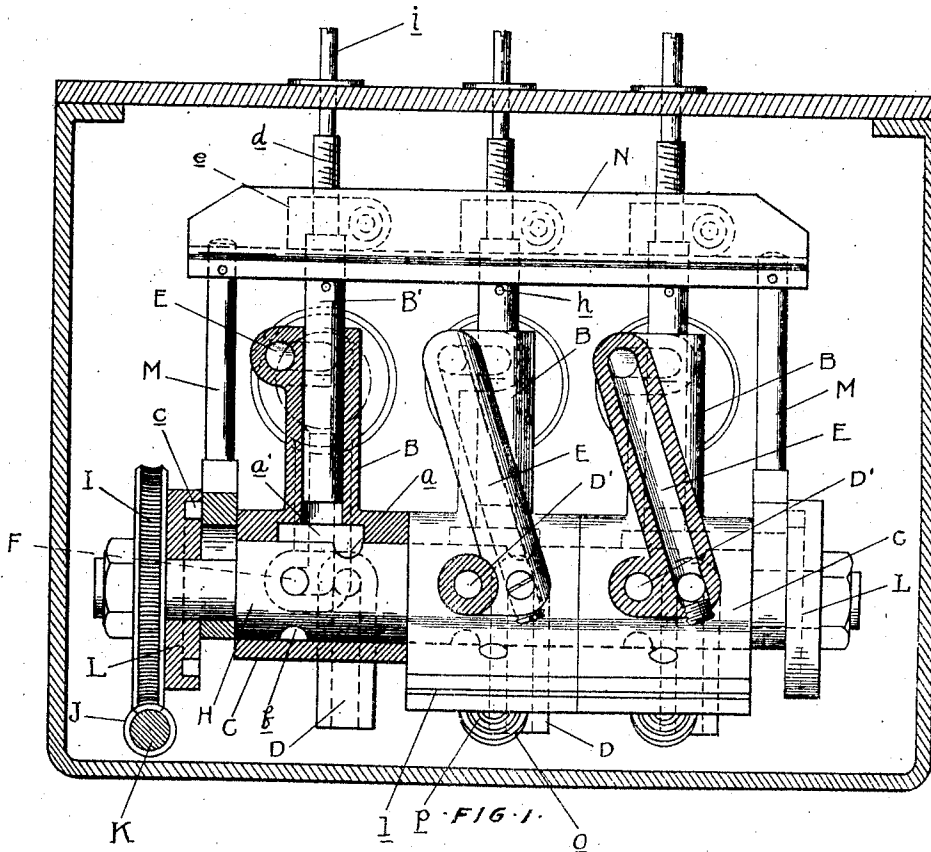


No. 841,250.

PATENTED JAN. 15, 1907.

F. W. HODGES.
FORCE FEED LUBRICATOR.
APPLICATION FILED JAN. 19, 1906.

2 SHEETS--SHEET 1.



WITNESSES
Amelia Williams
Geo. A. Green

INVENTOR
FREDERICK W. HODGES.

BY *Whittemore Hubert & Whittemore*

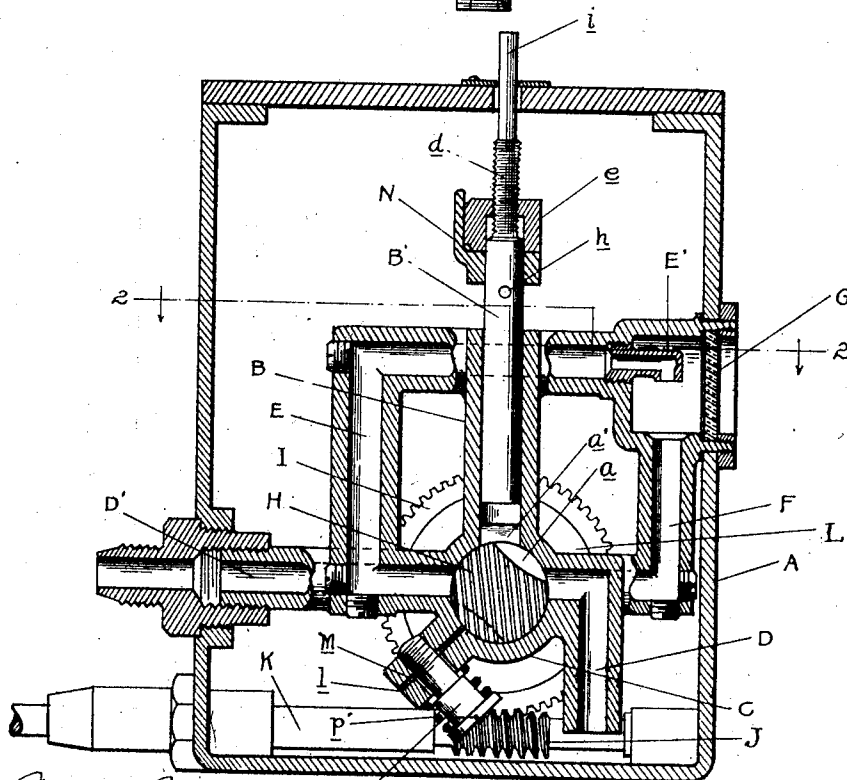
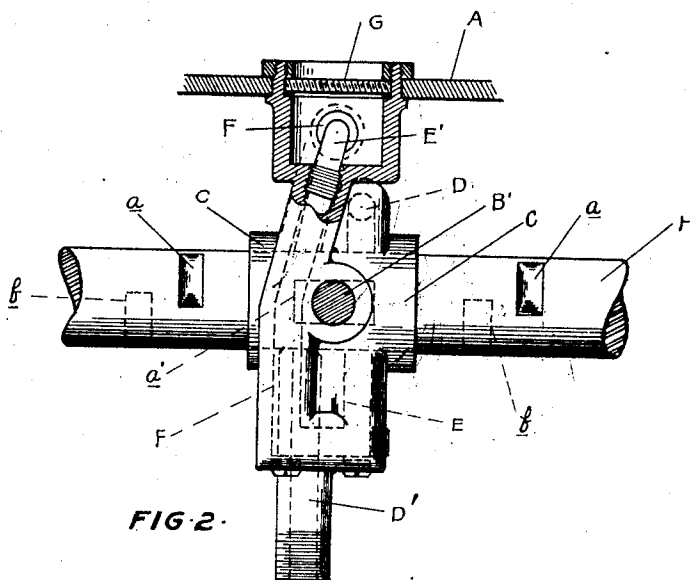
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UNITED STATES PATENT OFFICE.

FREDERICK W. HODGES, OF DETROIT, MICHIGAN.

FORCE-FEED LUBRICATOR.

No. 841,250.

Specification of Letters Patent.

Patented Jan. 15, 1907.

Application filed January 19, 1906. Serial No. 286,848.

To all whom it may concern:

Be it known that I, FREDERICK W. HODGES, residing at Detroit, in the county of Wayne and State of Michigan, a citizen of the United States, have invented certain new and useful Improvements in Force-Feed Lubricators, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to an improved force-feed lubricator; and it consists in the construction of such a device in which the oil is taken from a reservoir to a pump, discharged by the pump through a sight-feed conduit, and then taken by the same pump from the sight-feed conduit and delivered out through the discharge-passage to the point to be lubricated.

The invention particularly consists in a series of such pumps and in the construction of the device whereby it is adapted for such series arrangement, and, further, in the construction of such series of pumps with a common separately-ported valve-shaft for all the pumps, and, further, in the construction, arrangement, and combination of the various parts, as more fully hereinafter described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a section through the reservoir, showing three pumps in elevation and partly in section, and also with parts broken away to more clearly illustrate the construction of the different parts. Fig. 2 is a top plan view of one of the pumps detached and the valve-shaft. Fig. 3 is a vertical central section transverse to Fig. 1 through one of the pumps and the reservoir.

A is a reservoir, and in this case I have shown the pumps arranged therein, each pump consisting of a cylinder B, the piston B', the valve-casing C below the pump preferably formed integral therewith and having the inlet-conduit D and discharge-conduit D'. Opposite the inlet-conduit is the conduit E, which extends first laterally, then upwardly, then forwardly to the nozzle E', and then downwardly, and returns to the valve-casing in the section F thereof; Fig. 3. Opposite the nozzle E' is a sight-feed glass G, through which the amount of oil passing through this sight-feed passage can be observed. It will be noticed that this sight-feed conduit extends from the valve-casing at the face of the cylinder and returns thereto, the return connection being in line with the discharge-con-

duit D', while the connection E thereof is opposite the inlet-conduit D.

In the valve-casing is the rotary shaft H, which is a valve-shaft, and which is common to the series of pumps. For each pump this valve-shaft has two ports *a* and *b*. The port *a* is adapted to first connect the inlet-conduit D with the pump, and then to connect the pump with the discharge-passage E' to the sight-feed conduit, while the port *b* is adapted to first connect the section F of the sight-feed conduit with the pump and then connect the pump with the discharge-conduit D'.

The shaft H at one end is provided with the worm-wheel I, which meshes with the worm J on the driven shaft K, which is driven from any suitable source of power. A series of these pumps are arranged side by side, as shown in Fig. 1, and, as described, have a common valve-shaft for all the pumps.

At the end of the shaft H are the cams L, having the pins or roller-wrists *c* and the connecting-rod M engaging the camways of the cams, and connected to and operating the cross-head N. Passing through the cross-head are the pistons B', and each piston is provided with the screw-threaded portion *d* engaging a nut *e*. Below the cross-heads are the pins or shoulders *h*. The stroke of the piston may be adjusted by turning the piston and adjusting the distance between the nut *e* and the shoulder or pin *h*. This is effected by rotating the extension *i* of the piston, which, as shown, projects through the top of the reservoir, so that this adjustment may be effected from the outside.

The valve-casing preferably has the slit *l*, provided with suitable packing *m*, and the clamping-bolt *o* with the spring *p* for effecting a resilient clamping of the valve-casing against the rotary valve-shaft in order to at all times maintain a tight joint.

At the base of each cylinder, in case the cylinder itself is not large enough to span the two ports *a* *b*, I make the lateral enlargement *a'*, so that there will be sufficient width of opening to thus span these two ports and bring the respective conduits into communication with the cylinder of each pump.

The parts being thus constructed their operation is as follows: The shaft K being rotated it will impart rotation to the valve-shaft H, and it, through the cam L, will reciprocate the cross-head N, and according to the adjustment of the nuts *e* will give the desired reciprocation to the pistons B', accord-

ing to the amount of oil desired for each pump. Each pump will first draw the oil from the reservoir through the conduit D and the port *a* and then discharge through the ports *a* and E into the sight-feed conduit. The amount of oil being discharged by the pump can be observed through the sight-feed glass G. The pump in its next reciprocation draws the oil from the sight-feed conduit F and the port *b* and then discharges it through the port *b* into the discharge-passage D'.

This construction is capable of expansion, so as to use a large number of pumps side by side. Each pump is, in effect, a unit and is easily and cheaply manufactured. The use of the rotary valve-shaft avoids the use of check-valves, which are undesirable in handling oil, and if the pump is placed inside of a reservoir all the parts are lubricated perfectly. At the same time each pump may be speedily adjusted for delivering varying quantities to suit the requirements of the points to be lubricated.

What I claim is—

1. In a force-feed lubricator, the combination of a reservoir, a pump having inlet and discharge passages, a sight-feed conduit leading from the pump and returning thereto, and a rotary valve for said pump having separate ports adapted to successively connect the pump with the inlet, sight-feed inlet, sight-feed outlet and discharge passages.

2. In a force-feed lubricator, the combination of a reservoir, a pump having inlet and outlet conduits, and a sight-feed conduit leading from the pump and returning thereto, a rotary valve having separate ports adapted to alternately connect with the cylinder of the pump, and means for rotating the valve and actuating the pump to force the oil through the sight-feed conduit and take it therefrom and deliver it through the discharge.

3. In a force-feed lubricator, the combination of a series of pump-pistons, and cylinders, a rotary shaft at the end of the cylinders having pairs of ports adapted to connect with each cylinder, inlet and outlet ports, and a sight-feed conduit leading from and returning to the valve, for each pump, the parts operating for the purpose described.

4. In a force-feed lubricator, the combination of a series of adjacent pistons and cylinders, a valve-casing at the base of each cylinder, a rotary valve-shaft for all the pumps having ports for each pump, inlet and discharge ports in the valve-casing for each pump, a sight-feed conduit leading from and returning to each pump, and means for rotating the valve-shaft and operating the pis-

tons, the parts operating for the purpose described.

5. In a force-feed lubricator, a reservoir, a series of pumps, a sight-feed conduit leading from each pump and returning thereto, an inlet and a discharge passage for each pump, and a common valve-shaft, separately ported for the inlet and discharge and for the sight-feed conduit of each pump, the parts being combined to operate as described.

6. In a force-feed lubricator, the combination of a reservoir, a series of cylinders and pistons, a sight-feed conduit leading from and returning thereto, an inlet and a discharge passage for each pump, a common valve-shaft separately ported for the inlet and discharge and for the sight-feed conduit of each pump, and means for adjusting the throw of each piston, the parts being combined to operate as described.

7. In a force-feed lubricator, the combination of a valve-casing having connected on opposite sides at one point the inlet-conduit and one end of a sight-feed passage which leads therefrom and returns thereto, and at another point the other end of the sight-feed conduit and the discharge-conduit, and a rotary valve having separate ports adapted to cooperate with these passages, and means for reciprocating the piston.

8. In a force-feed pump, the combination of a piston, a cylinder having the enlargement *a'* at the base, a valve-casing at the base of the cylinder, the rotary valve in the casing, having the separate ports *a b*, the inlet and discharge conduits, and the sight-feed conduit leading from and returning to the valve-casing at the ports, the parts being combined and operating substantially as described.

9. In a force-feed lubricator, a pump, two inlets for the pump and two discharge-conduits, one of said discharge-conduits comprising a sight-feed feature, and the other leading to the part to be lubricated, and a rotary valve having separate ports adapted to successively connect the pump with the inlet and discharge of the sight-feed conduit and the inlet and discharge of the lubricating-conduit.

10. In a force-feed lubricator, the combination of a series of pump-pistons and cylinders, a rotary shaft at the end of the cylinders having pairs of ports adapted to connect with each cylinder, and separate inlet and outlet connections for both of said ports for each cylinder.

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

FREDERICK W. HODGES.

Witnesses:

AMELIA WILLIAMS,
JAMES P. BARRY.