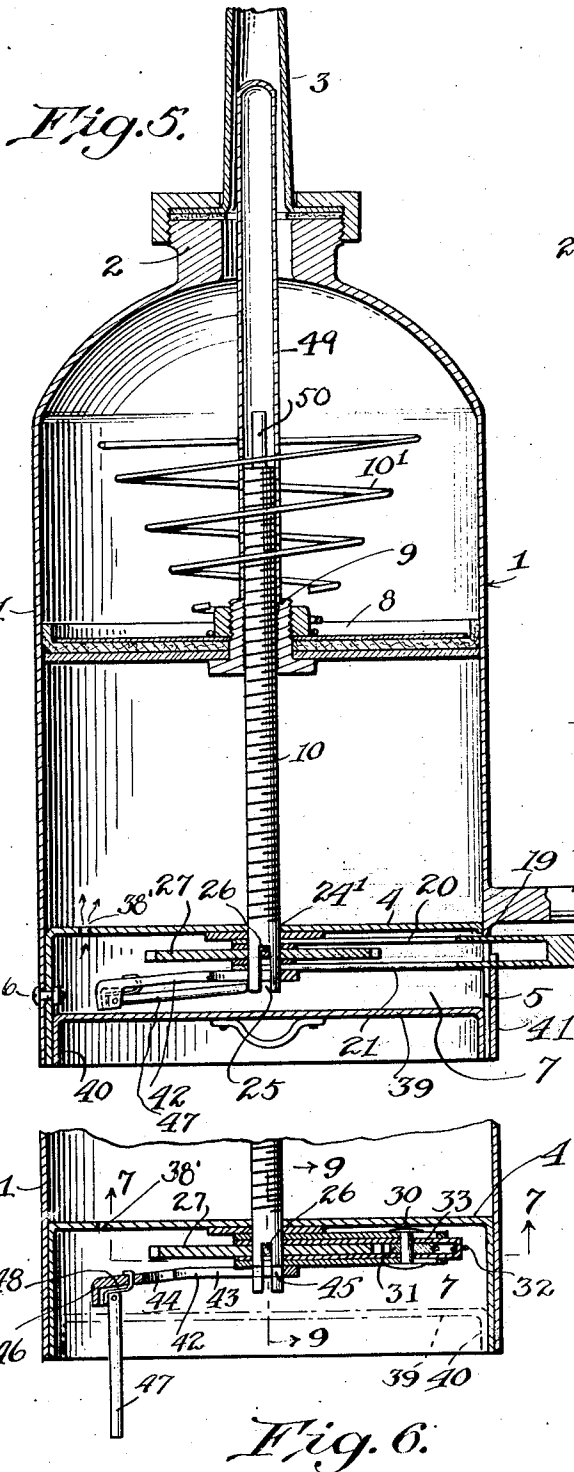
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DISPENSING DEVICE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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DISPENSING DEVICE.

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This invention relates to dispensing devices, and particularly to dispensing devices of that character employing a force feed for expression of the lubricant or other substance to be dispensed.

One object of my invention is to provide a force feed dispensing device employing an expression plunger or piston operated by ratchet feed mechanism of novel and improved type.

Another object of my invention is to provide a dispensing device of the stated character embodying improved means for housing and protecting the ratchet feed mechanism and permitting ready and convenient assembly and disassembly of its parts.

Still another object of the invention is to provide a dispensing device of the stated character in which the parts of the ratchet mechanism are so cooperatively combined and guided as to ensure positiveness and certainty of action.

Still another object of my invention is to provide a dispensing device of the stated character embodying novel and improved means for retracting the expression piston or plunger and returning it to normal or starting position.

Still another object of the invention is to provide a force feed device in the form of a hand oiler, of a type adapted for dispensing thick lubricants, in which dispensing device a handle and an actuating member are so related that the ratchet feed mechanism may be operated by the same hand grasping the handle to manipulate the device.

The invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a perspective view of a dispensing device, shown in the form of a hand oiler, embodying the invention.

Figure 2 is a bottom plan view thereof with the cover partially broken away.

Figure 3 is a horizontal section through the bottom of the can, looking upward toward the ratchet feed mechanism, and showing the parts thereof shifted from the position shown in Figure 2 to impart feed motion to the piston.

Figure 4 is a detail section on line 4—4 of Figure 3.

Figure 5 is a vertical longitudinal section through the can and a portion of the handle and operating lever.

Figure 6 is a section through the bottom of the can showing the handle of the retracting crank swung to operative position.

Figure 7 is a section on line 7—7 of Figure 6.

Figure 8 is a perspective view of the lower end of the threaded piston rod.

Figure 9 is a section on line 9—9 of Figure 6.

In the present instance I have shown the application of my invention to a hand oiler or similar dispensing vessel 1, which comprises a cylindrical body portion having at its upper end an externally threaded outlet neck 2 with which may be either fixedly or detachably engaged a discharge spout 3. The spout 3 is shown in the present instance as having a threaded connection with the neck 2, allowing interchangeable spouts of different lengths or bore sizes to be used, and also providing a type of can which may be filled through the neck portion upon detaching the nozzle, whenever required, as will be readily understood.

The receptacle 1 is provided with a bottom wall or partition 4 disposed at an elevation above its lower edge. The bottom wall 4 is shown in the present instance as being cup-shaped and having a downwardly projecting annular flange 5 secured to the wall of the receptacle by bolts or screws 6, adapting the bottom wall to be detached when desired. The lower edge of this flange 5 terminates flush with the bottom edge of the can body, and forms therewith a stable support for the can, and the space bounded by said flange 5 provides an enclosing chamber or casing 7 for the ratchet elements and associated parts of the feed mechanism.

The feed mechanism comprises an expression piston or diaphragm 8, of suitable construction, and embodying an internally threaded bushing 9 engaging a threaded operating rod 10, which extends therethrough. The material to be dispensed is normally contained in the receptacle between the top of the receptacle and the said piston or diaphragm 8. Upon rotating the rod 10 in one direction the piston or diaphragm 8 may be moving toward the outlet end of the container so as to force on each working mo-

tion thereof a part of the contents out through the spout 3. When the receptacle is fully or substantially emptied of its contents, the piston 8 may be retracted by reverse rotation of the shaft 10, so as to place the receptacle in condition to be replenished or refilled, and for the purpose of permitting retraction of the piston, as above described, a suitable retracting device is provided, as hereinafter set forth. A spiral spring 10' has its reduced end engaging the piston 8 and its enlarged end disposed for contact with the top of the can so that said spring will be compressed at the limit of upward movement of the piston, for a purpose hereinafter described.

Arranged at one side of the receptacle 1 is a stationary handle of conventional U shape, comprising a vertically disposed grip member 11 and upper and lower horizontal arms 12 and 13 fastening the same to the receptacle. Carried by this handle, adjacent to the upper end of the grip member 11, is a guide arm 14 provided with an eye 15, which detachably and pivotally receives the upper end of an actuating lever 16. The lever 16 is disposed normally and substantially in a vertical plane parallel with the grip member 11, and is pivotally connected at its lower end, as at 17, with the outer end of an actuating plunger or feed bar 18. This plunger or feed bar extends into the chamber 7 through a slot or opening 19 in the adjacent side of the wall of said chamber and is slotted or bifurcated at its inner end to provide a pair of superposed bracket arms 20 and 21.

The arms 20 and 21 of the plunger or feed bar 18 are each provided with a longitudinally extending slot 22 in axial alinement with the plunger bar and a laterally projecting triangular extension 23, each bracket extension 23 being provided at its outer end or apex portion with a slot 24 arranged at right angles to the plunger bar and to the slot 22.

The lower end of the shaft 10 is journaled for rotation in a bearing opening 24' in the wall 4 and extends downwardly therethrough into the chamber 7 and through the slots 22 in the bracket arms 20 and 21. The lower end of the shaft is bifurcated or provided with a transverse slot 25 receiving a cross pin or key 26, which pin or key is disposed between the bracket arms 20 and 21 and holds the shaft from upward or downward displacement. A ratchet wheel 27 is arranged in a horizontal plane between the arms 20 and 21 and to rotate during a portion of its orbit of motion through the space therebetween, and this ratchet wheel is provided with an opening 28 through which the bifurcated end of the shaft 10 extends and with slots or notches 29 intersecting said opening and receiving the ends of the pin or key 26, whereby the ratchet

et wheel is coupled to the shaft for rotation therewith and to transmit working motion thereto.

In the back and forth movements of the reciprocating plunger 18, the slotted bifurcated arms thereof move diametrically across the chamber 7 and across the upper and lower surfaces of the ratchet wheel 27, the slots 22 permitting the plunger arms to move without interference from the lower end of the shaft 10 between which and the plunger a relative sliding motion is established by the provision of the slots 22. A headed pin or stud 30 slidably and pivotally engages the slots 24 in the triangular bracket extensions 23 and carries a feed dog or pawl 31 having a toothed end for operative engagement with the teeth of the ratchet wheel 27 and normally held in yielding engagement with said teeth by a spring 32 suitably mounted upon the outer end of an actuating lever 33. This lever comprises a pair of parallel arms pivotally mounted at their inner ends to swing upon the slotted end of the shaft 10 as an axis and suitably united at their outer ends for movement in unison, the connection between the outer ends of said arms supporting the spring 32. The pin 30 passes through these arms and pivotally supports the dog or pawl 31 which lies between the arms, said lever being movable through an arc of a predetermined radius in the back and forth movements of the plunger lever, in which arc the pin 30 is free to slide in the slots 24. The slotted apex portions of the triangular bracket members 23 thus serve the function of a crank acting on the pin 30 to impart swinging motion to the lever 33 and working motion to the dog or pawl 31, as will be readily understood, the slots 24 permitting the pin 30 to have a proper shifting motion in such arc of movement. When the plunger member 18 is moved inwardly the lever 33 will be so swung as to cause the toothed end of the dog 31 to engage the shoulder of one of the ratchet teeth and impart a determined feed motion to the ratchet wheel 27 whereby a predetermined working motion will be imparted to the rod 10 and expressing piston 8. When the plunger bar 18 is moved outwardly, a reverse motion of the lever 33 takes place, during which the dog 31 slides idly over the curved edges of the ratchet teeth. Owing to the described mounting of the lever 16, it will be seen that when the handle bar 11 is gripped in the hand of the operator the lever 16 will be enclosed and gripped therewith, so that the operator in handling the dispensing device may, by pressure of the hand engaging the grip bar 11 press the lever inwardly to impart feed motion to the plunger 18, so that with the use of a single hand the operator may manipulate the dis-

ensing device as required to bring the spout into proper position for use and at the same time impart working motion to the feed mechanism. A spring 34 of suitable type, herein shown as a leaf spring, is mounted on the grip bar 11 and acts upon the lever 16 to normally hold the same retracted and to return the lever and feed mechanism to normal position after each actuation.

In order to prevent any possibility of casual retraction of the shaft 10 and piston 8 on the non-working or return portion of the movement of the ratchet mechanism, a detent 35 is provided. This detent comprises a dog or pawl pivotally mounted upon a bracket 36 and yieldingly pressed into working position by a spring 37, said dog having a channeled end portion 38 embracing the edge of the ratchet wheel and one part of which forms a tooth for coaction with the teeth of the ratchet wheel. When the ratchet wheel is turned by the feed mechanism in the direction to impart feed motion to the threaded rod and piston, the detent 30 slides idly over the curved surfaces of the ratchet wheel. At the end of such feed motion of the ratchet wheel, and during the return movement of the actuating plunger and lever, the dog 35 engages a shoulder of one of the teeth of the ratchet wheel and holds said ratchet wheel against retrograde rotation. The bracket 36 may be secured in position by one of the pawls or fastenings 6 which secures the wall 4 in place. An air inlet 38' is provided in the wall 4 to permit air to pass into the receptacle 1 behind the piston on the feed motion of the piston and to permit of the discharge of air from behind the piston when the piston is retracted or returned to starting position.

The wall 4, as stated, is detachably mounted in position so as to provide for the ready and convenient initial assemblage of the parts and their disassemblage for removal, repairs or replacement whenever required. The flange portion of such wall provides a chamber in which the ratchet feed mechanism is enclosed and whereby it is protected from injury, while it is rendered readily accessible for cleaning or any repairs which may be necessary without the necessity of disassemblage. If desired a detachable cover plate 39 may be provided to close the base of the chamber 7, which cover plate is provided with a flange 40 frictionally engaging the wall of the chamber 7 or otherwise detachably engaged therewith. When this cover plate is applied it will close the chamber 7 against the access of dirt or dust and further guard the parts of the ratchet mechanism against liability of casual injury. If desired a closure plate or strip 41 secured to the receptacle by certain of the fastenings 6 may be provided to close the base of the slot

9, to serve as a guide and support for the bar 18 and to further close the chamber against the access of dust, dirt and other foreign materials.

In order to enable the rod 10 to be rotated reversely for returning the piston 8 back to starting position, after reaching the limit of its outward feed movement, as when it is desired to replenish the receptacle with material to be dispensed, I provide a simple and convenient type of crank device for performing such retracting action. This crank device comprises a plate-shaped crank member 42 having a longitudinal slot 43 provided at one end with an enlarged portion 44. The side edges of the walls of the slot portion 43 are adapted for engagement with grooves 45 in the limbs of the slotted portion 25 of the rod 10, the slot 43 being of somewhat less width than the diameter of such portion of the rod, so that when engaged with the grooves 45 the crank member 42 will be fixed to the rod 10 and secured thereto against displacement therefrom. This construction adapts the crank 42 to be applied to and removed from the slotted end of the rod 10 by a longitudinal sliding movement, the widened slot portion 44 being thereby adapted to be moved into and out of register with the rod end to permit the crank to be applied, removed and properly fitted into engagement with the grooves 45. At its free end the crank 42 is provided with a channeled portion 46 in which is pivoted one end of a combined handle and latch member 47, against the pivoted end of which acts a spring 48. When the cover member 39 is removed, this handle 47 may be disposed in the position shown in Figure 6, in which position said handle member may be gripped and operated to rotate the rod 10 by means of the crank 42 in a direction opposite to its feed motion, when the ratchet wheel is free for retrograde rotation, so that the piston 8 may be retracted. The handle 47 when not intended for use may be swung upward to a position substantially parallel with the crank 42, as shown in Figures 2, 3 and 5, in which position it will be held by the pressure of the spring 48 and also in which position its free end will bear against the adjacent side of the slotted end of the rod 10, whereby it will serve as a latch to hold the crank member from sliding motion and displacement. The dogs 31 and 35 are of special construction in order to permit of their retraction so that the ratchet wheel may be turned in a retrograde direction. To this end, pawl 31 is provided with a retracting arm 31' and inclined faces 31^a—31^b against which the free end of spring 32 may bear, while similarly pawl 35 is provided with a retracting arm 35' and inclined faces 35^a—35^b against which the free end of spring 37 may bear. When springs 32 and

37 engage the inclined surfaces 31^a—35^a of their respective pawls, the pawls are held in engagement with the teeth of the ratchet wheel for normal action. By, however, pressing on the pawl arms 31'—35', the pawls may be tilted to retracted position, in which springs 32 and 37 will engage the inclined pawl surfaces 31^b—35^b, and hold the pawls retracted, thereby permitting free retrograde rotation of the ratchet wheel for retraction of the piston.

A tube 49, open at its lower end and closed at its upper end, is fixed at its said lower end to the bushing 9 and normally slidably and telescopically engages the rod 10 above the piston 8. This tube travels with the piston and is movable upwardly into the spout 3 on the upward movement of the piston. The function of the tube is to close communication between the material containing space in the receptacle 1 and the engaging threaded surfaces of the rod 10 and piston 9 in order to prevent leakage of the material downward between surfaces and below the piston.

At the upper end of the rod 10 is a reduced portion, spindle or stem 50 which is adapted to turn freely in bushing 9 and maintain the piston in centered position, after the piston reaches the limit of its upward movement and the threaded surface of the bushing passes out of engagement with the threaded surface of the rod. This allows the rod to turn freely at such stage in the event that the operator should continue manipulation of lever 16 after piston 8 passes upward beyond the threaded surface of the rod and prevents any possibility of the jamming of the threaded surfaces and mutilation of the threads. As piston 8 nears the limit of its upward movement spring 10' is brought to bear on the top wall of the receptacle 1 and in the further movement of the piston, and until the piston passes upward out of engagement with the threads of the rod, this spring is compressed and serves as a resistance element to hold the released piston centered and against turning or tilting. The spring also acts as a pressure element to hold the bushing 9 against displacement from the spindle 50 and against the shoulder formed by the body of the rod at the base of this spindle, so that the bushing 9 will be maintained in position for re-engagement with the threads of the rod when the rod is rotated in a retrograde direction, as previously described, for the purpose of retracting the piston.

From the foregoing description, taken in connection with the drawings, the construction and mode of operation of my improved dispensing device will be readily understood, and it will be seen that the invention provides a device of this character which embodies an expressing piston and ratchet feed

mechanism of simple type whereby the piston may be operated to dispense desired quantities of the material to be dispensed on each working motion thereof. Also it will be seen that the invention provides a construction and arrangement of parts whereby the ratchet feed mechanism will be securely housed and protected from dust, dirt and injury. It will further be seen that the invention provides a means whereby the actuating lever for the ratchet mechanism may be engaged and operated by the same hand of the operator which grips the manipulating handle of the dispensing device, so that by the use of one and the same hand the operator may manipulate the dispensing device and also actuate the dispensing mechanism, leaving the other hand of the operator free for performing other work. It will further be seen that the invention provides means of a simple type for returning the expelling piston to starting position when it is desired to refill or replenish the receptacle, and in general provides a dispensing receptacle which is simple of construction, reliable and efficient in action and adapted to be manufactured and sold at a comparatively low cost.

While the construction disclosed is preferred, it is to be understood that I do not limit myself thereto, as changes in the form, construction and arrangement of parts within the scope of the appended claims may be made without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described my invention, I claim:

1. In a dispensing device, a dispensing receptacle, a piston movable therein, a threaded rod engaging the piston, a ratchet wheel on said rod, an actuating lever mounted to swing upon the rod, a pin carried by said lever, a dog mounted on the pin for engagement with the teeth of the ratchet wheel, and a reciprocating plunger slidably engaging the rod and having slotted crank projections receiving and engaging said pin.

2. The combination of a receptacle having a lubricant containing chamber and a base chamber, a piston movable in the lubricant containing chamber, a rod in threaded engagement with the piston and extending at its lower end into the base chamber, means in said base chamber for intermittently rotating the rod in one direction, an actuating device for said means on the exterior of the receptacle, and means in said base chamber whereby the rod may be rotated for returning the piston to initial position.

3. The combination of a receptacle having a lubricant containing chamber and a base chamber, a removable closure for the base chamber, a piston in the lubricant containing chamber, a rod in said chamber and in

threaded engagement with the piston and extending at its lower end into the base chamber, pawl and ratchet mechanism in said base chamber for intermittently rotating said rod in one direction for advancing the piston, means for operating said pawl and ratchet mechanism from the exterior of the receptacle, and means in said base chamber for rotating the rod for returning the advanced piston to initial position.

4. The combination of a receptacle having a lubricant containing chamber and a base chamber, a piston in the lubricant containing chamber, a rod in said chamber in threaded engagement with the piston and extending at its lower end into the base chamber, pawl and ratchet mechanism in the base chamber for intermittently rotating said rod in one direction for advancing the piston, means for actuating said pawl and ratchet mechanism, and means for said base chamber normally inoperative and engageable with the rod whereby the rod may be rotated to return the piston to initial position.

5. In a dispensing device, a dispensing receptacle, a dispensing piston movable therein, a rotary operating rod in threaded engagement with the piston, a ratchet wheel engaging said rod, a reciprocating plunger in guided engagement at one end with the rod, and a swinging lever provided with a dog for actuating the ratchet wheel, said lever being pivotally coupled to the guided end of the plunger for actuation thereby.

6. In a dispensing device, a dispensing receptacle, a piston movable therein, a threaded rod engaging the piston, a ratchet wheel mounted on said rod, a lever pivoted at one end to swing upon the rod as a center of motion, a dog upon the opposite end of the lever for engagement with the ratchet wheel, and an actuating plunger having a slotted end in sliding engagement with the rod, said end of the plunger having a lateral projection to which the second-named end of the lever is slidably and pivotally coupled.

7. The combination of a receptacle, a threaded rod therein having a smooth-sur-

50 faced centering spindle at its upper end, a piston in threaded engagement with the rod, a tube carried by the piston for closing communication between the threaded surfaces of the rod and piston and the portion of the receptacle above the piston, and a coiled spring disposed about said tube and between the piston and top of the receptacle and adapted to be compressed between the piston and the top of the receptacle at the limit of upward movement of the piston.

8. In a dispensing device, a dispensing receptacle, a piston movable therein, a rotary operating rod in threaded engagement with the piston, feed mechanism for rotating the rod in one direction for transmitting motion to the piston in dispensing direction, a crank carried by the rod for rotating the rod in the opposite direction to return the piston to starting position, a pivoted handle for the crank foldable in a plane parallel therewith, and means for retaining said handle in folded position.

9. In a dispensing device, a dispensing receptacle, a piston movable therein, a rotary operating rod in threaded engagement with the piston, a ratchet wheel on the rod, an actuating lever mounted at one end to swing on the rod and provided at its opposite end with a dog for engagement with the teeth of the ratchet wheel, and a reciprocating plunger having a slotted end slidably engaging the rod and provided with a slotted laterally projecting bracket to which the pawl carrying end of the lever is slidably and pivotally coupled.

10. In a dispensing device, a receptacle, a rotary rod within the receptacle, a piston in threaded engagement with and operated by said rod, feeding means for rotating the rod in one direction, a reversing crank connected with said end of the rod, and a folding handle carried by said crank, said handle being foldable into and out of the plane of the crank.

In testimony whereof I affix my signature.

LOUIS GAGNE.