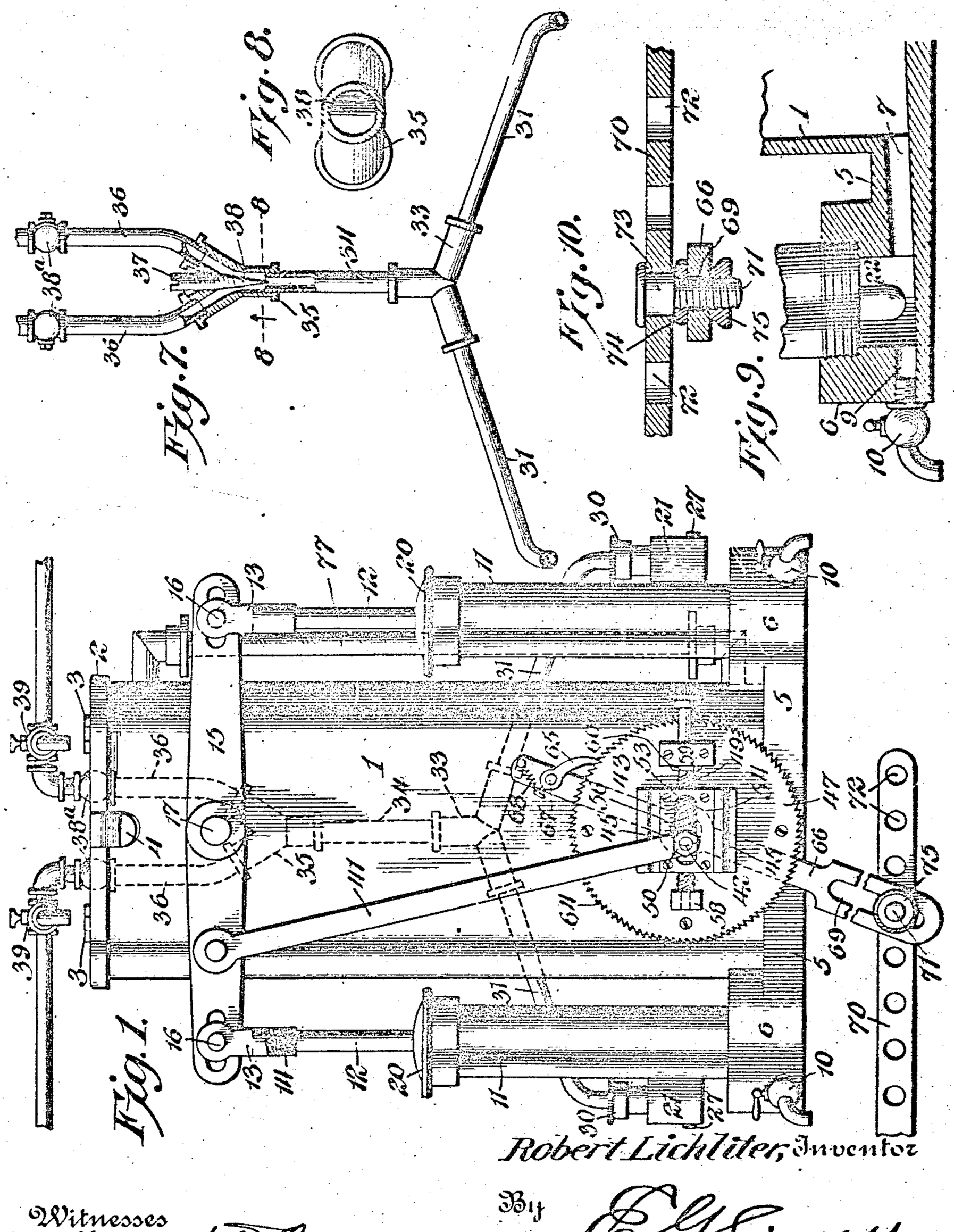
No. 789,923. PATENTED MAY 16, 1905.

R. LICHLITER.

LUBRICATOR.

APPLICATION FILED FEB. 5, 1903.

2 SHEETS—SHEET 1.



Witnesses
Howard D. Orr.
H. C. Riley

Inventor
Robert Lichliter,
By E. G. Siggers.
Attorney

No. 789,923. PATENTED MAY 16, 1905.

R. LICHLITER.

LUBRICATOR.

APPLICATION FILED FEB. 5, 1903.

2 SHEETS—SHEET 2.

Fig. 3.

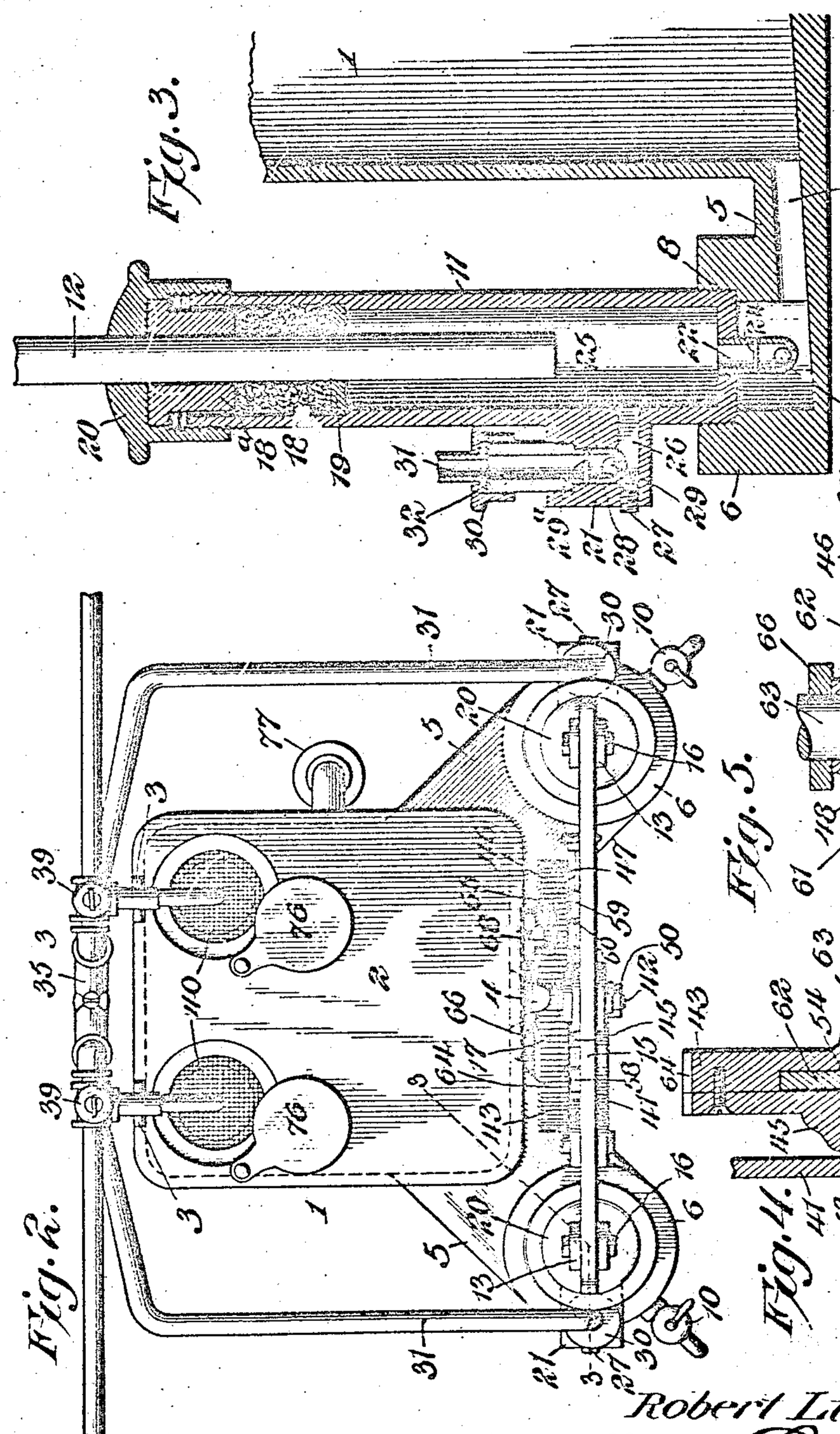


Fig. 6.

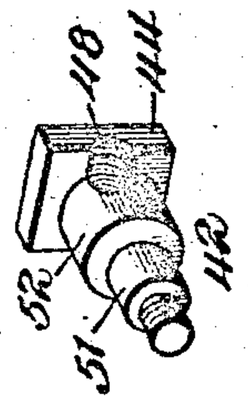


Fig. 2.

Fig. 5.

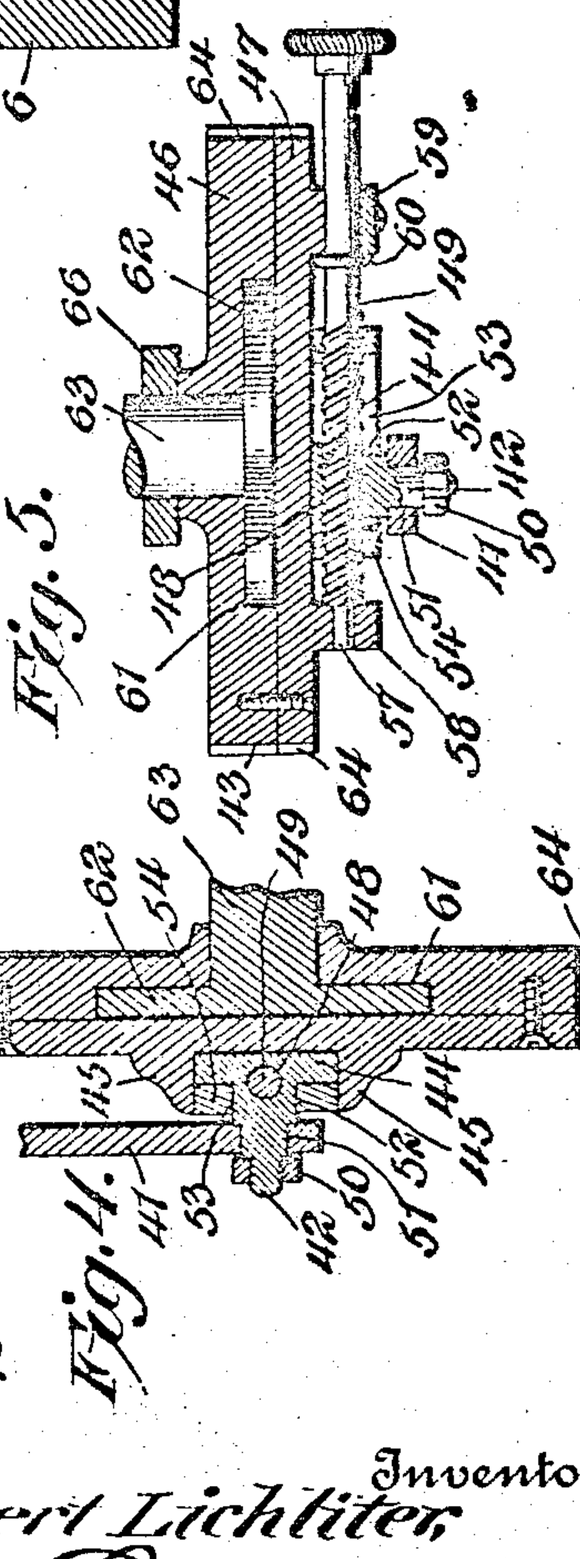


Fig. 4.

Witnesses
Howard D. Orr.
H. J. Riley

Inventor,
Robert Lichliter,
By E. G. Siggers.
Attorney

No. 789,923. Patented May 16, 1905.

UNITED STATES PATENT OFFICE.

ROBERT LICHLITER, OF CHICAGO, ILLINOIS, ASSIGNOR TO ARTHUR H. GOSSLING, OF CHICAGO, ILLINOIS.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 789,923, dated May 16, 1905.

Application filed February 5, 1903. Serial No. 142,035.

To all whom it may concern:

Be it known that I, ROBERT LICHLITER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Lubricator, of which the following is a specification.

The invention relates to improvements in lubricators.

The object of the present invention is to improve the construction of lubricators and to provide a simple, inexpensive, and efficient one designed for use on locomotives, engines, and various kinds of machinery and adapted to afford a continuous supply of oil to the bearings of the desired amount.

A further object of the invention is to provide a lubricator of this character which will be absolutely reliable and which will indicate the quantity of oil supplied to the bearings and enable the engineer to ascertain positively if the lubricator is working properly and if the amount indicated by the dial or scale is being delivered to the bearings.

The invention also has for its object to provide a lubricator which will enable a quantity of oil delivered to the bearings to be quickly changed to adapt the flow of oil to the requirements of a locomotive or other engine or machine.

With these and other objects in view the invention consists in the construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the claims hereto appended, it being understood that changes in the form, proportion, and minor details of construction within the scope of the claims may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is an elevation of the lubricator constructed in accordance with this invention. Fig. 2 is a plan view of the same. Fig. 3 is a vertical sectional view on the line 3 3 of Fig. 2. Fig. 4 is a detail sectional view of the ratchet-wheel, illustrating the manner of connecting the same with the pump-operating mechanism. Fig. 5 is a sectional view taken at right angles to Fig. 4. Fig. 6 is a detail perspective view of the slidable pivot or wrist-pin. Fig. 7 is a detail view of the distributing-pipes. Fig. 8 is a detail sectional view on the line 8 8 of Fig. 7. Fig. 9 is a detail sectional view illustrating the manner of mounting the cocks or faucets at the lower ends of the pumps. Fig. 10 is a detail view illustrating the manner of connecting the reciprocating actuating-bar with the vibratory lever.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a reservoir constructed of any suitable material of sufficient strength to enable the lubricator to be firmly mounted on a suitable support, and the said reservoir, which is preferably rectangular in cross-section, is provided with a cover 2, hinged at the back at 3 and provided at the front with a suitable catch 4 for holding it in its closed position. The cover may be mounted in any other desired manner, and the reservoir is provided at its base with arms or extensions 5, located at the front corners, as clearly illustrated in Fig. 2 of the drawings, and provided at their outer ends with suitable sockets 6, having upstanding annular walls and connected at the bottom with the reservoir by passages or ducts 7. The sockets, which have interiorly-threaded upper portions 8, are pierced at their outer walls by horizontal passages 9, (see Fig. 9,) which are threaded for the reception of cocks or faucets 10 and which are arranged in alinement with the passages or ducts 7, whereby the latter may be readily cleaned should they become clogged. The cocks or faucets, which are of the ordinary construction, enable the reservoir to be drained when desired, and they are readily removable to permit a suitable instrument to be introduced into the ducts or passages 7 should the latter become clogged.

The upper threaded portions 8 (see Fig. 2) of the sockets of the arms 5 receive the lower ends of upright cylinders 11 of force-pumps, which are exteriorly threaded at the lower ends of the cylinders to fit the said sockets,

suitable seats being formed in the latter for the pump-cylinders. The force-pumps are provided with vertically-reciprocating plungers or pistons 12, having adjustable yokes or sections 13 at their upper ends, and these yokes or sections are provided with lower threaded sockets 14 to receive the upper ends of the body portions of the plungers or pistons 12. The interiorly-threaded sockets of the yokes and the threaded upper ends of the plungers or pistons permit the parts to be adjusted to vary the length of the said plungers or pistons. The sides of the yokes or sections 13 receive the ends of a walking-beam 15, which is slotted for the reception of pivots 16 for connecting the walking-beam with the yokes or sections of the pistons or plungers of the force-pumps. The slots permit the necessary lateral play of the parts incident to the oscillation of the walking-beam 15. The walking-beam is centrally pivoted on the reservoir, near the top thereof, by a horizontal stud 17, which may be fixed to the adjacent wall of the reservoir in any desired manner. The pistons or plungers of the force-pumps are reversely reciprocated by the walking-beam, so that there is practically a positive feed of the lubricant to the bearings at all times, irrespective of the position of the plungers or pistons. The plungers or pistons extend through suitable stuffing-boxes at the upper ends of the pump-cylinders, and these stuffing-boxes comprise a suitable packing 18 and a metallic gland 18ª of the ordinary construction and are interposed between a seat 19 and a cap 20, which fits over the upper end of the cylinder and which is threaded to engage the same. The disk 19, which forms a seat or support for the packing, is arranged upon a suitable shoulder formed on the interior of the cylinder, as clearly illustrated in Fig. 3 of the accompanying drawings. Each cylinder is provided at one side with an enlargement 21 and is provided at its bottom with an opening, which is interiorly threaded to receive the upper exteriorly-threaded end of an upright valve-casing 22, rounded at the bottom, as clearly shown in Fig. 3, to form a seat for a ball 23. The ball forms a check-valve, and its movement within the valve-casing is limited by a horizontal pin 24, located above and spaced from the ball and piercing the walls of the valve-casing. The valve of the bottom of the cylinder is adapted to open on the upstroke of the piston or plunger to permit the oil to flow into the cylinder, and it closes and remains closed on the downstroke, whereby the oil is forced out of the pump by the plunger or piston.

The enlargement 21 of the pump-cylinder is pierced by vertical and horizontal bores 25 and 26, the vertical bore extending downward from the top of the enlargement and terminating short of the bottom thereof, and the horizontal bore being extended entirely through the enlargement and constituting a communication between the upright bore or passage and the interior of the cylinder. The outer end of the horizontal bore or passage is normally closed by a plug 27, which is adapted to be readily removed to permit an instrument to be used for cleaning the valve should the passages become clogged. Within the upright bore or passage 25 is arranged a valve casing 28, receiving a ball 29 and having a rounded lower end similar to the valve-casing 22 to form a valve-seat for the ball. The bottom of the valve-casing 28 is provided with an opening for the passage of the oil, and the upward movement of the ball is limited by a horizontal pin 29ª. The pin pierces the walls of the valve-casing, which is exteriorly threaded to engage corresponding interior screw-threads of the upper portion of the enlargement 21. The valve-casings 28 extend above the enlargements and are exteriorly threaded for the reception of couplings or caps 30, which are threaded, as shown in Fig. 3, and which secure the adjacent ends of lower branch distributing-pipes 31 to casings 28. The lower branch distributing-pipes 31 are provided at their lower ends with flanges 32 for engaging the caps or couplings, and the upper ends are connected by an approximately T-shaped coupling 33, Fig. 7, with a pipe 34, having a coupling 35 at its upper end. The coupling 35 is Y-shaped, and its upper arms are connected with upper branch distributing pipes or tubes 36, extending to the bearings to be lubricated; but the upper coupling may be T-shaped, similar to the lower one, if desired. The crotch formed by the upper arms of the coupling 35 is pierced and threaded for the reception of a shank 37 of a wedge 38, located centrally within the lower arm of the coupling and arranged at the upper end of the intermediate connecting pipe or tube 35 and adapted to separate and divide the oil flowing through the distributing-pipes, whereby a practically-continuous supply of oil will be positively delivered to the bearings to be lubricated at all times, irrespective of the position of the plungers or pistons of the pumps. One of the plungers or pistons is moving downward at all times except at the instant of reversal of motion of the beam 15, and the oil forced outward by such plunger will be divided by the wedge and caused to flow through the upper or outer distributing pipes or tubes. The lower end or apex of the wedge is arranged centrally of the upper or outer end of the intermediate connecting pipe or tube and extends entirely across the same, as clearly shown in Fig. 8 of the accompanying drawings. The distributing pipes or tubes may, as illustrated in the accompanying drawings, extend to the back of the reservoir or they may be located wholly in front of the same, and their upper portions

are provided with globe-valves 38ª and with cocks or faucets 39, Fig. 2, having nozzles extending inwardly or forwardly over the reservoir, which is provided in its top with screen-covered openings 40, forming strainers and located directly beneath the discharge ends of the cocks or faucets 39 to permit oil to flow from the seam into the reservoir. By this construction an engineer is enabled to divert the oil from the bearings and cause the same to discharge through the faucets 39 back into the reservoir in order to ascertain exactly the amount of oil being delivered to the bearings. By this construction the operator may ascertain accurately whether the feed of the lubricator corresponds to the indicator, and any inaccuracy may be readily corrected by the valves 38ª to prevent the lubricant from discharging or feeding too irregularly. Should there be any difference in the feed or discharge of the two distributing-pipes, it may be readily corrected by adjusting the valves 38ª. Also these valves will enable the discharge of the distributing-pipes to be varied, and should for any reason it be desirable to supply one set of bearings with more oil than the other the valves 38ª may be adjusted to constrict one of the distributing-pipes and relatively enlarge the passage of the other.

The walking-beam is connected by a bar or pitman 41 with an adjustable wrist-pin 42, which is adapted to be moved inward and outward toward and from the center of the ratchet-wheel 43 to vary the length of the stroke, and consequently the amount of oil forced through the distributing-pipes by the plungers or pistons. The adjustable pivot or wrist-pin is provided with a polygonal body portion 44 of rectangular form arranged in a suitable guide or way of the ratchet-wheel formed by parallel ribs or flanges 45, as clearly illustrated in Fig. 4 of the drawings. The ratchet-wheel, which may be of any desired construction, is preferably composed of inner and outer sections 46 and 47, the inner section being preferably constructed of steel to form a bearing and the outer section being preferably made of brass or other suitable material. The inner portion of the adjustable pivot or wrist-pin is provided with a threaded opening 48 for the reception of an adjusting-screw 49, and the outer portion of the same is threaded for a nut 50. The intermediate portion of the pivot or wrist-pin is of two diameters, the smaller portion 51 forming the pivot proper and passing through a perforation of the lower end of the connecting bar or pitman 41. The larger portion 52 is arranged in a slot 53 of a plate 54, arranged between the ribs or flanges 45, as illustrated in Fig. 4 of the drawings, and provided with a scale 56 for indicating the position of the wrist-pin or pivot, and consequently the amount of oil fed to the bearings. The inner end 57 of the adjusting-screw is reduced to form a journal and is arranged in a bearing-opening of the lug 58, formed integral with the outer section of the ratchet-wheel, as clearly shown in Figs. 1 and 5, and the outer portion of the adjusting-screw is arranged in a bearing 59, having a removable plate adapted to be readily detached to permit the adjusting-screw to be arranged in and removed from its bearings. The adjusting-screw is provided with a collar or flange 60, forming a shoulder for engaging the outer bearing 59, and a suitable head having a milled periphery is arranged at the outer end of the screw to form a grip or handle. The long threads of the adjusting-screw engage corresponding threads of the pivot or wrist-pin and enable the pivot or wrist-pin to be quickly adjusted radially by a slight rotation of the adjusting-screw, and the feed of the oil changes instantly with the adjustment of the screw. This is highly advantageous, especially in starting a heavy train, where the movement of the parts are slow and where there is a heavy strain. A large amount of oil may be supplied at this time, and the feed may be reduced while the train is running at a high rate of speed, as less oil will then be required. The plate, which is graduated to form a scale, may be secured to the ratchet-wheel in any suitable manner, and its slot limits the adjustment of the pivot or wrist-pin and prevents the pistons or plungers from being reciprocated too far. The inner section 46 of the ratchet-wheel is suitably secured, by screws or other suitable fastening devices, to the outer section, and it is provided with a central recess 61 to receive a head or flange 62 of a stud or stub-shaft 63, upon which the ratchet-wheel rotates. The ratchet-wheel is also provided at its inner section with a central opening communicating with the recess 61 and receives the stub-shaft or stud 63, as clearly shown in Fig. 4. The stud or stub-shaft is suitably fixed to the front of the reservoir, and it forms a support for the ratchet-wheel and is located directly beneath the pivot 17 of the walking-beam, as clearly indicated in Fig. 1 of the drawings. The ratchet-wheel 64 is provided with any desired number of ratchet-teeth to produce the desired rotation, so that the ratchet-wheel will make one complete rotation at the end of the desired number of revolutions of the drive-shaft or eccentric of an engine; but it may be arranged to be operated by and correspond with any other movable portion of an engine or machine, as will be readily understood. The ratchet-wheel is engaged by an actuating pawl or dog 65, pivoted to the upper portion of an oscillatory lever 66, which is provided between its ends with an opening for the reception of the stub-shaft 63, upon which the ratchet-wheel is mounted. The actuating pawl or dog is pivoted to the upper arm of

the lever 66 by a screw 67 and is connected with a spring 68, which holds the tooth of the pawl or dog in engagement with the ratchet-wheel. The lower arm of the lever is provided with a longitudinal slot 69 and is adjustably secured to a reciprocating rod 70 by a screw 71. The reciprocatory rod or bar 70 is designed to be connected with the eccentric or with any other movable portion of an engine or machine, and it is provided, adjacent to the lever 66, with a series of perforations 72 for the reception of the screw. The screw has a smooth portion 73, which forms a pivot and which receives the actuating rod or bar, and the threaded portion of the screw passes through the slot of the lever and is rigidly secured to the same by inner and outer nuts 74 and 75. The rod or bar 70 is arranged between the head of the screw and the inner nut. The screw 67, which forms the pivot of the pawl or dog 65, is constructed similarly to the screw 71 just described, and all of the pivots of the lubricator may be arranged in a similar manner, if desired.

The adjustable connection between the reciprocating actuating-bar and the vibratory lever enables the length of the active portion of the lower end of the lever to be varied to vary the stroke of the upper arm and the consequent movement of the pawl or dog to cause the ratchet-wheel to be advanced the desired number of teeth at each stroke of the machine or engine. The adjustable pivot or wrist-pin controls the movement or length of stroke of the plungers or pistons and the amount of oil fed to the bearings by the force-pumps. By these adjustments the desired quantity of oil may be supplied to the bearings to be lubricated in a given interval of time, and the feed of the lubricant is positive and practically continuous, as one of the plungers or pistons is always moved downward by the actuating mechanism.

The reservoir is provided at its top with a pair of pivoted plates or covers 76, adapted to be swung over the screened apertures to exclude dust from the reservoir when the cocks or faucets of the distributing-pipes are not in use. The reservoir is designed to be provided with a suitable glass sight-gage 77 to enable the quantity of oil within the reservoir to be ascertained.

What I claim is—

1. In a device of the class described, the combination of a reservoir provided at opposite sides with exterior projecting arms having exteriorly-arranged sockets, said arms being also provided with passages extending from the sockets to the interior of the reservoir, upright pumps fitted in the sockets of the arms and provided with pistons, a walking-beam pivoted between its ends and connected with the pistons of the pumps, and operating mechanism located between the pumps and connected with one of the arms of the walking-beam, substantially as described.

2. In a device of the class described, the combination of a reservoir having an arm provided with a socket, said arm having inner and outer bores, the inner bore extending from the socket to the reservoir and the outer bore being arranged in alinement with the inner bore, a pump mounted in the socket, a cock or faucet fitted in the outer bore and removable therefrom to afford access to the inner bore, and a distributing-pipe connected with the pump, substantially as described.

3. In a device of the class described, the combination of a reservoir, pumps having reversely-reciprocating pistons, a walking-beam connected with the pistons, a ratchet-wheel provided with an adjustable wrist-pin, a vibratory lever provided with a pawl or dog for engaging the ratchet-wheel and having a slot, an actuating-bar having perforations, a pivot adjustably mounted in the slot of the lever and arranged in one of the perforations of the bar, and means for connecting the walking-beam with the wrist-pin, substantially as described.

4. In a device of the class described, the combination with a reservoir and a pump, of a ratchet-wheel mounted to turn and provided with guide ribs or flanges, a slidable wrist-pin arranged between the guides or flanges and having a threaded aperture, a plate extending across the space between the guides or flanges and having a slot to receive the wrist-pin and provided with a scale, an adjusting-screw journaled in suitable bearings of the ratchet-wheel and engaging the threads of the aperture of the wrist-pin, and means for connecting the pump with the wrist-pin, substantially as described.

5. In a device of the class described, the combination of a reservoir, a pump, a stub-shaft having a head, a ratchet-wheel composed of sections, one of the sections being provided with an opening to receive the stub-shaft and having a recess for the reception of the head, a wrist-pin carried by the ratchet-wheel, means for connecting the wrist-pin with a pump, and mechanism for actuating the ratchet-wheel, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ROBERT LICHLITER.

Witnesses:
HENRY JACOBSEN,
S. H. PARKER.