

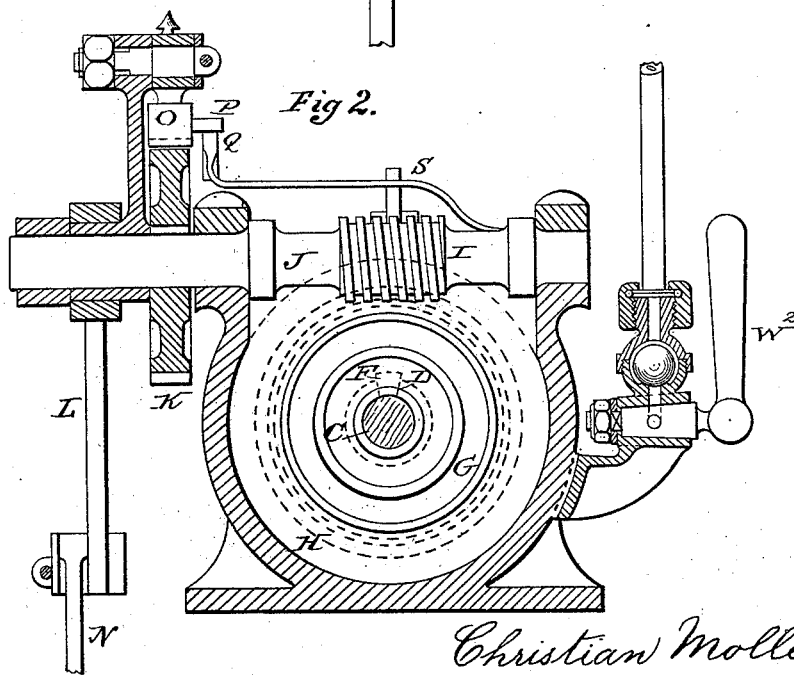
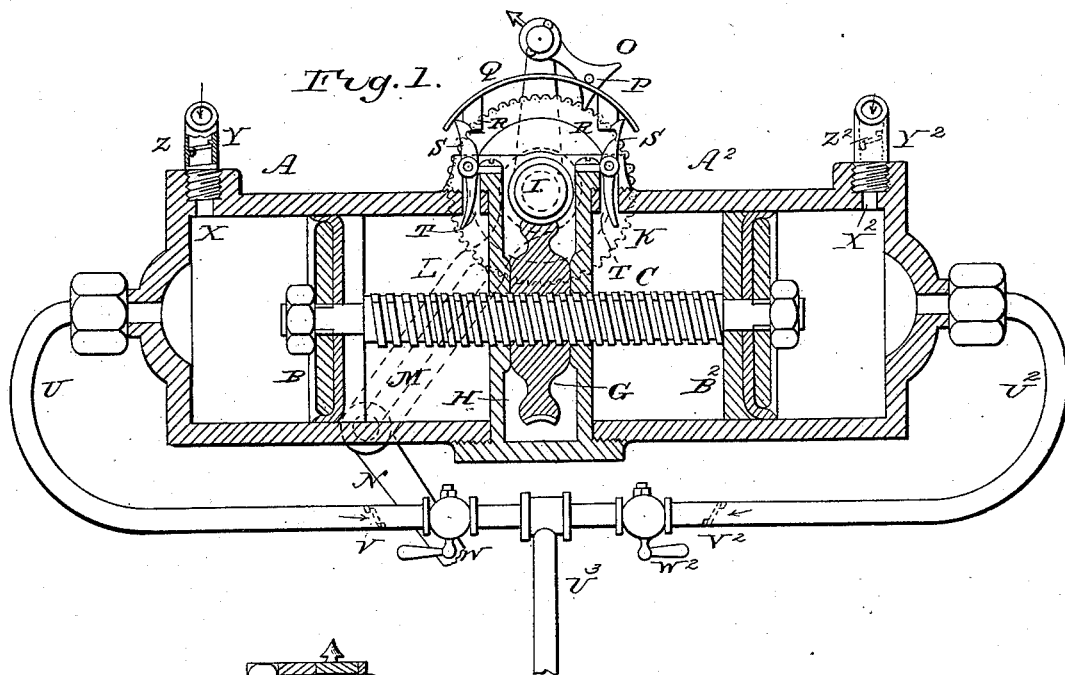
(No Model.)

2 Sheets—Sheet 1.

C. MOLLERUP.
LUBRICATOR.

No. 307,319.

Patented Oct. 28, 1884.



WITNESSES:

Ad. L. Dietrich,
Wm. Bagge,

Christian Mollerup,
INVENTOR,
by Louis Bagge & Co,
ATTORNEYS.

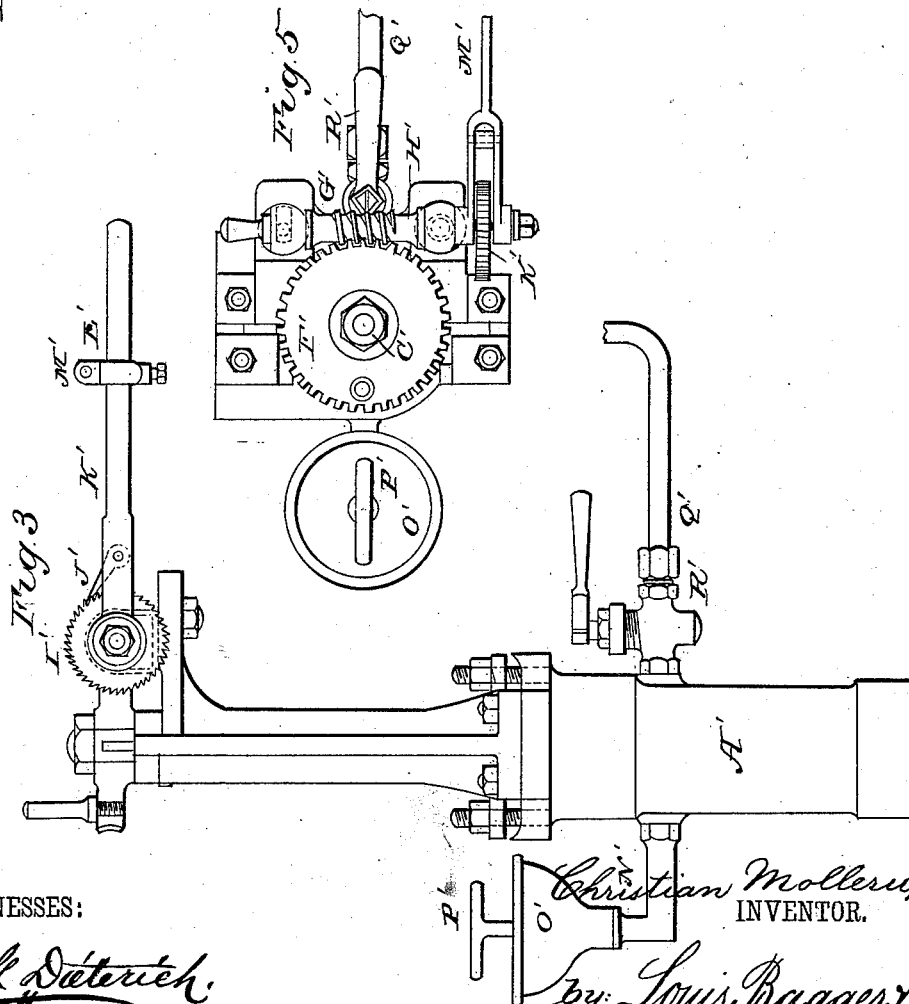
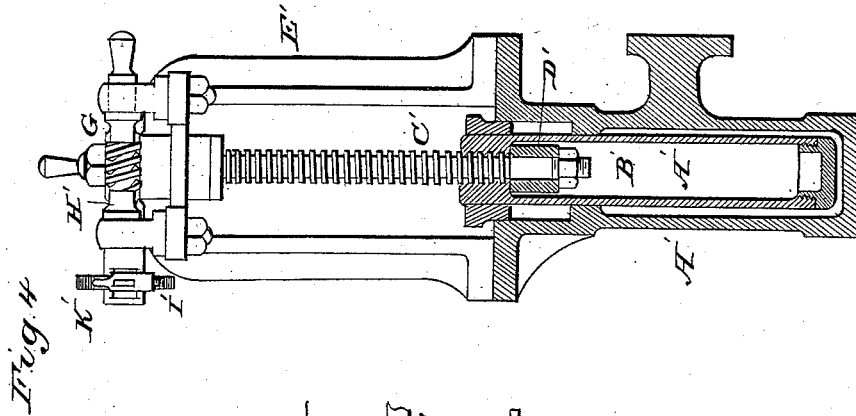
(No Model.)

2 Sheets—Sheet 2.

C. MOLLERUP.
LUBRICATOR.

No. 307,319.

Patented Oct. 28, 1884.



WITNESSES:

Ed. L. Dieterich.
Wm. Bagger.

Christian Mollerup,
INVENTOR.
by *Louis Bagger & Co.*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHRISTIAN MOLLERUP, OF DALUM, NEAR ODENSE, DENMARK.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 307,319, dated October 28, 1884.

Application filed September 15, 1884. (No model.) Patented in Germany October 7, 1879, No. 9,060; in Denmark November 6, 1879, No. 1,589; in Sweden February 6, 1880; in England May 18, 1881, No. 2,165; in Belgium July 30, 1881, No. 55,136; in Norway August 20, 1881; in France November 4, 1881, No. 144,655; in Russia March 22, 1882, No. 1,968; in Austria-Hungary September 11, 1882, No. 18,730 and No. 35,707, and in Italy June 30, 1884, No. 16,965.

To all whom it may concern:

Be it known that I, CHRISTIAN MOLLERUP, a subject of the King of Denmark, residing at Dalum, near Odense, in the Kingdom of Denmark, have invented certain new and useful Improvements in Lubricators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Figure 1 is a longitudinal vertical sectional view of my improved lubricator. Fig. 2 is a vertical transverse sectional view of the same. Fig. 3 is a vertical sectional view illustrating a modification. Fig. 4 is a side elevation of the latter, and Fig. 5 is a plan view illustrating the modified construction of the device.

The same letters refer to the same parts in all the figures.

This invention relates to lubricators; and it has for its object to provide a device adapted to be operated by some suitable part of the machine to be lubricated; by means of which at each stroke or pulsation a given quantity of the lubricant shall be supplied to the place to be lubricated, and which shall be certain and automatic in its action, and possessed of superior advantages in point of simplicity, durability, and general efficiency.

With these ends in view the invention consists in the improved construction and arrangement of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, A A² designate two cylinders, arranged horizontally in a line with each other, their inner ends being suitably connected, as shown. The pistons B B² of the said cylinders are connected by a piston-rod, C, which is screw-threaded throughout its entire length, and for the passage of which openings are provided in the inner adjoining ends of the cylinders. The said piston-rod is provided with a longitudinal groove, D, in which is fitted a key or feather, F, to prevent it from turning.

G is a worm-wheel, the bore of which is threaded, so as to form a nut for the screw-threaded piston-rod C, upon which it is placed in the space H between the cylinders. The worm-wheel G meshes with a worm, I, formed upon a shaft, J, which is journaled in suitable bearings transversely above the cylinders. One end of the said shaft has a toothed wheel, K, in rear of which is a bell-crank lever, L, journaled loosely upon the said shaft. The lower arm of the lever L has a slot, M, in which one end of a pivoted connecting-rod, N, is adjustable, said rod serving to connect the bell-crank lever with some suitable part of the machine to be lubricated, and whereby the lubricator is operated. The upper end of the bell-crank lever carries a pawl, O, engaging the toothed wheel K, and having a forwardly-projecting stud, P, resting on a bow, Q, which is secured upon the ends of a pair of flat springs, R R, which latter engage and are held depressed by the pivoted latch-levers S S, the lower ends of which extend through openings or slots T T into the inner ends of the cylinders, so as to be capable of being operated by the pistons of the latter, as will be presently described. The ends of the cylinders are connected by pipes or tubes U U² with a third tube, U³, through which the oil is conveyed to the part which is to be lubricated. The tubes U U² are provided at some suitable point—for instance, at or near the point where they are connected with the tube U³—with back-pressure valves V V², and they are also provided with suitably-located cocks or faucets W W². The upper sides of the cylinders are provided, at or near the ends, with openings X X², into which are screwed pipes Y Y², by which they are connected with some suitable oil-reservoir. (Not shown in the drawings.) The pipes Y Y² are also to be provided with back-pressure valves Z Z².

The operation of this invention is as follows: The bell-crank lever L is vibrated by the operation of the machine which is to be lubricated, the length of the stroke being regulated by adjusting the connecting-rod N at the desired distance from the fulcrum of the said lever. The pawl O, engaging the toothed wheel

K, will cause the latter to revolve, while the worm upon the shaft J will impart a rotary motion to the worm-wheel G, thereby causing the piston-rod to travel longitudinally in the cylinders. The suction of the piston in one of the cylinders, moving toward the inner end of the latter, will cause it to be filled with oil through the supply-pipe Y, (or Y², as the case may be,) while the piston in the other cylinder expels the lubricant from the latter through the pipe U or U², and thence through the pipe U³ to the part of the machinery which is to be lubricated, and with which the said pipe is connected. When the inwardly-moving piston, which may be supposed to be B, nearly reaches the end of the cylinder, it comes in contact with the latch S, thus releasing the spring R, held thereby, and causing the corresponding end of the bow Q to fly suddenly in an upward direction, striking the stud P of pawl O and turning the latter upon its pivot, so as to reverse its position with relation to the axis of the toothed wheel K, thereby reversing the direction of the rotation of the latter. Oil will now be expelled from the cylinder which was formerly being filled, and vice versa. The back-pressure valves will prevent oil from being expelled through the pipes Y Y² or from being drawn in through the pipes U U², and the cocks W W² will enable the oil-supply to be cut off from either end of the cylinder, when desired, for cleansing or repairing purposes. When one end of the bow has been released from the latch S in the act of reversing the apparatus, it must be reset by hand before the apparatus is again in position to reverse. Should this be neglected and the opposite end of the bow Q be likewise released, the bow will be so far elevated as to hold the pawl O out of engagement with the toothed wheel K, thus simply suspending the operation without any possibility of breakage or injury to the apparatus. This form of my improved lubricator, it will be seen, is self-filling and entirely automatic in its action, with the trifling exception of the necessity for occasionally resetting the bow Q, which may be done at any convenient time before the reversal of the device.

In Figs. 3, 4, and 5 I have shown a modification of my invention, which consists, mainly, in applying a principle of operation similar to that already described to a single cylinder, which of course involves the necessity of refilling the cylinder by hand when empty. A' designates the cylinder, which is vertical, and provided with a hollow piston, B', the upper end of which forms a bearing for a screw, C', upon which the said piston may travel. The piston is prevented from turning in the cylinder by frictional contact with the packing in a stuffing-box, D', at the upper end of cylinder. The latter is provided with a yoke, E', in which the upper end of the screw C' is journaled in such a manner as to prevent its longitudinal displacement. The upper end

of the screw C' carries a horizontal worm-wheel, F', engaging a worm, G', upon a shaft, H', journaled transversely in suitable bearings upon the yoke E'. The said shaft is provided with a ratchet-wheel, I', engaging a pawl, J', which is pivoted to a lever or handle, K', mounted loosely upon the said shaft H'. The lever K' has an adjustable sleeve, L', connected by a pivoted rod, M', with some suitable moving part of the machine to be lubricated, and from which the lubricator derives its motion, the speed, and consequently the oil-supply, being regulated by properly adjusting the sleeve L' upon the lever K'. One side of the cylinder A' is provided with a pipe, N', carrying a suitable oil-supply cup, O', having a cock or valve, P', and the other side of the cylinder is provided with an exit-pipe, Q', leading to the part which is to be lubricated, and having a cock, R'.

The operation of this device will be readily understood. The shaft H', being operated by lever K', communicates motion through its worm G' to the wheel F', thereby turning the screw C' and causing the piston to descend, forcing the oil contained in the cylinder out through the pipe Q. When the piston has reached the limit of its motion, it will revolve with the screw C' against the friction caused by the contents of the packing-box without danger of breakage or injury.

In order to refill the cylinder, the worm G' is disengaged from the wheel F', which may be easily done by properly constructing the bearings of the shaft H'. The screw may then be easily turned, so as to raise the piston by means of a crank or handle, S', upon the worm-wheel F'. While this is being done it is obvious that the cock R' should be closed and the valve P' of the oil-supply open.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a lubricator, the combination, with a cylinder having a supply and an exit pipe for the lubricant, of a piston or follower adapted by its movement in opposite directions to fill the cylinder and to expel the lubricant from the same, and a screw-threaded suitably-operated stem or piston rod, substantially as and for the purpose set forth.

2. In a lubricator, the combination of a cylinder having a supply and an exit pipe for the lubricant, the piston or follower, suitable operating mechanism, and means for preventing breakage when the said piston or follower reaches the limit of its movement, substantially as and for the purpose set forth.

3. A lubricator comprising a pair of cylinders arranged in a line with each other, and having supply and exit pipes for the lubricant, the pistons mounted upon a common piston-rod sliding longitudinally in the inner adjoining ends of the cylinders, and suitable operating mechanism, substantially as and for the purpose set forth.

4. In a lubricator, the combination of a pair of cylinders arranged in a line with each other, and having supply and exit pipes for the lubricant, the pistons, a screw-threaded piston-rod connecting the same and sliding in the inner adjoining ends of the cylinders, means for preventing the said piston-rod from turning in its bearings, and interiorly-threaded worm-wheel mounted upon the screw-threaded piston-rod between the ends of the cylinders, and suitable operating mechanism, substantially as and for the purpose set forth.

5. In a lubricator, the combination of a pair of cylinders arranged in a line with each other, and having supply and exit pipes for the lubricant, pistons or followers mounted upon a piston-rod arranged to slide in the inner adjoining ends of the cylinders, suitable operating mechanism, and mechanism for automatically reversing the motion when the pistons reach the limits of their movement, substantially as and for the purpose set forth.

6. In a lubricator, the combination of a pair of cylinders arranged in a line with each other, the pistons mounted upon the ends of a piston-rod sliding in the inner adjoining ends of the cylinders, supply and exit pipes for the lubricant, suitable operating mechanism for the piston-rod, actuated by a transverse shaft carrying a toothed wheel, a bell-crank lever mounted upon the said shaft, and having one arm connected by a pivoted rod with some

suitable moving part of the machinery to be lubricated, and having pivoted to its other arm a reversible pawl engaging the toothed wheel and provided with a forwardly-projecting stud, a bow mounted upon the ends of a pair of flat springs and supporting the said stud, and a pair of pivoted latches adapted to engage the said springs and retain them in a depressed position, and having their lower ends extending through slots into the inner ends of the cylinders, where they will be operated by the pistons when the latter approach the limits of their inward movements, substantially as and for the purpose herein shown and specified.

7. In a lubricator constructed substantially as described, and having a pair of cylinders arranged in a line with each other, and provided with pistons mounted upon a common suitably-operated rod, the inlet-pipes connecting the cylinders with a suitable oil-reservoir, and having back-pressure valves, and the outlet-pipes equipped with cocks and back-pressure valves, and connecting with a third pipe leading to the part to be lubricated, substantially as and for the purpose set forth.

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

CHRISTIAN MOLLERUP.

Witnesses:

M. OLANSEN,
GAWRITZ ANDERSON.