C. B. & F. W. HODGES.

FORCE FEED LUBRICATOR.

APPLICATION FILED APR. 20, 1905.

922,141.

Patented May 18, 1909.

2 SHEETS—SHEET 1.

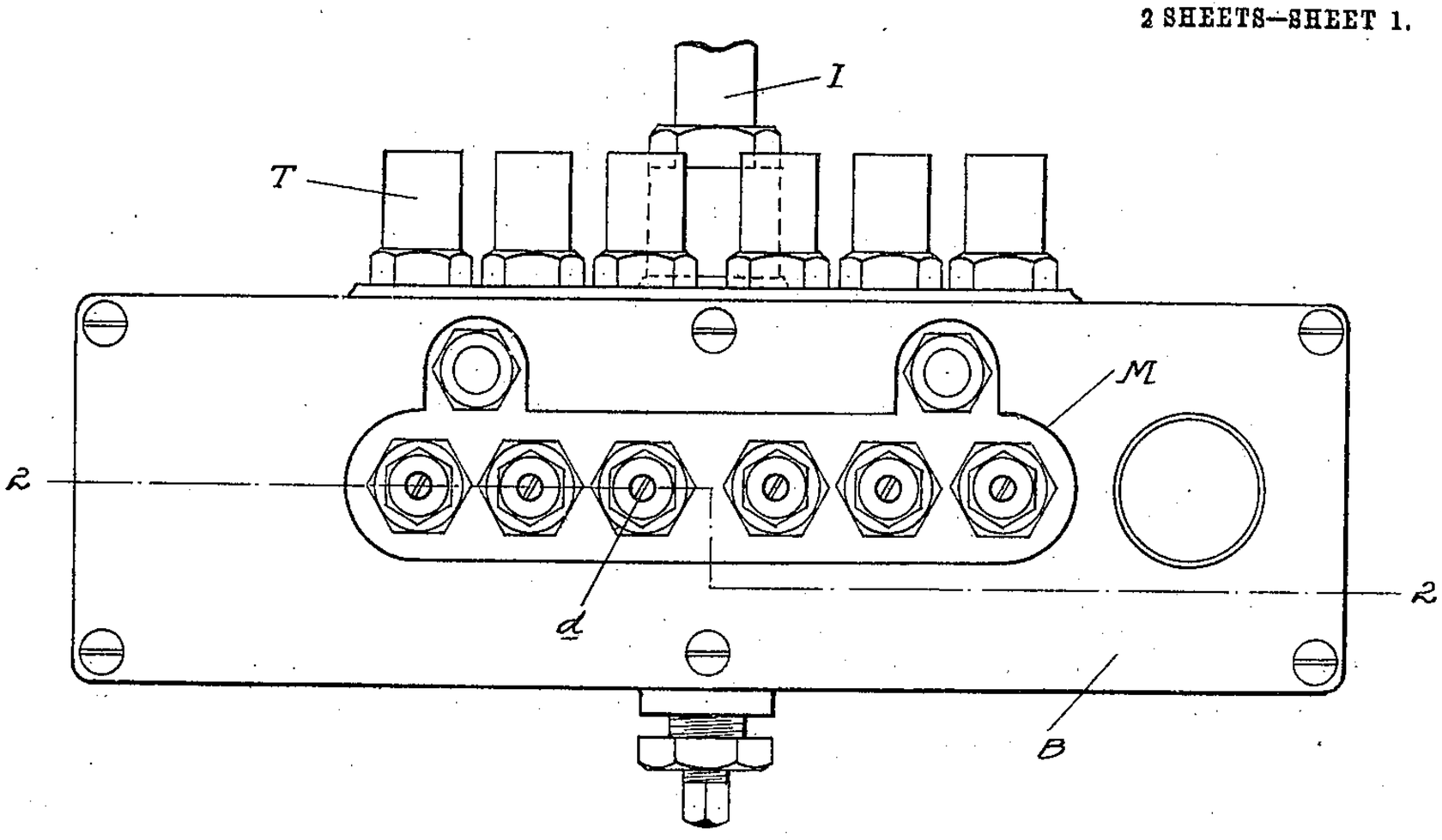

FIG. 1.

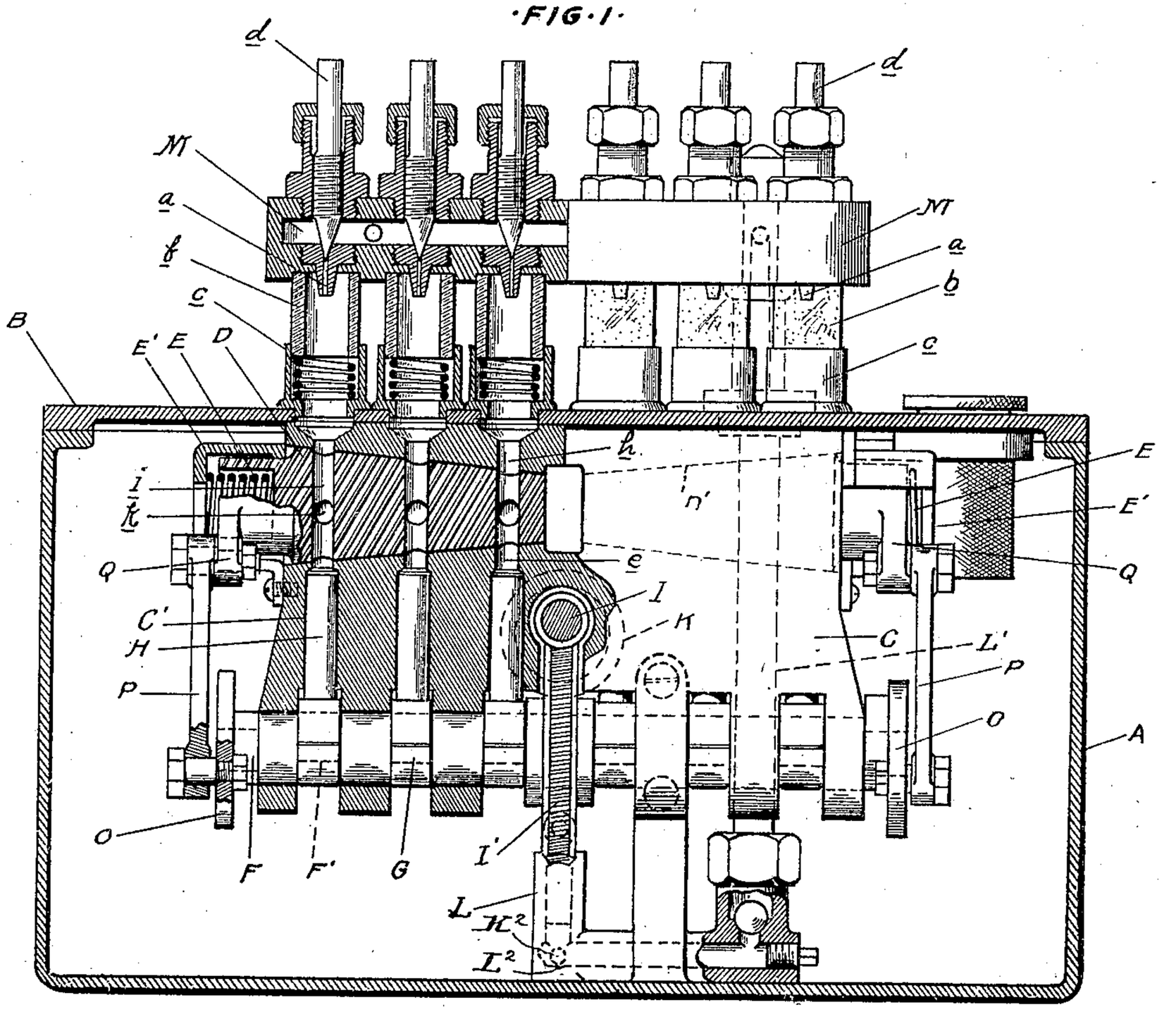

FIG. 2.

WITNESSES

Geo. H. Graves

Edward D. Adams

INVENTORS:
CLARENCE B. HODGES.
FREDERICH W. HODGES.

BY James Whittemore

ATT'Y.

C. B. & F. W. HODGES.

FORCE FEED LUBRICATOR.

APPLICATION FILED APR. 20, 1905.

922,141.

Patented May 18, 1909.

2 SHEETS—SHEET 2.

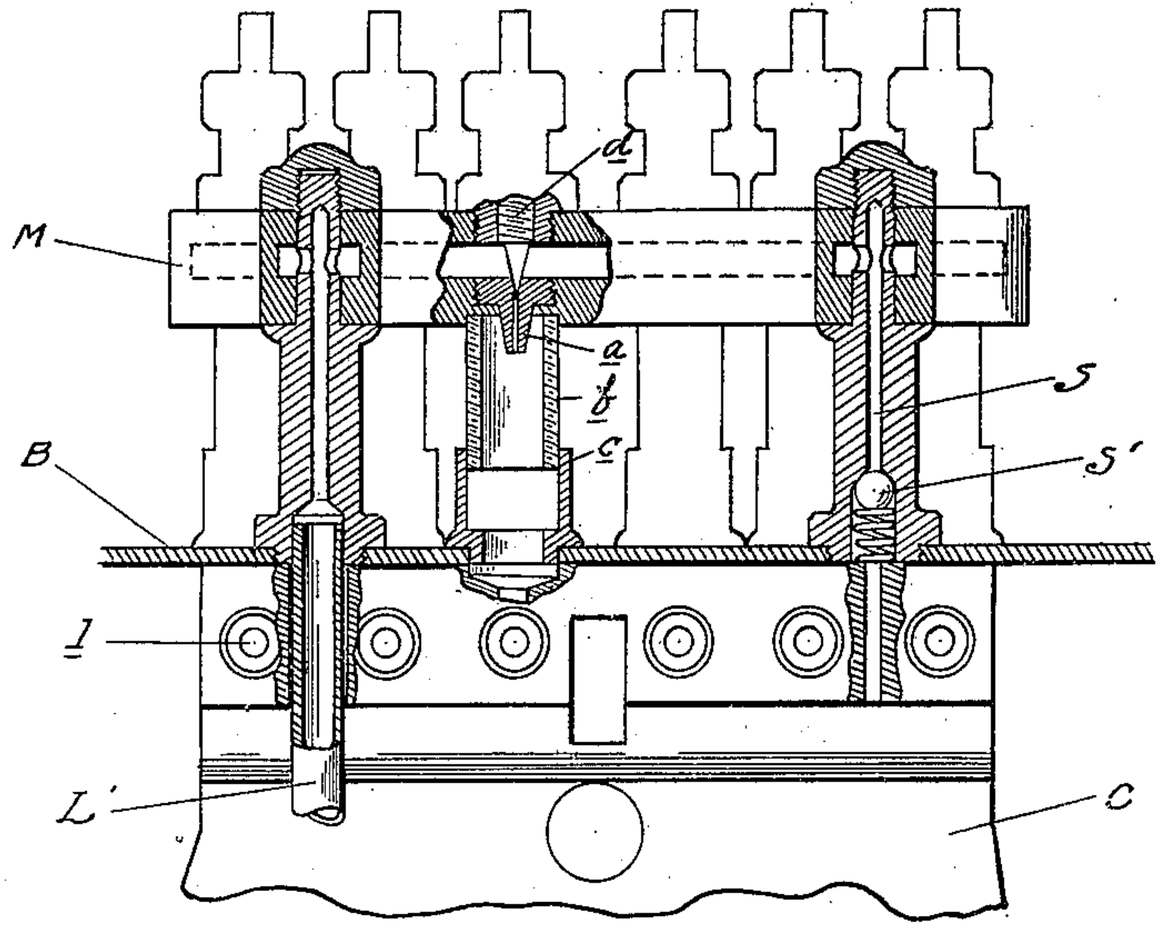

FIG. 3.

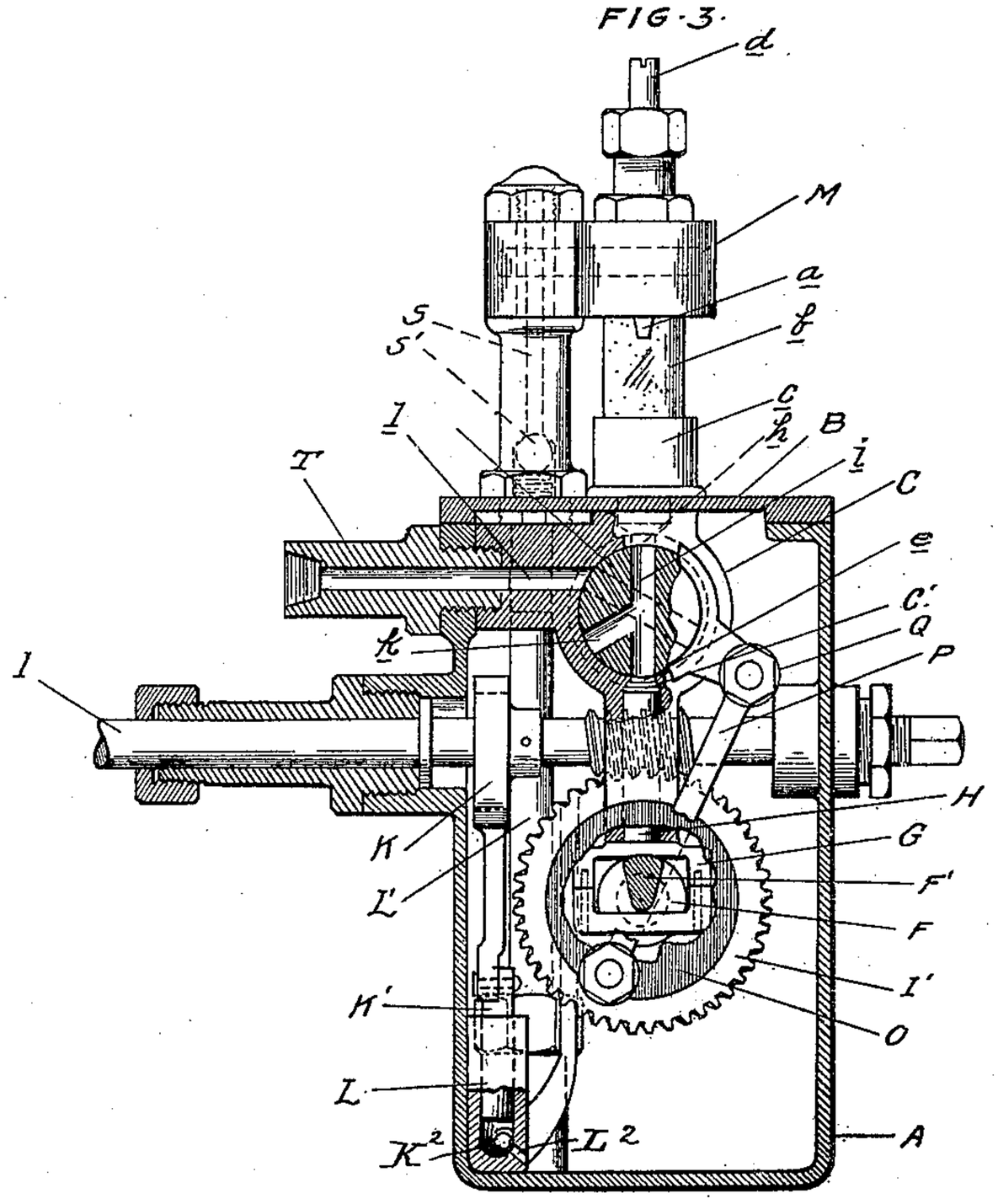

FIG. 4.

WITNESSES

Geo. H. Graves

Edward D. Ault

INVENTORS:

CLARENCE B. HODGES.

FREDERICH W. HODGES.

BY James Whittemore

ATT'Y.

UNITED STATES PATENT OFFICE.

CLARENCE B. HODGES AND FREDERICK W. HODGES, OF DETROIT, MICHIGAN.

FORCE-FEED LUBRICATOR.

No. 922,141. Specification of Letters Patent. Patented May 18, 1909.

Application filed April 20, 1905. Serial No. 256,633.

To all whom it may concern:

Be it known that we, CLARENCE B. HODGES and FREDERICK W. HODGES, citizens of the United States, residing at Detroit, in the county of Wayne and State of Michigan, 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 new and useful improvements in force feed lubricators, and the invention consists in the construction of a pump having suction and discharge conduits and a rocking valve having passages adapted to connect the pump alternately with the suction and discharge conduits, and in the construction of such a device embodying a multiple of such pumps with a common valve for 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 top plan view of my improved force feed lubricator; Fig. 2 is a vertical longitudinal section thereof on line 2—2 of Fig. 1; Fig. 3 is a sectional elevation of the header, the reservoir top and the sight-feed features showing the inlet and over-flow connection of the header; Fig. 4 is a vertical section through the reservoir, showing the valve and part of one cylinder in section, and illustrating a drive mechanism for the rocking valve and the pump.

A represents the reservoir; in this case, I have shown my pumping apparatus as arranged therein.

B is the top plate of the reservoir which carries the pumping apparatus and which when removed will likewise carry the sight feed and the feed and the delivery pumps.

Secured to the top plate in any suitable manner is a block C, in the lower part of which is formed a series of cylinders C′ and in the upper part of which I have shown the two conical valves D and D′ entering tapering apertures at opposite ends. Thus, the block forms in its lower portion what may be called the cylinder block and in the upper portion a valve casing.

The valves are held tightly in their tapering bearings by the springs E which bear at one end against the outer end of the valves and at the other end against the bracket E′.

Journaled in suitable bearings at the lower end of the block is the cam shaft F having suitable cams F′ engaging in yokes G, to each of which is secured a piston H. The block is transversely apertured, and in this aperture is journaled the drive shaft I having thereon a suitable worm engaging the worm wheel I′ secured centrally to the cam shaft. The shaft I is driven from any suitable source of power, not shown.

On the drive shaft I is an eccentric inclosed by the eccentric ring K (Fig. 4) which eccentric ring in the rotation of the shaft, reciprocates the piston K′ in the cylinder L. This pump is adapted to take the oil from the reservoir through the lateral port L^2 controlled by a ball valve K^2 and discharge it through the pipe L′ into the header M secured above the top plate B. From this header are a series of delivery nozzles *a*, which deliver oil through the chambers within the sight-feed glasses *b* secured within the sleeves *c* on the top plate. These delivery nozzles are controlled by suitable valves *d*, thus forming a valve controlled sight-feed for each pump and all being supplied from the common pump K′, L.

The valve casing or that part of the block C around the rocking valve is provided with the passages *e* on one side of the valve and the passages *h* opposite thereto and connecting with the sight-feed passages. The valve is provided with a passage *i* extending transversely therethrough and adapted to connect the passages *e* and *h* with the cylinder through the valve. Each valve is also provided with a branch passage *k* as shown in Fig. 4. The valve casing is provided with the discharge passages *l* extending out through the side of the reservoir as shown in Fig. 4. At each end of the shaft F is a crank wheel O having a crank pin to which is connected the connecting rods P, each connected in turn to a crank arm Q on each valve.

The parts being thus constructed their operation is as follows:—The reservoir being filled with oil and motion being imparted to the shaft I, the worm wheel I′ will be rotated and with it the cam shaft F. The eccentric sleeve K will likewise actuate the piston K′ and pump oil from the bottom of the reservoir into the header M from whence it will flow through each of the nozzles *a* and through the sight-feed passages into the passages *h* above the valve. The valve will be rocked through the connections described from the position shown in full lines in Fig. 4

to the position shown in dotted lines in that figure. In Fig. 1 the passage *i* through the valve is shown as connecting the passages *h* and *e*, and the pump at that time will be descending so that the oil delivered through the sight-feed nozzles will be drawn into the cylinder, the valves D, D′ being rocked until the passages therein are in the position shown in dotted lines in Fig. 4, when the branch passages *k* will register with the passages *e* and thence with the cylinders, while the passages *i* at their upper end will connect with the discharge passages *l*, and as the pistons rise the oil will be delivered out through the discharge passages.

It is obvious that each pump may have its supply of oil regulated to any desired degree or may be shut off by the valves *d*.

I provide a suitable over-flow passage S controlled by a spring-pressed check valve S′, so that in case more oil is pumped by the piston K′, it will flow back from the header M into the reservoir.

It is obvious that as all the parts are supported from the top plate B, they may be removed by the removal of that plate, when the drive shaft I and the connecting nipples T of the discharge pipe are removed.

Having now particularly described and ascertained the nature of the said invention, what is claimed is:—

1. The combination with a pump, of a suction conduit, a discharge conduit, a rocking valve having three connected ports, two of said ports being arranged to connect alternately with said pump and the third port being arranged to connect with said suction and discharge conduits alternately, and means for rocking the valve and for operating the pump.

2. In a force feed lubricator, the combination of a reservoir, a pump for delivering oil therefrom to a header, a series of sight-feeds connected with the header, a series of pumps, the suction conduits of which connect with the sight-feed passages, discharge conduits for the pumps, and a rocking valve having passages adapted to connect the pump alternately with the suction and discharge conduits.

3. In a force feed lubricator, the combination of a reservoir, a feed pump, a header to which the pump delivers the oil from the reservoir, a series of valve-controlled nozzles leading therefrom, a series of sight-feed passages, a series of pumps, the suction conduits of which connect with the sight-feed passages, discharge conduits for the pumps, a rocking valve shaft having controlling passages for each pump, and a common actuating device of the reed pump, delivery pumps and valve shaft.

4. The combination of a reservoir, a block therein, a series of cylinders in the block, a series of pistons in the cylinders, a shaft journaled in the block, cams thereon for actuating the pistons, a rocking valve having suction and discharge conduits, connection from the cam shaft for rocking the valve shaft, and drive connections for the cam shaft.

5. The combination of a reservoir, a block therein, a series of cylinders in the block, a series of pistons in the cylinders, a shaft journaled in the block, cams thereon for actuating the pumps, a tapering valve casing in the block above the cylinders, a spring-pressed tapering rocking valve therein having passages for each pump, adapted to connect the pumps alternately with the suction and discharge conduits.

6. The combination of a reservoir, a transverse drive shaft therein, a feed pump operated thereby, a header to which the pump delivers oil, a cam shaft operated by the drive shaft, a series of pumps operated from the cam shaft, a series of sight-feed passages connecting from the header to the suction conduits of the pump, and a rotary valve driven from the cam shaft, having passages adapted to connect the pumps alternately with the suction and discharge conduits.

7. In a force feed lubricator, the combination of a reservoir, a detachable top plate therefor, a pump-actuated controlling valve, an actuating cam shaft for the pump carried by and detachable with said top plate.

8. In a force feed lubricator, the combination of a reservoir, a detachable top plate therefor, a series of pumps, an actuating cam shaft therefor, rocking controlling valves operated from the cam shaft, a feed pump, a header to which the feed pump delivers, and sight-feeds from the header to the controlling valve, all carried by the detachable top plate.

9. In a force feed lubricator, in combination, a cylinder having an inlet port and an outlet port; a plunger in said cylinder; a valve controlling said ports; a shaft; a cam on said shaft for reciprocating said plunger; the high portion of said cam being curved concentrically with the axis of the cam; and a crank on said shaft for operating said valve, said crank being set about a quarter revolution distant from said cam.

10. In a force feed lubricator, in combination, a plurality of pump units, means for actuating said pump units, a single valve for all of said pump units, said valve having a fixed range of action, and means for varying the intake of said pump units.

11. In a force feed lubricator, the combination with an inclosing casing or reservoir, and a cap or cover plate therefor, of a supporting frame depending from said cover plate into said reservoir, a pump chamber supported by said frame, a plunger in said pump chamber, a valve controlling the flow of oil to and from said pump chamber, and operating mechanism for said valve and plunger carried by said frame, substantially as described.

12. The combination of a reservoir having a removable plate, a pump carried by said plate and supplied from the reservoir, and actuating mechanism for the pump plunger comprising a main driving shaft mounted on the body of the reservoir, a second shaft carried by said removable plate, and having means for separably connecting it to said main shaft, and means for transmitting motion from said second shaft to the pump plunger, substantially as set forth.

In testimony whereof we affix our signatures in the presence of two witnesses.

CLARENCE B. HODGES.
FREDERICK W. HODGES.

Witnesses:
EDWARD D. AULT,
AMELIA WILLIAMS.