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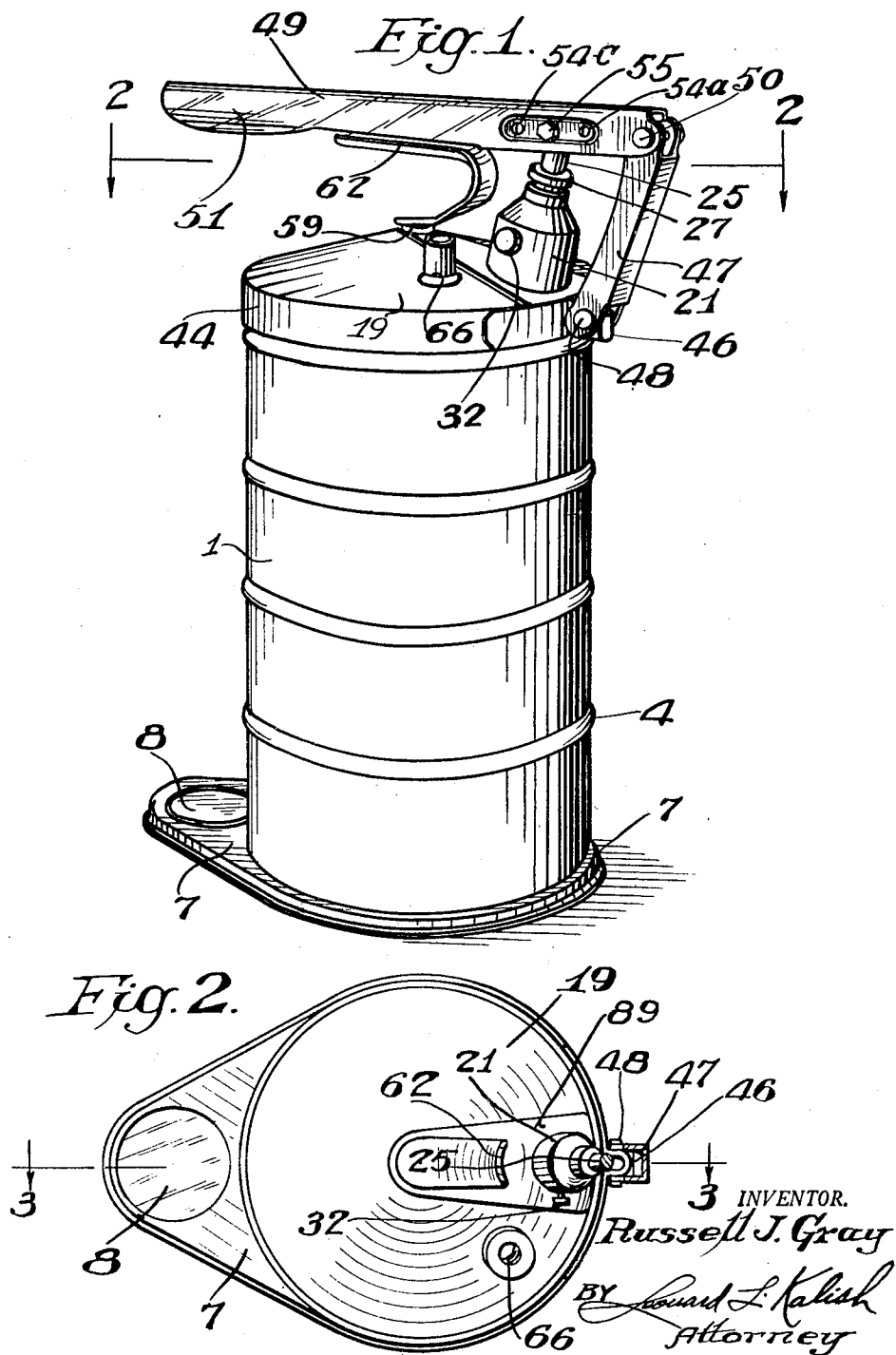
R. J. GRAY

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LUBRICANT-DISPENSING APPARATUS

Filed Oct. 20, 1945

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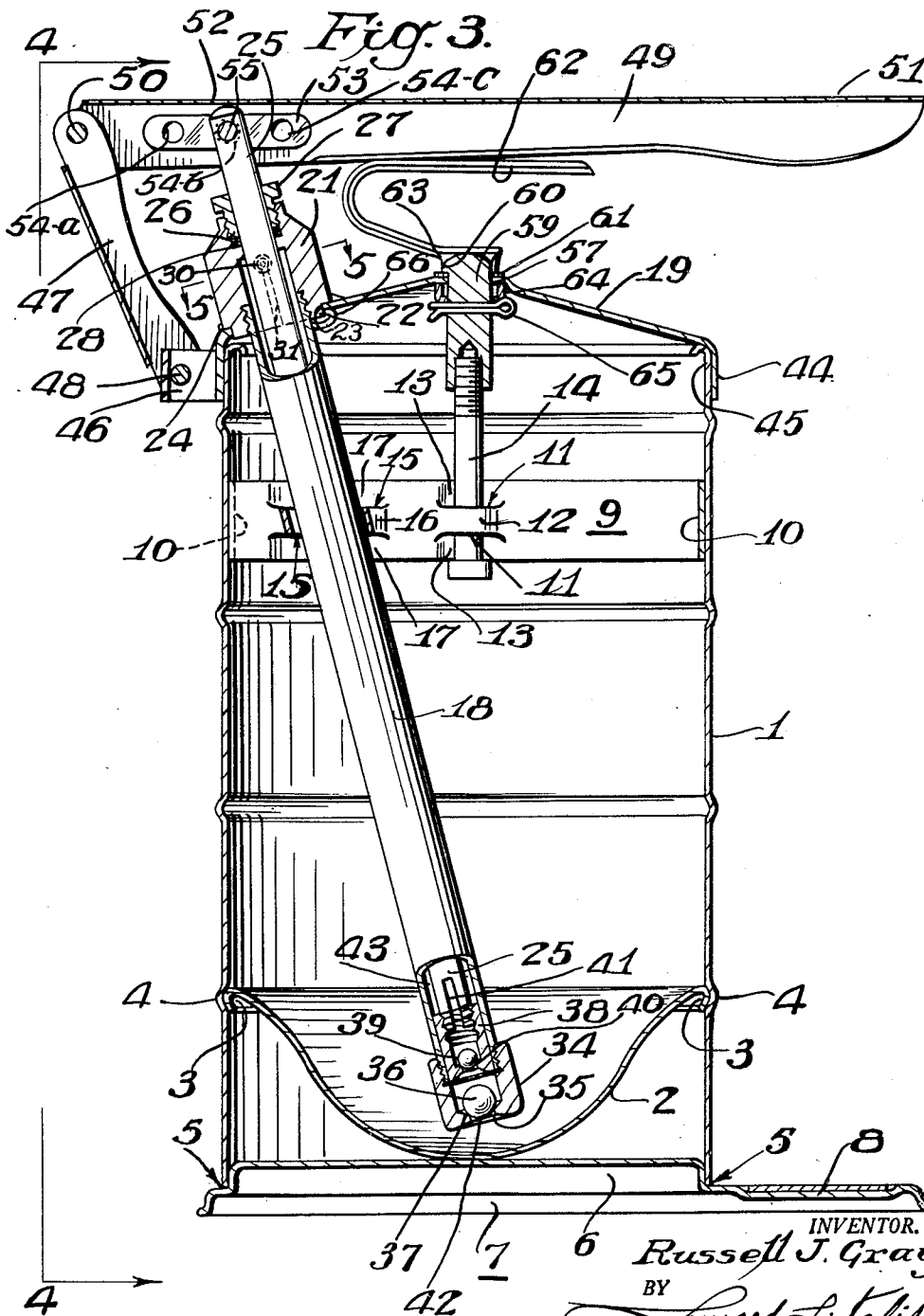
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LUBRICANT-DISPENSING APPARATUS

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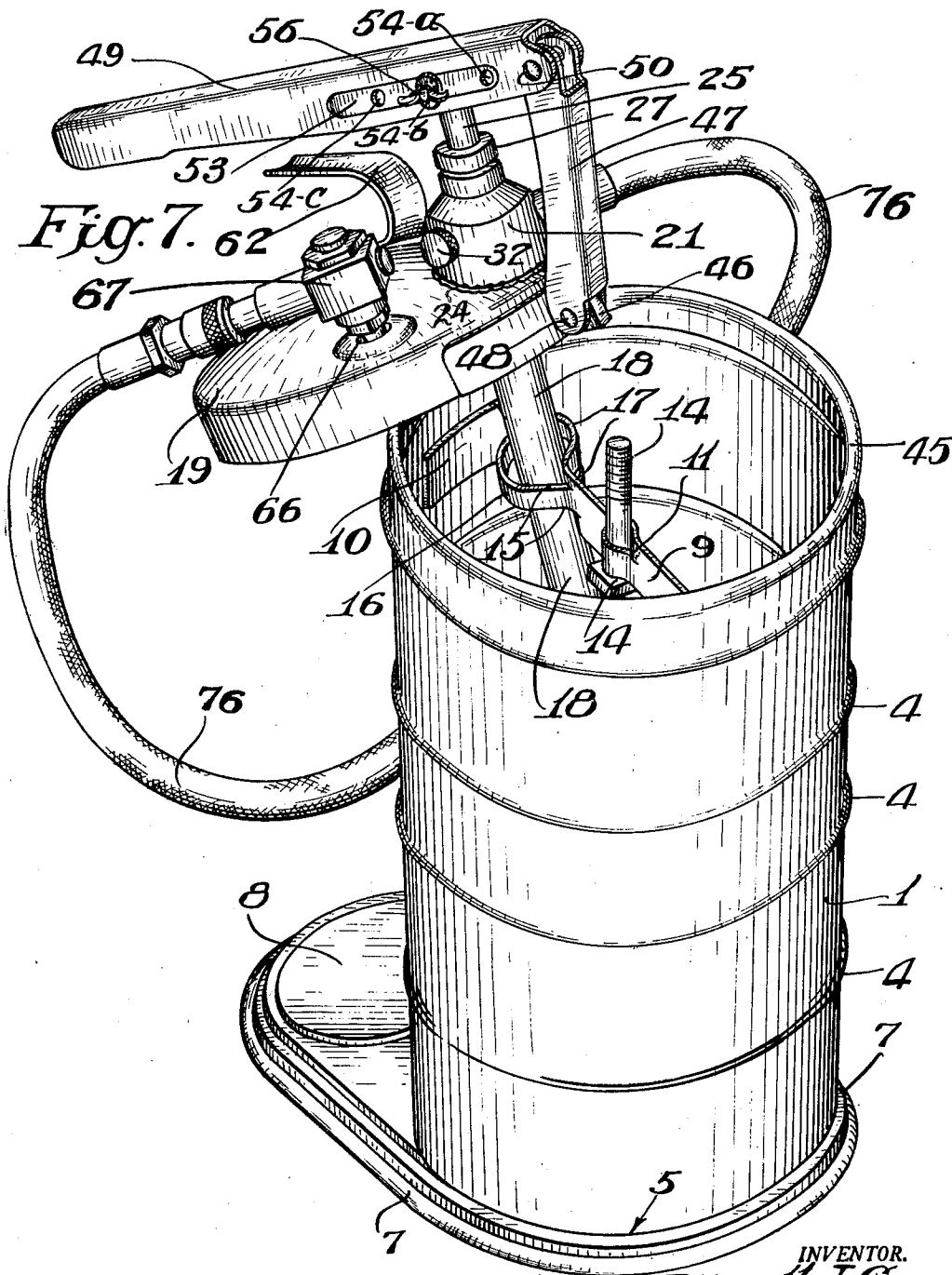
R. J. GRAY

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LUBRICANT-DISPENSING APPARATUS

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6 Sheets-Sheet 4



INVENTOR.
Russell J. Gray
BY
Leonard L. Kalish
Attorney

Feb. 28, 1950

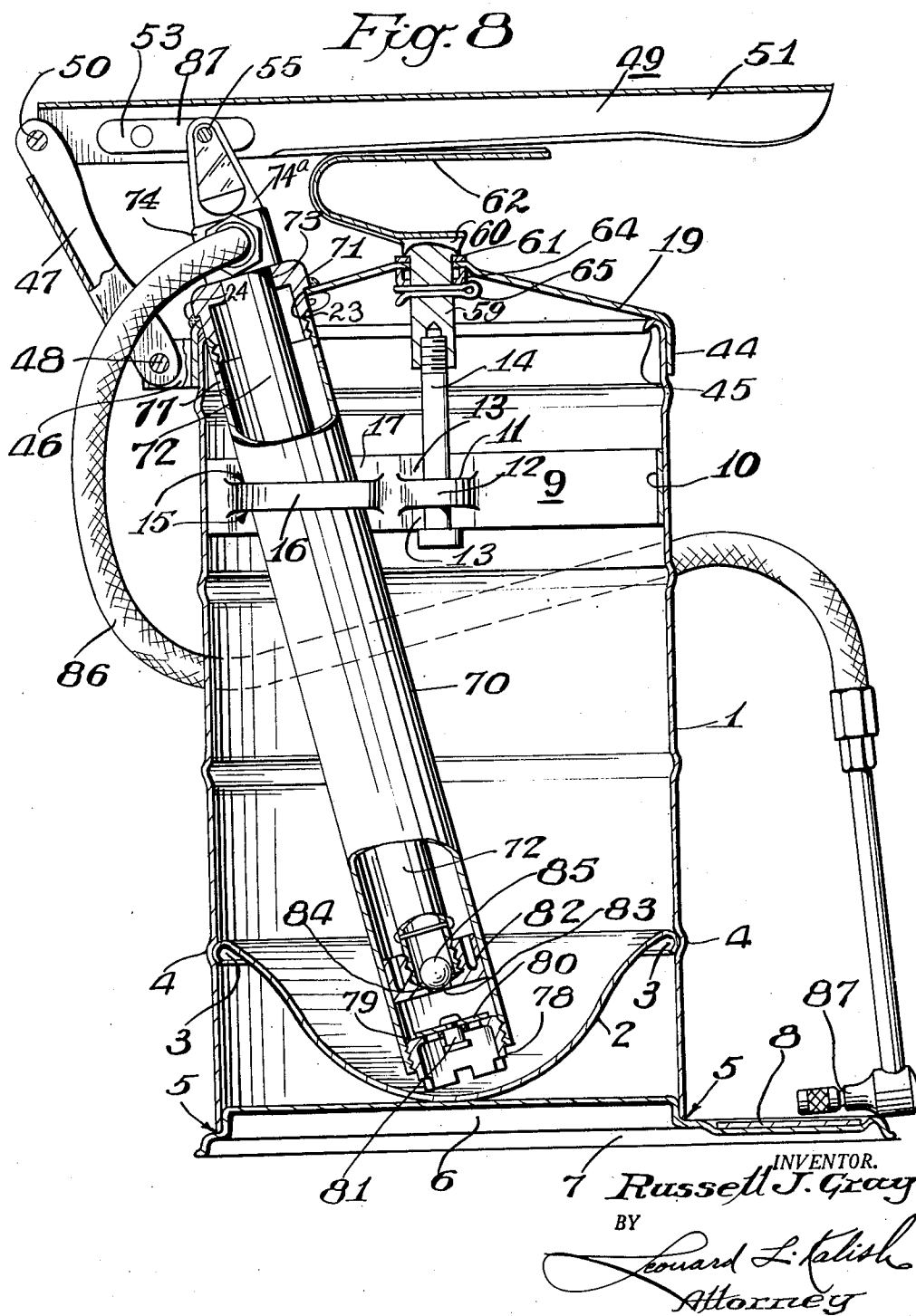
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LUBRICANT-DISPENSING APPARATUS

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Fig. 9.

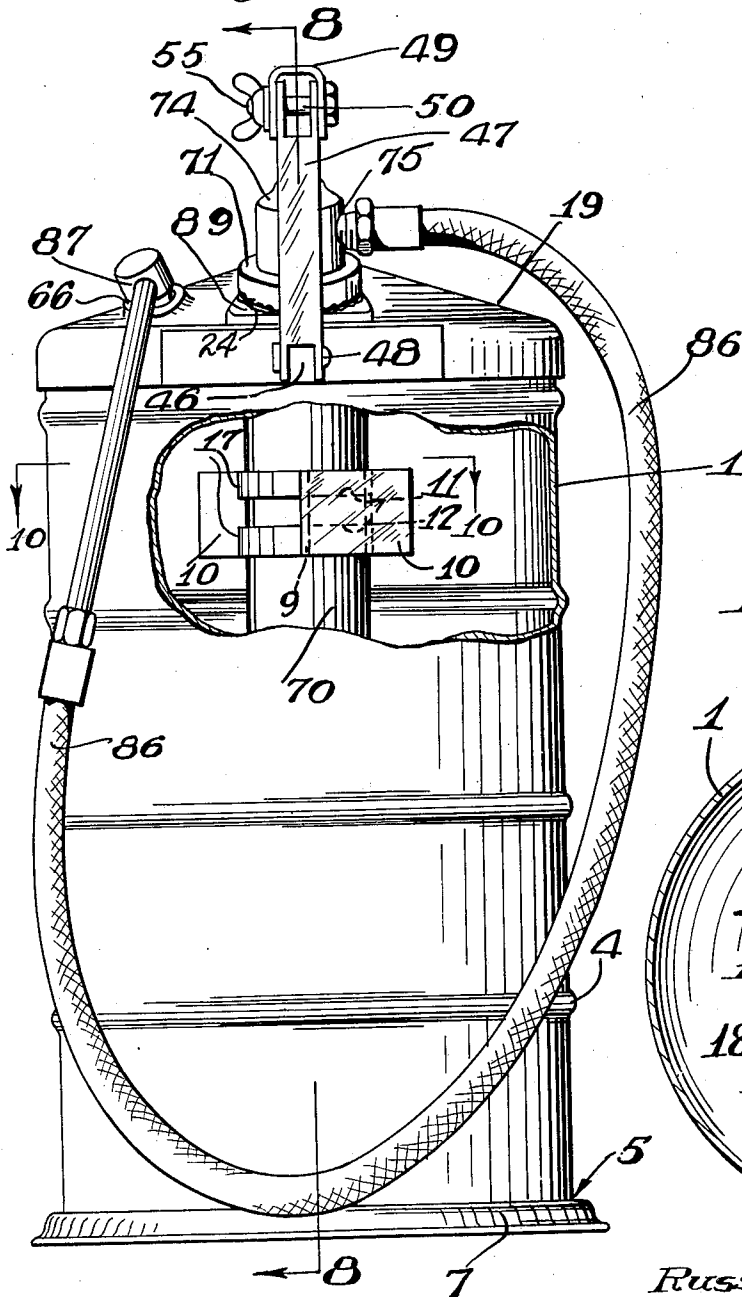
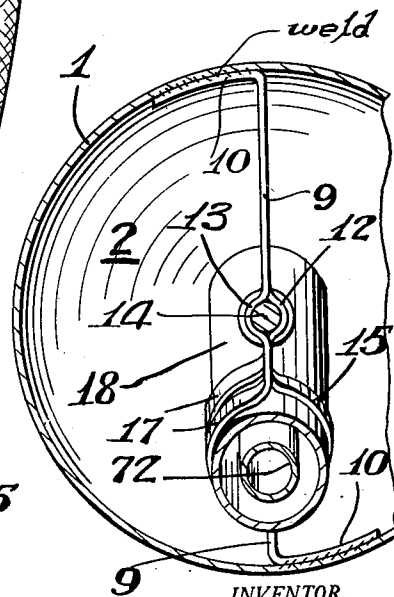


Fig. 10



INVENTOR.
Russell J. Gray
BY
Leonard L. Kalish
Attorney

UNITED STATES PATENT OFFICE

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LUBRICANT-DISPENSING APPARATUS

Russell J. Gray, Excelsior, Minn., assignor, by
mesne assignments, to Gray Company, Inc.,
Minneapolis, Minn., a corporation of Minne-
sota

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5 Claims. (Cl. 222-385)

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The present invention relates to lubricant-dispensing apparatus, and it relates more particularly to self-contained lubricant-dispensing devices which include, as a permanent part of such apparatus, a relatively large lubricant reservoir or storage-compartment, into which a substantial quantity of lubricant (25, 40 or 50 pounds, more or less) may be placed from time to time, from any original container or from any other source, and from which reservoir or storage-compartment the lubricant may be dispensed manually, as, for instance, by a manually-operated pump.

Some of the principal objects of the present invention are to provide a lubricant dispenser of such construction that it may be manufactured inexpensively, yet durably, and which will be of greater utility in actual use or service, and more convenient to handle not only from the standpoint of dispensing the grease but from the standpoint of loading the grease or lubricant into the dispenser and from the standpoint of keeping the lubricant free of dust and dirt which tend to collect on lubricating apparatus when in actual use in the field.

Other objects and advantages of the present invention will appear more fully from the following description and accompanying drawings.

In the accompanying drawings, in which like reference characters indicate like parts,

Figure 1 represents a perspective view of a lubricant-dispenser representing an embodiment of the present invention (with the hose and discharge-nozzle omitted).

Figure 2 represents a section on line 2-2 of Figure 1.

Figure 3 represents a cross-sectional view, on line 3-3 of Figure 2 on a somewhat larger scale.

Figure 4 represents a rear elevational view of the dispenser of Figures 1, 2 and 3, viewed along line 4-4 of Figure 3.

Figure 5 represents a cross-sectional view of the pump-head of the dispenser of Figures 1, 3 and 4, taken on line 5-5 of Figures 3 and 6.

Figure 6 represents a cross-sectional view on line 6-6 of Figure 5.

Figure 7 represents a perspective view of the dispenser of Figures 1 to 6, with the lid raised and turned into the position in which the lubricant may be placed in the dispenser.

Figure 8 represents a vertical cross-sectional view of another form of construction embodying another phase of the present invention, taken on line 8-8 of Figure 9.

Figure 9 represents a rear-elevational view of

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the form of construction shown in Figure 8, with the outer housing partly broken away, so as to expose to view the interior thereof.

Figure 10 represents a cross-sectional view on line 10-10 of Figure 9.

For the purposes of illustrating the present invention, there are shown, in the accompanying drawings, exemplifying forms thereof, although it is to be understood that the various instrumentalities of which the several forms, embodiments, phases and extensions of the present invention consists, can be variously arranged and organized and that the present invention is not limited to the precise arrangements and organizations of the instrumentalities as herein shown and described.

In one phase of the present invention illustrated in Figures 1 to 7, inclusive, the lubricant-dispenser comprises a generally upright cylindrical sheet-metal housing or container 1, having a sump-like bottom 2; the outer flanged periphery 3 of the bottom 2 being united with the cylindrical sheet-metal side-wall by a bead 4, or being otherwise secured thereto, as, for instance, by spot-welding the outer flange of the bottom member 2 to the cylindrical portion of the side-wall of the container 1, a substantial distance above the lower edge 5 of the cylindrical body 1; the lower edge 5 being telescoped over a corresponding raised cylindrical portion or boss 6 which is preferably pressed out of a sheet-metal base member 7, provided with an offset foot-rest 8. The one piece bottom 2 strengthens the entire container and automatically feeds all the lubricant to the lower end of the pump to be described.

Within the cylindrical body 1, a transverse sheet-metal strap or yoke 9 is provided, with oppositely turned or flanged ends 10 welded to the side-wall of the container, as best shown in Figure 10, and having at its center a pair of parallel, longitudinal slits 11 cut therein, and portion 12 between said slits being pressed in one direction while the flanking portions 13 above and below said slits are pressed in the opposite direction, so as to provide a vertical support in which the lid-clamping bolt stud 14 is fastened by spot-welding, arc-welding or otherwise to extend vertically and centrally of the body 1.

Similar slits 15 may also be cut into the band or yoke 9, but off center, and the portion 16 between slits 15 is pressed in one direction and the flanking portions 17 are pressed in the opposite direction, so as to provide a slightly inclined up-

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right passageway or guide for the reception of the stationary, tubular pump-cylinder or riser-tube 18, which is so disposed that it may slide up and down within the guide, as the pump-supporting cover or lid 19 is raised and lowered, from time to time, for the insertion or loading of grease or lubricant into the container 1, and so as to permit the pump-supporting cover or lid 19 to be raised and turned into the position shown in Figure 7.

The upper end of the pump-cylinder or pump-riser 18 may be screw-threadedly or otherwise fastened to the pump-head 21, which, in turn, may be permanently affixed to the lid or upper closure 19, as, for instance, by having its lower end turned down slightly to a somewhat smaller diameter as at 22 (Figure 3) and fitted into a hole 23 within the lid, and then welded in place, as at 24.

A piston-rod 25 of a diameter substantially smaller than the inner diameter of the pump-cylinder or riser-tube 18 is disposed therein and extends through the end of the pump-head 21, and through the stuffing-box portion 26 and the stuffing-gland 27, and through the packing 28 compressed between the two, so as to provide a pressure-seal around the upper end of the pump-rod or piston-rod 25.

A discharge outlet at 29 (Figures 5 and 6) extends through the side of the pump-head 21, into which a high-pressure discharge-hose 76 may be screw-threadedly or otherwise fastened; the free end of which hose, in turn, carries any suitable quick-attachable and quick-detachable coupler for making temporary fluid-tight connection with any type of lubricant-receiving "nipple" or "fitting" on the bearing of the machine to be lubricated such as, for instance, the so-called "hydraulic" coupler of the multi-jawed chuck type, or the bayonet type coupler or the "button-head" type coupler or the like, or which may carry a plain discharge-nozzle or a non-drip discharge-nozzle or a manually-operable discharge-valve, nozzle or booster or the like.

A relief and return port 30 is also provided, with a return passageway 31 extending downwardly therefrom, back into the container 1, with a screw-retained and screw-operable needle-valve 32 normally closing the port 30; which needle-valve may be opened whenever it is desired to relieve the hose-line of its grease content or to relieve the hose-line of its pressure or to permit the lowering of the pump-handle and pump-piston without expelling grease from the hose-line.

To the lower end of the cylinder (or riser) 18, a foot-valve housing 34 (Figure 3) is screw-threadedly or otherwise secured, having a central inlet 35, and having a gravity-seated ball check-valve 36 (or other suitable check-valve) resting against the intake valve-seat 37 thereof.

To the lower end of the piston-rod 25 a hollow piston 38 is screw-threadedly or otherwise secured, in fluid-sealing engagement with the inner bore of the cylinder 18, and within this hollow piston a gravity-seated (or other suitable) check-valve 39 is disposed, adapted to seat against the valve-seat 40, on the intake stroke of the pump. One or more slots or other passageways 41, are provided in the sides of the lower end of the piston rod 25, across and beyond that portion thereof which is overlapped by the hollow piston 38, so that the grease or lubricant which passes through the inlet opening 42 of the hollow piston and passes by the ball check-valve 39 there- of (on the compression stroke) may pass into

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the space 43 between the piston rod 25 and the inner bore of the cylinder 18.

The upper end of the cylinder 18, and indeed, the pump-head 21 are so disposed in relation to the center of the lid 19, and in relation to the cylinder-supporting portions 16 and 17 of the yoke 9, that the cylinder 18 will be disposed at such an angle as brings that foot-valve housing 34 to the center and into proximity of the bottom of the sump-like bottom 2 of the container.

The lid 19 is provided with a downwardly depending flange 44, which telescopes over the upper end 45 of the cylindrical container, and to which flange 44 a link-anchorage member 46 is secured by spot welding or otherwise.

To the link-anchorage 46, a link 47 of generally U-shaped cross section is pivotally secured by means of the pivot pin 48. To the upper end of the link 47, the manually-operable (or otherwise operable) lever-arm 49 is pivotally secured by means of the pivot-pin 50. The lever-arm 49 is preferably made of sheet-metal, and formed into a more or less tubular formation in the handle portion 51 thereof, and in a generally inverted U-shaped cross-section in the pivot portion 52 thereof; in the sides of which U-shaped portion, flat, elongated panel-like portions 53 (Figure 3) are pressed inwardly, to a distance from each other substantially equal to the diameter of the pump-rod 25, and within these two flat panels 53, three alternate sets of pivot-holes 54—a, 54—b and 54—c are provided, for the alternative reception of a removable pivot-bolt 55, held in place by the wing nut 56; which bolt 55 extends through a similar hole in the upper end of the piston-rod 25.

By interchanging the position of the bolt 55 between the holes 54—a, 54—b and 54—c, the leverage may be varied, so that with the same manual effort (or other force), the amount of pressure obtainable is varied; the hole a providing the highest pressure, the hole b somewhat lower pressure and hole c a still lower pressure.

A central opening 57 is provided in the lid 19, through which the stem of the cap-nut 59 extends and in which it is rotatably disposed. The upper end of the cap-nut 59 is provided with an enlarged head 60 beneath which a washer 61 is placed, and to the upper end of which the handle member 62 is welded as at 63, or otherwise affixed. A cup-shaped washer 64 is placed over the cap-nut 59, and is held in place by a cotter-pin 65, so as to hold the cap-nut 59 rotatably within the central lid-opening 57 without permitting the cap-nut 59 to change its axial position within said opening.

By turning the handle 62, the cap-nut 59 may be threaded onto, or threaded off, from the bolt 14, so as screw-threadedly to lock, or so as to unlock, the lid 19 in relation to the cylindrical body 1 of the container. The upper horizontal portion of the handle member 62 is placed directly beneath the lever arm 49 so that it will act as a lower stop or rest for the lever-arm. The handle also affords convenient means for lifting the lid off the container, and when the lid is secured, the handle may be used to lift the entire container.

A side-opening 66 may also be provided in the lid 19 into which the nozzle or coupler 67 at the free end of the hose 76 may be inserted, when the device is not in use as shown in Figure 4. If desired, instead of merely having an opening into which the end of the nozzle coupler can be placed,

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a lubricant-receiving fitting or nipple, of any of the conventional types, may be fastened in the hole 66, corresponding to the coupler at the end of the hose, so that when the device is not in use, the coupler may be attached to said fitting. This may be of the "button-head" type fitting, "bayonet" type fitting or so-called "pin" fitting, or a ball-headed fitting commonly known in the trade as a "hydraulic" fitting, or any other type of fitting, or may be a screw-threaded fitting. Thus any lubricant draining from the hose 76 when not in use will flow back into the container.

When the container has been emptied or substantially emptied, the handle 62 is rotated so as to unscrew the cap-nut 59 from the bolt 14, the lid 19 is lifted upwardly by means of the handle and, in so doing, the pump-cylinder 18 is slipped upwardly through its loosely retaining straps 16 and 17 and the lid then turned around into the position shown in Figure 7, where the lid and pump will come to rest without further attention or without need for further manual support. In this position the container may then be filled from any source, and when it has been filled the lid may be turned around into alignment with the body of the container and telescoped down over the body, and the cap-nut 59 then tightened onto the bolt 14 by turning the handle 62 in the opposite direction.

In an alternative form of construction shown in Figures 8 and 9, the pump cylinder 70 is screw-threadedly or otherwise secured to a cap-like member 71, fastened to the lid 19 by welding at 24, and is also slidably retained within the bands 16 and 17.

In this form of construction (Figures 8 and 9) the pump cylinder 70 is intended for relatively low pressure and large-volume discharge, and, hence, is preferably of somewhat larger diameter. Within the cylinder 70 a hollow piston-rod 72 is disposed, which passes freely through the upper opening 73 in the cap 71, and is, in turn, capped by the movable pump-head 74 which is screw-threaded (or otherwise secured) thereto, and which has a side-opening 75 to which the low-pressure hose 86 is secured. The pump-head 74, in turn, is then provided with the pivot portion 74^a, for the reception of the pivot-bolt 55 to connect it with the lever-arm 49.

The upper end of the cylinder 70 is vented back into the container 1 by means of one or more openings 77. The lower end of the cylinder 70 is closed off by means of the foot-valve body 78, to the apertured transverse portion 79 of which a disc type valve 80 is loosely secured by the loose pin 81. To the lower end of the hollow tubular piston rod 72, the piston 82 is secured, in sliding fluid-sealing engagement with the cylinder-wall, and is provided with a central inlet opening 83 having the valve-seat 84 adapted to be closed off by a gravity-seated ball check-valve 85.

By reciprocating the lever-arm 49, the grease or lubricant is drawn in past the foot-valve 80 on the up-stroke, and then is driven past the check-valve 85 on the down-stroke or compression-stroke out through the movable hollow piston-rod 72 and out through the reciprocatory pump-head 74 and out through the hose 86.

For dispensing grease or lubricant in relatively large volume and at relatively low pressure any suitable discharge nozzle 87 is provided at the free end of the hose 86, as, for instance, for filling gear casings such as transmission or differential casings of automobiles, or the like.

I may press a generally V-shaped or sector-like

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reinforcing rib or raised flat portion 88, upwardly a slight distance above the rest of the lid-surface as shown in Figure 9, or I may superimpose a reinforcing-plate (not shown) of the same shape over the lid, to interconnect the pump-receiving off-center opening in the lid and the nut-receiving opening in the center of the lid.

In both forms of the invention the yoke 9 is so connected with the pump that while rotation and sliding are freely permitted, the pump cannot be completely removed from the container unless the foot-valve housing 34 is first unscrewed. This is important because it prevents the pump from being laid in dirt and mixing such dirt with the grease in the container when the pump is subsequently replaced.

Having thus described my invention what I claim as new and desire to protect by Letters Patent is:

1. A manually-operable pumping dispenser including an upright container open at its top, a lid having an opening therethrough offset from the center thereof, said lid having detachable engagement with the container adjacent the top thereof so that said lid normally closes the top of said container, a yoke secured within said container, a pump-cylinder mounted in said offset opening and slidably extending through said yoke, thereby providing means whereby said lid may be detached from said container and pulled off the end thereof and swung about said pump-cylinder as an axis so as to leave the top of the container open to receive a supply of lubricant, a piston mounted for reciprocating movement in said cylinder, manually-operable actuating-means mounted on said lid for reciprocating said piston in said pump-cylinder, and inter-engaging lid-securing elements mounted on said lid and on said yoke and manually operable from above the lid when in closed position so as to be quickly attachable to and detachable from one another.

2. A lubricant-dispenser including a normally upright housing having its upper end open, a lid having sliding engagement with the side walls of said housing so as to normally close said opening and having a perforation therethrough, a yoke secured within said housing and having a perforation passing therethrough aligned with the perforation in said lid, a pump-cylinder fixedly secured in the perforation in said lid and slidably mounted in the perforation in said yoke, a pump-piston mounted for slidable movement in the pump-cylinder, manually-operable actuating-means for reciprocating said piston in said cylinder, a connector mounted on said lid and a connector mounted on said housing and adapted for quick attachment to and detachment from one another, and a handle forming part of the connector on said lid and underlying the actuating-means for said pump-piston so as to provide a stop for said actuating means at one end of its stroke.

3. A lubricant dispenser including a container closed at the top by a removable lid, means within the container to secure the lid, said securing means comprising a structural member secured to and extending generally diametrically across said container, a screw-threaded bolt rigidly secured to said structural member and extending generally vertically upward therefrom, and a nut operable from the top side of the lid to engage with and disengage from said bolt, a force pump passing through the lid at a point near one edge and extending downwardly close to the bottom of the container, said force pump including a piston

and having an inlet at its lower end, removable means to secure the upper end of the force pump to the lid, a lever pivotally mounted on said lid and having operative connection with the piston of the force pump, a lubricant hose connected to the discharge outlet of the force pump, means within the container and secured to the inner walls thereof to co-operate with the lid to hold the force pump against any movement except sliding and rotation, said last-mentioned means comprising a slightly over-sized collar formed in said structural member and adapted to encircle said force pump at a point generally intermediate its ends; the assembly of said lid, lever and force pump being constructed and arranged to be unitarily lifted slightly and swung on the axis of the pump to expose nearly the entire interior of the container as for refilling the same, whenever the lid-securing means has been disconnected.

4. A lubricant dispenser including a container, a removable lid closing the top of the container, an elongated force pump passing through the lid at a point well removed from the center and extending downwardly toward the bottom of the container, said force pump having a piston and a valve-controlled inlet at its lower end, a lubricant hose connected to the discharge outlet of the force pump, means to secure the upper part of the force pump to the lid, means within the container to guide and hold the force pump, said last named means consisting of a yoke or strap extending transversely of the container and secured at opposite ends to the side walls of the container, said yoke having a pair of parallel slits cut therein and extending longitudinally of the yoke and transversely of the container, the material of the yoke which lies between said slits being bent or bowed outwardly in a direction transverse of the container, and the material of the yoke above and below said slits being bent or bowed outwardly in a direction also transverse of the container but directly opposite to the first-mentioned direction of bending, the force pump passing through the opening formed by said oppositely bent yoke portions and being rotatably and slidably held thereby and means for engaging and disengaging said lid, said last-mentioned means comprising a member extending rigidly upward from said yoke and a movable member extending through said lid and operable from the top

of said lid, said movable member being adapted to make detachable connection with said rigid member.

5. A lubricant dispenser including a container body open at the top and a lid normally closing said top, a pump including a piston and piston rod secured to said lid and extending down inside the container body, a hose connected with the discharge side of the pump to dispense lubricant, manually operable actuating means pivotally mounted on the lid and connected with the piston rod to reciprocate the same, a stud bolt rigidly secured within the container so that its threaded end is uppermost and near the underside of the lid, a cap-nut rotatably and slidably mounted on the lid in such position that it may be threaded on the stud bolt and being so constructed and arranged that when it is engaged with the stud bolt it will secure the lid firmly on the container body, a handle secured to the upper end of the cap-nut and lying in the plane of movement of said pivotally mounted piston-actuating means so that downward movement of the latter means is stopped by direct contact with the handle; said handle serving as a lifting handle for the lid, as a lid-tightening or loosening means, and when the lid is secured, also serving as a carrying means for the entire container.

RUSSELL J. GRAY.

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