(No Model.) 2 Sheets—Sheet 1.

J. F. McCANNA.

LUBRICATOR.

No. 453,372. Patented June 2, 1891.

Fig 1

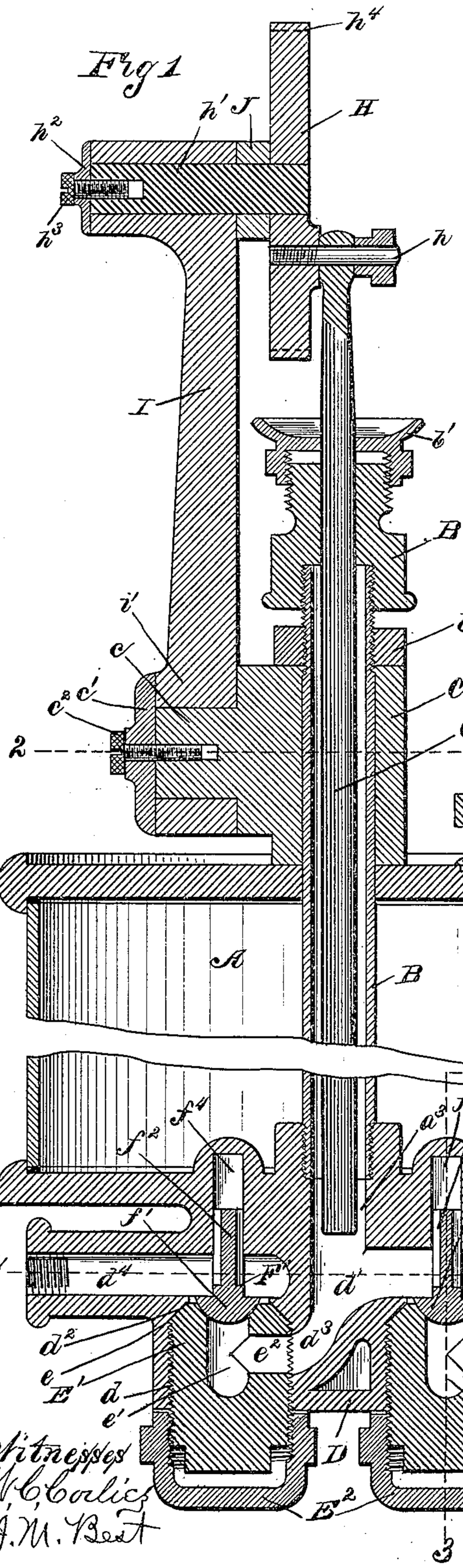
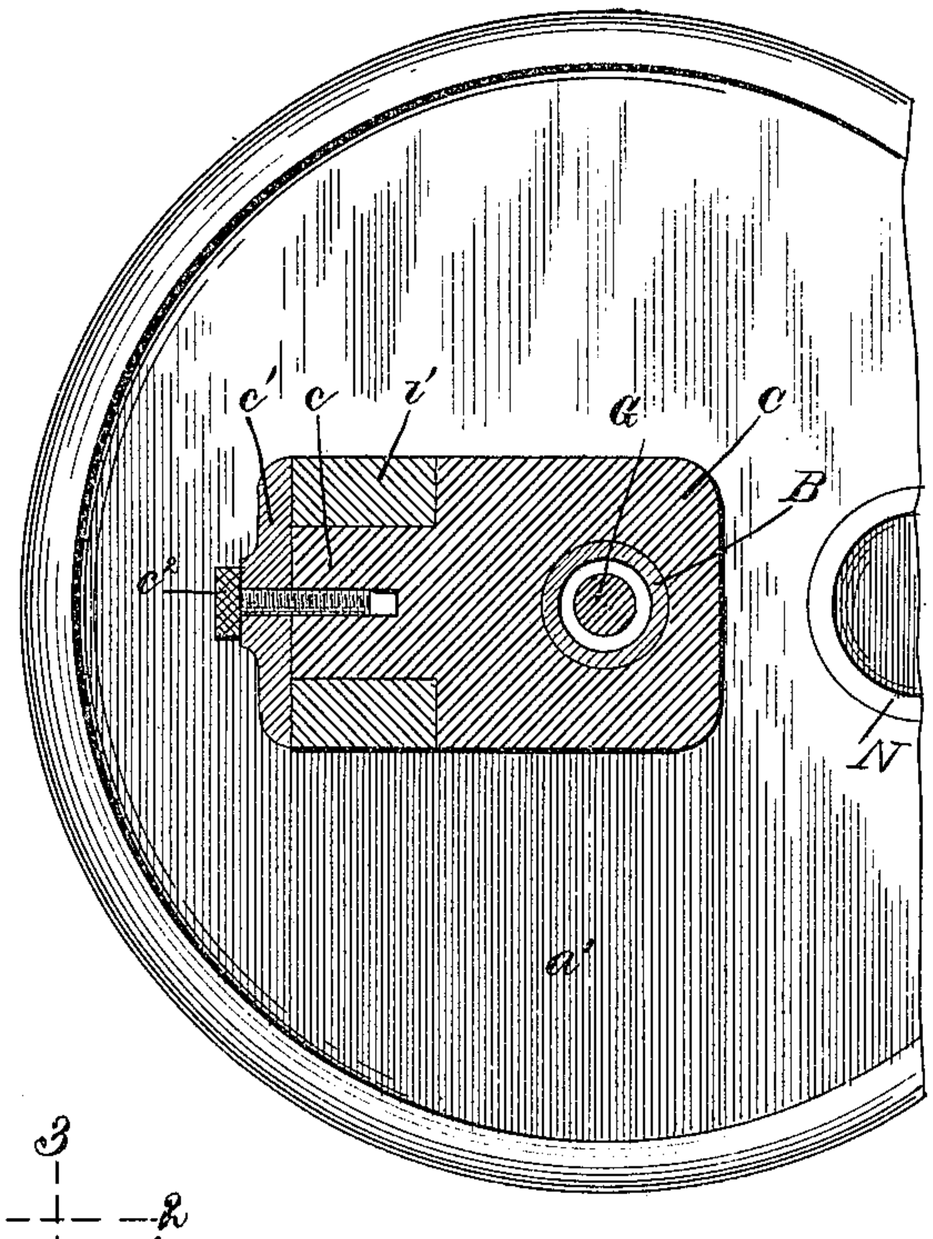


Fig 2



Witnesses
W. C. Corlies
A. M. Best

Inventor
John F. McCanna.
By Cobourn & Tucker
Attys

(No Model.) 2 Sheets—Sheet 2.

J. F. McCANNA.

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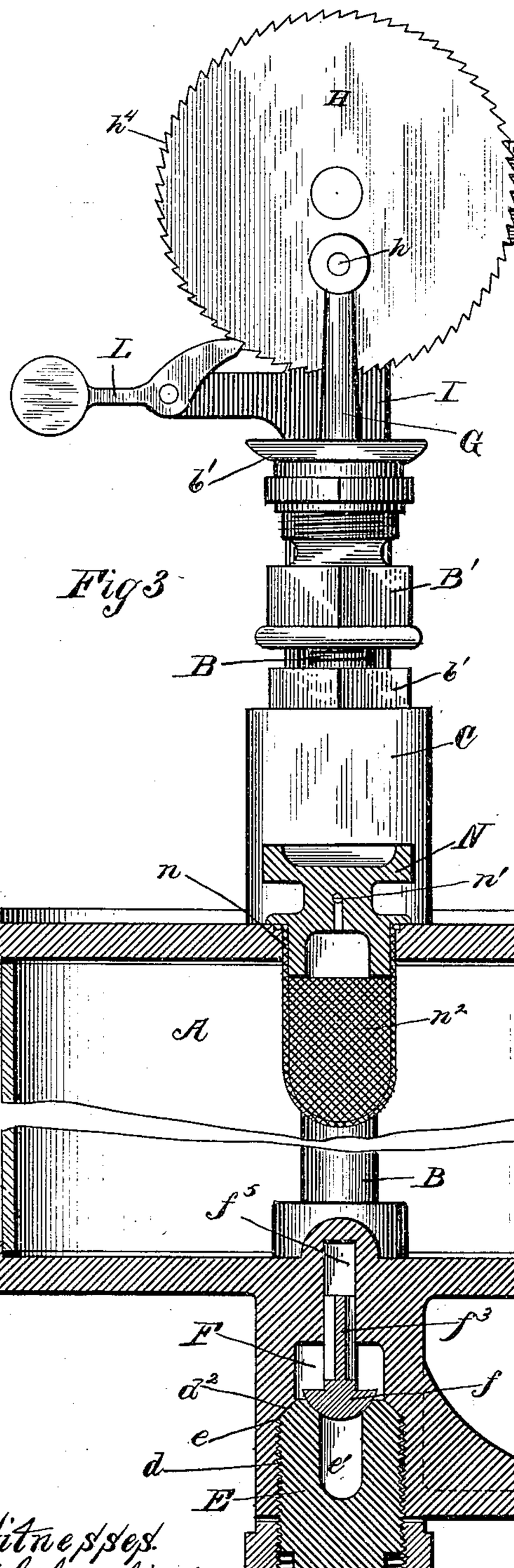

Fig 3

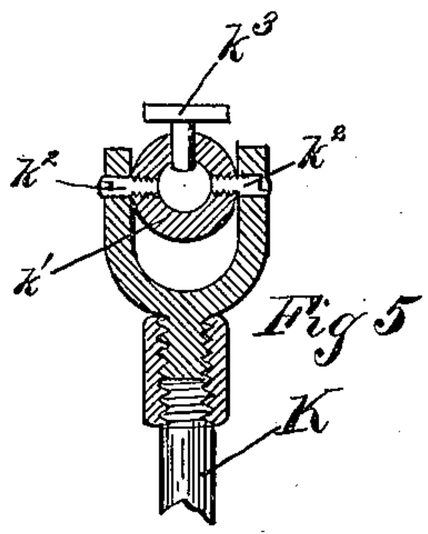

Fig 5

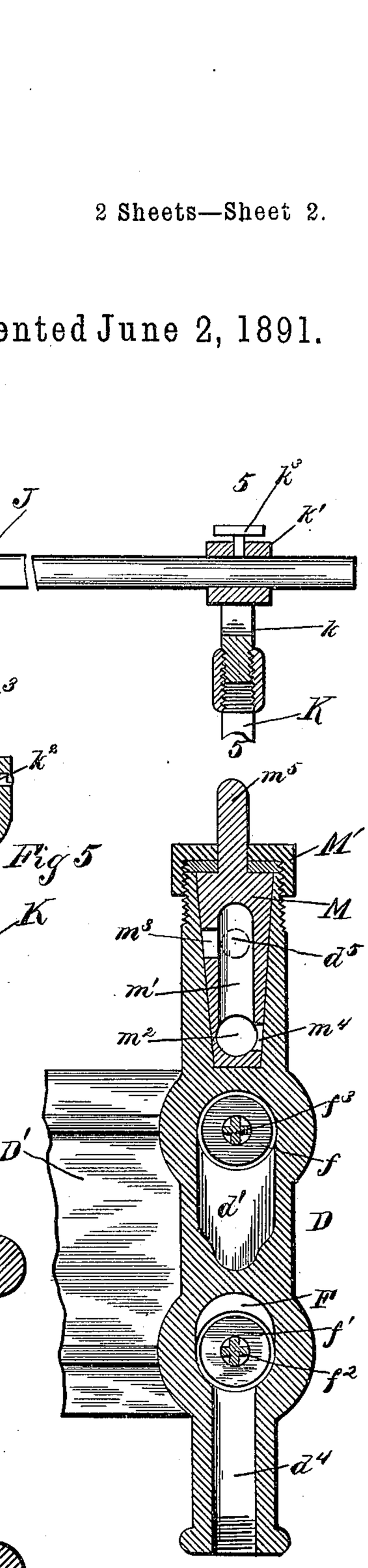

Fig 4

Witnesses.
W. C. Corlies
A. M. Best

Inventor
John F. McCanna.
By Johnson & Dunham
Attys

UNITED STATES PATENT OFFICE.

JOHN F. McCANNA, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO BENJAMIN T. McCANNA, OF SAME PLACE.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 453,372, dated June 2, 1891.

Application filed October 24, 1890. Serial No. 369,173. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. McCANNA, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lubricators, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical section of a lubricator embodying my invention; Fig. 2, a plan section of the same, taken on the line 2 2 of Fig. 1; Fig. 3, a front elevation of the same, partly in section, on the broken line 3 3 of Fig. 1; Fig. 4, a detail plan section taken on the line 4 4 of Fig. 1, and Fig. 5 a detail section taken on the line 5 5 of Fig. 3.

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

The invention relates to lubricators of the pump order—that is, in which the feed is obtained by the action of a plunger something like a pump—and my improvements relate particularly to the devices for reciprocating the plunger and the valve mechanism, through which the oil is fed to the cylinder.

I will now proceed to describe in detail the construction and operation of a lubricator embodying my invention in one practical form, and will then point out more definitely in claims the particular improvements which I believe to be new and wish to secure by Letters Patent.

In the drawings, A represents the cup for the lubricating material, which is preferably of glass and cylindrical in form. This cup is held between a bottom *a* and a top *a'* in a well-known way, these parts being secured by means of a 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 Fig. 1 of the drawings.

From the central portion of the bottom *a* depends a casing D, which is of suitable thickness to contain the valve-seats and ducts of the feed mechanism, and extends diametrically nearly across the cup-bottom, as seen in Figs. 2 and 3. This part may be called the "valve-casing" and is preferably cast in one piece with the bottom. At one side it is provided with a wide horizontal flange or foot D', by means of which the lubricator is fastened to its support wherever located. In the bottom of this casing are two large circular openings *d*. These openings extend directly upward, are threaded internally, and at their upper ends are contracted slightly and open respectively into a central duct or chamber *d'* in the central portion of the casing and side duct d^4. At their upper ends the openings *d* are provided with narrow interior bevels d^2, as seen in Fig. 2. In these apertures are located, respectively, valve-seats E E', which are of plug form—that is, they are short cylindrical plugs threaded externally and adapted to fit the threaded openings *d*. The upper ends of these valve-seats are provided with exterior bevels *e*, which are adapted to fit the interior bevels d^2, and thereby perfectly seat the valves when they are turned into place, as seen in Fig. 2. These 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 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 and 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 will register with the side aperture e^2 therein, thus making communication between the interior of the oil-cup and the central recess 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 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.

As already stated, the upper end of the opening in which is seated the valve-plug E′ opens into a 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 feed-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 drawings, 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 sockets or 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 of these valves find suitable seats in the flaring mouths of the recesses in their respective valve-seats, as seen in Fig. 2, and are held to these seats by gravity and at the same time are free to rise when this force is overcome by pressure underneath. 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 any other ordinary expedient may be adopted for readily removing these plugs. 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 short duct a^3, 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 attachment to the crank-pin h thereof in the usual way. The tube-cap may, if desired, be provided with a stuffing-box b', through which the plunger passes. The journal h' of the crank-wheel is mounted in a suitable bearing at the upper end of a supporting arm or post I, its upper end being enlarged somewhat to give a broad bearing, as seen in Fig. 1.

The block C is provided at the rear with a round stud c, which serves as a journal-pin for the lower end i' of the post I, this end being also enlarged somewhat and perforated so as to be fitted loosely upon the said stud-journal. The post when mounted on this stud is held in position by any suitable device. In the drawings a cap-washer c' is shown, which is secured to the end of the pin by a screw c^2. The journal of the crank-wheel may also be secured by a similar device. There is shown in Fig. 1 a similar washer-cap h^2, fastened to the outer end of the journal by a screw h^3. 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, as will now be described. The periphery of the crank-wheel is serrated, the notches or serrations h^4 extending entirely around the wheel.

The pawl-lever J is mounted at its inner end loosely upon the journal of the crank-wheel, as seen in Fig. 1, being arranged, as here shown, between the wheel and its supporting-post. This lever extends outward to one side of the wheel in a horizontal direction, and is provided with a spring-pawl j, pivoted to the lever and arranged to engage with the notched periphery of the crank-wheel, as seen in Fig. 3. The upward vibration of this lever will obviously turn the crank-wheel a certain distance, while upon its lower stroke it will be ineffective, the pawl slipping over the teeth on the wheel. In order to vibrate the pawl-lever, a pitman K is connected to it at any suitable point beyond the wheel, this pitman being at its lower end connected to any moving part of the engine or other machine which will give the proper reciprocation to the pitman for vibrating the pawl-lever.

The entire pitman and its actuating device are not here shown, as no specific device is intended, and this mode of driving the crank-wheel is already known in this type of lubricator. The connection between the pitman and pawl-lever is made by a connecting-piece k, which is forked to receive a collar k', which is slipped upon the lever and is movable back and forth thereon. The collar is mounted in the fork by means of pivot-pins k^2, which may be conical, if desired, thus providing a kind of gimbal-joint, which evidently will accommodate the movements of the two parts. The collar is fastened to the lever at any desired point by means of a set-screw k^3, thus providing for an adjustment of the connection upon the lever to regulate the throw. A stationary pawl L is mounted on the supporting-post, being fixed on an arm projecting therefrom in such position as to engage with the teeth on the crank-wheel on the lower side of the latter opposite to the actuating-pawl j, as seen

in Fig. 3. This pawl is simply for the purpose of preventing any back movement of the wheel.

At the inlet end of the valve-casing a conical plug M is fitted into a similarly-shaped hole m, bored directly inward into and a little beyond the inlet-duct a^2. This plug is provided with a longitudinal chamber or duct m' and a cross-port m^2, running through it near its inner end, and a second port m^3, leading out from its chamber near the outer end thereof, and another port m^4, leading into the inner end of the chamber on the side of the plug opposite to the port m^3. A duct d^5 extends downward from this valve through this part of the casing, with which the outer port m^3 may be caused to register by suitably turning the plug, which is provided with a handle m^5 for this purpose. This plug therefore serves as a valve for drawing off the contents of the oil-cup and is held in position by a stuffing-cap M', threaded upon the end of a boss, through which the plug enters.

The cover of the oil-cup is provided with a filling-opening, which is closed by a plug N, suitably fitted to this opening n in the cup. This plug is provided with a small duct n', which admits air to the interior of the cup above the oil, and there is connected to the plug on the inside of the cup a little receptacle n^2, of wire-gauze or any other suitable material, for the purpose of catching and retaining any dirt which may be contained in the lubricator.

The operation of this lubricator is as follows: It being set up in place upon an engine or elsewhere and its actuating devices properly connected, and the valve M being in position, as shown in Fig. 1, it is evident that the vibration of the pawl-lever will gradually turn the crank-wheel by an intermittent motion and thereby slowly raise the plunger by a similar movement. The plunger being in fixed vertical bearings must, of course, move up and down in the same straight line. This movement is provided for by the freely-swinging post on which the crank-wheel is mounted, this post moving laterally to one side or the other with each movement of the crank-wheel under the stress of the plunger held vertically. The upward movement of the plunger tends, of course, to produce a slight vacuum with every successive movement, and therefore a small quantity of oil will be admitted to the central chamber d' with every upward movement of the plunger, the oil from the cup flowing down through the inlet-duct into the central recess in the valve-seat E, and raising the valve F, finding its way into this chamber. As soon as the crank-pin of the crank-wheel reaches its highest point the further movement of the wheel will, of course, begin to depress the pin, and so depress the plunger by a step-by-step movement. This downward movement of the plunger will obviously force a little oil with each step outward from the central chamber into the recess in the valve-seat E', and force the valve F' thence into the outlet-duct d^4, and thence to the cylinder.

It will be seen that the entire valve mechanism is outside and below the oil-cup. It will also be seen that under the construction described above the valve-seats and valves can readily be removed for repairs, cleaning, or any other purpose. This is accomplished by simply removing the caps of the valve-seats and then unscrewing the latter, when, of course, the valves will also drop out. The contents of the oil-cup can be drawn off at any time by simply turning the valve M so that the port m^4 will register with the duct leading into the oil-cup, when, obviously, the port m^3 will register with the duct d^5, and connection is at once made between the interior of the cup and the outer air, and of course the liquid in the cup will flow outward.

The freely-swinging support for the crank-wheel is a very important improvement, for it provides for the required lateral movement of the crank-wheel with very little friction, and at the same time provides a stable support for this wheel.

In some details of construction changes may be made, so that I do not wish to be understood as limiting my invention to the precise construction in all respects as herein shown and described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a pump-lubricator having an oil-tank, valves, and passages for the oil, the plunger, in combination with a crank-wheel to which the plunger is connected, the freely-swinging pivoted support on which the crank-wheel is mounted, and mechanism for imparting an intermittent rotary movement to said wheel, substantially as and for the purposes specified.

2. In a pump-lubricator having an oil-tank, valves, and passages for the oil, a supporting-block C, in combination with the swinging post I, journaled at its lower end to said post, the crank-wheel H, mounted on the upper end of said post, the plunger G, connected at its upper end to the crank-pin of said wheel, and the vibrating pawl-lever J, provided with a pawl adapted to engage with the ratcheted periphery of the crank-wheel, substantially as and for the purposes specified.

3. In a pump-lubricator having valves and oil-passages, the oil-cup, in combination with the tube B, fixed in said cup, the tube-cap B', the plunger G, passing down through said cap, the crank-wheel H, to which said plunger is connected, the swinging post I, on which said crank-wheel is mounted, and means for operating the crank-wheel, substantially as and for the purposes specified.

4. The oil-cup, in combination with the valve-casing D, depending from the bottom of said cup and provided with openings d in the bottom thereof, the valve-seats E E', adapted

to be fitted into said openings, said valve-seats being provided with connecting lateral and vertical ports, and the valves F F′, whereby said valve-seats and valves may be readily removed from the casing, substantially as and for the purposes specified.

5. In a pump-lubricator, the oil-cup, in combination with the valve-casing D, depending from the bottom thereof and provided with inlet-duct a^2, leading from the oil-cup, central duct or chamber d' and outlet-duct d^4, the plunger and plunger-tube B, opening at its lower end into the central chamber d', the valve-seats E E′, provided with central recesses and side apertures e^2 connecting therewith, and the valves F F′, substantially as and for the purposes specified.

6. The valve-casing D, depending from the bottom of the oil-cup and provided with the threaded seat-openings d, in combination with the valve-seats E E′, threaded to fit said openings and provided with central recesses e', and gravity-valves F F′, seated on the inner ends of said valve-seats to close the mouths of said recesses, substantially as and for the purposes specified.

7. The oil-cup, in combination with the valve-casing D, provided with the inlet-duct a^2 and the duct d^5, the hollow valve M, provided with cross-port m^2, side port m^3, leading into the latter, and port m^4 at the opposite end and side of the valve, substantially as and for the purposes specified.

JOHN F. McCANNA.

Witnesses:
CARRIE FEIGEL,
BENJ. T. McCANNA.