March 6, 1934. L. E. RUSH ET AL 1,949,491

FOOLPROOF GREASE DISPENSER AND RECORDER

Filed Feb. 14, 1931

FIG. 1

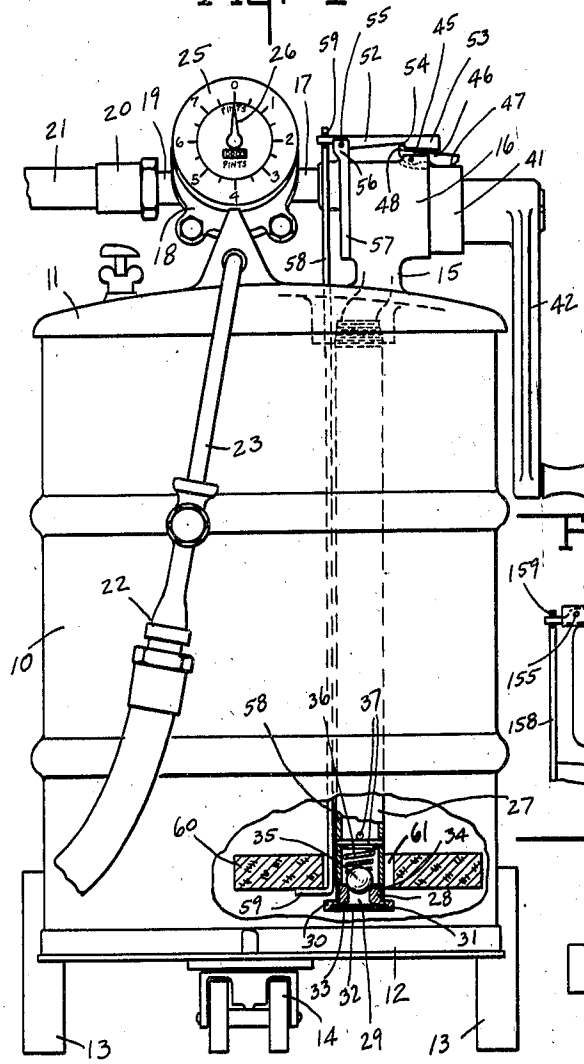


FIG. 2

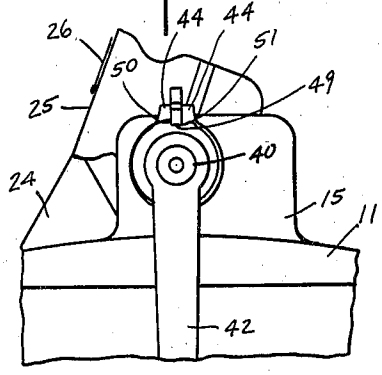


FIG. 3

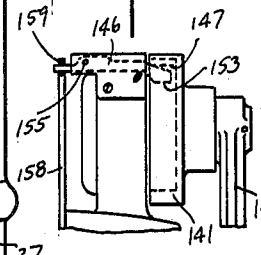


FIG. 4

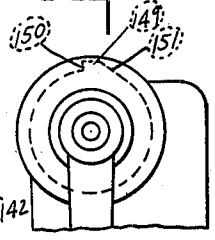


FIG. 5

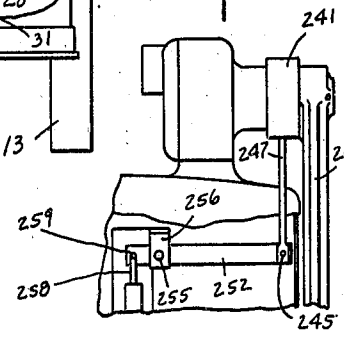
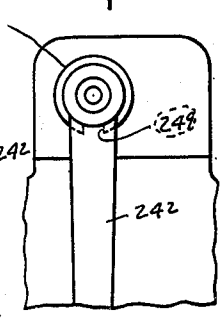


FIG. 6



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1,949,491

FOOLPROOF GREASE DISPENSER AND RECORDER

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Application February 14, 1931, Serial No. 515,666

18 Claims. (Cl. 221—95)

This invention relates to a unitary, compact, fool-proof device or metering pump for the dispensing of fluid such as grease or the like.

The chief object of this invention is to provide an accurate means of measuring grease, oil, or any other similar liquid, by providing means associated with the pump which prevents air from entering the same and which also is provided with a locking device which prevents operation of the pump at such times as the supply of material to be dispensed is substantially exhausted and this locking device also serves as a warning to the pump operator that the supply has been or is about to become exhausted.

Another object of the invention is to insure delivery of the predetermined designated amount indicated by the meter and another object of the invention is to provide a structure which is inoperable except when actually dispensing material, so that the amount of material actually dispensed by the operator is automatically and perfectly recorded without any included air.

The chief feature of the invention consists in the locking of the operating means to prevent pumping whenever the amount of material is insufficient, and associated therewith is means for preventing entrance of air to the pumping mechanism so that the pump always will dispense the liquid to be dispensed and not air, and the reading of the meter will always indicate the amount dispensed and the total amount dispensed from the container, whereby accuracy is assured to the purchaser and to the owner of the dispenser independent of the operator.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims:—

In the drawing, Fig. 1 is a side elevational view with parts broken away to show the dispensing device in the unlocked position immediately preliminary to automatically locking the mechanism against further pumping.

Fig. 2 is an end elevation of the pump lock and the meter.

Fig. 3 is a side elevation of a modified form of pump lock and actuating mechanism.

Fig. 4 is an end elevation thereof.

Fig. 5 is a side elevation with parts broken away to show a modified form of pump lock and actuating mechanism.

Fig. 6 is an end elevation thereof.

In the drawing, there is illustrated a container 10, commonly known as a drum, the end or head of which is removed, or may be suitably perforated, and the upper edge of said drum supports a cover 11 which may be suitably secured to the drum in any suitable manner. The drum may be stationarily mounted or may be mounted upon a platform 12, having the main supporting wheels 13 and the caster wheel construction 14, and said platform may be provided with a suitable handle construction for wheeling, all of which is old in the art.

The base supports a neck 15 which terminates in a pump housing 16 that discharges through pipe, or conduit, 17 through the meter 18 and an outlet 19. Outlet 19 detachably supports at 20 one end of the dispensing hose 21, the other end of which terminates in a nozzle 22 which is of the self-closing type. When a self-closing nozzle is employed, it will be evident that when the discharge end 23 of said nozzle is removed from the container into which the liquid or grease is being discharged, the nozzle will automatically close and retain the hose full of liquid or grease, providing, however, that the pump be not actuated at this time.

As indicated at 24, the cover plate, or base, provides a retainer, or catch, for the end of the nozzle 23 which not only serves as a cover but also serves as a catch or rack to receive and hold the nozzle until it is desired to remove the same therefrom.

It will also be observed that the meter has a face 25 which is arranged at an angle to the vertical or any other suitable position. The meter is of the progressive reading type, is calibrated to measure pints or pounds one revolution of the indicating finger 26 measuring the discharge of eight pints or pounds or more and the meter is also adapted to register the total.

Herein, the neck 15 is shown having free communication with the tubular conduit 27 which terminates in an open lower end and of a length that will terminate above the bottom of the drum or container 10 when the cover plate 11, or base, is mounted thereon. A foot-valve is provided and the same includes a laterally flanged member 28 which may be suitably secured to and in the open end of the conduit 27 and the same includes a central passage 29 and a flange 30 recessed at 31 to receive a screen 32, press fitted, or otherwise suitably secured, into the open flared mouth 33 thereof. The inner end of the passage 29 is flared as at 34 and a ball check 35 is normally seatable thereon and maintained in seatable engagement by a spring 36, said spring bearing at one end upon said ball for seating the same and at the other end upon a pair of spring retaining, transversely positioned rods 37, or any other suit-

able open work spring retainer which will permit the liquid or grease to pass readily therethrough.

From the foregoing, therefore, it will be apparent that, when the cover plate is positioned upon the drum and the conduit 27 is positioned within the drum simultaneously therewith, the grease or liquid will, as the conduit 27 initially is forced downwardly through the liquid, displace the air in the tube and the liquid or grease will rise in the tube until a substantial balancing is obtained. When the pump is initially actuated, the initial reading will be taken from the total reading portion of the meter and noted, and then the indicator 26 will be moved to the zero position, if of the frictional adjustment type. This is for the first dispensing of the liquid or grease from the container. Thereafter the indicator need not be adjusted.

In order that an accurate check may be maintained as to the total amount of grease actually dispensed, in other words, to insure continuous and correct meter reading, and in order to insure the customer that he is always getting the full amount for which the meter indicates has been dispensed, it is necessary to provide means for automatically stopping the pump or shutting off the intake of the conduit 27 immediately upon the contents of the drum or container 10 becoming nearly exhausted.

If the intake of the conduit were automatically closed, the operation of the pump might create such a suction in the conduit and associated parts that a leak might develop and thus permit the pump to pump air through the meter and this would introduce an error in the readings. It will be apparent also that if no means were provided for shutting off the pump or locking the pump until the contents of the drum were actually exhausted, it would invariably occur that air would be introduced into the conduit 27, the pump and meter, and such air would create an error in the meter reading.

One of the simplest forms of the device, therefore, which is arranged to eliminate the possibility of this introduction of air into the intake or conduit and the introduction of an error into the meter reading, is to provide an automatic lock for the pump. If the pump be motor driven, in order to prevent damage to the motor or the pump, or both, this device should be arranged so that the means which operates the pump lock should automatically open the motor circuit, if the power be of the electric current type, or shut off the air if the power be of the pneumatic motor type. The device should also be arranged so that when the locking means for the pump is repositioned for pump operation, the associated mechanism which has disconnected the motive power from its source of power, should likewise automatically recondition the supply line, or lines, to said motive power.

In the present invention, there is illustrated a simple form of locking arrangement which is applicable to a manually operable pump. The pump may be of the conventional gear type with its inlet connected to the conduit 27 through the neck 15 and base 11 and its outlet indicated at 17. The shaft 40 constitutes the power shaft and mounted thereon, is the hub 41 of the crank 42 having the handle portion 43. The housing of the pump includes a pair of spaced ears 44 and pivotally supported at 45 therebetween, is a locking-dog 46 which has a locking portion 47 and a catch portion 48. The weight of the locking-dog and catch portion 47 is such that it is normally constrained when released to gravity to move in a clockwise direction and bear upon the periphery of the hub 41. The hub 41 normally rotates in the clockwise direction with the handle and said hub includes a notch 49 which provides a shoulder 50 and a cam portion 51 for the adjacent side portions. Whenever the locking-dog is released to gravity, it rides upon the hub portion until it drops into the notched slot or groove 49 and then the side wall or shoulder 50 of the hub is engaged by the locking portion 47 and then the handle is locked to the pump casing, since the locking-dog 46 is mounted between the two spaced ears.

The means for releasing this locking-dog, and broadly for actuating the same, includes a trip-lever 52 having the counterweight portion 53 and the locking tooth 54, and which is pivotally supported at 55 between the ears 56 mounted upon the cover plate 57 of the pump. An actuating rod 58 is suitably associated with the projecting end of the counterweighted tripping-lever 52 as at 59. The weight of the lever 53 is greater than the weight of the lever, or locking-dog 46, wherefore, the said dog will always be held in an elevated or non-locking position until such time as the lever 52 is actuated to release the locking-dog and said actuation occurs through the rod 58. The rod 58 on its lower end includes an angular portion 59.

Concentric with the tube 27 and slidably mounted thereon, is a float 60, having a central aperture 61 therein. The float 60 is shown in Fig. 1, just engaging the angular end 59 of rod 58 immediately prior to further removal of additional liquid or grease from the drum. Upon such additional removal, the float follows the lowering of the level of the drum contents and pulls down upon the rod 58 which thereupon tilts counterclockwise the trip-lever 52 to release the catch 48 from the latch portion 54 and thereupon permits the locking-dog to tilt counterclockwise into locking engagement with the hub when the handle next registers the locking slot or notch in alignment with said locking-dog.

It will be apparent, therefore, that the pump is locked prior to the removal of all of the liquid and, therefore, there will be no pumping of air into the conduit 27 so that the conduit 27 and hose intermediate communicating parts are always full of the liquid or grease. The drum and cover are thereupon removed from the platform and a new drum substituted, whereupon the end of the full drum is removed and the cover plate or base 11 with the associated mechanism is positioned upon the new drum. In positioning the same upon the new drum, the float 60 will engage the upper level of the liquid or grease in said drum and as the tube 27 passes into the drum contents for positioning near the base of the drum, the float continues to ride upon the level of the liquid or will not be submerged very much, depending upon the rapidity of the positioning of the base upon the drum. In any event, there will be sufficient reverse movement of the float 60 so that gravity will again become operable through the weight 53 to reposition the latch in the locking position by a slight moving of handle 42 in an anti-clockwise direction by means of the cam portion 51 elevating lock latch 46 to a position where it is again in the open or released position, and thus the handle will be unlocked from the pump housing and may be rotated for pumping purposes.

In Figs. 3 and 4 a modified form of the invention is illustrated. In this form of the invention, the handle 142 has a chambered hub 141, the chamber of which is defined by a cylindrical wall which has a recessed notch or slot 149 therein including a tapered side wall 151 and a shoulder 150. The locking-dog and actuating mechanism therefor is also modified to this extent—the rod 158 is operably associated as at 159 with the end of a lever 146 pivoted as at 155 and said lever has sufficient weight therein, as indicated at 153, to hold the rod 158 in elevated position and the lever or locking-dog in the unlocked position. When the float moves from the position shown in Fig. 1 and continues downwardly toward the bottom of the drum, the rod 158 will move downwardly therewith and this elevates the lever 148 in opposition to the counterweighting thereof and the edge 147 rides upon the inner cylindrical wall of the chambered hub of the handle, until it seats in the slot, whereupon continued movement for pumping purposes of said handle is prevented.

In Figs. 5 and 6 there is illustrated still a further form of the invention and in these figures, 242 indicates the handle of the pump and 241 the hub thereof, said hub includes a notch or groove 249. This notch or groove is positioned in alignment with the handle so that the handle serves as a guard therefor to prevent tampering with the lock. A locking rod 247 is supported as at 245 upon an actuating lever 252, pivotally supported as at 255 in the ears 256, carried by the base. The rod 258 extends downwardly from the end of the lever 252 to which it is connected as at 259 and when the float moves from the position shown in Fig. 1 to a lower level, the rod 258 moves therewith which tilts the lever 252 counterclockwise and projects the locking rod 247 into engagement with the periphery of the hub 241 and said hub, when said recess or slot 249 registers with said locking rod 247, will be projected into the same and serve to lock the handle against further rotation.

It will be apparent that in the first two modifications, the rod 58 and 158 must of necessity pass through the base or cover plate 11, and in the form shown in Figs. 5 and 6, said rod does not pass therethrough but the locking rod 247 does pass therethrough.

The first form of the invention appears to be the safest from the standpoint of longevity, because if there be any failure, the failure will occur by reason of the shearing of the locking-dog 46 and this may readily be replaced.

The form of the invention shown in Figs. 3 and 4 would be given second preference, because the failure would take place by shearing the dog or locking mechanism 136.

The third form, which is shown in Figs. 5 and 6, would probably have third preference, because unless the locking rod 247 was of very hard matial, it might readily be bent out of line and thus free the hub for further rotation, when it should be locked against said rotation. This deformation, however, may be prevented by providing a protecting collar formed integral with the cover base 11 and having the same terminating immediately beneath the hub 241.

In the invention, it is noted that the actuating rod is positioned close to the conduit or intake 27, and also that the actuating float is positioned close thereto and herein is illustrated as supported thereby and furthermore, as previously set forth, is concentrically mounted upon said conduit. It is to be clearly understood, however, that the float and rod may be supported independent of the conduit 27 but this construction is preferred, because it readily lends itself to the elimination of a lot of additional parts.

To prevent tampering with the locking mechanism, a cover construction is preferably provided, which is suitably secured to the base so that access to the locking mechanism is prevented. The handle, of course, is mounted without the same and the hub extends through this housing.

The invention claimed is:—

1. A unitary pumping attachment for dispensing liquids and the like, such as grease, including a supporting base for detachably engaging the open top of a liquid container, a depending conduit of relatively small cross sectional area therein carried by the base and insertable through the grease upon the mounting of the base upon the container, said conduit being removable with base when the latter is detached upon substantial exhaustion of the container contents, a metering pump construction supported by the base, a rotatable shaft for operating same, a float slidably supported adjacent the conduit and normally initially positionable on the top level of the container contents upon insertion of the conduit therein, means operable by the float when it nears the bottom of the container upon discharge of the contents for automatically locking said shaft against further pump operation, a cover for enclosing the shaft locking mechanism, and a crank exposed without the cover and having a portion projecting into the same for shaft rotation.

2. A unitary pumping attachment for dispensing liquids and the like, such as grease, including a supporting base for detachably engaging the open top of the liquid container, a depending rigid conduit of relatively small cross sectional area therein carried by the base and insertable through the grease upon the mounting of the base upon the container, said conduit being removable with base when the latter is detached upon substantial exhaustion of the container contents. a metering pump construction supported by the base, a rotatable shaft for operating the same, a float slidably supported by said conduit, and normally initially positionable on the top level of the container contents upon insertion of the conduit therein, and means operable by the float when it nears the bottom of the container upon discharge of the contents for automatically locking said shaft against further pump operation.

3. A device as defined by claim 2, characterized by said float being apertured and slidably mounted on said conduit, said conduit being positioned within the float aperture.

4. A unitary pumping attachment for dispensing liquids and the like, such as grease, including a supporting base for detachably engaging the open top of the liquid container, a depending rigid conduit of relatively small cross sectional area therein carried by the base and insertable through the grease upon the mounting of the base upon the container, said conduit being removable with base when the latter is detached upon substantial exhaustion of the container contents, a metering pump construction supported by the base, a rotatable shaft for operating the same, a float slidably supported by said conduit and normally initially positionable on the top level of the container contents upon insertion of the conduit therein, means operable by the float when it nears the bottom of the container upon discharge of the contents for automatically locking

said shaft against further pump operation and a ball-check at the base of said conduit for permitting the admission of the liquid, such as grease, and preventing the escapement of the same upon removal of the conduit from the container, whereby accurate content metering is obtained in the successive dispensing of the contents of a plurality of containers.

5. A device as defined by claim 2, characterized by said float being apertured and slidably mounted on said conduit, said conduit being positioned within the float aperture, and a ball-check at the base of said conduit for permitting the admission of the liquid, such as grease, and preventing the escapement of the same upon removal of the conduit from the container, whereby accurate content metering is obtained in the successive dispensing of the contents of a plurality of containers.

6. A unitary pumping attachment for dispensing liquids and the like, such as grease, including a supporting base for detachably engaging the top of a liquid container, a depending conduit therein carried by the base and insertable and removable therewith, a metering pump construction supported by the base, a rotatable means for operating the same and having a locking shoulder, a float slidably associated with said base and arranged for following the level of the container contents, a rod having a lateral portion normally positioned near the bottom of the container and slidably supported relative to said base and engageable by said float when the level is substantially near the bottom of the container for sliding the rod, and lever operable locking means tiltable by said rod in the sliding movement thereof and arranged for shoulder engagement for locking the rotatable means against further rotation.

7. A device as defined by claim 6, characterized by said lever locking means including a counterweighted lever operable by said rod in opposition to the weight.

8. A device as defined by claim 6, characterized by said lever locking means includng a counterweghted lever operable by said rod in opposition to the weight, and a counterweighted locking-dog releasable when said lever is tilted in opposition to its weight and operable by the weight for engaging the locking shoulder.

9. A unitary pumping attachment for dispensing liquids and the like, such as grease, including a supporting base for detachably engaging the open top of a liquid container, a depending conduit of relatively small cross sectional area therein carried by the base and insertable through the grease upon the mounting of the base upon the container, said conduit being removable with the base when the latter is detached upon substantial exhaustion of the container contents, a metering pump construction supported by the base, a rotatable shaft for operating same, a float surrounding and slidably supported by said conduit, means operable by the float when it nears the bottom of the container upon discharge of the contents for automatically locking said shaft against further pump operation, a cover for enclosing the shaft locking mechanism, and a crank exposed without the cover and having a portion projecting into the same for shaft rotation.

10. In a liquid dispensing apparatus, the combination with a lubricant container, of a pump in cooperative relation with said container, including a rotary shaft for withdrawing lubricant from said container and dispensing it through said pump upon rotation of said shaft, locking means for automatically stopping and preventing rotation of said shaft if and when the lubricant is exhausted from said container, means for continually maintaining said locking means in cooperative relation with said pump means, whereby when the container is empty the operator is apprised of that fact and operation of said pump is continually prevented until said container is charged with liquid in position to be dispensed by said pump, and a removable cover adapted to fit said container as a closure for the top thereof and constituting the sole support for said pump mechanism.

11. In a liquid dispensing apparatus, the combination with a lubricant container, of a pump in cooperative relation with said container, including a rotary shaft for withdrawing lubricant from said container and dispensing it through said pump upon rotation of said shaft, locking means for automatically stopping and preventing rotation of said shaft if and when the lubricant is exhausted from said container, means for continually maintaining said locking means in cooperative relation with said pump means, whereby when the container is empty the operator is apprised of that fact and operation of said pump is continually prevented until said container is charged with liquid in position to be dispensed by said pump, said locking means including a member continually adapted to automatically engage said shaft, and a float operatively connected with said shaft engaging member and adapted to normally hold it in its engaged position by flotation of said float upon liquid in said container and to cause said shaft engaging member to engage said shaft by lowering movement of said float as the liquid is exhausted from the container and continually prevent rotation of said shaft until the container is charged with liquid in position to be dispensed by said pump.

12. In a liquid dispensing apparatus, the combination with a lubricant container, of a pump in cooperative relation with said container, including a rotary shaft for withdrawing lubricant from said container and dispensing it through said pump upon rotation of said shaft, locking means for automatically stopping and preventing rotation of said shaft if and when the lubricant is exhausted from said container, means for continually maintaining said locking means in cooperative relation with said pump means, whereby when the container is empty the operator is apprised of that fact and the operation of said pump is continually prevented until said container is charged with liquid in positon to be dispensed by said pump, said locking means including a member adapted to engage said shaft, and a float continually operatively connected with said shaft engaging member and adapted to hold it in disengaged position by flotation of said float upon liquid in said container and to cause said shaft engaging member to automatically engage said shaft by lowering movement of said float as the liquid is exhausted from said container, and a member between said float and said shaft engaging member and adapted to automatically disengage the latter with respect to said shaft in accordance with the position of said float and independently of control by the operator.

13. In a liquid dispensing apparatus, the combination with a lubricant container, of a pump in cooperative relation with said container, including a rotary shaft for withdrawing lubri-

cant from said container and dispensing it through said pump upon rotation of said shaft, locking means for automatically stopping and preventing rotation of said shaft if and when the lubricant is exhausted from said container, means for continually maintaining said locking means in cooperative relation with said pump means, whereby when the container is empty the operator is apprised of that fact and operation of said pump is continually prevented until said container is charged with liquid in position to be dispensed by said pump, said locking means including a member adapted to engage said shaft and normally constrained toward shaft engagement, a float operatively connected with said shaft engaging member adapted to normally hold it in disengaged position by flotation of said float upon liquid in said container and to cause said shaft engaging member to automatically engage said shaft by lowering movement of said float as the liquid is exhausted from said container, said shaft engaging member being automatically urged toward shaft engaging position and automatically effective to cause shaft engagement by movement of said float corresponding to exhaustion of the container contents and independently of control by the operator.

14. In a liquid dispensing apparatus, the combination with a lubricant container, of a pump in cooperative relation with said container, including a rotary shaft for withdrawing lubricant from said container and dispensing it through said pump upon rotation of said shaft, locking means for automatically stopping and preventing rotation of said shaft if and when the lubricant is exhausted from said container, means for continually maintaining said locking means in cooperative relation with said pump means, whereby when the container is empty the operator is apprised of that fact and operation of said pump is continually prevented until said container is charged with liquid in position to be dispensed by said pump, and a registering mechanism operatively connected with said shaft and including means adapted to continually manifest the quantity of liquid dispensed in accordance with the rotation of said shaft whereby false indication of the quantity dispensed is automatically prevented by said locking means, preventing movement of said registering mechanism when the lubricant is exhausted from said container.

15. In liquid dispensing apparatus, the combination with a pump including a rotary shaft, and means adapted to dispense liquid through said pump upon rotation of said shaft, of locking means continually adapted to automatically stop and prevent rotation of said shaft if and when the supply of liquid to be pumped is exhausted, said locking means including a member continually adapted to engage said shaft, and a float continually operatively connected with said shaft engaging member continually adapted to normally hold it in disengaged position by flotation of said float upon the liquid to be dispensed and to cause said shaft engaging member to automatically engage said shaft by lowering movement of said float as the supply of liquid to be dispensed is exhausted.

16. In liquid dispensing apparatus, the combination with a pump including a rotary shaft, and means adapted to dispense liquid through said pump upon rotation of said shaft, of locking means continually adapted to automatically stop and prevent rotation of said shaft if and when the supply of liquid to be pumped is exhausted, said locking means including a member continually adapted to engage said shaft, and a float continually operatively connected with said shaft engaging member continually adapted to normally hold it in disengaged position by flotation of said float upon the liquid to be dispensed and to cause said shaft engaging member to automatically engage said shaft by lowering movement of said float as the supply of liquid to be dispensed is exhausted, and a cover for said container constituting the sole support for said pump and its appurtenances, said locking means including a float carried by said cover and adapted to reciprocate vertically beneath it, and means cooperatively connecting said float with said locking means continually and adapted to lock and unlock said shaft in accordance with the position of said float independently of the control of the operator.

17. In a liquid dispensing apparatus, the combination with a lubricant container, of a pump in cooperative relation with said container, including a shaft for withdrawing lubricant from said container and dispensing it through said pump on rotation of said shaft, locking means for automatically stopping and preventing rotation of said shaft, if and when the lubricant is exhausted from said container, and means for continually maintaining said locking means in cooperative relation with said pump means whereby when the container is empty the operator is apprised of that fact and operation of said pump continually prevented until said container is charged with liquid in position to be dispensed by said pump, said locking means including a member continually adapted to engage said shaft and a float continually operatively connected with said shaft engaging member and continually adapted to normally hold it in disengaged position by flotation of said float upon the liquid to be dispensed and to cause said shaft engaging member to automatically engage said shaft by lowering movement of said float as the supply of liquid to be dispensed is exhausted.

18. In a liquid dispensing apparatus, the combination with a pump including a rotary shaft, and means adapted to dispense liquid through said pump on rotation of said shaft, of locking means continually adapted to automatically stop and prevent rotation of said shaft if and when the supply of liquid to be pumped is exhausted, said rotary shaft including a notch at its periphery and the locking means having a portion adapted to engage in said notch when the supply of lubricant is exhausted from the container.

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