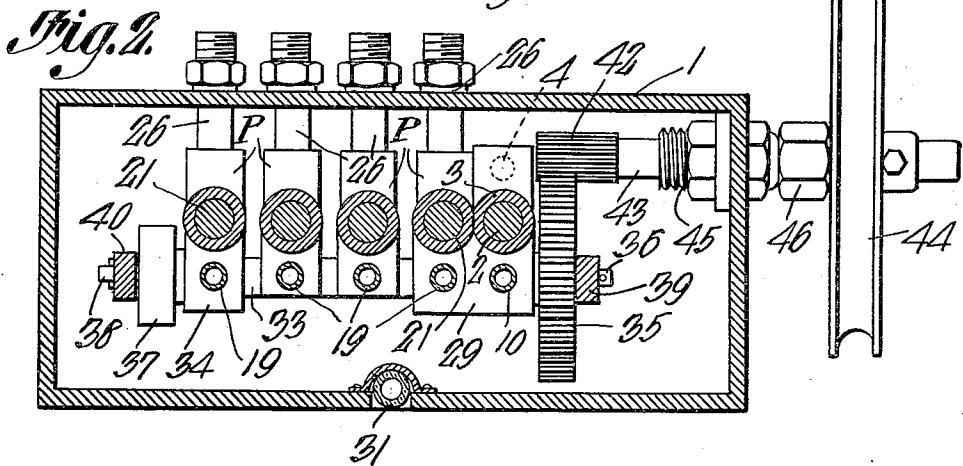


1,063,197.

2 SHEETS—SHEET 1.



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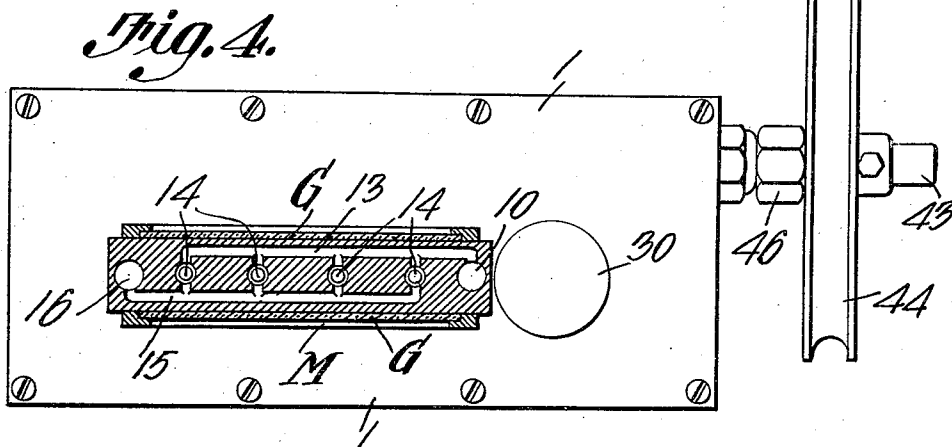
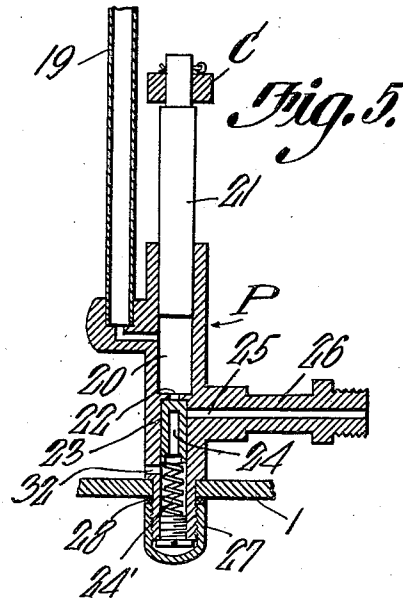
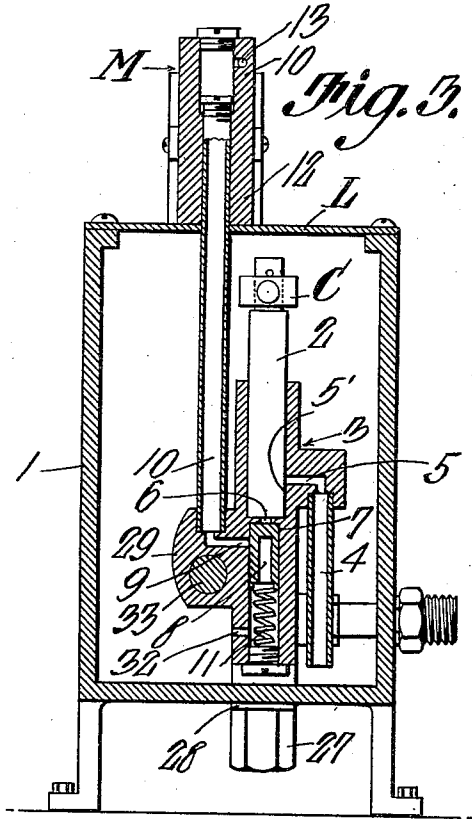
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FORCE FEED LUBRICATOR.
APPLICATION FILED JAN. 8, 1912.

1,063,197.

Patented June 3, 1913.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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FORCE-FEED LUBRICATOR.

1,063,197.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed January 8, 1912. Serial No. 670,012.

To all whom it may concern:

Be it known that I, JOHN G. HALL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Force-Feed Lubricator, of which the following is a specification.

The present invention relates to improvements in force feed lubricators, the primary object of the present invention being the provision of a force feed lubricator in which a continuous circulation of the lubricant from the main tank through a distributing manifold is afforded, there being means to direct feed from the lubricator to the various parts of the engine such as a feed pump, all of said feed pumps and the circulating pump being operated simultaneously from a single shaft.

A still further object of the present invention is the provision of a force feed lubricator in which a plurality of feed pumps are individually mounted so as to be readily removed and replaced or disconnected to be put out of use, while a single circulating pump and distributing manifold is coupled for use to automatically supply the various feed pumps from the main tank or reservoir.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings—Figure 1 is a front elevation of the complete lubricator with various portions of the main tank and manifold shown in sections to demonstrate the arrangement and construction of the various parts. Fig. 2 is a section taken on line 2—2 of Fig. 1. Fig. 3 is a section taken on line 3—3 of Fig. 1. Fig. 4 is a section taken on line 4—4 of Fig. 1. Fig. 5 is a vertical sectional central view through one of the feed pumps, the plunger being in the full up-stroke position.

In taking the case up for detail description, the description as near as possible will follow the operation of the lubricator.

The operating parts are all incased in a

metal tank or reservoir 1. Disposed within this tank is a single circulating pump 3 and a plurality of feed pumps P, while mounted upon the cover L of the reservoir or tank 1 is the distributing manifold M, provided with the sight glass G. When the plunger 2 of the circulating pump 3 is raised, the oil flows from the tank 1 through the suction tube 4 up to and through the passage 5 into the upper chamber 5' of the circulating pump. When the plunger descends, the oil is forced downwardly and through the passage 6 into the lower chamber 7 of the pump. A shut-off plunger 8, which has to this time, closed the opening or passage 9 into the circulating tube 10, is forced downwardly against the spring 11, which yields to such pressure. The oil is thus received into the lower chamber 7 and the passage from that chamber to the circulating tube 10 being gradually opened, the oil flows into the circulating tube 10. This flow is assisted by the rising of the shut off plunger 8 due to its spring 11, when relieved of the downward pressure of the oil and plunger 2. When the shut-off plunger 8 reaches the top of the lower chamber, it has shut off the flow to the circulating tube 10, and as the main plunger 2 at this time is raised, said plunger creates a partial vacuum in the upper chamber 5', and when the plunger passes the inlet port 5, the rarefied air space beneath the plunger is filled with oil and further upward movement of the plunger draws in the oil. The manifold M serves a purpose of continually receiving and distributing the oil to the various separate feed pumps P, and also takes care of any surplus which is finally fed back into the reservoir or tank 1. The circulating tube 10 is continued through one leg 12 of the manifold M up to near its top as clearly indicated in Figs. 1 and 3. At the upper end, the oil is delivered into the circulating passage 13 of the manifold, said passage being disposed lengthwise of the manifold and leading into the several feed passages 14, any surplus flowing through overflow passages 15 to the downward return passage 16 which connects the opposite end of the manifold with the tank 1. By means of the regulating screws and valves 17, the control of the flow of oil through the feed passages 14 is possible, and as the same are disposed exteriorly of the manifold M, the same may be readily

regulated so as to control the flow of the oil through the drip tubes 18 which are readily discernible through the glass G in the front of the manifold M. The force feed pumps P are so disposed that the respective manifold drip tubes 18 direct the oil into the receiving tubes 19 at the upper ends thereof, so that the oil is permitted to flow into the upper chamber 20 of the respective force feed pumps P, when the plunger 21 is raised. When the plunger 21 descends the oil is forced through the passage 22 into the lower chamber 23, the lower or shut-off plunger 24 at this time is crowded or moved downwardly against the tension of a spring 24', so that the oil is permitted to flow into the passage 25 of the discharge or feed tube 26 to lubricate any desired part of the engine or other machinery.

The force feed pumps are rendered stable by means of the holding or locking nut 27, and the universal cross head C, the discharge feed tube 26 also assisting in retaining the respective force feed pumps and also the circulating pump in the proper relative position within the reservoir or tank 1. It is also noted that one of the force feed pumps is provided with its individual holding nut 27, a washer 28 being inserted between all of the nuts and the bottom of the tank to prevent any leakage at such points. By this means of fitting or supporting of the respective pumps, any individual one can be removed by disconnecting the cross head 35 therefrom and removing the holding nut 27. A hole in the bottom of the tank may then be sealed by any means.

As before stated the circulating pump 3 as shown is combined with one feed pump P, the same being formed in one casting such as 29, which also constitutes a bearing for the shaft 33.

A removable filtering screen 30 is mounted in the lid of the tank or reservoir and provides a means for straining the oil as the same is poured within the tank or reservoir.

In order to ascertain the level of the oil within the tank or reservoir 1, a gage glass 31 is mounted as indicated in Fig. 2 in the forward portion of the front wall of the tank.

In each of the respective force and circulating pumps, a vent aperture 32 is provided near the lower portion thereof to permit ingress and egress of the oil below the plunger.

In order to properly operate all of the respective pumps, a main shaft 33 is supported in the bearings 29 and 34 within the tank or reservoir 1, a gear 35 mounted upon one end of said shaft being provided with an eccentric pin 36, while an eccentric 37 is mounted upon the other end of the shaft and is provided with an eccentric pin 38. The two eccentric rods 39 and 40 respectively, have their upper ends connected to the respective

ends of the universal cross head C, and to the respective pins 36 and 38, so that the rotation of the shaft 33 will cause the cross head C to be moved upwardly and downwardly and simultaneously actuate all of the respective plungers of the circulating and force feed pumps. By this means an exceedingly regular stroke is imparted to the pistons so as to produce the desired pulsating feed of the lubricant through the directing tubes 18 and into the respective force feed pumps from whence the oil is led through the conduits 26 to the various parts of the machine which are to be lubricated.

In order to operate the shaft 33 the driving pinion 42 meshes with the gear 35 and is carried by the drive shaft 43 which extends through one wall of the tank 1 and carries exteriorly thereof a pulley 44, or in fact any other means by which said shaft may be rotated. This driving shaft 43 is supported in a collar 45, and mounted thereon to prevent any leakage of the oil from the tank and around said shaft, is a stuffing box 46.

It will be noted that both of the members 29 and 34 constitute journaling lugs or supports for the shaft 33, and by such construction, the shaft 33 is properly supported and is lengthened or shortened according to the number of pumps in the unit.

What is claimed is:—

1. A force feed lubricator, having a main reservoir and a distributing reservoir disposed thereabove and in communication therewith through a supply and an overflow channel, a casting carrying a supply pump and a distributing pump connected to the bottom of and disposed within the main reservoir, a plurality of separable distributing pumps detachably connected to the bottom of and disposed within the main reservoir, the distributing pump at the opposite end to the supply pump and also the supply pump being each provided with a journaling lug, a shaft journaled in said lugs, means for rotating said shaft, a bar detachably connected to the plungers of all pumps, and means for operably connecting said shaft to the bar, whereby the rotation of the shaft reciprocates the bar.

2. A force feed lubricator, having a main reservoir and a distributing reservoir disposed thereabove and in communication therewith through a supply and an overflow channel, a casting carrying a supply pump and a distributing pump connected to the bottom of and disposed within the main reservoir, a plurality of separable distributing pumps detachably connected to the bottom of and disposed within the main reservoir, the distributing pump at the opposite end to the supply pump and also the supply pump being each provided with a journaling lug, a shaft journaled in said lugs, means for ro-

tating said shaft, a bar detachably connected to the plungers of all pumps, and two rods, one connected to each end of the bar and to the respective ends of the shaft, whereby the rotation of the shaft imparts a reciprocation to the plungers through the rods and bar.

In testimony that I claim the foregoing as

my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN G. HALL.

Witnesses:

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ALBERT C. LEMBKE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
