No. 894,423. PATENTED JULY 28, 1908.

J. M. CHAMBERS.

LUBRICATOR.

APPLICATION FILED AUG. 12, 1907.

2 SHEETS—SHEET 1.

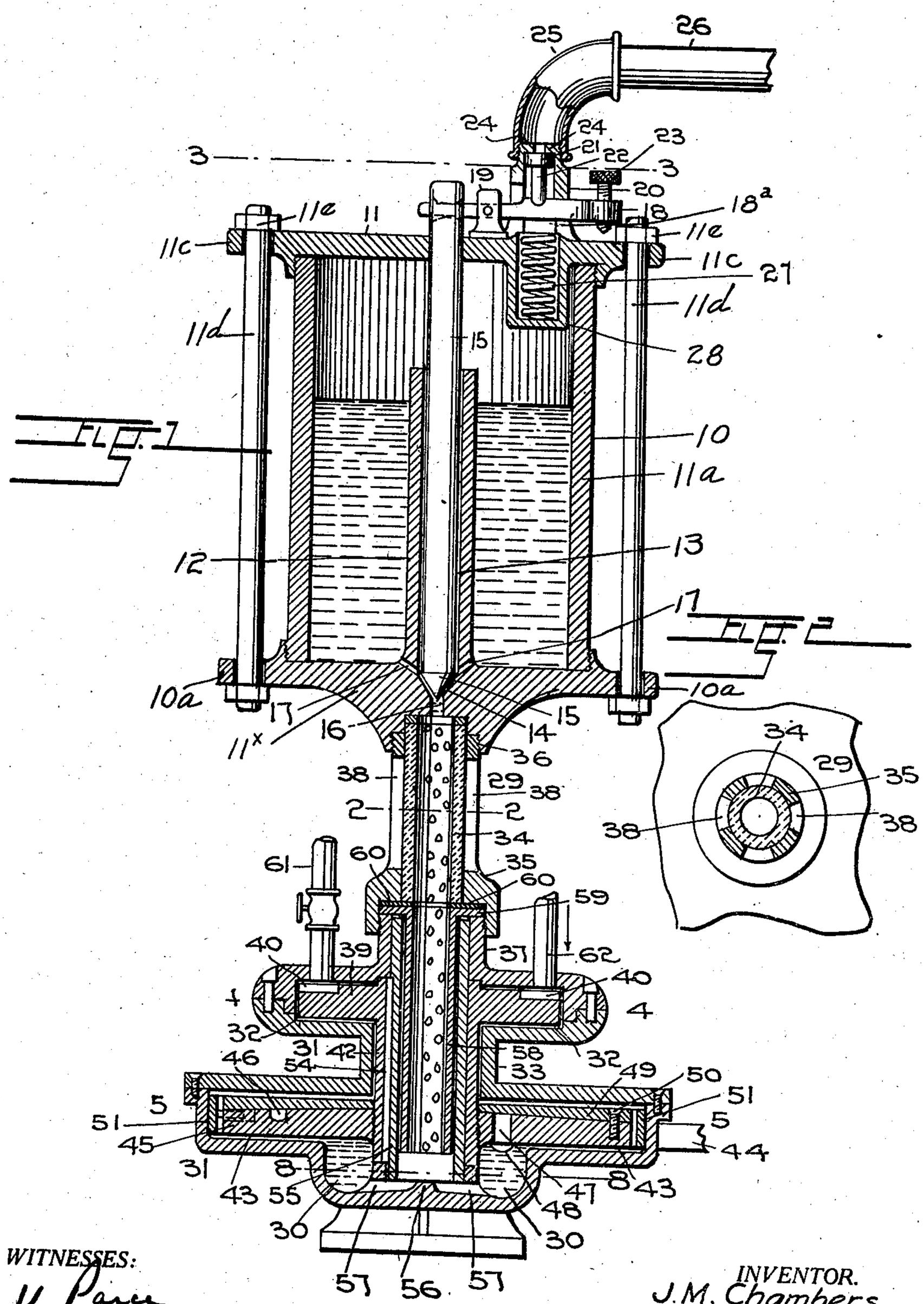

FIG. 1

FIG. 2

WITNESSES:

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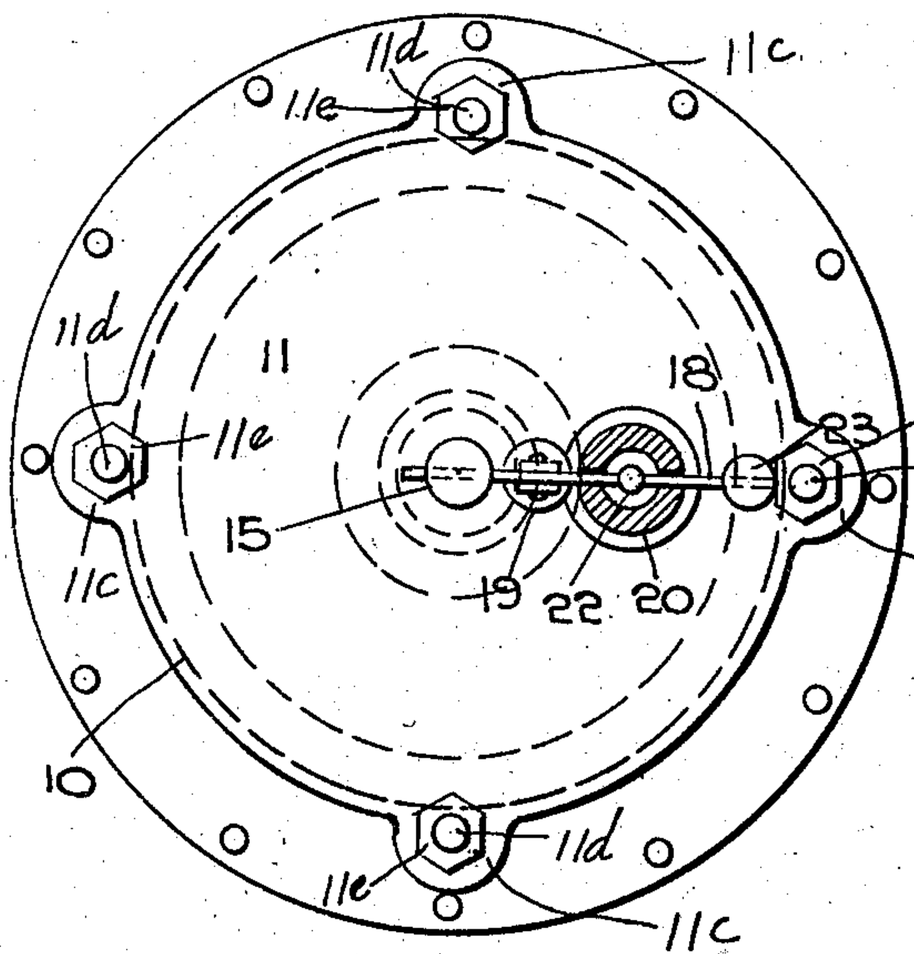


FIG. 3.

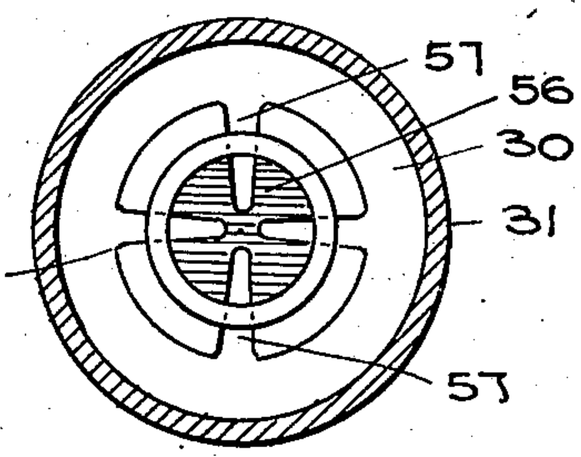


FIG. 8.

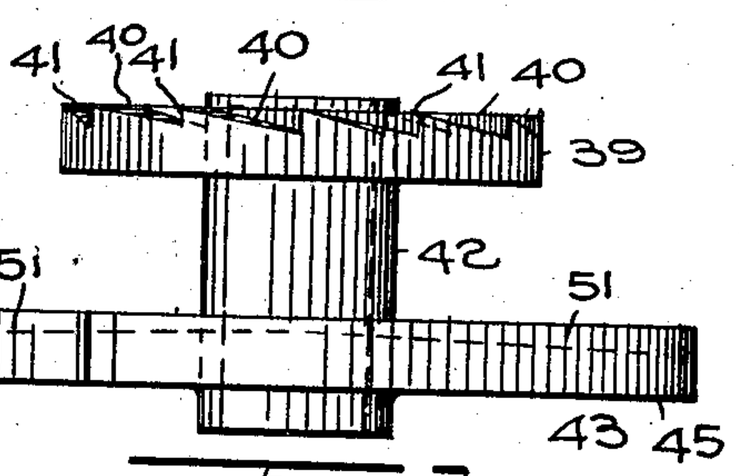


FIG. 7.

FIG. 6.

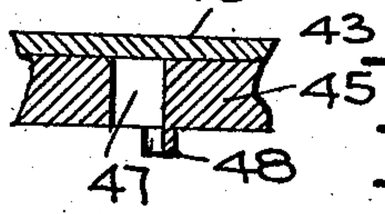
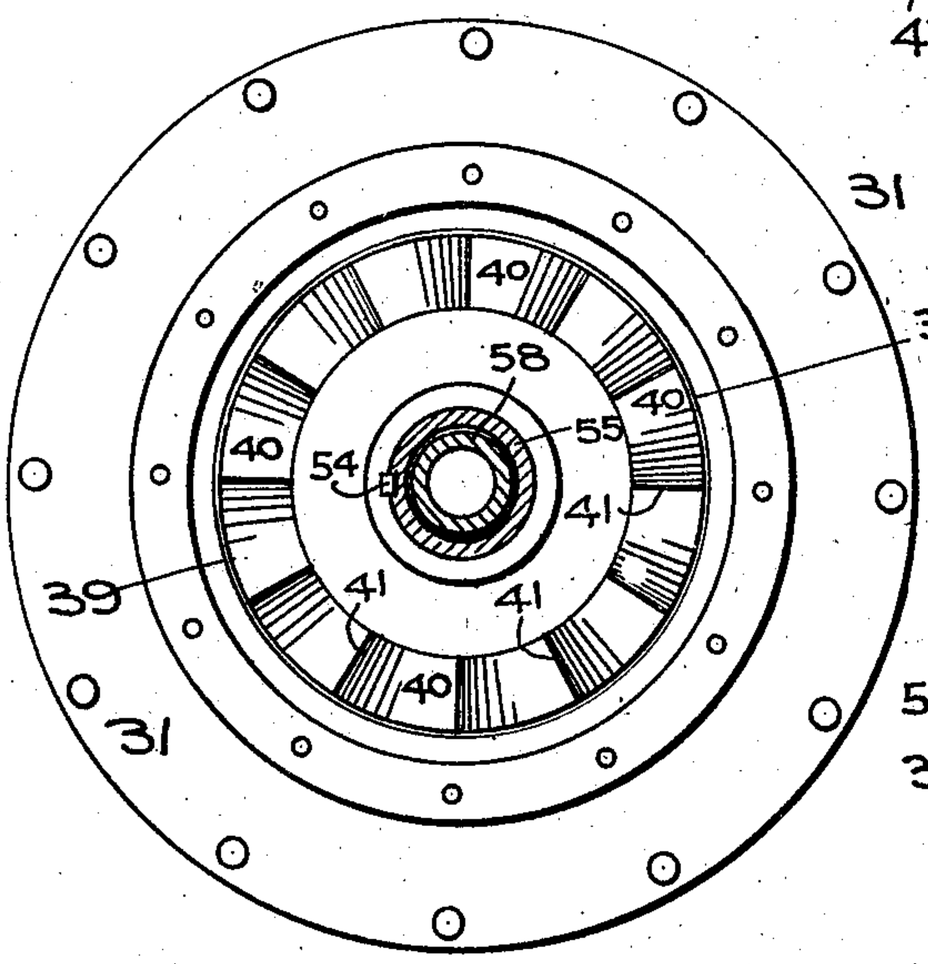


FIG. 5.



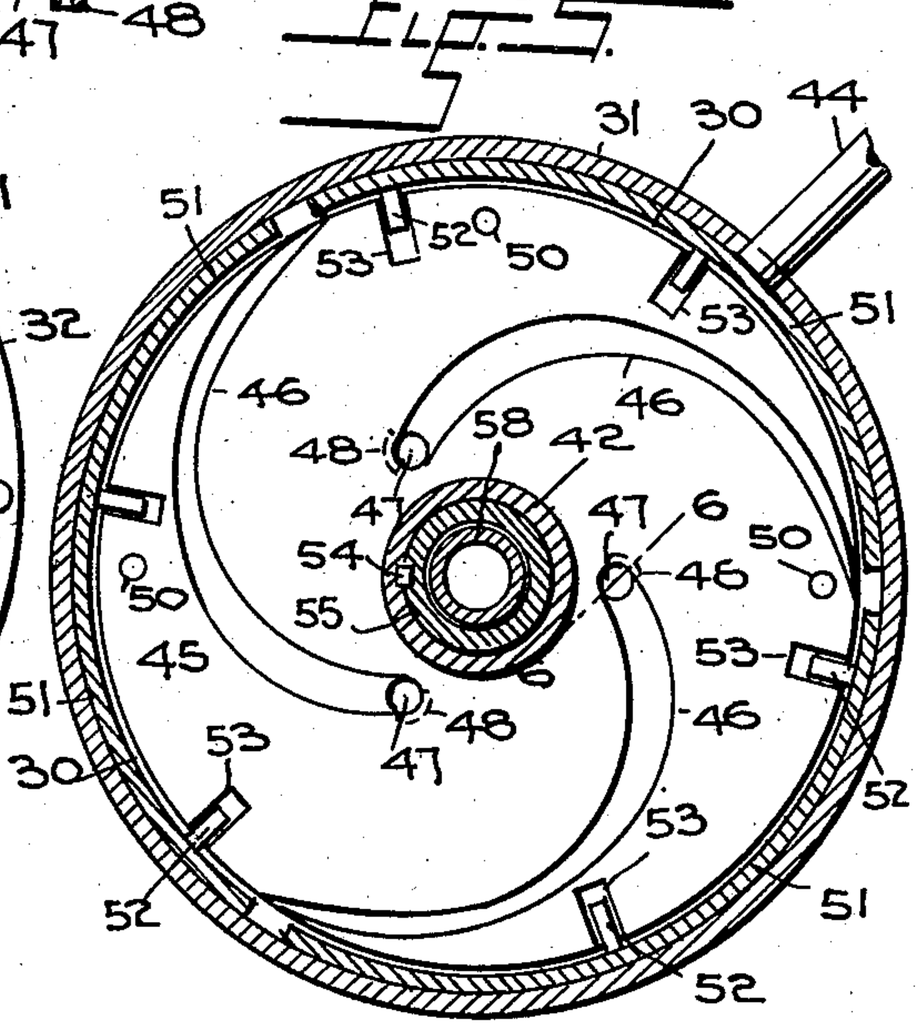


FIG. 4.

WITNESSES:

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J. M. Parker

INVENTOR.

J. M. Chambers

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UNITED STATES PATENT OFFICE.

JAMES M. CHAMBERS, OF BOULDER, COLORADO, ASSIGNOR OF ONE-HALF TO MOSES MEYER, OF BOULDER, COLORADO.

LUBRICATOR.

No. 894,423. Specification of Letters Patent. Patented July 28, 1908.

Application filed August 12, 1907. Serial No. 388,229.

To all whom it may concern:

Be it known that I, JAMES M. CHAMBERS, a citizen of the United States of America, residing at Boulder, in the county of Boulder and State of Colorado, have invented certain new and useful Improvements in Lubricators, of which the following is a specification.

This invention relates to improvements in lubricators and more especially to the class of contrivances by means of which the lubricant is infused into the motive fluid for the purpose of introducing oil uniformly between the moving parts of the engine with which the said fluid comes in contact.

The main objects of my invention are to provide a device which may be used with equal results on both stationary and locomotive engines, which when employed in connection with intermittently operated engines, will feed the lubricant only while the engine is in operation, which discharges the lubricant into the fluid by which the engine is operated, in minute particles so that the two substances may thoroughly and uniformly intermix, and which may be speedily refilled while the engine is in operation.

An additional advantage derived by the use of my contrivance resides in the fact that the sight-glass included therein is not subjected to pressure of the steam or air and that accidents due to breaking of the glass tubes are consequently reduced to a minimum.

I attain these objects by the mechanism illustrated in the accompanying drawings in the various views of which like parts are similarly designated and in which

Figure 1— represents a vertical section through my lubricator, Fig. 2— a transverse section taken along a line 2—2, Fig. 1, Fig. 3— a sectional view along a line 3—3, Fig. 1, Fig. 4— a transverse section taken along the line 4—4, Fig. 1, Fig. 5— a cross section taken along a line 5—5, Fig. 1, Fig. 6— a fragmentary section along the line 6—6, Fig. 5, Fig. 7— an elevation of the turbine and therewith associated centrifugal member employed in the device, and Fig. 8— a transverse section along a line 8—8, Fig. 1.

Referring to the drawings, let the reference numeral 10 indicate a cylindrical oil reservoir comprising a cylinder 11^a made of glass or other suitable substance supported upon a base $11^\times$ and normally closed by means of a cap 11 held in oil-tight position thereon by means of a plurality of bolts 11^d which, passing through ears 10^a extending from the reservoir and correspondingly arranged ears 11^c on the cap, are provided upon their projecting threaded extremities with nuts 11^e.

The reservoir 10 is provided with an internal, axially arranged, tubular projection 12, the bore 13 in which is contracted at its lowermost extremity to form a seat 14 for the corresponding extremity of a needle-valve 15 which being fitted in the said bore, extends through a central opening in the cap 11.

The contracted portion of the bore terminates in an opening 16 through which the oil, fed into the tube by means of a plurality of openings 17 in its circumferential wall, is discharged from the reservoir into the subjacent conduit.

The movement of the valve 15 in relation to its seat is automatically controlled by means of a lever 18, fulcrumed upon a support 19 on the cap 11 and whose arms extend respectively through a transverse slot in the upper extremity of the valve stem and through opposite vertical slots in the circumferential wall of a small cylinder 20, which being integral with the cap 11, extends in parallel relation to the longitudinal axis of the reservoir.

A piston 21 is fitted in the cylinder and has a downwardly extending rod 22 which engages the upper edge of the subjacent arm of the lever, whose outer extremity is provided with an adjusting screw 23, which by engagement with the upper surface of the cap 11, determines the amount of movement of the lever and the therewith connected valve 15.

The cylinder 20, which is open at its upper end, is provided with two or more inwardly extending stops 24 which limit the upward movement of the piston, and connects by means of an elbow 25 with a pipe 26 which leads to a source of supply of the motive fluid by which the engine to which the lubricator is applied, is operated.

A coiled spring 27 disposed within a downwardly extending extension 28 of the cylinder 20 engages with its upper extremity a projection 18^a on the arm of the lever 18 for the purpose of maintaining the parts in their normal position, in which the piston 21 is in engagement with the stops 24 and the valve 15 is in place upon the seat 14 and thus closes the outlet of the reservoir.

The reservoir 10 communicates by means

of an interposed conduit 29 with a cylindrical chamber 30 in a housing 31 which forms the base of the contrivance and which includes in addition to the said chamber, a superposed compartment 32 which is connected with the chamber 31 by an interposed axially alined cylindrical neck 33.

The conduit 29 consists of a glass tube 34 and a surrounding metal casing 35, the threaded extremities of which are respectively secured in a correspondingly tapped socket 36 in the lower portion of the reservoir into which the outlet 16 opens, and around an upwardly extending, central, hollow cylindrical projection 37 of the housing or base 31.

The casing 35 has a plurality of longitudinal openings or windows 38 which permit observation of the passing of the oil from the reservoir through the glass tube 34.

The upper compartment 32 of the housing 31 is occupied by a disk-shaped impulse wheel or turbine 39 provided in its upper surface and along its peripheral edge with a continuous series of circularly arranged, angular depressions 40 the radially extending vertical sides 41 of which provide a plurality of shoulders upon which motive fluid introduced into the compartment through a pipe 62 may impinge.

The turbine 39 is associated by means of a downwardly extending tubular connection 42 which is fitted within the neck 33 of the housing 31, with an annular member 43 which being disposed within the chamber 30 is designed to eject the oil accumulated therein into a therewith connected conduit 44.

The member 43 consists of a centrally apertured disk 45 provided with a plurality of vertical passages 47, arranged in proximity to and at equal distances from its center, and in its upper surface with a corresponding number of curvilinear, centrifugal grooves 46, which connect the passages 47 with the circumferential surface of the member. The disk is furthermore provided with a plurality of wings or vanes 48 which project downwardly from its lower surface in juxtaposition to the passage 47 and which are designed to direct oil contained in the chamber 30, into the passages and the therewith communicating centrifugal grooves during the rotative movement of the member 43.

The disk 45 is covered by a correspondingly shaped plate 49, which being secured thereto by screws 50 or analogous fastening means, closes the passages 47 and converts the grooves 46 into conduits, which connect the upper extremities of the passages with the annular space between the opposite, concentric, circular surfaces of the member 43 and the surrounding wall of the housing 31.

Disposed within the above named space is a divided ring concentrically surrounding the disk and composed of a number of segmental plates 51 which are spaced from each other at the points where the conduits 46 open into the circumferential surface of the member 43 and which during the latter's rotative movement are impelled by centrifugal action, to engage the inner surface of the circumferential wall of the chamber 30.

The plates 51 are maintained in their position relative to the member 43, by means of pins 52, which projecting radially from their inner surfaces, extend in correspondingly arranged recesses 53 in the upper surface of the disk 45.

The connected turbine and centrifugal member are mounted by means of a feather 54 upon a hollow shaft or spindle 55, whose lower extremity is rotatably supported in a step 56 which being integral with the bottom portion of the housing 31, is provided with a plurality of radial grooves 57 through which the lubricant discharged from the reservoir 10, passes into the chamber 30. A tube 58 disposed within the hollow shaft 55 provides a conduit for the oil after it leaves the glass tube 34 and is held against rotation by a flange 59 at its upper extremity, which is clamped between the opposed surfaces of the extension 37 of the housing and the thereupon screwed socketed extremity of the casing 35.

A washer 60 composed of cork or other resilient material is placed between the flange 59 and the opposite surface of the casing to render the joint impervious to moisture.

A valve-controlled pipe 61 leading from the turbine compartment 32, is arranged to exhaust the spent steam or other motive fluid by which the impulse wheel is actuated.

Having thus described the mechanical construction of my device its operation will be readily understood. The pipes 26 and 62, leading respectively into the small cylinder 20 on the cap 11 and into the turbine compartment 32, are preferably connected with the main steam pipe which connects the boiler with the engine to which the lubricator is applied and the pipe 44 leading from the discharge chamber 30 is connected with the steam chest, cylinder or other portion of the engine which it is desired to lubricate. When by opening of the throttle valve, the steam is led into the cylinder of the engine, it simultaneously passes through the conduit 26 and by depression of the piston 21 in the cylinder 20, causes through instrumentality of the lever 18, the needle valve 15 to rise from its seat which opens the outlet 16 and permits the oil contained in the reservoir 10 to pass through the glass tube 34 and the subjacent stationary tube 58, into the lower portion of the oil chamber 30 in which it rises until it has reached a level even with the lower surface of the disk 45. The steam entering the compartment 32 through the pipe 62, im-

parts a rotary movement to the turbine 39 by impact again the blades 41 and this movement being communicated to the member 43, causes the vanes 48 projecting below the lower surface of the said member, to direct the oil contained in the chamber 30, into the vertical passages 47 from where it passes into the conduit 46 through which the oil impelled by centrifugal force, is conducted into the space between the rotating member and the surrounding wall of the casing. Each time the mouth of one of the conduits 47 comes in communication with the outlet pipe 44 in the wall of the casing, the oil is forcibly ejected thereinto and mixing with the steam contained in the said pipe, is conducted thereby to the moving parts of the engine. The divided ring produced by the segmental blades 51, intermittently closes the outlet 44 and thus prevents ingress of motive fluid contained in the pipe 44 into the chamber 30 when the said pipe is not in direct communication with the mouths of the conduits 46.

It will be understood that the device may be employed with equal results in connection with engines in which compressed air or other fluid is the motive agent and that if applied to electrically driven devices, an electric motor may be used in place of the turbine to actuate the wheel 43.

Although but one discharge pipe 44 is shown in the drawings, a number of them may be employed at different points of the housing to lead to various parts of the engine, and instead of the small reservoir 10, the oil distributing device may be connected with a tank adapted to hold a number of gallons of oil.

Having thus described my invention what I claim is:—

1. A lubricator comprising in combination, a reservoir, a circular chamber in communication therewith and having an outlet in its circumferential wall, and a rotary member within the said chamber having openings in its lower surface, internal conduits connecting the said openings with its circumferential surface and means to direct fluid contained in the said chamber, into the said openings.

2. A lubricator comprising in combination, a reservoir, a circular chamber in communication therewith and having an outlet in its circumferential wall, and a rotary member within the said chamber, having openings in its lower surface, internal conduits connecting the said openings with its circumferential surface, and downwardly extending wings adapted to direct fluid contained in the said chamber, into the said openings.

3. A lubricator comprising in combination, a reservoir, a circular chamber in communication therewith and having an outlet in its circumferential wall, a rotary member within the chamber, having openings in its lower surface, internal passages connecting the said openings with its circumferential surface and means to direct fluid contained in the said chamber, into the said openings, and an expansible ring surrounding the said member, divided at points opposite the outlets of the said passages and adapted to engage the surrounding wall of the said chamber during movement of the said member.

4. A lubricator comprising in combination, a reservoir, a circular chamber in communication therewith and having an outlet in its circumferential wall, a rotary member within the chamber having openings in its lower surface, internal passages connecting the said openings with its circumferential surface and means to direct fluid contained in the said chamber, into the said openings, and means to intermittently close the outlet of the chamber during movement of the said wheel.

5. A lubricator comprising in combination, a reservoir, a chamber communicating therewith, a conduit connected with the latter, a rotary member within the chamber, having means to centrifugally convey fluid contained in the said chamber, into the said conduit, and a turbine associated with the said member and adapted to actuate the same by impact of a motive fluid.

6. A lubricator comprising in combination a reservoir, a stationary housing including a turbine compartment having an inlet and an outlet for motive fluid and a chamber communicating with the reservoir, a conduit connected with the latter, a rotary member within the chamber having means to centrifugally convey fluid contained therein into the said conduit and a turbine within the compartment, coöperatively connected with the said member.

7. A lubricator comprising in combination, a stationary base, a superposed reservoir, and an interposed conduit, the said base including a motor compartment having an inlet and an outlet for motive fluid and a subjacent chamber, a hollow shaft rotatably mounted within the base, in communication with the said conduit and with the chamber, an outlet conduit connected with the latter, a member within the chamber having means to centrifugally convey liquid contained therein, into the said outlet conduit and a motor within the compartment, the said member and motor being fixed upon the said shaft.

8. A lubricator comprising in combination a stationary base, a superposed reservoir and an interposed, transparent conduit, the said base including a motor compartment having an inlet and an outlet for the motive fluid and a subjacent chamber, an outlet conduit connected with the latter, a hollow shaft axially alined with the said conduit within the base and supported upon a step having means to connect its bore with the chamber, a stationary tube within the shaft in communication with the conduit, a member upon

the shaft, within the chamber, having means to centrifugally convey liquid contained in the latter, into said conduit connected therewith, and a motor upon the shaft within the compartment.

9. A lubricator comprising a reservoir having an outlet, an adjustably arranged needle valve controlling the latter, a chamber communicating with the outlet, and a rotary member within the chamber having means to centrifugally convey liquid contained therein, into a conduit connected therewith.

10. A lubricator comprising a reservoir having an outlet, a needle valve controlling the latter, a chamber communicating with the outlet, a conduit connected with the said chamber a rotary member within the chamber having means to centrifugally convey liquid contained therein, into the said conduit, and means adapted to control the movements of the valve, by influence of motive fluid conveyed thereto.

11. A lubricator comprising a reservoir having an outlet, a needle valve controlling the latter, a chamber communicating with the outlet, a conduit connected with the said chamber a rotary member within the chamber having means to centrifugally convey liquid contained therein into the said conduit, a lever engaging the valve with one of its arms, a piston engaging its opposite arm, means to convey motive fluid to the said piston and means to resiliently maintain the valve in its closing position.

12. A lubricator comprising in combination, a reservoir having an outlet, a needle valve controlling the latter, a chamber communicating with the outlet, a conduit connected with the said chamber a rotary member within the chamber adapted to centrifugally convey liquid contained therein, into the said conduit, a turbine coöperatively associated with the said member, means adapted to control the movements of the valve by the influence of motive fluid conveyed thereto, and conduits connecting the said means and the turbine with a source of motive fluid.

13. A lubricator comprising in combination, a base, a reservoir, and an interposed conduit, the said base including a motor compartment and a subjacent chamber having an outlet, a hollow shaft rotatably mounted within the base, in communication with the said conduit and the chamber, an element within the latter adapted to centrifugally convey liquid contained therein, into the said outlet and a motor within the compartment, the said element and the motor being fixed upon the said shaft.

14. A lubricator comprising in combination, a base, including a motor compartment and a subjacent chamber having an outlet, a reservoir supported upon the said base in communication with the chamber, an element within the latter adapted to centrifugally convey liquid contained therein, into the said outlet, and a motor within the motor compartment coöperatively connected with the said element.

15. A lubricator comprising in combination a base, including a motor compartment and a subjacent chamber having an outlet, a reservoir supported upon the said base, a hollow shaft rotatably mounted within the base to form a conduit between the reservoir and the chamber, an element within the latter adapted to centrifugally convey liquid contained therein, into the said outlet, and a motor within the compartment, the said element and the said motor being fixed upon the shaft.

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

JAMES M. CHAMBERS.

Witnesses:
S. S. Rust,
C. C. Cole.