No. 865,315. PATENTED SEPT. 3, 1907.

W. E. PARR.

LUBRICANT FEEDING AND DISTRIBUTING MECHANISM.

APPLICATION FILED MAR. 13, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

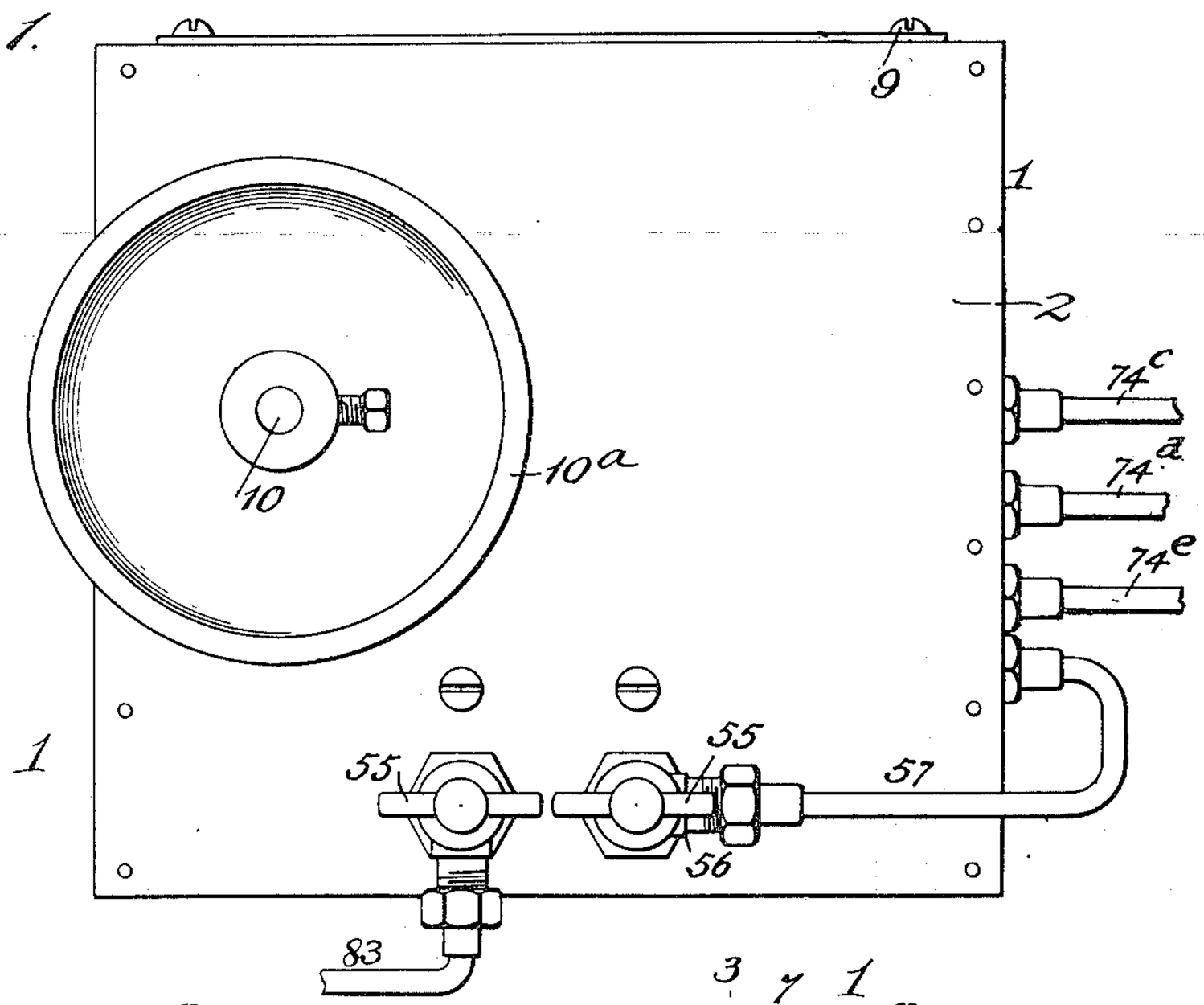

Fig. 2.

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3 SHEETS—SHEET 2.

Fig. 3

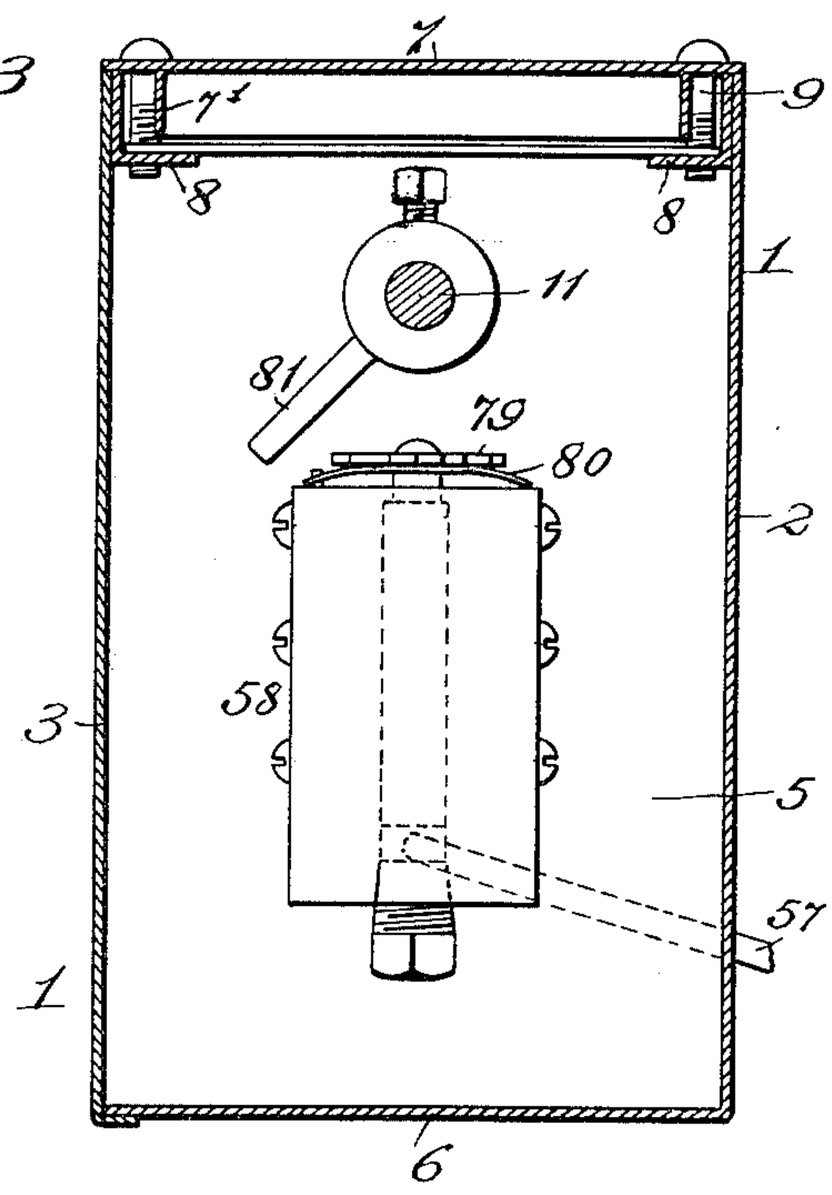


Fig. 4

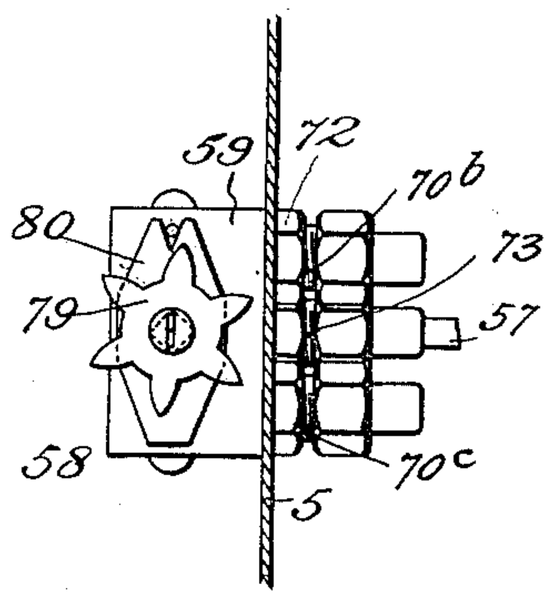


Fig. 7.

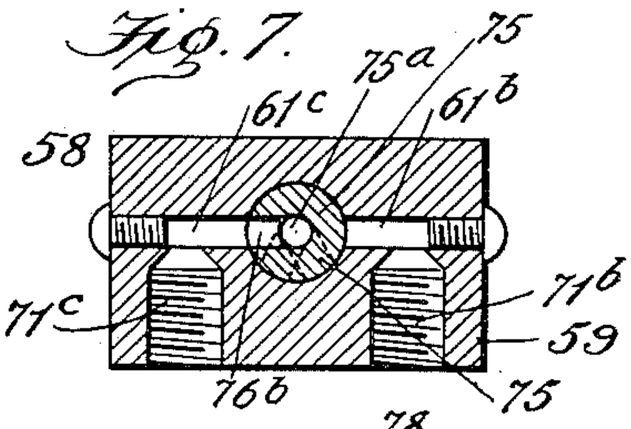


Fig. 5

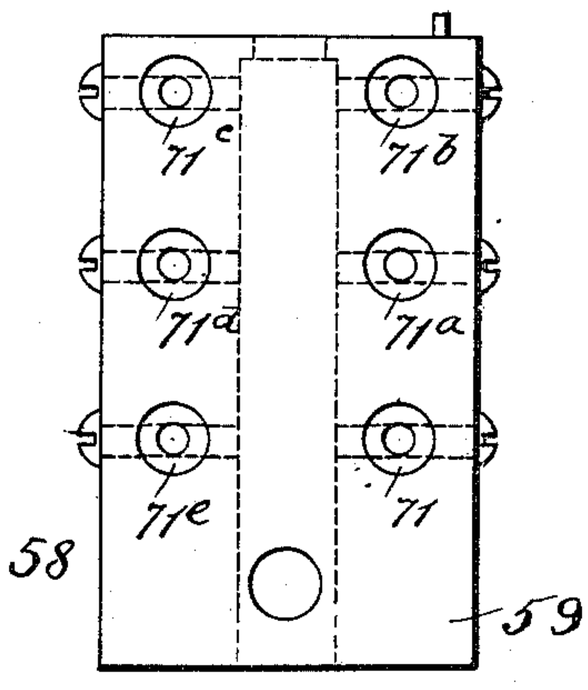


Fig. 6.

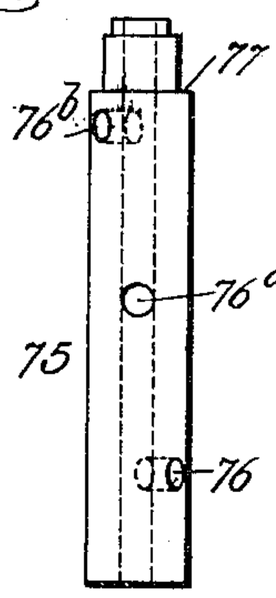
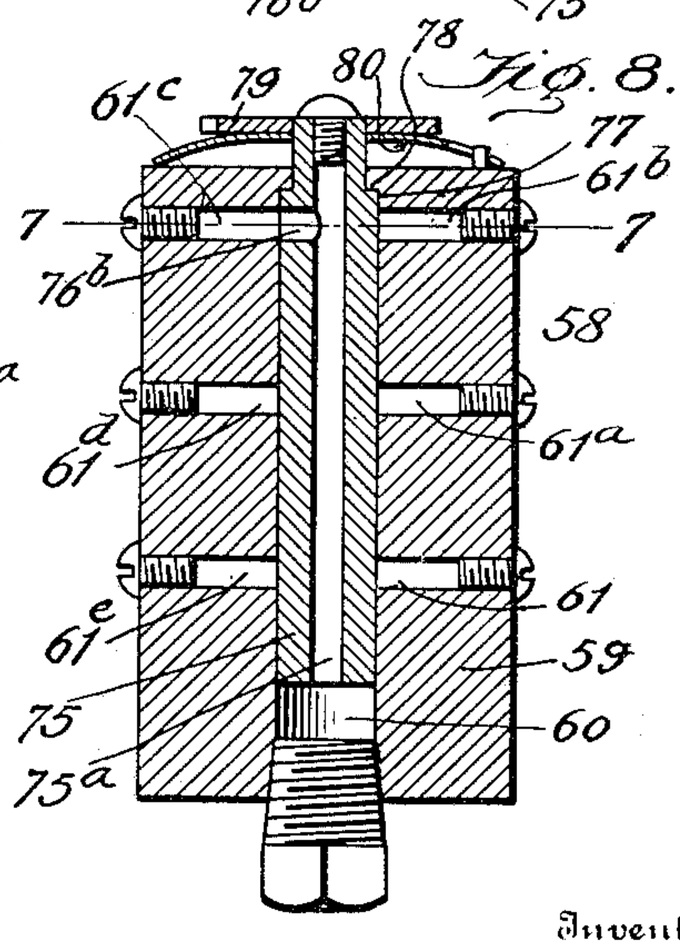


Fig. 8.



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3 SHEETS—SHEET 3.

Fig. 9.

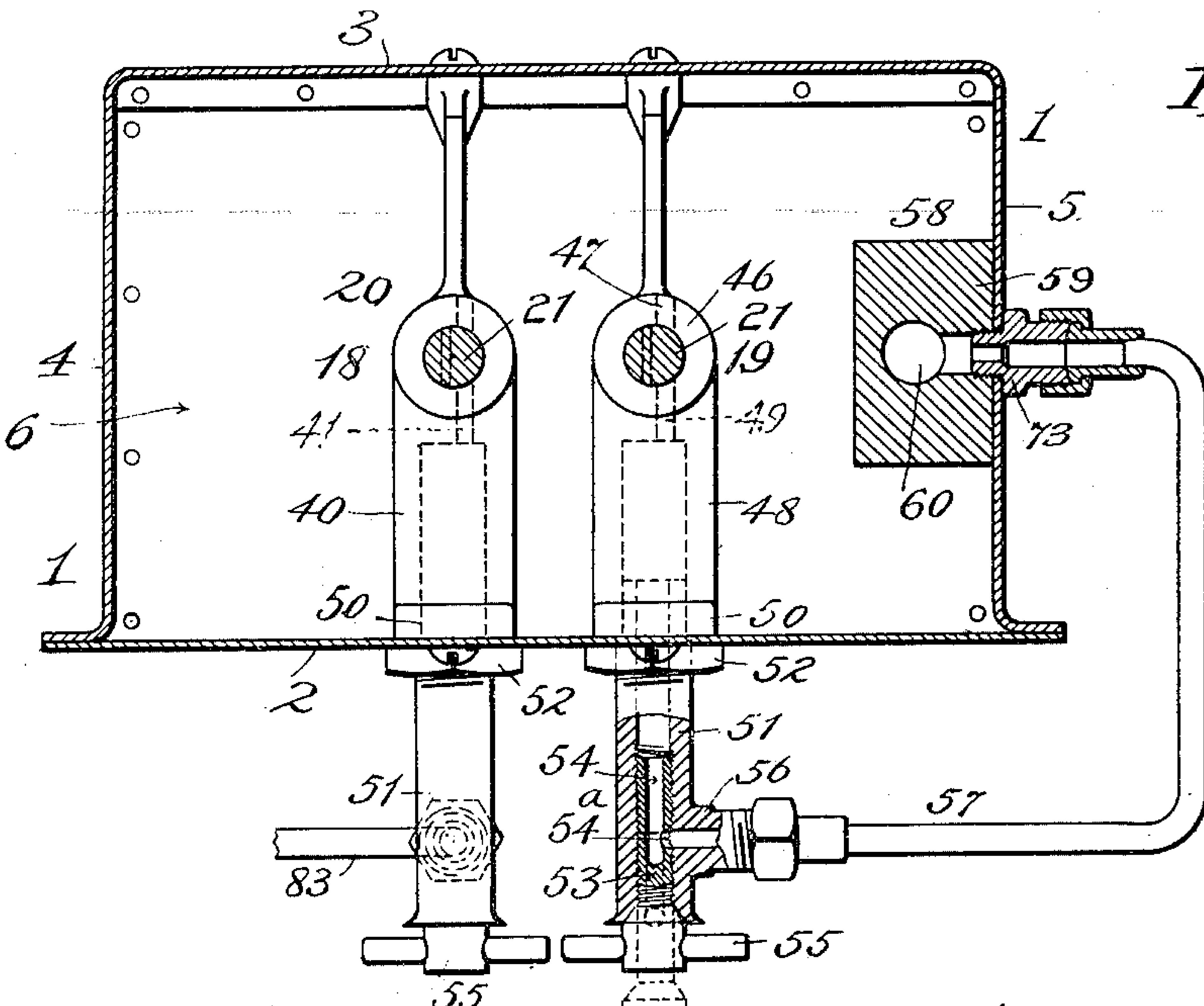


Fig. 10.

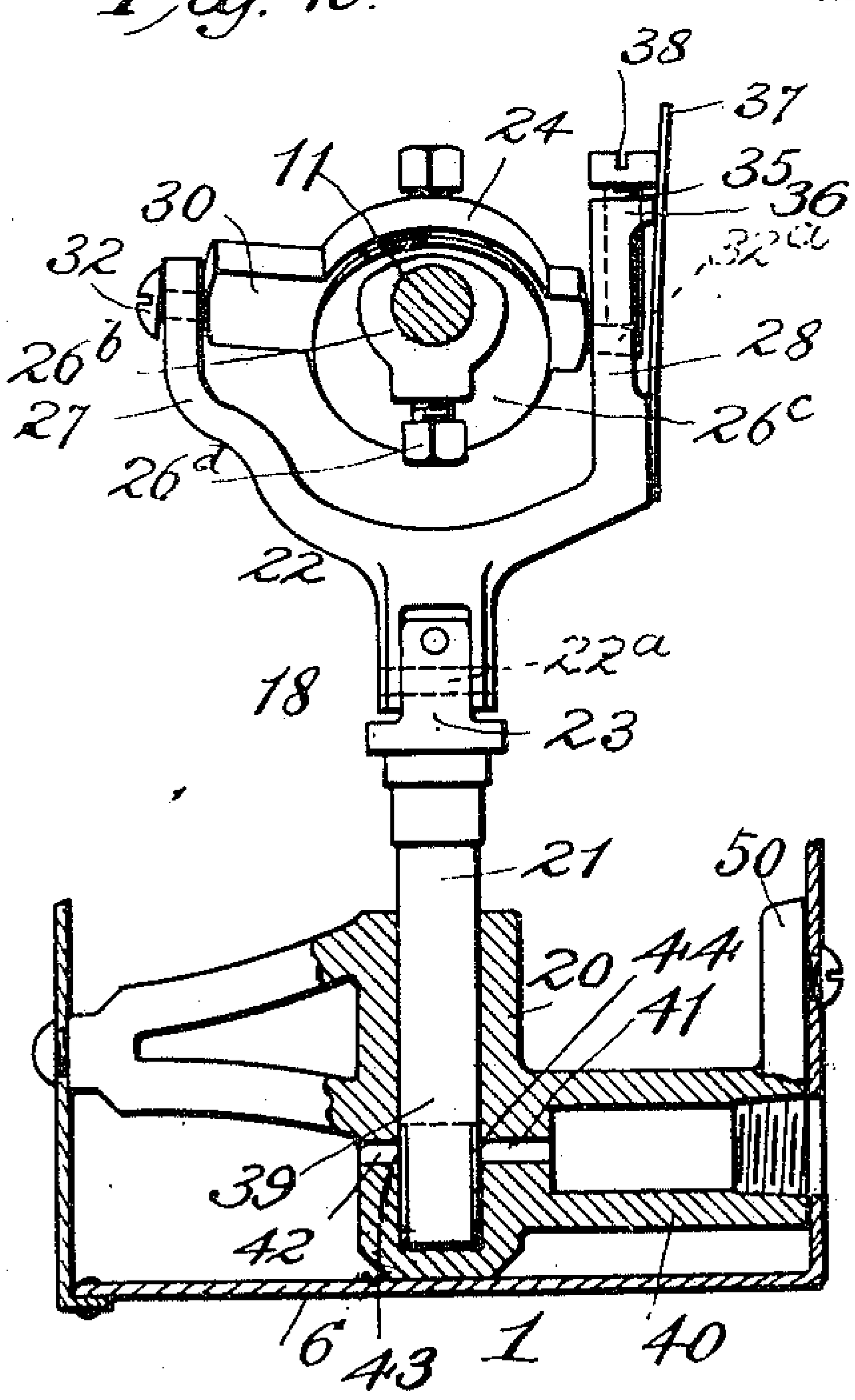


Fig. 11.

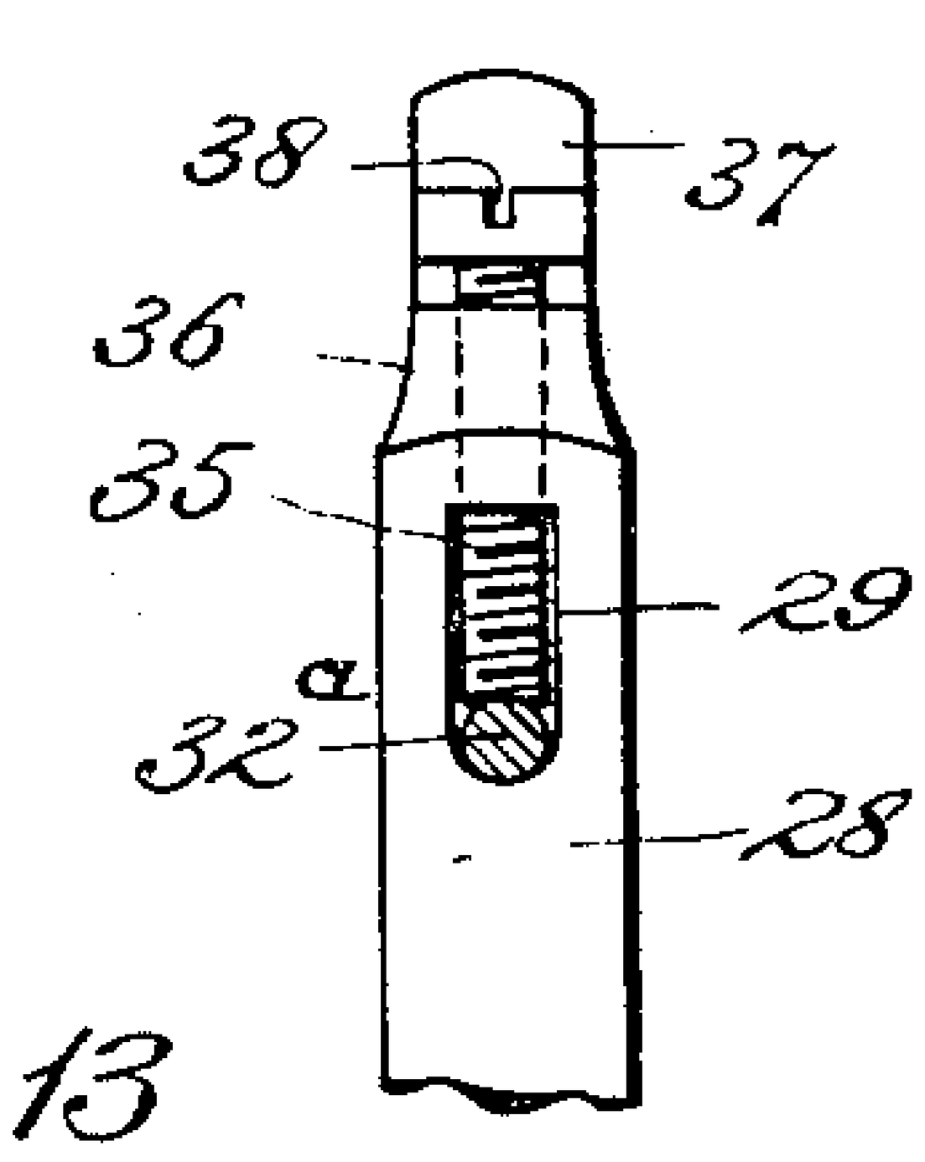


Fig. 12

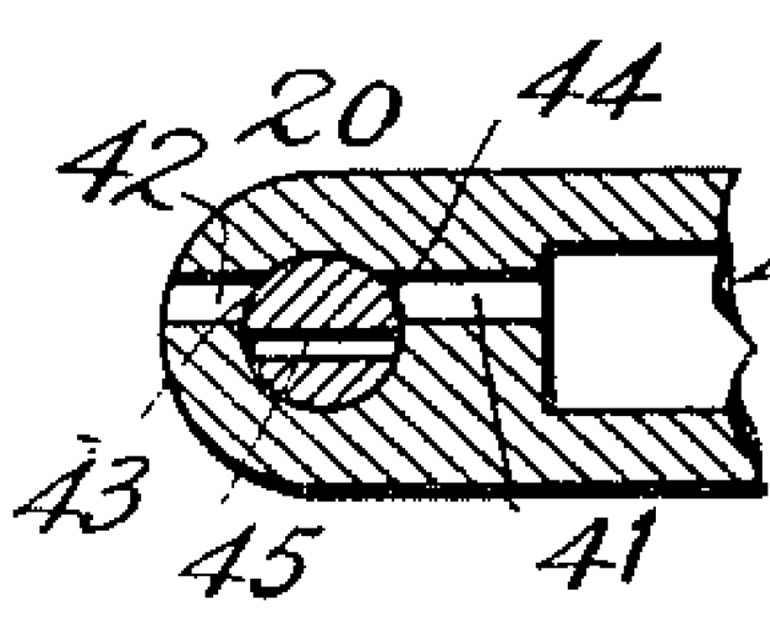


Fig. 13

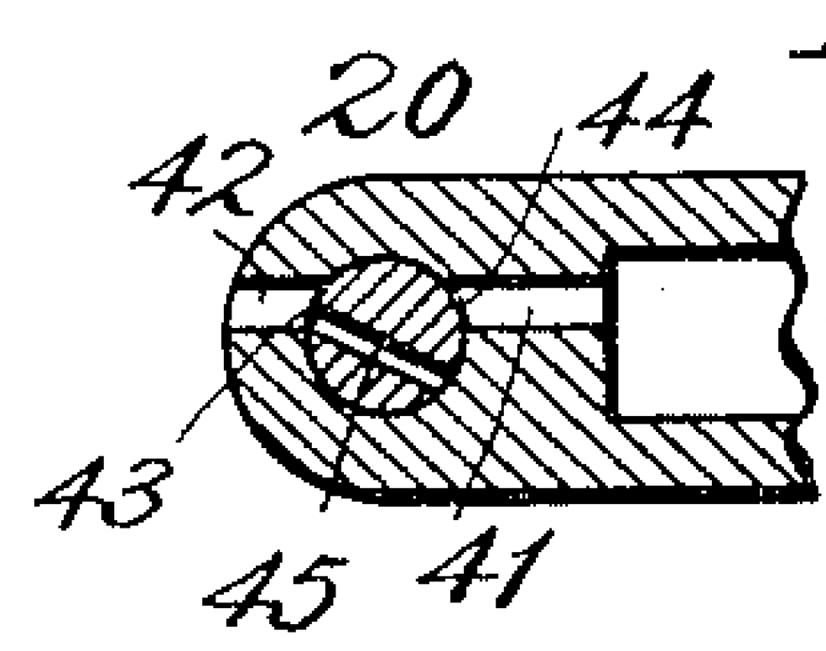


Fig. 16.

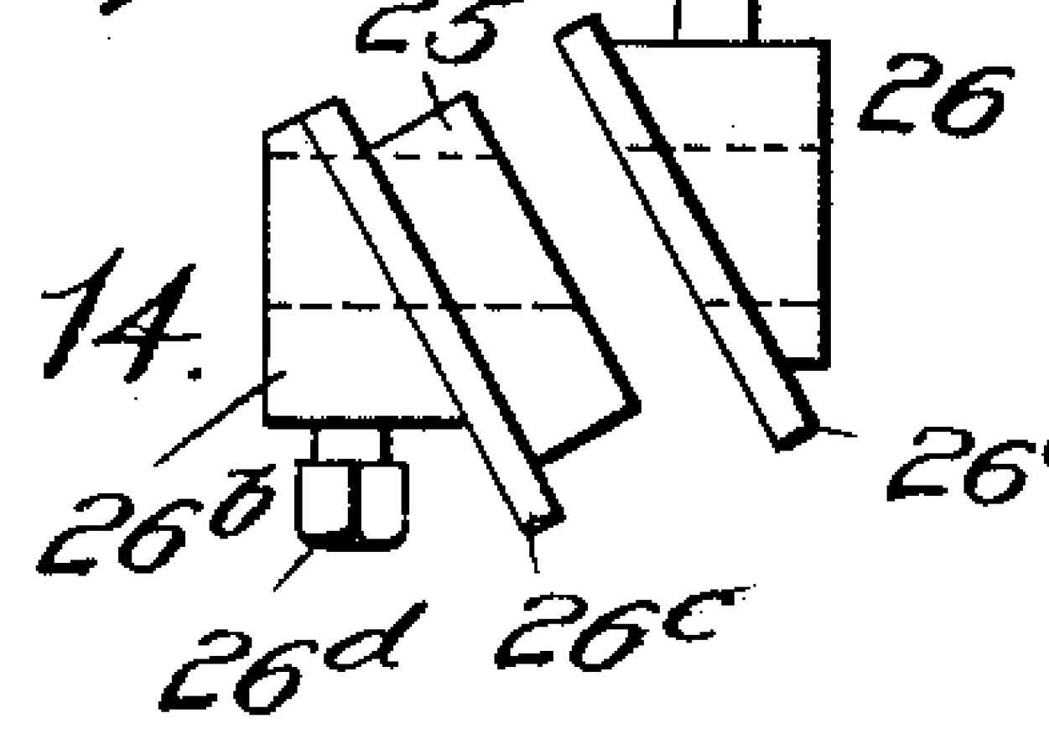


Fig. 14.

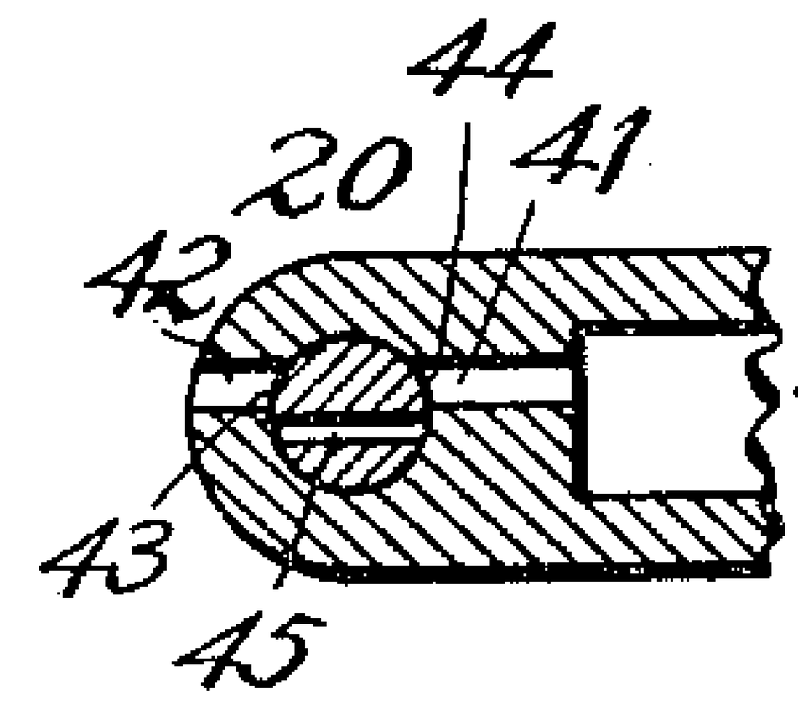
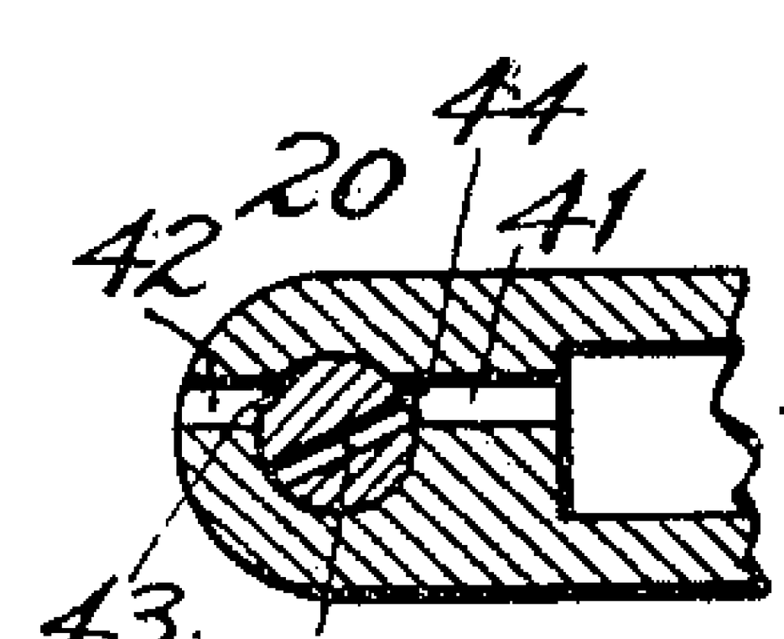


Fig. 15.



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UNITED STATES PATENT OFFICE.

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LUBRICANT FEEDING AND DISTRIBUTING MECHANISM.

No. 865,315. Specification of Letters Patent. Patented Sept. 3, 1907.

Application filed March 13, 1905. Serial No. 249,849.

To all whom it may concern:

Be it known that I, WILLIAM E. PARR, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Lubricant Feeding and Distributing Mechanism, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in devices for supplying lubricant from a vessel or receptacle by forced pressure and for distributing it in continuous or intermittent streams to each of several ducts which carry it to different points of final delivery.

Figure 1 is a side elevation of a lubricating mechanism embodying my improvements. Fig. 2 is a vertical cross section. Fig. 3 is a transverse section on the line 3—3 of Fig. 2. Fig. 4 is a top view of the distributer part. Fig. 5 is a face view of the distributer. Fig. 6, is an elevation of the distributer valve, detached. Fig. 7, is a sectional view taken on the line 7—7 of Fig. 8. Fig. 8 is a section taken on the line 8—8 of Fig. 2. Fig. 9 is a horizontal section taken on the broken line 9—9 of Fig. 2. Fig. 10 shows one of the pumps together with its eccentric driving devices. Fig. 11 is a side view of the adjustable connecting device for the eccentric. Figs. 12 to 15 are a series of views showing the successive positions of the pump plunger or piston during one of its cycles of movement. Fig. 16 is a detail view of the two parts that together form one of the eccentrics.

The operative parts of the device are mounted within, or are supported upon, a box-like structure indicated as a whole by 1. It has side walls 2 and 3, end walls 4 and 5, a bottom 6 and a cover 7. The latter is preferably made and attached in the way shown, there being flanges 8 extending inward from the side walls and end walls of the box, and the cover 7 being firmly fastened to these by means of screws 9 which tightly press the edges of the cover upon the top of the walls 2, 3, 4, and 5

10 is a shaft mounted in the walls 2 and 3, and 11 is another shaft supported in the walls 4 and 5, this shaft being situated transversely to the shaft 10. The several bearings of these shafts are preferably constructed in the way shown; 12 indicates a thimble passing through an aperture in the box wall and having a cavity 13 adapted to receive the end of a shaft. At 12^a the thimble is headed or flanged and at its inner end it is provided with an external thread. 15 is a nut fitting this thread and adapted to bear against the inner face of one of the box walls. When this nut is turned it tends to draw the thimble 12 inward and the wall is clamped tightly between the nut and the flanged head 12^a. At 14 the thimble head is preferably provided with a slot to receive a tool for the purpose of either turning the thimble or holding it stationary as required. The shafts 10 and 11 are mounted in bearings of the sort described, one of the thimbles for the shaft 10 having an aperture which extends entirely through it so that the shaft can project sufficiently far outward to permit it to have attached thereto a power receiving wheel 10^a.

It will be seen that I have thus produced a thrust or end bearing for a shaft which is particularly adapted for use in lubricators of the style to which I have shown it applied, as thereby I am enabled to easily provide a bearing that will not leak, and, at the same time, one that can be brought almost flush with the outer wall of the casing.

The shaft 10 has a worm 16 which engages with the worm wheel 17 fastened to the shaft 11.

The wheel 10^a is belted, or connected by suitable power transmitting devices, to an external driving shaft, and when the device is in operation the revolutions of the shaft 10 result in a relatively slower rotating of the shaft 11.

18 and 19 indicate pumps, as entireties, each comprising a barrel 20 having a plunger or piston rod connecting the plunger with the driving mechanism. 22 is a yoke joined to a fork 23 at the end of the plunger rod or piston rod 21 by a pivot device 22^a.

The yoke 22 is connected to a strap or ring 24 which is fitted to an eccentric 25 secured to the shaft 11. This eccentric is preferably made in two parts, one having the hub 26, a flange 26^a and a set screw by which the part may be secured to the shaft 11, and the other part formed with a hub 26^b, a set screw 26^d extending through the hub, the eccentric 25, and a flange 26^c separating the hub and the eccentric and so disposed as to be parallel with the flange 26^a of the other part. When the two parts are set tightly upon the shaft 11 in proper relation to each other they serve as an eccentric device to hold the strap or ring 24 properly in position. It will be seen that the eccentric thus provided is so situated that it is inclined to the axis of the shaft 11, and that, consequently, a compound movement is imparted to the yoke 25 and the plunger 39, that is to say, a movement having a longitudinal component and also a rotary component.

In order to provide variation, of one in relation to the others, of the power transmitting devices interposed between the driving shaft 11 and the plunger or piston, to permit an increase or decrease of the work done by the plunger or piston, I construct said parts as follows:

The arm 27 of the yoke 22 extends upward and outward and is pivotally connected with an arm 30 projecting laterally from the ring 24, the pivot being shown at 32, it passing through a relatively large aperture in the end of the arm 27. The opposite arm 28 of the yoke

is provided with an elongated opening or slot 29 in which is situated the pivot 32ª on the opposite side of the ring 24.

35 is an adjustable screw passing through the head 36 on the arm 28. By means of this screw the pivot 32ª can be forced down or allowed to rise, as desired, in the slot 29. The screw has a square head, and 37 is a spring arranged to bear against this head and hold it in any position to which it may be adjusted. By means of the slot 38 the screw can be turned as desired and after turning it is locked, in the way described, by the spring.

It will be seen that the extent of movement of the plunger 39 will be varied according as pivot 32ª is situated higher or lower in the slot 29 and by means of this connection and adjusting screw 35 the work done by the pump can be delicately regulated.

The barrel 20 is preferably cast as part of the device indicated by 20, 40; 20 being the barrel proper, and 40 being the extension projecting laterally from the lower end of the barrel to the wall 2 of the box or receptacle. Through this part 40 is formed delivery duct 41 through which the lubricant passes from the pump. At 42 there is an inlet duct having, at 43, a port or place of communication with the chamber in the pump barrel 20. And at 44 there is an outlet port at the receiving end of the duct 41. The piston or the plunger may be of the same diameter as the rod part 21, or the latter may be reduced while the plunger is relatively larger in diameter, as preferred. As shown the plunger or piston part at 39 is of the same diameter as the stem or rod part 21.

45 is a slot or recess in the lower end of the plunger or piston. It is formed in a plane eccentric to the axis, and the ducts 41 and 42 are also on a line eccentric to the axis. It is not necessary, however, that both the slot 45 and the intake and delivery ducts should be eccentric provided they be so related to each other and to the axis that the slot 45 shall, at the required times in its cycle, be cut off entirely from both ducts or ports.

The other pump shown, (indicated as an entirety by 19) is constructed of parts similar to those of the pump 18, and is connected to the driving shaft 11 in a similar manner. The barrel 46 has an inlet duct and a port 47 and an extension 48 projected to the wall 2 of the receptacle through which is formed the outlet duct 49; the latter being similar to the corresponding parts 40, 41, and 42 as above described.

The inclined eccentrics cause the pump plungers or pistons to reciprocate both longitudinally and axially. As the plunger is moved upward it acts to draw or suck in a charge of liquid, and as it moves downward it tends to impart pressure to the liquid drawn in. While it is moving upward its slot 45 registers with the port 43 and duct 42, the slot at the same time being out of communication with the port 44 and the duct 41 see Fig. 13 so that the sucking action permits a charge of liquid to be drawn into the barrel. Then as the plunger moves downward it is moved part way around, axially, closing the port 43 see Fig. 14 and bringing the slot 45 so as to register or communicate with the port 44 see Fig. 15, and the liquid is forced along the duct 41 under pressure.

One of the objects of the present invention is to provide a small lubricant feeding mechanism which can at one and the same time be delivering through one duct a practically continuous supply of liquid and through a large number of ducts, in series, and successively, smaller intermitting charges or quantities of the liquid. This I accomplish as follows: The tubes 40 and 48 are provided with flanges at 50 which fit against the inner surface of the wall 2 of the receptacle. 51 is a tube fitted by threads into the end of the part 40. It has the external thread with which engages a nut 52 that binds tightly together the wall 2 and the parts at 50, 51, and 40 or 48. In the tube 51 there is a screw plug 53 with a handle at 55. 54 is a longitudinal duct therein with a lateral port 54ª. When the plug is in tight position the port 54ª communicates with the outlet duct. But the plug can be rotated in such way as to advance longitudinally and close the outlet duct and so as to bring the port 54ª to the end of the tube where it communicates with the open air. When it is brought to this position it can be used to ascertain the action of the pump and to see the rate of feed. If it is found that the feed must be varied it can be done by properly adjusting the connecting device between the eccentric and the pump plunger as above described. At 56 there is a coupling nipple by which a tube 57 can be connected with that at 51. The liquid that travels through the tube 57 is taken to the distributer indicated as a whole by 58. It may be made in any of several ways. I have illustrated a simple method for readily making it. 58 is a block of metal in which is formed a chamber 60 preferably by drilling a cylindrical aperture. To this chamber the tube 57 delivers the liquid from the pump 19. A series of delivery ducts 61, 61ª, 61ᵇ, 61ᶜ, 61ᵈ and 61ᵉ are formed in the part 59, these communicating with nipple tubes 70, 70ª, 70ᵇ etc. each nipple tube being secured in a threaded socket as at 71, 71ª, etc. The nipple tubes have nut-like flanges 72 and these parts permit the metal block 59 of the distributer to be clamped tightly against the inner face of the wall 5. 73 is a nipple tube which connects the pipe 57 with the distributer. 74 and 74ª etc. are pipes or tubes secured to the nipple tubes 70, 70ª, etc., and conduct the liquid therefrom respectively.

In the chamber 60 is mounted valve 75 being inserted through an aperture in the wall of the distributer casing which is afterward closed by a screw-threaded plug. It has a longitudinal duct 75ª and short ducts with ports 76, 76ª, 76ᵇ, etc. At 77 a shoulder is formed which fits against the corresponding shoulder 78 of the part 59. 79 is a wheel secured to the upper end of the valve 75. 80 is a flat spring interposed between the part 59 and the wheel 79 and acting to hold the valve upward in proper place.

Intermittent rotary movements are imparted to the wheel 79 and to the valve 74 by means of a projection or tooth 81 carried by the shaft 11. At each revolution of the shaft the wheel 79 is advanced step by step. At one step the port 76 is brought into communication with the port at 61 and the oil which is contained in the chamber 60 and the duct 75ª under pressure is for a brief period forced through the pipe 74. At the next step the port 76ª registers with the port at 61ª and a charge of liquid, under pressure, from pump 19, is forced through the pipe 74ª. At the next step the port 76ᵇ communicates with that at 61ᵇ and a charge of oil is delivered through pipe 74ᵇ; and so on throughout the cycle of the valve 75.

The pump 18 forces liquid to its outside pipe 51 and thence through the conductor 83. As this pipe 83 is supplied with a relatively large quantity of oil, (it taking all that comes from the pump 18), it can be connected to some part of the mechanism requiring such quantity, as for instance, the piston or cylinder of a gas or gasolene engine, while at the same time the other pump 19, situated in the same receptacle can, through the medium of the distributer be given a few drops, intermittently, to each of a large number of small bearings which require small quantities of lubricant at frequent intervals.

It is essential in lubricators for use on motor vehicles that the oil chamber should be readily accessible and that it should be practically oil tight so that no leaks will occur when the liquid is splashed around within the chamber. 7′ is a downwardly projecting flange on the cover 7, its walls being substantially parallel to the walls of the compartment and arranged, when the cover is in place, to project downward inside of the inner walls of the flange 8 to points adjacent to the said flange. By means of this construction of cover together with the flange 8 I have provided a simple and efficient arrangement of parts for preventing the escape of oil from the compartment due to splashing, both the flange 7′ and the flange 8 tending to prevent the escape of oil thrown or splashed upward within the oil chamber.

It will be seen that the cylinder of the pump and the casing of the distributer are each formed in a solid block of metal in which are the various apertures required. This not only makes a construction easy to manufacture, as the various ducts and chambers can be easily and accurately drilled, but also one that may be easily fitted in place within the box or casing 1 and secured against the inner face of the walls thereof. When such body parts for the pump and for the distributer are employed, it is found most desirable to arrange the connection between them outside the lubricant receptacle 1, as it is thus possible to easily make liquid-tight connections; to have these entirely outside the lubricant receptacle; it becomes unnecessary that these parts (the pump and the distributer) be particularly arranged with reference to each other, as the small tube or tubes that constitute the connections between them are easily bent to suit the positions of the parts they are to connect; and, if such tubes become clogged or the parts otherwise obstructed, it is very easy to ascertain the trouble from the outside and without requiring the opening of the casing 1 or any examination into the interior thereof.

In order that the pump cylinder may be securely held in place, and at the same time serve to brace the opposite walls of the casing and lubricant receptacle I provide the pump cylinder with a bracket-like extension, as represented in Figs. 9 and 10, arranged to extend to and be connected with that wall of casing which is opposite the one to which the block in which the pump cylinder is formed is directly secured.

What I claim is:

1. In a lubricating mechanism, the combination of the lubricant receptacle, a pump fitted therein and having its cylinder secured to the inner face of one of the walls of the casing of the receptacle, a distributer, also secured to the inner face of one of the walls of the receptacle, and having a lubricant chamber, connections between the pump and the distributer arranged outside the receptacle and extending through the walls thereof to make connections with the said parts respectively, means for operating the pump arranged within the receptacle and a valve within the lubricant chamber of the distributer also operated from within the receptacle, substantially as set forth.

2. In a lubricating mechanism, a distributer through which the lubricant passes having a chamber and a series of delivery ducts communicating therewith, a screw-threaded plug or closure for the said chamber, a valve for opening and closing the said ducts, a star wheel 79 secured to a projecting end of the said valve, and a spring for holding the valve in place in the lubricant chamber of the distributer, substantially as set forth.

3. In a lubricating mechanism, the combination with the lubricant receptacle, of the pump situated in the receptacle, the pump actuating devices in the receptacle, the shaft 11 also within the receptacle, the bearing thimble 12 inserted through the wall of the receptacle and having a bearing cavity for the shaft 11, and the clamping means at 15 for securing the bearing thimble to the wall with an oil tight joint, substantially as set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

WILLIAM E. PARR.

Witnesses:
JOSEPH M. BOYD,
A. A. STELTING.