

No. 895,683.

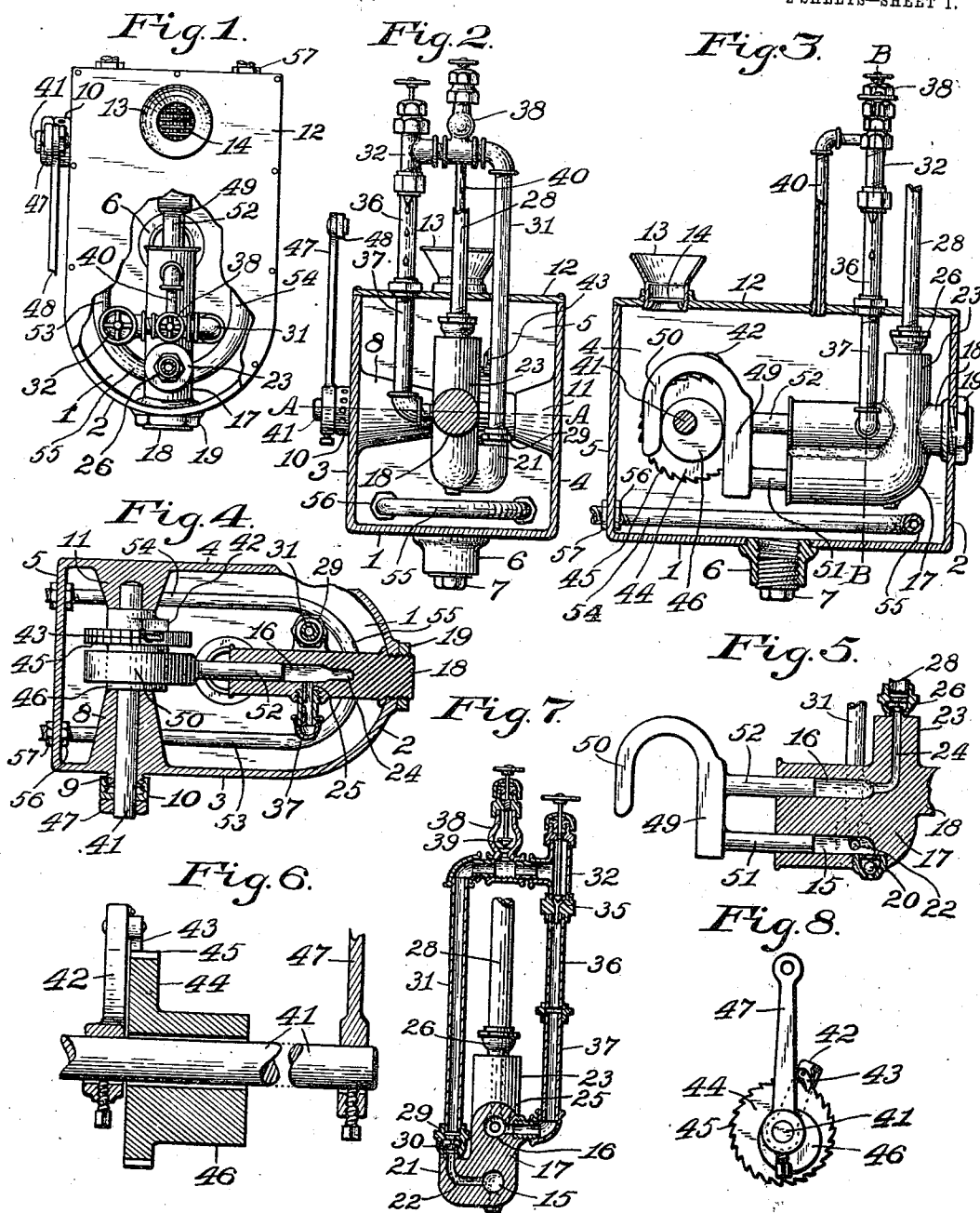
PATENTED AUG. 11, 1908.

J. RICE.

FORCE FEED LUBRICATING PUMP.

APPLICATION FILED SEPT. 19, 1907.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2

Fig. 9.

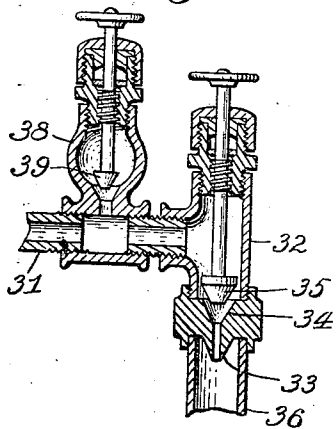


Fig. 10.

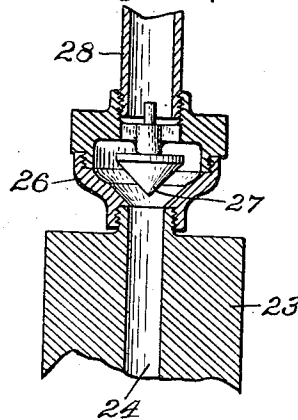


Fig. 11.

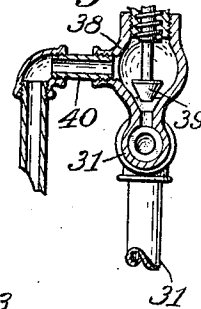


Fig. 12.

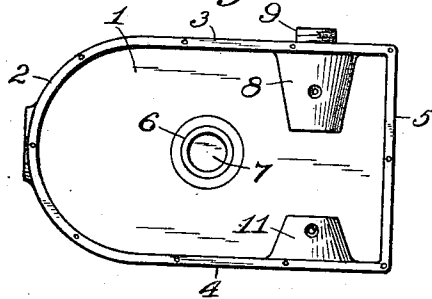


Fig. 13.

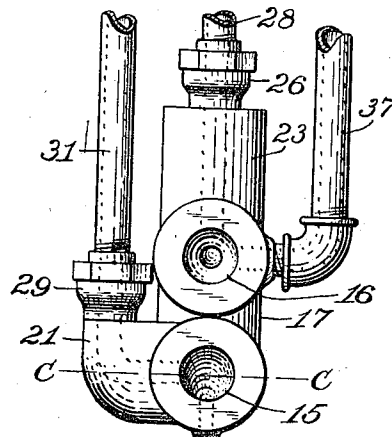


Fig. 14.

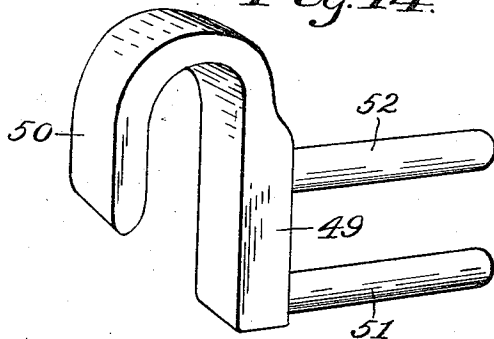
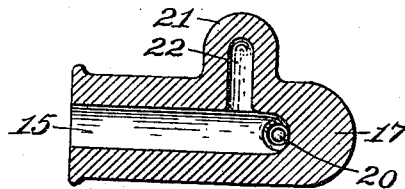


Fig. 15.



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JOHN RICE, OF SALINEVILLE, OHIO

FORCE-FEED LUBRICATING-PUMP.

No. 895,683.

Specification of Letters Patent.

Patented Aug. 11, 1908.

Application filed September 19, 1907. Serial No. 393,635.

To all whom it may concern:

Be it known that I, JOHN RICE, a citizen of the United States, residing at Salineville, in the county of Columbiana and State of Ohio, have invented certain new and useful Improvements in Force-Feed Lubricating-Pumps; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to sight-feed lubricators of the mechanical type that are designed for forcing lubricating oil into valve chests for lubricating the steam valves and the pistons which operate in the cylinders of steam engines, or for forcing lubricating oil to journal bearings of machinery, the invention having reference particularly to an improved sight-feed lubricating pump and oil reservoir combined, and mechanism for operating the pump adapted to be connected to parts of machinery for convenient operation of the pump.

Objects of the invention are to provide a relatively simple and inexpensive force feed pump for lubricating purposes which may be depended upon to operate reliably and economically and with the minimum amount of attention, a further object being to provide a lubricating pump which will be adapted to be used in various situations and in winter seasons equally as well as in summer seasons.

The invention consists in a force-feed lubricating pump comprising a reservoir and frame combined, pump barrels mounted in the reservoir, a drive shaft mounted in the reservoir, pump plungers mounted in the barrels and operatively connected with the drive shaft, and a conduit from one of the barrels to the other barrel, and having a branch conduit leading to the reservoir, one of the barrels having a discharge pipe connected therewith, the reservoir being provided with a heating coil.

The invention also consists in certain novel features and in the parts and combinations and arrangements of parts as hereinafter particularly described and defined in the appended claims.

Referring to the drawings Figure 1 is a top plan of the improved lubricating pump in which a portion of the cover of the reservoir is broken away; Fig. 2, a sectional end ele-

vation, the nearer end of the reservoir being broken away; Fig. 3, a longitudinal vertical sectional view; Fig. 4, a horizontal sectional view approximately on the line A A in Fig. 2; Fig. 5, a fragmentary vertical sectional view through the pump barrels; Fig. 6, a fragmentary sectional view showing the drive shaft and devices for operating the pump plungers; Fig. 7, a vertical sectional view of parts of the apparatus on the line B B in Fig. 3; Fig. 8, an end view of the drive shaft and side elevations of the devices connected therewith for operating the pump plungers; Fig. 9, a fragmentary sectional view showing portions of the circulating conduit and regulating valves thereof; Fig. 10, a fragmentary sectional view showing one of the check valves employed in the apparatus; Fig. 11, a fragmentary vertical sectional view showing one of the regulating valves in the conduit; Fig. 12, a top plan of the reservoir without its cover; Fig. 13, a fragmentary elevation showing the open ends of the pump barrels; Fig. 14, a perspective view of the pump plungers and the yoke whereby they are connected together and operated; and, Fig. 15, a horizontal sectional view on the line C C in Fig. 13.

Similar reference characters in the different figures of the drawings designate like elements or features of construction.

A practical embodiment of the improved lubricating pump includes a reservoir comprising a bottom 1, a semicircular end 2 joined by two straight sides 3 and 4, and an end 5, the bottom being preferably provided with a nipple 6 in which is a plug 7, and the nipple may be conveniently employed if desired for supporting the reservoir in various ways, and may also be used for draining the reservoir if required. The side 3 has a journal box 8 on the inner side thereof which is provided on the exterior of the reservoir with a packing box 9 on which is a packing nut 10, the opposite side 4 having a journal box 11 on the inner side thereof opposite to the journal box 8, both journal boxes being arranged near the end 5 and somewhat above the bottom 1 of the reservoir, the latter being provided with a cover 12 which preferably is provided with a filling funnel 13 in which is a screen 14. In the opposite end of the reservoir a primary pump barrel 15 and a delivery pump barrel 16 are mounted and preferably comprise parts of a casting 17 that

has a stem 18 extending through the end 2 of the reservoir and secured by means of a nut 19, so that the casting is anchored in the reservoir.

5 The barrel 15 is provided at its inner end with an inlet valve 20 which may be a ball valve type or any other suitable type so as to admit oil from the reservoir into the barrel and prevent return of the oil. The casting 10 17 is provided with a lateral projection 21 in which is a port 22 extending therethrough from the barrel 15. The upper portion of the casting 17 has a neck 23 in which is an outlet port 24 extending from the barrel 16, there 15 being an inlet port 25 communicating with the inner end portion of the barrel 16. One pump barrel, as will be seen, is arranged above the other one, but if desired they may be arranged otherwise. A check valve body 26 20 connected to the neck 23 and has a check valve 27 therein, there being a discharge pipe 28 connected to the valve body 26, and the pipe may lead to any desired place at which oil is to be fed. A check valve body 25 29 is connected to the projection 21 and has a check valve 30 therein, a pipe or conduit 31 being connected to the valve body 29 and extending up through the cover 12 and provided with a regulating valve body 32 having a drop nozzle 33 and a valve seat 34 on 30 which the regulating valve 35 operates, a sight feed glass 36 being connected with the valve body, and a pipe 37 extends from the sight feed glass to the inlet port 25.

35 Another regulating valve body 38 is connected with the pipe 31 and has a regulating valve 39 therein, the body 38 being connected by a pipe 40 which extends therefrom through the cover 12 of the reservoir, so 40 that oil that may be delivered by the pump in excess of the demands may flow over and return to the reservoir. It should be understood however, that if desired the valve 39 may be dispensed with, or it may be 45 kept open at all times and the regulation of the feed be accomplished by means of the valve 35, but both valves may be employed, and the valve 35 will be useful as a stop valve if renewal of the sight feed glass 36 becomes necessary during operation of the 50 pump.

A rotative drive shaft 41 is mounted in the journal boxes 8 and 11 and extends through the journal box 8 and packing nut 10, and 55 has an arm 42 secured to it adjacently to the journal box 11, the arm having a pawl 43 mounted thereon. A wheel 44 is mounted rotatively on the shaft 41 and has undercut or ratchet teeth 45 to be engaged by the pawl 43 for turning the wheel. An eccentric 46 is 60 mounted rotatively on the shaft 41 and is driven by the wheel 44, and preferably is formed as an integral part thereof. An arm 47 is secured to the outer end of the shaft 41 65 and has a rod 48 pivoted thereto, and the rod

may be connected to the eccentric rod of an engine or it may be actuated in any other suitable manner.

A yoke comprises a main bar 49 to be engaged by one side of the eccentric 46 and a 70 crook 50 extending over and down against the opposite side of the eccentric, the bar 49 connecting a plunger 51 which operates in the barrel 15 and a plunger 52 which operates in 75 the barrel 16, the plungers being fitted closely in the barrels and preferably ground therein, so as to make tight joints without requiring packing boxes, and the plungers working in the barrels guide the yoke while it is operated by the eccentric. 80

A heating coil comprises two branches 53 and 54 joined by a semicircular part 55, the 85 latter extending under the casting 17 near the inlet valve 20, the branches 53 and 54 extending through the end 5 and secured thereto by nuts 56 and 57, and the coil may be suitably connected to a steam boiler from 90 which steam may be supplied for heating the oil in the reservoir.

It should be understood that various kinds 90 of valves may be employed and arranged in any suitable manner for governing the passage of oil from the pump barrel 15 to the pump barrel 16, and the surplus, if any, from the pump barrel 15 through the pipe 40 to 95 the reservoir, the character and arrangement of the valves being dependent upon the conditions of services, as for instance, in some cases it is obvious that the valve 39 may be spring-pressed to its seat so that the plunger 100 52 may force oil through the port 24 under predetermined pressure yet may be forced from its seat by a greater pressure exerted by the plunger 51, so that the excess oil may pass over through the pipe 40 to the reservoir, 105 or obviously a check valve may be employed at any suitable place between the pump barrel 16 and the valve 35 if conditions make it desirable, within the scope of the invention. 110

In practical use, the lubricating oil is to be poured into the reservoir so that the pump machinery will usually be immersed in the oil. Reciprocating motion will be imparted 115 to the connecting rod 48 in any suitable manner, so that rocking motion will be imparted to the arm 47 which in its movement in one direction will carry the pawl 43 idly over the 120 teeth 45 of the wheel 44, permitting the pump plungers to remain at rest, and in the opposite direction of movement of the arm 47 the pawl 43 will engage one of the ratchet teeth and cause the eccentric 46 to rotate a short distance and thereby move both of the pump plungers, which on their outward 125 movement will draw oil into the pump barrels, the barrel 15 receiving oil from the reservoir and the barrel 16 receiving oil from the conduit or pipe 37. On the reverse movement or instroke of the plungers the oil will 130

be forced from the pump barrel 15 through the conduit pipe 31 and thence through the regulating valve body 32 and drop through the sight feed glass 36 and pass thence
 5 through the pipe 37 to the pump barrel 16 to be forced thence through the port 24 and out through the discharge pipe 28. During the instroke of the pump plungers under some conditions while the plunger 52 is moved in, a
 10 portion of the distance, some of the oil would be forced from the pump barrel 16 out of the port 25 if not prevented by the pressure exerted by the pump plunger 51 moving inward at the same time until the plunger 52
 15 closes the port 25, after which the plunger 52 will force the oil that has been compressed in the pump barrel 16 out through the port 24. Other results of operation will be clearly understood from the foregoing description of
 20 the construction of the apparatus.

Having thus described the invention, what is claimed as new is—

1. In a lubricating pump, the combination of a reservoir having two journal-boxes on
 25 the interior of two sides thereof, a drive shaft rotative in the journal-boxes and extending through one of them, a packing box and nut for the shaft at the outer side of the reservoir, an operating arm secured to the shaft
 30 adjacent to the packing box, an arm secured to the shaft adjacent to one of the journal-boxes, a pawl mounted on the arm, a ratchet wheel rotative on the shaft between the other journal-box and the arm and engaged by the
 35 pawl, an eccentric rotative on the shaft and connected to the ratchet wheel, a pump barrel in the reservoir, a plunger in the barrel, and a yoke on the plunger and engaging the eccentric.
2. In a lubricating pump, the combination of a reservoir, a journal-box in the reservoir,
 40 a shaft journaled in the journal-box, an eccentric on the shaft to be moved thereby, a cover on the reservoir, a primary pump barrel and a delivery pump barrel fixedly supported in the reservoir, the primary pump
 45 barrel having an inlet valve, a conduit extending from the primary pump barrel to the delivery pump barrel and having a branch conduit connected thereto that extends
 50 through the cover, a delivery pipe connected with the delivery pump barrel, two plungers, one plunger being in one barrel and the other plunger in the other barrel, and a yoke connected rigidly to the two plungers and engaging
 55 the eccentric.

3. In a lubricating pump, the combination of a reservoir, a journal-box in the reservoir,
 60 a shaft journaled in the journal-box, an eccentric on the shaft to be moved thereby, a cover on the reservoir, a primary pump bar-

rel and a delivery pump barrel fixedly supported in the reservoir, the primary pump barrel having an inlet valve and the delivery pump barrel having an outlet valve, a conduit
 65 extending from the primary pump barrel to the delivery pump barrel, a part of the conduit being a sight-feed glass, a pipe connected to the conduit and extending through the cover, a valve connected with the conduit
 70 between the sight-feed glass and the connection of the pipe with the conduit, a valve for closing the pipe, two plungers, one plunger being in one barrel and the other plunger in the other barrel, and a yoke connected rigidly to the two plungers and engaging
 75 the eccentric.

4. In a lubricating pump, the combination of a reservoir having two journal-boxes on the interior of two sides thereof, a drive shaft
 80 rotative in the journal boxes, an eccentric on the shaft to be rotated thereby, two pump barrels of identical shape and size formed integrally and mounted on the interior of another side of the reservoir, a yoke connected
 85 with the eccentric, two plungers of identical shape and size connected rigidly to the yoke, one plunger extending into one and the other plunger extending into the other one of the two pump barrels, the two plungers fitting
 90 closely in said barrels and supporting and guiding said yoke in connection with said eccentric when the yoke is moved by the eccentric.

5. An improved lubricator comprising a
 95 reservoir having two journal-boxes on the interior of two sides thereof and having also a semicircular end joined to the two sides, the bottom of the reservoir having a threaded opening therein, a cover on the reservoir hav-
 100 ing an opening therein, a screen in the opening of the cover, a drive shaft rotative in the journal-boxes, an eccentric on the shaft to be rotated thereby, two pump barrels formed integrally and attached to said semicircular
 105 end of the reservoir, two plungers, one in each barrel, a yoke connected rigidly to the two plungers and engaging the eccentric, and a pipe coil comprising two branches that are connected to the end opposite the semicircular
 110 end of the reservoir and extend under the journal-boxes near to said bottom and past said opening therein, the branches having a semicircular part connected therewith that extends along said semicircular end adja-
 115 cently to said pump barrels.

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

JOHN RICE.

Witnesses:

WM. V. BLAZER,
 S. E. McCORMICK.