No. 787,155. PATENTED APR. 11, 1905.

E. DENEGRE.

LUBRICATOR.

APPLICATION FILED FEB. 2, 1905.

2 SHEETS—SHEET 1.

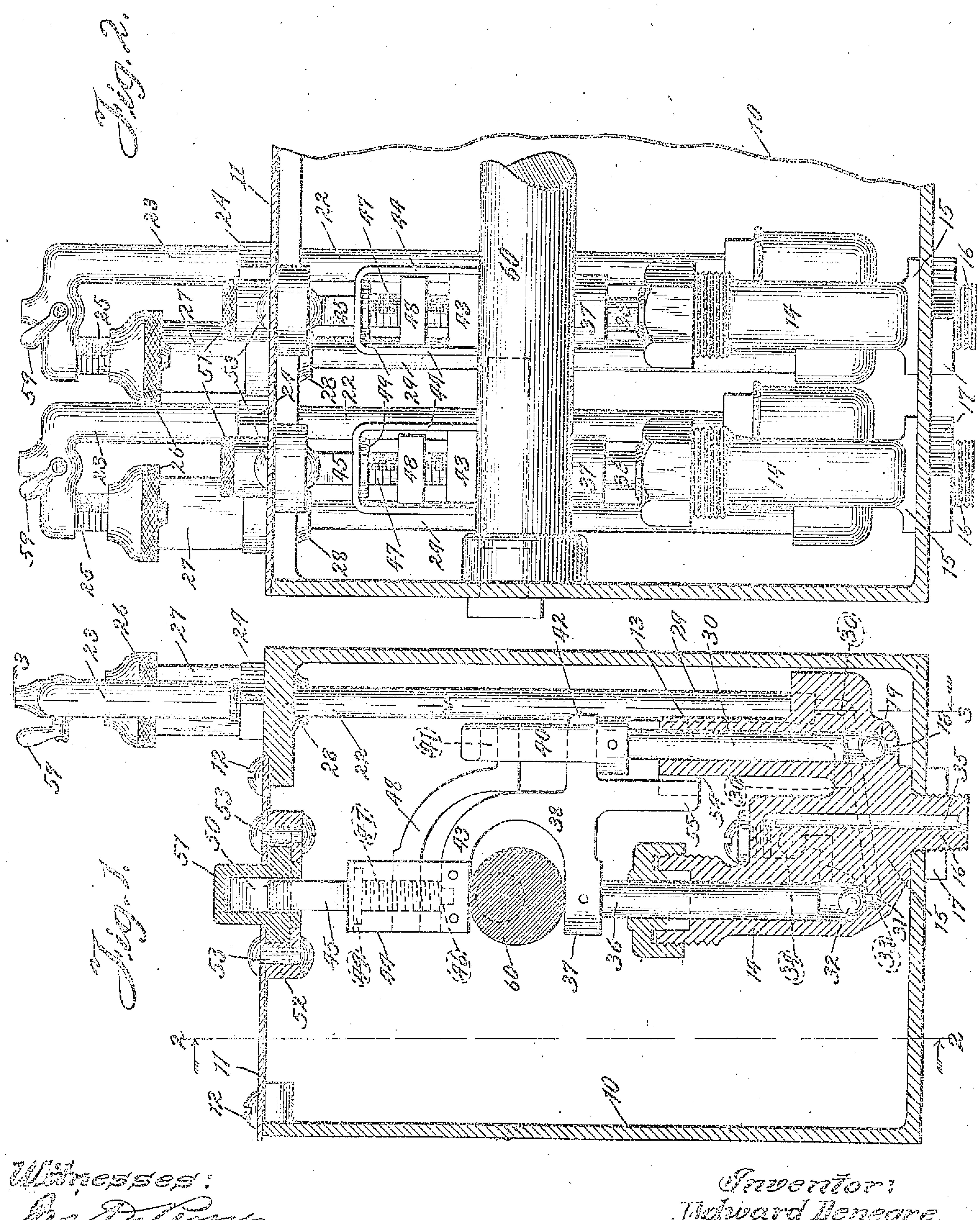

Fig. 2.

Fig. 1.

Witnesses:

Inventor:
Edward Denegre.

By [signature] Attys.

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2 SHEETS—SHEET 2.

Fig. 3.

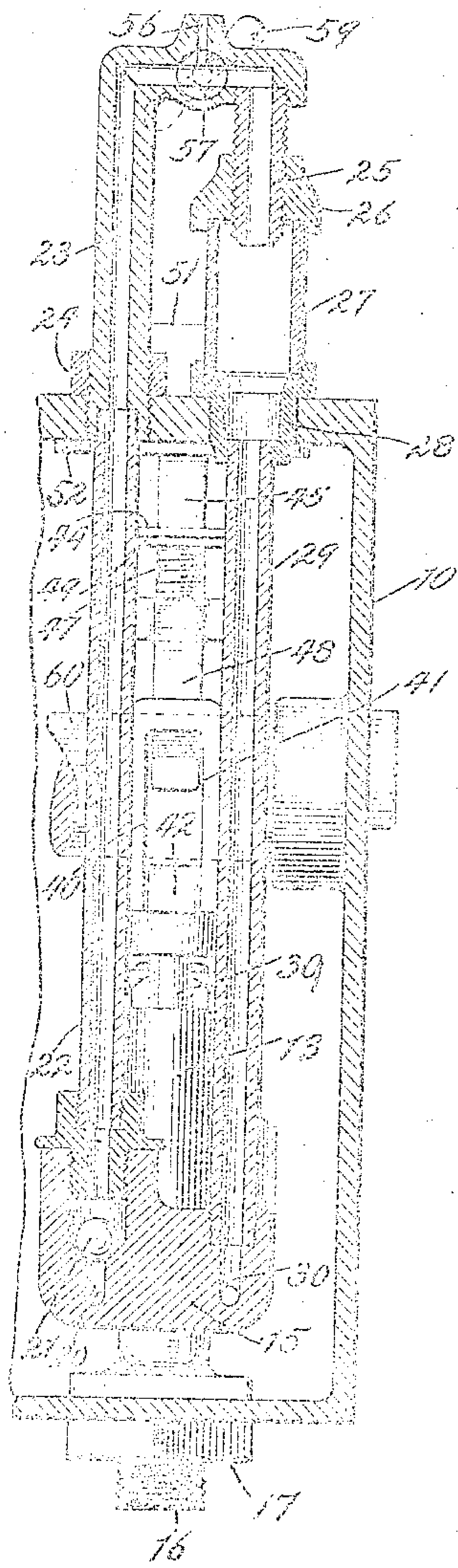


Fig. 4.

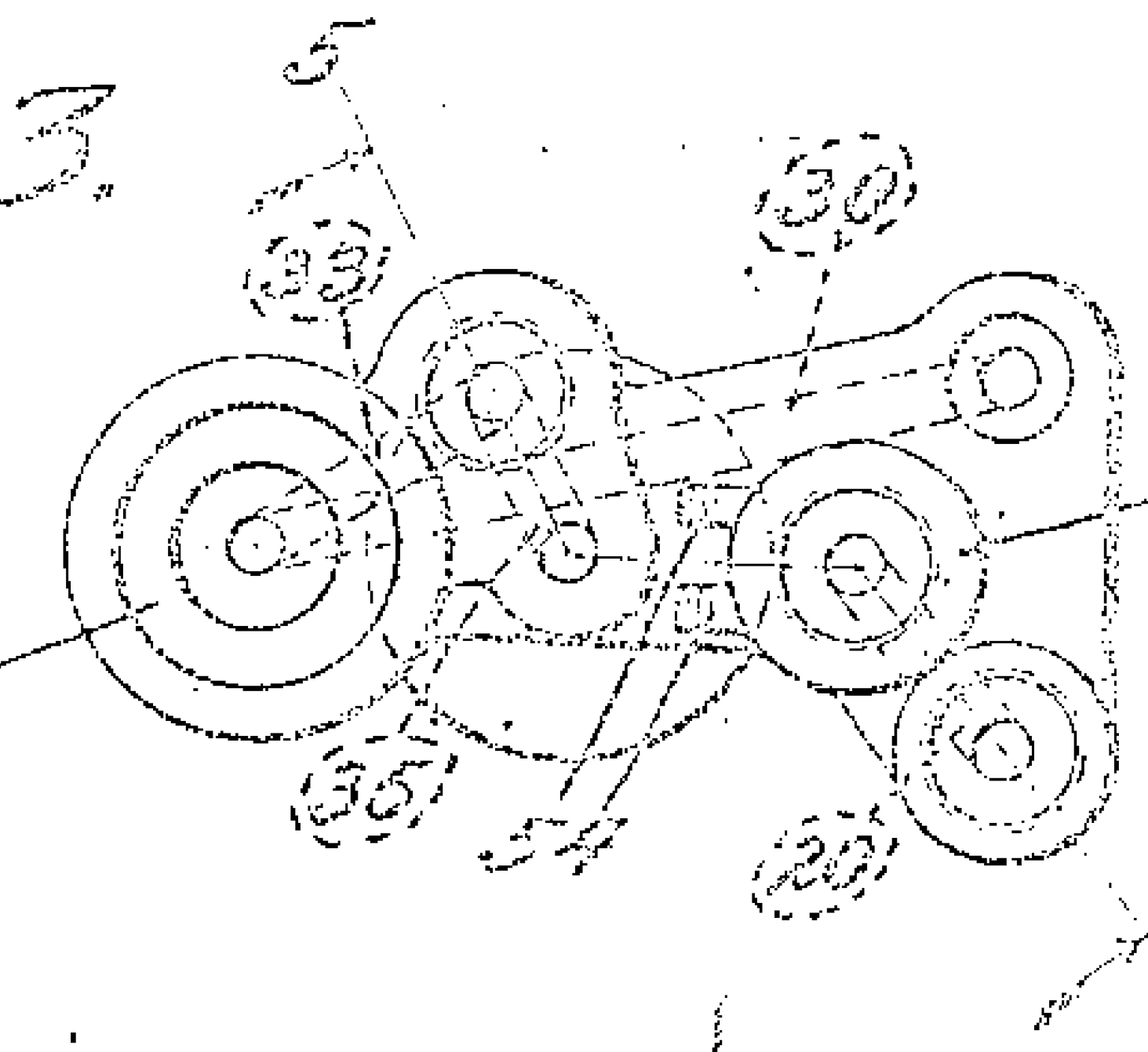


Fig. 5.

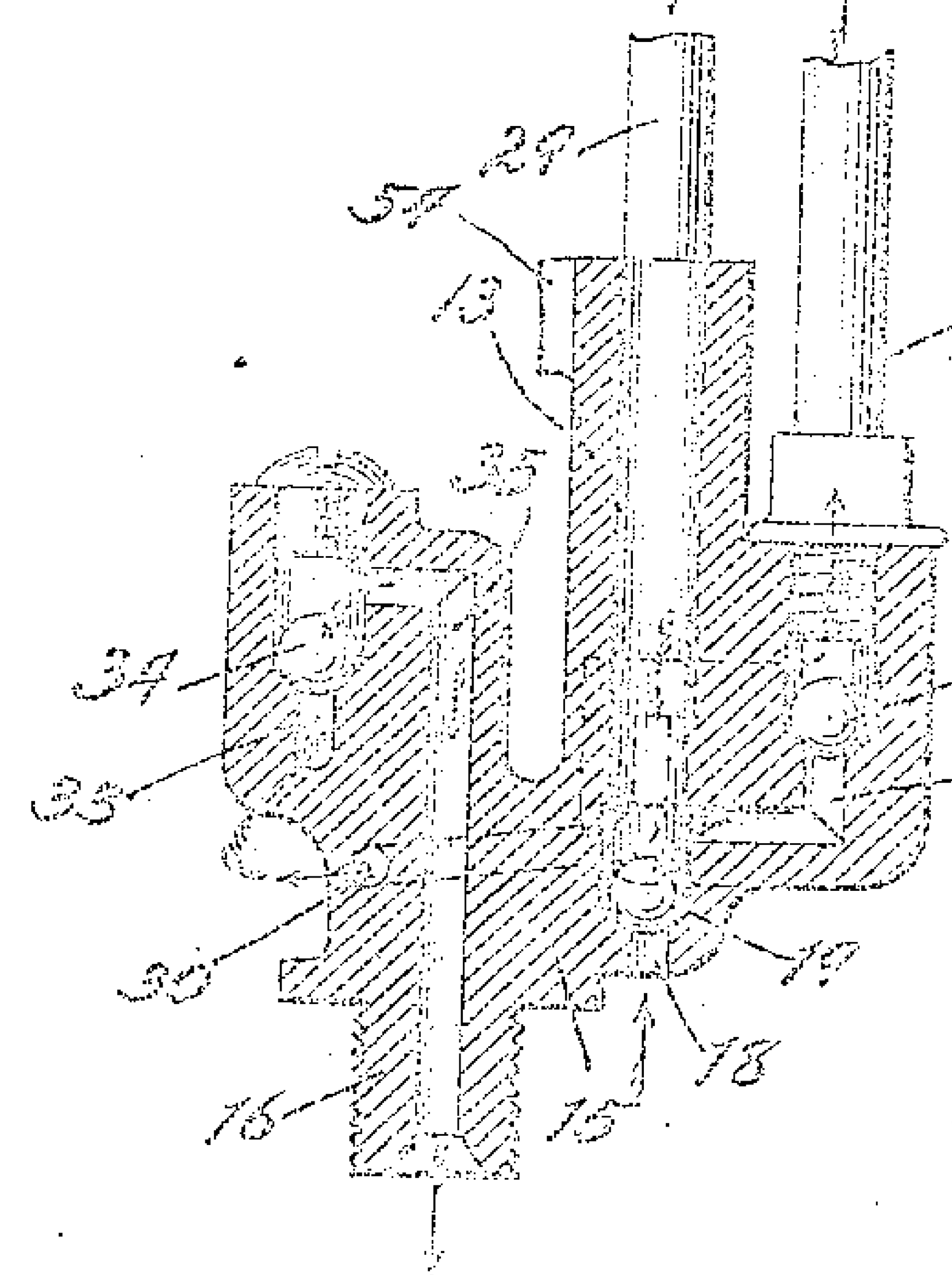
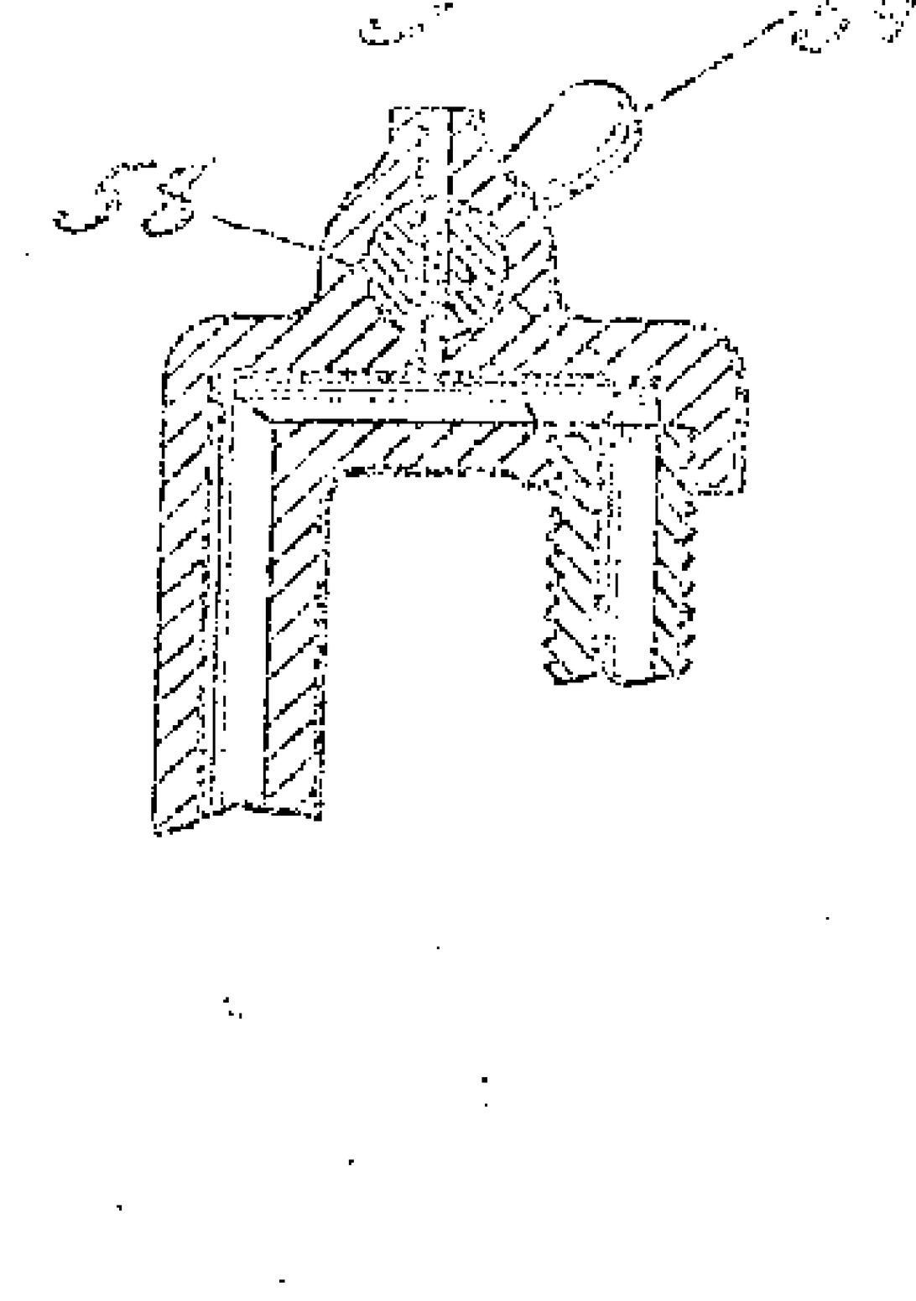


Fig. 6.



Witnesses:
[signature]
[signature]

Inventor:
Edward Denegre.
By Robinson & McRoberts
Attys

No. 787,155. Patented April 11, 1905.

UNITED STATES PATENT OFFICE.

EDWARD DENEGRE, OF CHICAGO, ILLINOIS, ASSIGNOR TO McCORD & COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 787,155, dated April 11, 1905.

Application filed February 2, 1905. Serial No. 243,791.

To all whom it may concern:

Be it known that I, EDWARD DENEGRE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lubricators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in that class of force-feed lubricating-pumps which are designed to deliver oil from a suitable reservoir to bearings or other working parts, such as the cylinders and bearings of automobile-motors, engines, and other mechanisms.

The invention consists of the combinations and arrangements of parts hereinafter particularly described and then pointed out in the appended claims.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a vertical transverse section of an oil-reservoir, showing one of the sets of coöperating pumps located therein, the pumps being shown partially in section for convenience of illustration. Fig. 2 is a longitudinal section on the line 2 2 of Fig. 1, one end of the reservoir being broken away. Fig. 3 is a section on the line 3 3 of Fig. 1. Fig. 4 is a detail plan view showing the pump-barrels of each associated set of pumps and the arrangement of the communicating ports and passages. Fig. 5 is a section substantially on the line 5 5 of Fig. 4, and Fig. 6 illustrates another type of valve for controlling the air-port for the connection between the coöperating pumps.

Referring to the drawings, 10 designates a suitable reservoir, which may be of any preferred size and shape. This reservoir is shown as provided with a cover 11, removably secured in place by screws 12. The reservoir is designed to contain one or more sets of coöperating pumps, each of which sets comprises a primary pump for drawing the oil from the reservoir and an auxiliary or delivery pump to which the oil is forced by the primary pump and which delivers the oil to the bearing. In the present instance the barrels 13 and 14 of the primary and auxiliary pumps, respectively, are vertically disposed and project upwardly from a body 15, having a screw-threaded nipple 16, which passes through an opening in the bottom of the reservoir, as shown in Fig. 1. A nut 17 in threaded engagement with the nipple 16 serves to clamp the body 15, and consequently the pump-barrels 13 and 14, rigidly in position.

The barrel 13 of the primary pump is provided with an inlet 18, controlled by a suitable check-valve 19, and a discharge-port 20, controlled by a suitable valve 21. A tube 22 communicates with the discharge-port 20 beyond the valve 21 and at its upper end enters a pipe 23. The pipe 23 is located on the cover 11 and is in threaded engagement with the tube 22. A nut 24 locks the pipe 23 in position. The pipe 23 is bent laterally at its upper end and is provided with a depending nozzle 25, which projects downwardly through the cap 26 of a sight-feed glass 27, which is suitably secured on a base-ring 28, passing through the cover 11. The sight-feed glass is provided with suitable packing to render the same air-tight. A tube 29 screws at its upper end into the base-ring 28 and is in alinement with the nozzle 25 and its lower end is in threaded engagement with the body 15, which is provided with a passage 30, leading to the inlet 31 of the barrel 14 of the auxiliary pump. This inlet is controlled by a suitable valve 32, and the discharge-port 33 of the auxiliary or delivery pump is controlled by a valve 34, and leading from beyond the latter is a passage 35 in the nipple 16, through which the oil passes to a suitable pipe (not shown) extending to the part to be lubricated.

The plunger 36 of the auxiliary pump is fixed to the lower arm 37 of a yoke 38. The plunger 39 of the primary pump is provided at its upper end with an extension 40, having an elongated slot 41 to receive an extension 42 of the yoke 38. The upper arm 43 of the yoke 38 is provided with an inverted substantially U-shaped plate 44, and passing through the top of the plate 44 is a stem 45, the lower end of which is pivoted, as at 46, in the upper arm 43 of the yoke. As shown in Fig. 1, the

stem 45 is screw-threaded, as at 47, where it extends between the sides of the U-shaped plate 44 and is in threaded engagement with an arm 48, extending toward and entering the slot 41 in the extension 40 of the plunger of the primary pump, such arm conforming generally to the curvature of the yoke, as shown. A collar 49 on the stem 45 prevents vertical movement of such stem when the latter is rotated, and the arm 48 is guided and held from turning when adjusted by the parallel sides of the U-shaped plate 44. The upper end of the stem 45 is polygonal in cross-section and enters a similarly-shaped socket 50 in a button 51, carried by the cover. The button 51 is rotatably mounted on the cover, being retained in position by a ring 52, suitably secured, as by bolts 53, to the under face of the cover. The button 51, as shown in Fig. 1, projects through an aperture in and extends above the cover and may be milled, as shown, so as to be readily turned by hand, or it may be suitably shaped to receive a wrench or other tool to turn the same. The barrel 13 of the primary pump is provided with a pair of guides 54, which receive between them a lug 55 on the yoke and serve to guide the yoke as it reciprocates.

It is obvious that the tube 22, pipe 23, nozzle 25, sight-feed glass 27, and tube 29 provide a continuous connection leading from the primary pump to the auxiliary or delivery pump. This connection is provided with an air-port 56, which preferably communicates, as shown in Fig. 3, with the connection exterior to the reservoir, as with the passage in the pipe 23. This port may be opened and closed in any suitable manner or by any suitable means. In the present instance I have shown a valve for this purpose. Such valve may consist of an ordinary three-way valve 57, located at the intersection of the air-port with the passage in the pipe 23 and which when in one position opens the air-port, as shown in Fig. 3, and when turned one hundred and eighty degrees from the position shown in said figure opens the air-port without in either case obstructing the passage in the pipe 23. Any other suitable form of valve may be employed—as, for instance, that shown in Fig. 6, where the valve 58 is an ordinary one-way valve for opening and closing the port. A handle 59, fixed to the valve, is employed to turn the valve. Under normal conditions—that is to say, when both pumps are operating properly—the air-port is open, as shown in Fig. 3.

An eccentric 60 is suitably journaled on the ends of the reservoir and may be rotated in any suitable manner. This eccentric coöperates with the yokes 38 to reciprocate the plungers 36 and 39. As the plunger 36 is fixed to the yoke, its stroke will be constant. The stroke of the plunger 39 of the primary pump, however, may be varied by turning the button 51. When this button is turned, the arm 48 will be raised or lowered, depending upon the direction of rotation of the stem, and by this means lost motion between the yoke and the plunger 39 may be varied, so as to vary the rate of delivery of the primary pump. As shown in Fig. 1, the cross-sectional area of the plunger 36 is greater than that of the plunger 39, so that even when the plunger 39 makes a full stroke the capacity of the primary pump is less than that of the auxiliary or delivery pump. This difference in capacity may be increased by adjusting the arm 48, so as to provide lost motion between the yoke 38 and the plunger 39.

In the operation of the lubricator oil is sucked from the reservoir past the valve 19 by the plunger 39 of the primary pump and then forced up past the valve 21 into the tube 22 and through the pipe 23 and nozzle 25, the oil falling in drops through the sight-feed glass, so as to indicate the rate of delivery of the primary pump. After passing through the sight-feed glass the oil drops into the tube 29 and is then drawn therefrom by the plunger 36 past the valve 32 and forced out past the valve 34 through the passage 35 to the bearing. As the auxiliary or delivery pump is of greater capacity than the primary pump, a supply of air equal to the difference between the capacities of the pumps is drawn through the port 56 to the auxiliary pump and forced by the latter, with the oil, to the bearing.

In pumps of this character it frequently happens that the oil-passages become clogged or that the valves become fixed to their seats, so that while the plungers continue to reciprocate no oil is delivered to the bearing. Under the present invention so long as one pump is operative for supplying oil the other pump may be readily rendered operative if for any reason it becomes ineffective. If, for example, the primary pump fails to pass oil through the sight-feed, the valve 57 is turned, thereby closing the air-port 56. Assuming the auxiliary pump to be operating properly, its reciprocation will create a vacuum in the connection between the pumps, thereby sucking the oil past the valves 19 and 21 and clearing or washing away any obstructions, so that the suction-pump will again be in condition to operate properly and as intended. The valve 57 may then be turned to open the air-port, so that the delivery-pump will be supplied with air, as before. The closing of this valve in the manner described makes the auxiliary pump a suction as well as delivery pump, so that while the primary pump is out of operation oil will be supplied to the bearing. If, on the other hand, the auxiliary pump should fail to deliver oil, owing to an obstruction in the passages or the failure of its valves to unseat, the oil will back up into the sight-feed glass. When this happens, the

air-port 56 may be closed, and this will create a pressure-chamber in the sight-feed glass, so that the primary pump will become a force-pump and force the oil through the auxiliary pump past the valves of the latter to the bearing. This pressure of the primary pump will serve not only to unseat the valves of the delivery-pump, but also force out any obstructions in the connections. As soon as the auxiliary pump operates properly, so as to discharge the oil delivered thereto by the primary pump, the air-port may be opened again. It will thus be seen that either pump may be utilized to clear the other. When the lubricator is running at its normal rate, supplying oil to the bearing—at, for example, one drop per stroke—if for any reason more oil is required than is then being delivered the valve 57 may be closed, and the auxiliary pump will then draw oil to its full capacity past the primary pump and force it to the bearing. The air-port may then be opened again, and the primary and auxiliary pumps will coöperate, so as to deliver at the same rate as before. An advantage of this is that when it is desired to temporarily increase the rate of delivery this may be accomplished without disturbing the adjustment of the primary pump.

While I have shown and described a valve for closing the air-port 56, it is obvious that that port may be closed in any other suitable manner. The same results may be secured by employing, for example, the finger to close the air-port.

By reason of the arrangement of the button 51 means are provided for adjusting the stroke of the primary pump during the operation of the pump, thereby avoiding the necessity of stopping its operation when it is desired to vary the rate of feed, and this button entirely closes the aperture in the cover, so that the reservoir is entirely closed against the admission of dust. The socket 50 is of such length as to always be engaged with the stem 45 and not interfere with the reciprocation of the stem as the latter moves with the yoke.

It is obvious that any number of coöperating sets of pumps may be employed and the yoke of each set actuated by the common eccentric. In Fig. 2 two of each sets of pumps are indicated.

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

1. In a lubricator, the combination with a reservoir, of a pair of connected pumps, and means whereby either pump may be utilized to clear the other.

2. In a lubricator, the combination with a reservoir, of a primary pump, an auxiliary pump, a connection between the pumps, and means whereby either pump may be utilized to clear the other.

3. In a lubricator, the combination with a reservoir, a pump, a sight-feed device through which the oil is forced by the pump, a second pump adapted to draw oil from the sight-feed, and provision whereby either pump may be utilized to clear the other.

4. In a lubricator, the combination with a reservoir, of a suction-pump, a delivery-pump, a connection between the pumps, and provision whereby either pump may be made to deliver oil to the part to be lubricated independently of the other pump.

5. In a lubricator, the combination with a reservoir, of a suction-pump, a delivery-pump, a connection between the pumps, and provision whereby the suction-pump may be made to force the oil past and clear the delivery-pump or the delivery-pump may be made to suck the oil past and clear the suction-pump.

6. In a lubricator, the combination with a reservoir, of a primary pump supplied by the reservoir, a delivery-pump, and a connection between the pumps having a normally open air-port adapted to be closed when one of such pumps becomes ineffective, and whereby such pump may be cleared by the action of the other pump.

7. In a lubricator, the combination with a reservoir, of a primary pump supplied by the reservoir, a delivery-pump of greater capacity than the primary pump, and a connection between the pumps having a normally open air-port adapted to be closed when either of such pumps becomes ineffective, whereby such pump may be cleared by the action of the other pump.

8. In a lubricator, the combination with a reservoir, of a primary pump, an auxiliary pump of greater capacity than the primary pump, means to vary the stroke of the primary pump, a connection between the pumps having an air-port, and a valve for closing the air-port, whereby either pump may be utilized to clear the other.

9. In a lubricator, the combination with a reservoir, of a primary pump supplied by the reservoir, a delivery-pump of greater capacity than the primary pump, a connection leading from the discharge of the primary pump to the inlet of the delivery-pump and including a sight-feed device, the connection having an air-port exterior to the reservoir, and a three-way valve adapted to open and close the air-port without obstructing the connection.

10. In a lubricator, the combination with a reservoir, of a primary pump supplied by the reservoir, a delivery-pump of greater capacity than the primary pump, means for varying the stroke of the primary pump, a connection leading from the discharge of the primary pump to the inlet of the delivery-pump and including a sight-feed glass, the said connection having an air-port exterior to the reservoir, and a valve for opening and closing the air-port.

11. In a lubricator, the combination with a

reservoir, of a pair of coöperating pumps, a connection between the pumps, a reciprocating yoke to which the plunger of one pump is fixed and coöperating with the plunger of the other pump, and an adjustable arm carried by the yoke for varying or eliminating lost motion between the yoke and the latter plunger.

12. In a lubricator, the combination with a reservoir, of a primary and an auxiliary pump located therein, a connection leading from the discharge of the primary pump to the inlet of the auxiliary pump, a yoke to which the plunger of the auxiliary pump is fixed, the plunger of the primary pump having a slot, an extension on the yoke entering the slot, an arm carried by the yoke and also entering the slot, a stem for adjusting the arm to vary the stroke of the primary pump, and means for reciprocating the yoke.

13. In a lubricator, the combination with a reservoir, of a primary pump, an auxiliary pump of greater capacity than the primary pump, a connection between the pumps and having an air-port, a yoke to which the plunger of the auxiliary pump is fixed, the plunger of the primary pump having an elongated slot, an extension on the yoke entering the slot, a screw-threaded stem rotatably mounted on the yoke, an arm engaging the threaded stem and extending into the slot, and an eccentric for reciprocating the yoke.

14. In a lubricator, the combination with a reservoir, a cover therefor having an aperture, a pump in the reservoir, a stem for adjusting the throw of the pump, and a button rotatably mounted on the cover and closing the aperture and having a socket engaging the stem.

15. In a lubricator, the combination with a reservoir, a cover therefor having an aperture, a pump in the reservoir and whose plunger is provided with an elongated slot, a yoke having an extension entering the slot, an eccentric for reciprocating the yoke, a vertical screw-threaded stem rotatably mounted on the yoke, an arm in threaded engagement with the stem and entering the said slot, and a button rotatably mounted in and closing the aperture and having a socket engaging the stem.

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

EDWARD DENEGRE.

Witnesses:
ARTHUR B. SEIBOLD,
ELIZABETH MOLITOR.