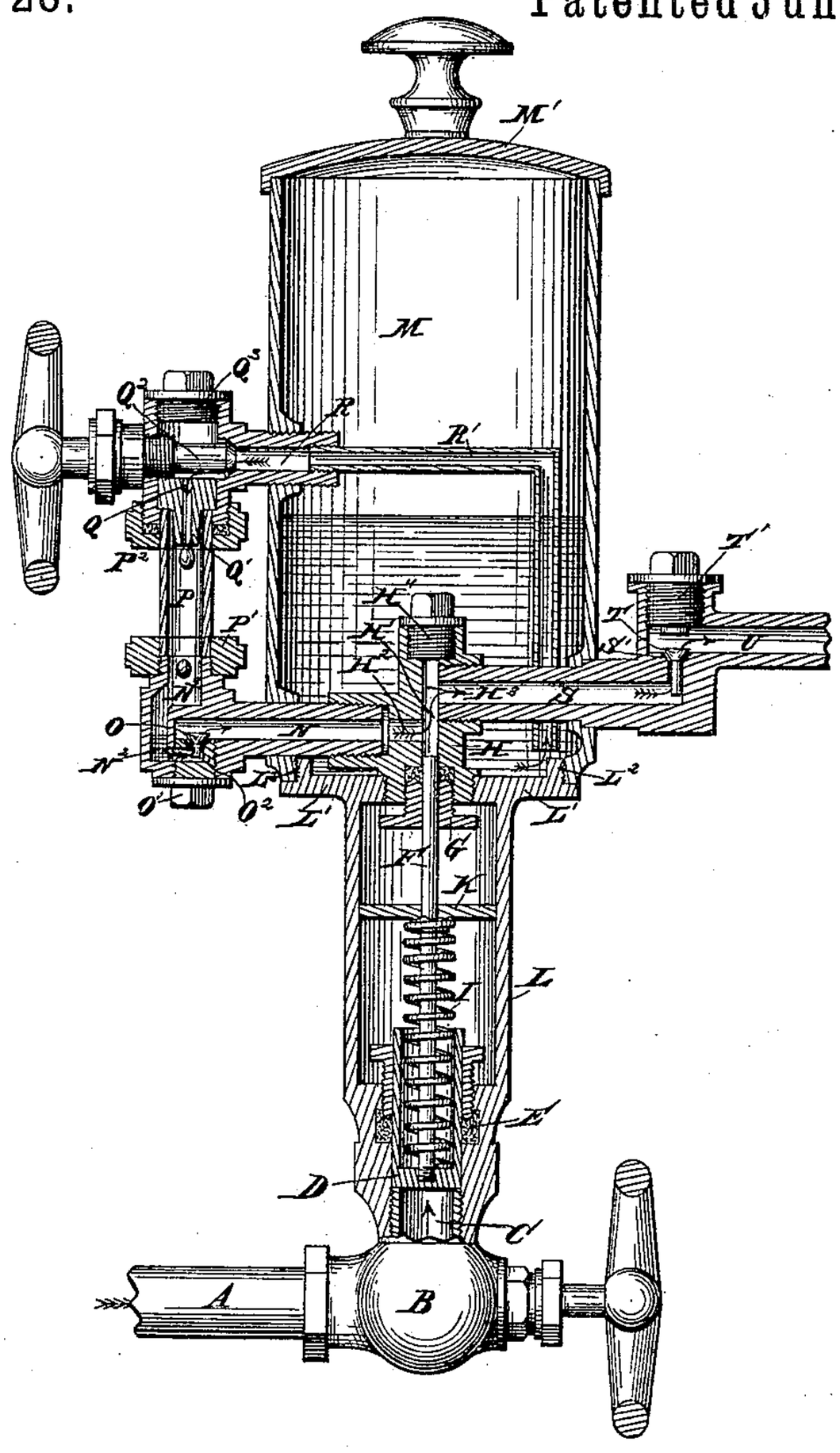
(No Model.)

C. H. PARSHALL.

LUBRICATOR.

No. 300,728. Patented June 17, 1884.



WITNESSES
Jno. E. Wiles.
Edw. Graco

INVENTOR
Charles H. Parshall

Attorney

UNITED STATES PATENT OFFICE.

CHARLES H. PARSHALL, OF DETROIT, MICHIGAN, ASSIGNOR TO THE MICHIGAN LUBRICATOR COMPANY, OF SAME PLACE.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 300,728, dated June 17, 1884.

Application filed February 13, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. PARSHALL, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Improvement in Lubricators, of which the following is a specification.

My invention relates to that class of lubricators in which the oil is injected into the machine to be oiled by action of a pump. My object is to provide a mechanical feed for the supply of oil, which, while it shall be effective and reliable in action, shall be simple in structure, and readily kept in proper working condition. To this end I employ the steam taken from one end of an engine-cylinder to actuate a plunger in one direction, and a coiled spring or its equivalent to actuate it in the other when the steam is exhausted from the chamber which gave the plunger its forward impulse. I control the admission of the steam to the auxiliary cylinder by a valve, which gives ready control to the length of the stroke of the pump-plunger. The pump is placed in the interior of the oil-reservoir, but its valves are exterior thereto, so as to be readily accessible. The pump draws its supply of oil directly from the bottom of a transparent chamber, in which a diminished atmospheric pressure is maintained by the action of the pump, and to which the oil is fed through a regulated pipe leading to the bottom of the oil-reservoir by the pressure of the atmosphere in the reservoir in excess of that in the vacuum sight-feed chamber.

In the annexed drawings, making a part of this specification, I have illustrated my invention as applied to the cylinder of a steam-engine, steam from which is withdrawn through the pipe A, tapped into the cylinder in or near the head, so as to receive steam only when the same is admitted to the chamber at that end of the cylinder. It is obvious that the same end can be attained by tapping the feed-pipe A into the cylinder of a pump or any other receiver for a fluid, which is alternately filled and emptied at regular intervals of not too long duration.

B is a globe or other suitable valve, by means of which the feed of the actuating-fluid can be regulated at will.

C is an auxiliary cylinder properly fitted to receive the plunger-head D, which, as illustrated, is a cup-formed plunger passing through the packing-ring E, and carrying the piston-rod or plunger F, which passes through a stuffing-box, G, into the cylinder H of the pump, of which it forms the reciprocating plunger. The cup-formed piston or plunger head D also incloses the lower end of a spiral spring, I, which is coiled around the piston-rod F, and bears at its upper end against a cross-tree, K, attached to the frame L, which supports or is suspended from the lubricator. When steam is admitted to the chamber of the cylinder to which the pipe A connects, the communication with the auxiliary cylinder C being open, it will fill the chamber in the latter below the head D and raise it. When the exhaust-port of that end of the cylinder is opened, the pressure of steam being relieved, the coiled spring I will force the piston-head D down, and so that head will receive a reciprocating movement corresponding with that of the piston-head of the engine.

Instead of the coiled spring, the piston-head D may be otherwise loaded, so as to carry it down when relieved from the pressure of the steam.

Instead of the single-acting cylinder shown, a double-acting cylinder may be employed, the piston-rod F passing through a stuffing-box in the upper head, and a steam-pipe being also extended from the upper chamber of cylinder C to the chamber in the engine-cylinder on the opposite side of its piston-head, so that the steam alternately admitted to the opposite ends of the engine-cylinder will in like manner actuate the piston-head and plunger of the auxiliary cylinder. Should it be more convenient, the plunger F may be actuated from any of the moving parts of the engine or other machine by any connecting mechanism which will communicate to it the requisite reciprocating movement.

The pump-cylinder, as illustrated, is screwed into the upper part, L′, of the frame, and is formed with a chamber, H′, in line with the plunger, F, which enters through the stuffing-box, G, which is tapped into the lower end of the pump-cylinder, and also with an oil in-

duction-branch, H^2, an oil eduction-opening, H^3. The pump-cylinder is inclosed within the oil-reservoir M, which is screwed onto a flange, L^2, on the upper face of frame L, and covered by a loose cap, M′, which opens the oil in the reservoir to the normal pressure of the atmosphere. An oil-induction pipe, N, passes through the wall of the oil-reservoir, with a tight joint, and is tapped into the oil-induction branch H^2 of the pump-cylinder. At the outer end of the induction-pipe is formed a chamber, N^2, by a partition, N^3, as shown, and having the valve O, which opens to admit the oil to the pump, but closes against pressure outward from the pump. To this induction-pipe above the chamber N^2 a section of glass tube, P, is attached by a packing-ring, P, and a similar packing-ring, P^2, connects it with the globe-valve Q, fitted with a nozzle, Q′, opening into the sight-chamber formed by the transparent tube P, and also with a valve, Q^2, by which the inflow of oil, coming through the tube R, may be regulated. This tube R extends through the wall of the oil-reservoir, with a tight-joint, and an extension, R′, carries it nearly to the bottom of the oil-reservoir. The eduction-opening H^3 connects with the eduction-pipe S, which also passes through the wall of the oil-reservoir with a tight joint, and outside the reservoir is fitted with a valve-seat, S′, to receive the inwardly-opening valve T, which yields freely to any pressure from the pump outward, but closes against pressure inward toward the pump. The oil is conducted through the pipe U to the part to be oiled, and may be fitted with a check-valve at any point in its length.

Provision is made for giving ready access to the different parts of the mechanism. Thus a screw-plug, T′, is placed above the valve T. Another, H^4, is placed above the chamber H′ of the pump. Another, Q^3, is placed above the valve Q^2. Another plug, O′, is screwed into chamber N^2, and has a valve-seat, O^2, and port connecting the chamber N^2 with the induction-pipe N, above the valve O. When this plug is removed, the valve comes with it.

The operation of the lubricator is as follows: Oil is supplied to the reservoir M by moving the cover M′, filling it nearly to the tube R, and there it is retained except when the machinery is in action. If the oil fills the reservoir above the tube R′, it may be retained by closing the valve Q^2 until the machinery is started. When the engine is put in motion, the valve B is set so as to give whatever action is desired to the piston-head C. It may be made to traverse to full-stroke, or to as short a one as is desired by opening or closing the valve. This communicates a reciprocating motion to the plunger F, exhausting on its downward movement, and driving the oil in the pump-chamber H′ with its forward movement out through the eduction-pipe and valve T into pipe U. The exhaust action of the plunger first draws the air out of the vacuum sight-chamber P until the equilibrium is so far disturbed that the external pressure on the surface of the oil in the reservoir M will force it upward through the pipe R R′ into the globe-valve Q, from which it will fall through the minute hole in the nozzle Q′ in quantities determined by the valve Q^2, so that it may be supplied in very slowly-forming drops, or more rapidly drop by drop, or in a slender continuous stream through the vacuum sight-chamber P and valve O to the pump. Thus the supply of oil is not only under the absolute command but also under the inspection of the engineer. Should it be desired in any particular case, a transparent section can be inserted in any part of the pipe U to give sight of the oil flowing away from the pump and into the mechanism to be oiled.

As the operation of the apparatus depends entirely upon the action of the pump which maintains the partial vacuum in the transparent chamber, it follows that the flow of the oil stops the instant the pump is stopped. There will therefore be none of the continued flow of the oil, which goes on filling the pipes and chambers in those lubricators in which the flow of the oil is dependent upon gravity.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a lubricator, in combination with an oil-reservoir and overhead supply-pipe, a lift and force pump, which raises the oil out of the reservoir and forces it also by the action of the plunger, an auxiliary cylinder, C, and plunger-head D, taking pressure in one direction from the cylinder of the engine, and in the other from the spring I or its equivalent, substantially as set forth.

2. In combination with the oil-reservoir M of a lubricator, a pump-cylinder placed inside the reservoir, and having its valves O and T arranged, respectively, in the induction and eduction pipes outside of the reservoir, substantially as set forth.

3. In combination with the pump and chamber P, the valve O, seated in the chambered plug O′, substantially as set forth.

4. In a lubricator, in combination with an oil-reservoir and pump, an intermediate transparent vacuum-chamber to which the oil is supplied from a lower level by atmospheric pressure, substantially as set forth.

5. In combination, an oil-reservoir and pump, and an intermediate transparent chamber, P, and nozzle and valve Q Q^2, for regulating the supply of oil to the chamber, from which it is withdrawn directly by the action of the pump as it is fed thereto, substantially as set forth.

6. In combination with the oil-reservoir M and pump, the intermediate transparent vacuum-chamber, P, the feeding-valve Q, and pipe R R′, bringing the oil from the bottom of the reservoir, and induction-pipe N, and valve O, for withdrawing the oil from the bottom of the chamber, substantially as set forth.

7. In a lubricator, in combination with the oil-reservoir and pump, an intermediate transparent chamber, a pipe leading from said reservoir projecting into the upper part of such chamber, and a pipe leading from the lower part of said chamber to the pump, whereby oil delivered into the interior of the chamber will fall through the same in visible quantities, and be thence drawn by the action of the pump, substantially as set forth.

As witness my hand in the presence of two subscribing witnesses.

CHARLES H. PARSHALL.

Attest:

R. MASON,

EDWD. GRACE.