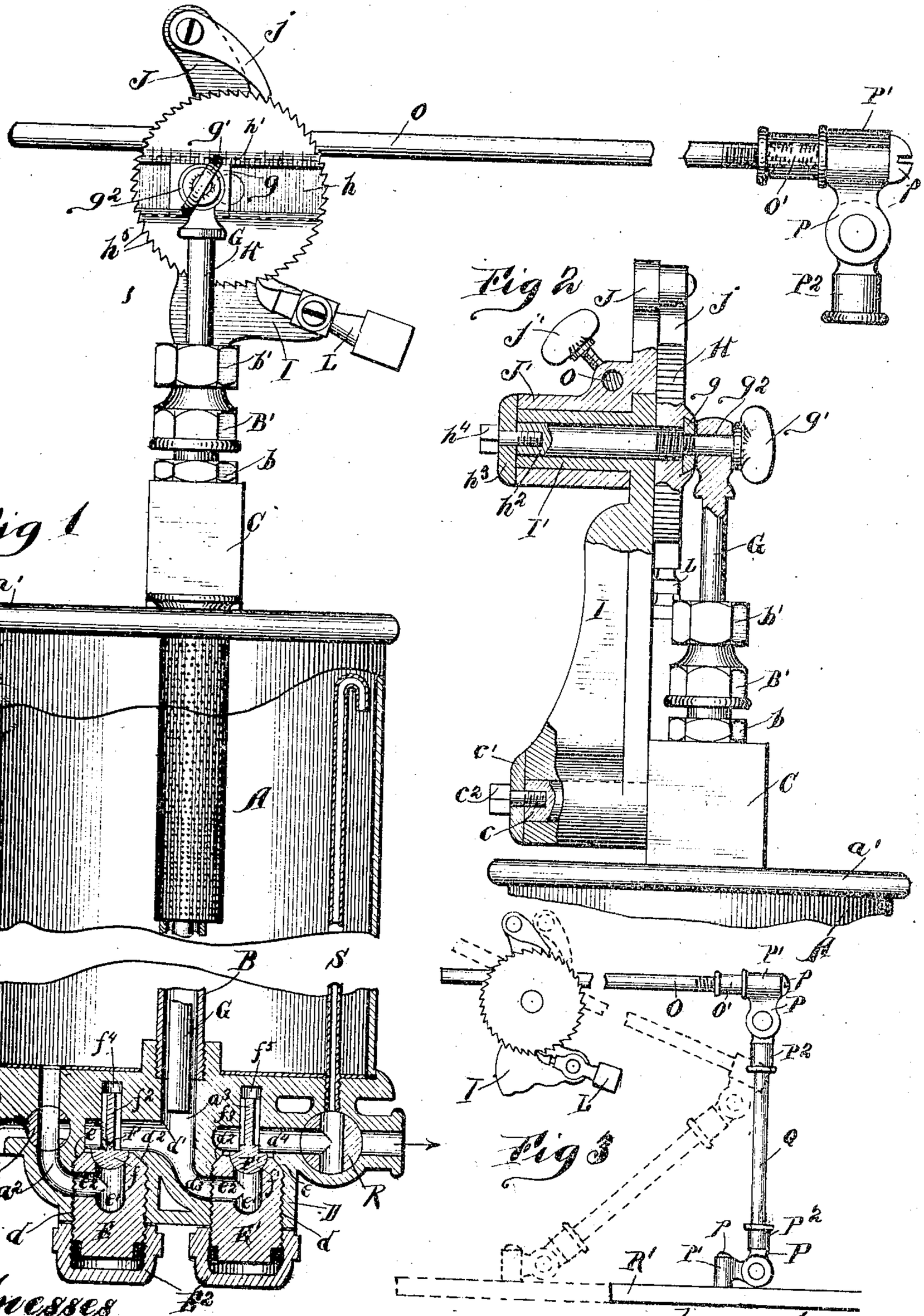
(No Model.)

J. F. & B. T. McCANNA.

LUBRICATING PUMP.

No. 604,072. Patented May 17, 1898.



UNITED STATES PATENT OFFICE.

JOHN F. McCANNA AND BENJAMIN T. McCANNA, OF CHICAGO, ILLINOIS.

LUBRICATING-PUMP.

SPECIFICATION forming part of Letters Patent No. 604,072, dated May 17, 1898.

Application filed October 23, 1897. Serial No. 656,136. (No model.)

To all whom it may concern:

Be it known that we, JOHN F. McCANNA and BENJAMIN T. McCANNA, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Lubricating-Pumps, which is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of our improved construction, the lower portion thereof being in vertical section through the center thereof. Fig. 2 is a side elevation of the upper portion of our improved construction, showing some of the parts broken away and in section. Fig. 3 is a side elevation showing the details of the connections between the lubricator and the engine or other moving machinery to which it may be attached.

Our invention relates to a lubricator for the purpose of feeding oil or lubricating material to the cylinders of steam-engines or elsewhere or to different machines where it is desired to obtain a small but steady supply of the lubricating material.

Our improvements relate to certain constructions in these devices, whereby the amount of the lubricating material which is fed to the machines may be varied to any desired quantity without varying the speed of the engine or other moving part which operates the lubricator.

Our invention further relates to an improved construction in lubricators, whereby, if desired, the lubricator may be so adjusted as to show the amount of the lubricant that is being fed to the engine or machine.

Our invention further relates to certain improvements in the connections between the lubricator and the engine or other machinery by which it is driven, so that the lubricator can be readily connected to any moving part, whether the movement of said part be horizontal, vertical, or at any possible angle.

We have shown our improvements as applied to that class of lubricators which are of the pump order—that is, in which the feed is obtained by the action of a plunger or piston something like that of a pump such as is shown in the Letters Patent to McCanna, No. 453,372, dated June 2, 1891, to which reference is made for a fuller description of the details of the construction and operation of the parts which are not concerned with the present improvements.

In the drawings, A represents the cup for the lubricating material, which is preferably of glass and cylindrical in form and is held between the bottom *a* and the top *a'* in any well-known manner, they being shown as secured by means of the tube B, the lower end of which is threaded into a suitable seat in the bottom, while the upper end passes up through the top, and a block C, seated on the latter, and is fastened in position by a nut *b*, screwed upon its upper end, which is also threaded, this nut being set down firmly on the block, as seen in Figs. 1 and 2 of the drawings.

From the central portion of the bottom *a* depends the casing D, which is of suitable thickness to contain the valve seats and ducts of the feed mechanism, and extends diametrically across the cup-bottom, as seen in vertical section in Fig. 1. This part may be called the "valve-casing," and is preferably cast in one piece with the bottom *a*. In the bottom of this casing are two large circular internally-screw-threaded openings *d*, extending directly upward and having their upper ends contracted slightly and opening, respectively, into the central duct or chamber *d'* in the central portion of the casing and into the side duct d^4. At their upper ends the openings *d* are provided with narrow interior bevels d^2, and the valve-seats E and E', respectively, which are screwed into the openings *d*, have the exterior bevels *e*, which fit the interior bevels d^2. The valve-seats are provided with central recesses *e'*, bored down into them from their upper ends, the mouths of these recesses being somewhat flaring, and each valve-seat is provided with a side aperture e^2, leading out from this central recess.

A duct a^2 leads down from the oil-cup into the bottom of the valve-casing, near one end of the latter, and opens at its lower end into the opening *d* for the valve-seat E, being located so that when this valve is seated the duct a^2 will register with the side aperture e^2 therein, thus making communication between the interior of the oil-cup and the central re-

cess in the valve-seat E. The central chamber d' opens at its lower portion by an aperture d^3 into the side of the opening d in which the valve-seat E' is fitted, and when this plug is properly seated this opening d^3 registers with the side aperture e^2 therein, thus establishing communication between the central chamber and the central recess in the valve-seat E'. This central chamber also connects with the tube B by means of a short duct a^3, extending down from the lower end of this tube through the cup-bottom into the said central chamber.

The upper end of the opening in which is seated the valve-plug E' opens into the side duct d^4. This communication is direct, and this duct is in the end of the casing opposite to that of the duct a^2, leading out from the oil-cup, and extends outward from the said valve-seat E' to the end of the casing. The duct a^2 is the feed-duct from the oil-cup to the valve mechanism, and the duct d^4 is the discharge-duct, through which oil is delivered from the valve mechanism to the cylinder by a pipe or any other suitable device connected with this duct at its outer end.

Valves F and F' are seated, respectively, upon the seats E and E'. These valves are ordinary check-valves and, as shown in the drawing, are simple gravity-valves. They consist of a convex head f f' and stem f^2 f^3, the latter extending upward across the chamber d' and duct d^4, respectively, and are received in suitable recesses f^4 f^5, bored upward through the casing into the cup-bottom and of sufficient depth to permit vertical play of the valve-stems therein. The convex heads f f' find suitable seats in the flaring mouths of the recesses in their respective valve-seats and are held to these seats by gravity and at the same time are free to rise when this force is overcome by pressure beneath them. The lower ends of the valve-seats E and E' are provided with small square heads, so that they may be readily turned out from the casing by means of a wrench or otherwise. Each of them is covered by a cap E^2, which is threaded internally, so as to be turned upon the projecting end of the plugs until firmly seated on the bottom of the casing, thus covering and protecting the end of these seat-plugs and securing them in position.

The upper end of the tube B is covered and protected by a cap B', which is provided with a threaded socket, whereby it is adapted to be turned upon the upper threaded end of the tube. This tube-cap is perforated for the accommodation of the plunger G, which is fitted within the tube and extends down through the latter into the duct a^8, leading to the central chamber in the casing. This plunger is somewhat smaller than the tube and is extended up through the tube-cap and at its upper end is connected to a crank-wheel H by connections which embody a portion of the present improvements. The crank-wheel H has a dovetailed groove h, centrally located and extending across its face, and one edge of which groove has arranged thereon a scale h', which is preferably graduated according to the number of drops it is desired for the pump to deliver at each stroke of the plunger or piston G. Slidingly mounted in this groove h is the rectangular block g, into which a set-screw g' takes after having passed through the bearing g^2, formed in the enlarged upper end of the piston G. It will be seen that the block g may be adjusted in the dovetailed groove h at any desired distance from the center of the crank-wheel H and secured in position by turning the set-screw g', so as to cause the beveled edges of the blocks g to bind against the interior beveled sides of the groove. As the the crank-wheel H is rotated by means to be subsequently described it will readily be seen that the length of a stroke of the piston G, and the consequent amount of oil forced out, will depend upon the position of the block g in the groove h, and we thus provide simple and effectual means for regulating the discharge of the lubricant to any desired amount.

The tube-cap B' may, if desired, be provided with a stuffing-box b', through which the plunger passes. The journal h^2 of the crank-wheel is mounted in a suitable bearing in the upper end of the supporting arm or post I, its upper end being extended and formed with a sleeve I' thereon, so as to give a long bearing, as seen in Fig. 2.

The block C is provided at its rear with a stud c, which serves as a journal-pin for the lower end of the post I, which end is enlarged and perforated so as to be fitted loosely upon the stud-journal and is held in position by a cap-washer c', which is secured to the end of the stud by the square-headed screw c^2. The journal of the crank-wheel is secured by a similar device as the washer-cap h^8 is fastened to the outer end of the journal h^2 by the screw h^4. It will be noticed that the supporting-post I is free to swing upon its journal-pin, thereby providing for a free vibration to accommodate the lateral movement of the crank-pin as the crank-wheel is rotated. The periphery of the crank-wheel H is serrated, the notches h^4 extending entirely around the wheel.

The pawl-lever J is mounted at its enlarged sleeve-like end J' upon the sleeve I', which constitutes the upper end of the arm I and extends outward to one side of the wheel and is provided with a pawl j, which may be spring-pressed, if desired, into contact with the teeth h^5 of the crank-wheel H. The arm J has running therethrough at right angles to the direction of its sleeve J' an aperture, through which passes the rod O, which is secured in any desired position by means of the set-screw j'. A gravity-actuated dog L, mounted upon the extension of the upper portion of the arm I, serves to prevent any backward movement of the crank-wheel H, thus permitting it to be operated in a forward direc-

tion by reason of any vibration which may be communicated to the arm J by reciprocating the rod O. This rod O terminates in a screw-thread, by which it is fastened in the sleeve O'. The knuckle P consists of a sleeve portion P', through which a screw *p* passes and is fastened in the sleeve O', so that the knuckle can rotate freely about the screw *p* as an axis. The knuckle P has pivoted therein the thimble P^2, into which one end of a connecting link or rod Q is screwed. The other end of this rod Q is screwed into a corresponding thimble in a corresponding knuckle, whose sleeve P' is fastened about the screw *p* to any reciprocating portion of the machinery or engine, such as R. It will be seen that these knuckles make two universal joints, by means of which the rod O can be readily arranged so as to be reciprocated by a moving part of any engine no matter what the direction of its movement. In Fig. 3 this reciprocating part R is shown as having a horizontal movement; but it will readily be seen that it might reciprocate vertically or at almost any angle that might be desired.

At the inlet end of the valve-casing a plug M is placed to operate as a three-way valve in connection with the duct a^2 and the duct d^5. The valve as positioned in Fig. 1 is arranged to permit the lubricant being drawn from the oil-cup through the valves in the ordinary operation of the device; but if it is desired to draw off from the oil-cup the oil it will only be necessary to turn the valve M from the right over to the left through an angle of ninety degrees, when there will be a passage from the oil-cup out through the duct d^5, so as to permit of the drawing off of any oil that may be in the cup. We also interpose a similar three-way valve R in the side duct d^4. Directly above this valve R we screw into the base D a small tube S, which extends up inside of the oil-cup A and turns over and terminates in a downwardly-projecting end near the outer end of said oil-cup. If at any time it is desired to observe the quantity of oil that is being forced into the machinery, it will only be necessary to turn the valve R into the position shown in Fig. 1, when the oil will be pumped up through the tube S and discharged in sight of the observer. Normally, however, the valve R is turned from the position shown in Fig. 1 from the right over to the left an angle of ninety degrees, and in this position the oil is pumped directly to the place where it is to be used. In case any air should accumulate in the valve-casing D if the valve R is turned to the position of Fig. 1 the air can be forced out into the oil-cup A by the ordinary operation of the plunger.

The operation of our device will be readily understood. With the oil-cup partially filled and the valve R turned to its discharging position the downward movement of the piston G closes the valve F and opens the valve F', thus forcing the oil in the central opening *d'* out into the machine to be lubricated. Upon the upward stroke of the piston the valve F' is closed and the valve F is opened to draw in from the oil-cup an amount of oil corresponding to what was forced out by the downward stroke. When it is desired to note how much oil is being discharged, the valve R is turned to the position shown in Fig. 1 and the discharge of the oil will be seen from the upper end of the tube S. In case too much oil is being discharged the block *g* will be moved nearer to the center of the crank-wheel H, and vice versa.

It will be seen that our improvement may be embodied in several different constructions and that we do not desire to be limited to the exact form shown and described, but only to such constructions as are necessitated by the terms of the following claims interpreted by the prior art.

We claim—

1. In a lubricator, the piston reciprocating in a straight line, with the support capable of reciprocating substantially at right angles to the line of movement of the piston, the disk rotated by a moving part of the machinery, a graduated channel in the face of said disk, the block pivotally connected to said piston, and means for fastening said block at any desired point in said channel.

2. In a lubricator, the pivoted arm, I, terminating in the sleeve, I', the disk, H, having the journal, h^2, in said sleeve, I', the piston, G, reciprocating in a straight line and adjustable connections between said piston, G, and the disk or crank-wheel, H.

3. In a lubricator, the pivoted arm, I, having the sleeve, I' the notched disk, H, journaled in the sleeve, I', the piston, G reciprocating in a straight line, means for adjustably connecting said piston and the disk, H, and the pawl-arm, J, carrying the pawl, *j*, and pivotally mounted on the sleeve, I'.

4. In a lubricator, the pivoted arm I terminating in the sleeve I', the disk H having the journal h^2 in said sleeve I', the piston G. reciprocating in a straight line, and adjustable connections between said piston G and the disk II comprising the dovetailed slot *h* in said disk, the block *g* slidingly mounted in said slot, means for securing it therein at any desired position, and the wrist-pin g^2 screwed into the block *g*, substantially as described.

5. In a lubricator, the pivoted arm I having the sleeve I'; the notched disk H journaled in the sleeve I'; the piston G reciprocating in a straight line; means for adjustably connecting said piston and the disk H, comprising the groove *h*, the screw-threaded block *g*, and the screw-threaded wrist-pin g^2; and the pawl-arm J carrying the pawl *j* and pivotally mounted on the sleeve I', all substantially as and for the purpose described.

6. In a lubricator, the pumping mechanism, the discharge-duct, a supplemental pipe suit-

ably located in connection to the discharge-duct at some visible point, and a valve for controlling the discharge through the discharge-duct or the supplemental pipe, as may be desired.

7. In a lubricator, the pumping mechanism, the discharge-duct, a supplemental pipe suitably located in connection to the discharge-duct at some visible point, and means for controlling the discharge through the discharge-duct or the supplemental pipe, as may be desired.

8. In a lubricator, the oil-cup, A, the discharge-duct, d^4, suitable mechanism and valves for discharging the lubricant from the oil-cup through the duct, d^4, the tube, S, terminating in said oil-cup, and the valve, R, for regulating the discharge through the duct, d^4, or the tube, S, as may be desired.

9. In a lubricator, the pivoted pawl-arm, J, the rod, O, adjustably connected thereto, the reciprocating portion, R′, and the universal knuckle-joints, P, interposed between the rod, O, and the reciprocating portion, R′.

10. In a lubricator, the reciprocating pawl-arm, J, the rod, O, adjustably mounted therein, the knuckle, P, having the sleeve, P′, pivotally mounted on said rod, O, and the thimble, P^2, to which is connected the rod, Q, by means of a similar knuckle, P, to the reciprocating portion, R′, of the machinery, substantially as and for the purpose described.

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