No. 753,859. PATENTED MAR. 8, 1904.

M. CROWTHER.

SELF REGULATING OIL CUP.

APPLICATION FILED MAY 27, 1903.

NO MODEL.

Fig. 1.

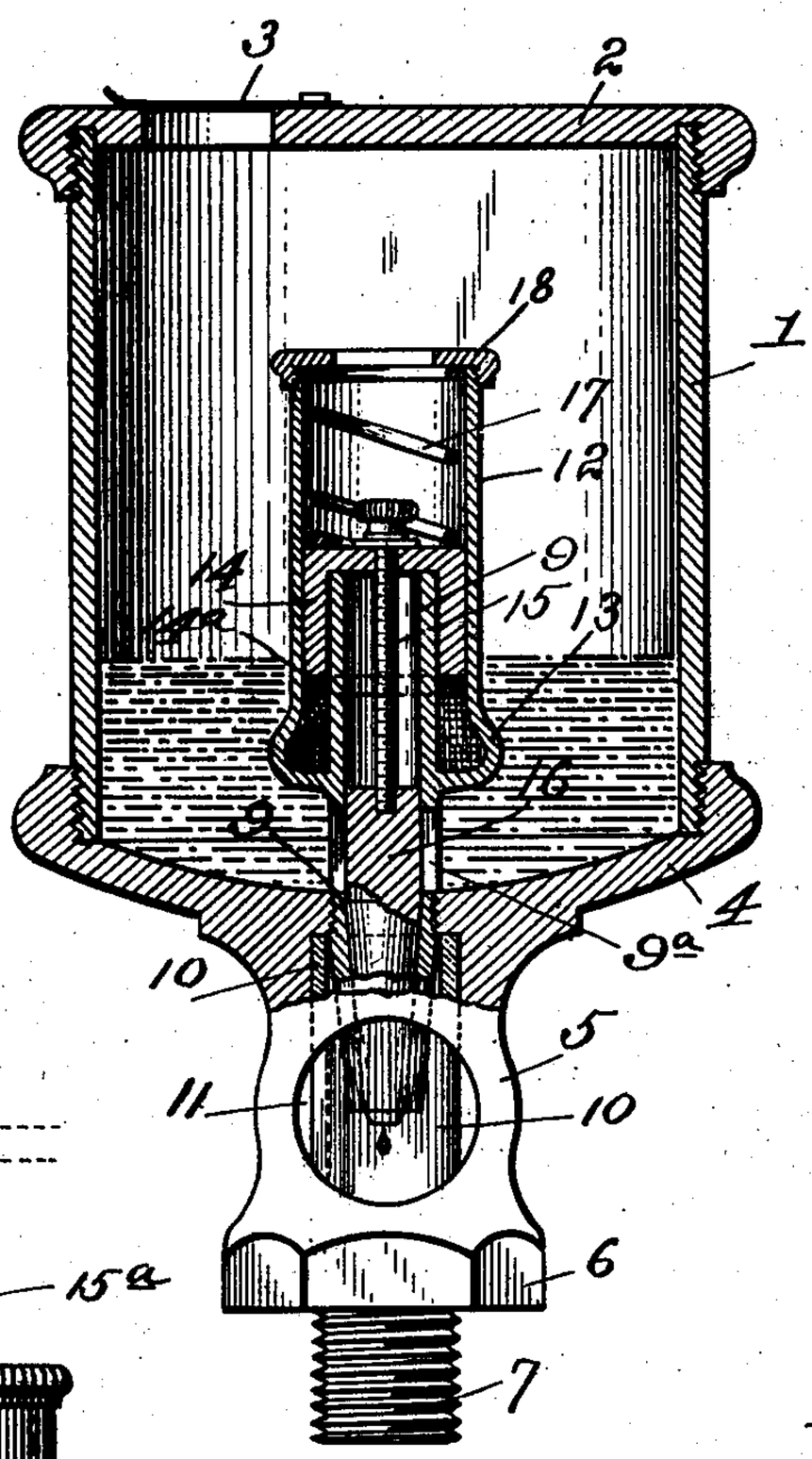


Fig. 2.

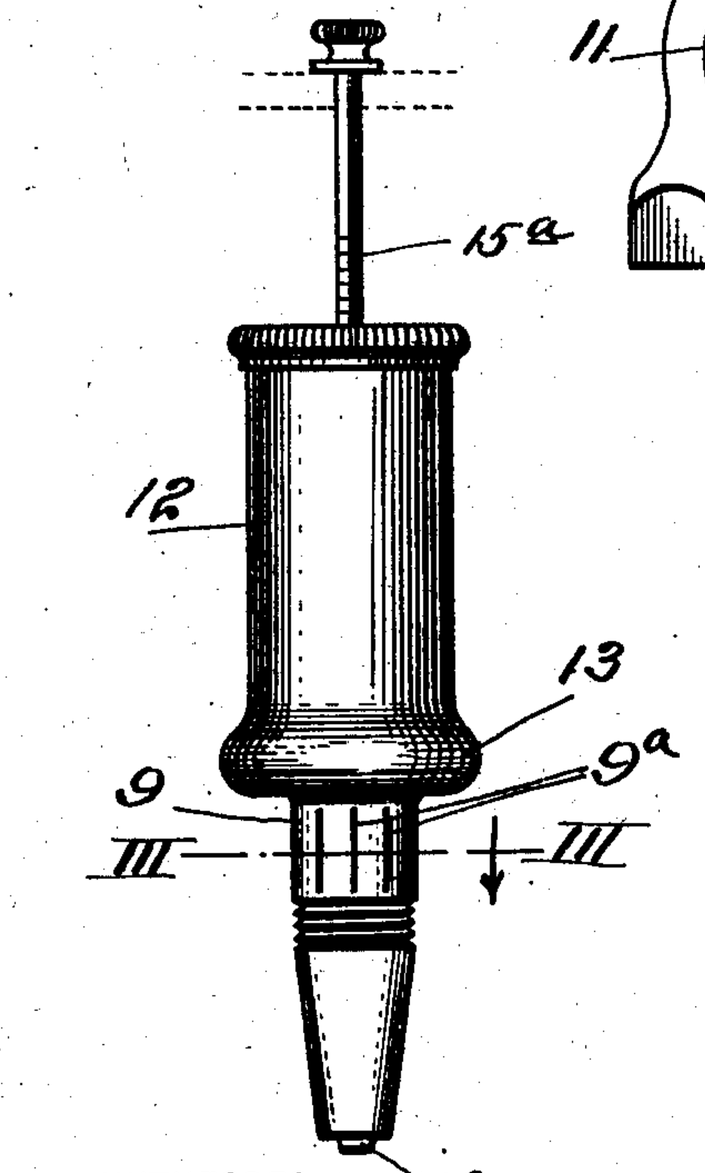
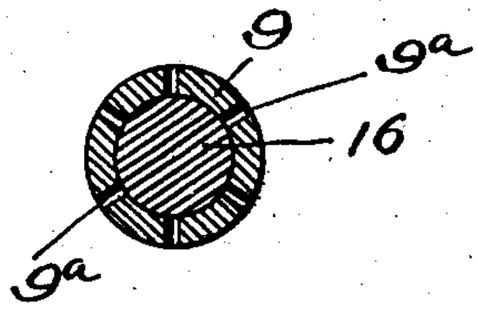


Fig. 3.



WITNESSES:

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No. 753,859. Patented March 8, 1904.

UNITED STATES PATENT OFFICE.

MATTHIAS CROWTHER, OF WEST PITTSTON, PENNSYLVANIA.

SELF-REGULATING OIL-CUP.

SPECIFICATION forming part of Letters Patent No. 753,859, dated March 8, 1904.

Application filed May 27, 1903. Serial No. 158,958. (No model.)

To all whom it may concern:

Be it known that I, MATTHIAS CROWTHER, a citizen of the United States, residing in the borough of West Pittston, county of Luzerne, State of Pennsylvania, have invented certain new and useful Improvements in Self-Regulating Oil-Cups, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a central vertical sectional view of the complete cup; Fig. 2, a side elevation of the automatic valve device removed from the oil-cup, and Fig. 3 a detail transverse sectional view of the feed-valve.

The main object of this invention is to provide an improved lubricating device which will be governed in its operation by the temperature of the journal to which it is to supply oil, the feed-valve thereof being so mounted as to respond positively to every slight expansion or contraction of a thermostatic medium, which is in a position to be affected by the temperature of the journal.

Other important objects and advantages will appear hereinafter.

Referring to the various parts by numerals, 1 designates an oil reservoir or cup, which may be of brass or glass, as desired. To the upper end of this reservoir is screwed the top 2, which is formed with a filling-opening, said opening being provided with a cover 3. To the lower end of this reservoir is screwed the bottom 4, which is provided with the central depending tubular part 5, a wrench-receiving part 6 being formed at the lower end thereof. A reduced threaded extension 7 is formed below the wrench part 6, which is adapted to engage a correspondingly-threaded opening in the bearing to which the lubricator is to be attached.

Screwed centrally into the bottom 4 and extending up into the oil-reservoir is a valve-tube 9, whose lower end is inwardly and downwardly tapered and extends into a glass tube 10, fitted in the tubular part 5 of the bottom. Transverse apertures 11 are formed through the part 5, so that the lower end of the valve-tube may be observed through the glass tube 10 and the feed of oil noted.

Secured to the valve-tube 9 a short distance above the bottom of the oil-reservoir is a cylinder 12, said cylinder being larger in diameter than the valve-tube, so that an annular chamber will be formed between the upper end of the valve-tube and the lower end of the cylinder. This cylinder is enlarged at its lower end, as at 13, to receive a supply of mercury or other thermostatic fluid or medium. Snugly fitting the interior of this cylinder 12 and adapted to extend down into the annular space between it and the upper end of the valve-tube is a tubular piston 14, whose upper end is closed, said closed end in the normal position of the piston—that is, when the valve is closed—resting on the upper end of the valve-tube. To the lower end of this piston is secured a packing-ring 14^a, said packing-ring resting directly upon the thermostatic medium contained in the cylinder. Connected to the upper wall of the piston is a depending screw-rod 15, which extends centrally through the valve-tube and is connected at its lower end to the valve 16. This valve is formed with the cylindric upper portion, which snugly fits within the valve-tube, and with the tapered lower part, which corresponds to the tapered lower portion of the valve-tube. In the valve-tube below the cylinder 12 are formed inlet-ports 9^a, through which the oil will pass from the oil-reservoir when the valve is raised. Within the cylinder 12, its lower end resting on the top of the piston 14, its upper end being confined within the cylinder by means of a screw-cap 18, is a coil-spring 17, which normally holds the piston against the valve-tube and maintains the valve 16 closed. It will be noted that the valve 16 is cylindrical from its upper end to a point just below the lower edges of the ports 9^a and that from this latter point it tapers inwardly and downwardly. It is obvious therefore that when said valve is raised slightly the tapered part thereof will be opposite the ports 9^a and permit oil to pass down through the valve-tube. By means of the screw-rod 15, which is threaded through the piston 14, the valve 16 may be nicely adjusted to close the ports 9^a when the piston is at rest on the upper end of the tube. If desired, this screw-rod may be extended to the top of the oil-cup

and be provided with a head on the outer side of the cup in order that the valve may be adjusted whenever desired without opening the oil-cup. This extended rod is shown at 15[a] in Fig. 2.

The operation of this device may be briefly stated as follows: A slight heating of the journal to which this lubricator is attached will cause an expansion of the thermostatic fluid in the enlarged part 13 of the cylinder 12, said expansion lifting the piston 14, and thereby opening the valve. As soon as sufficient oil has been supplied to the journal to reduce the heat thereof the thermostatic fluid will gradually lose its heat and will contract, permitting the spring 17 to force the valve to its seat, thereby shutting off the supply of oil. It will be noted that the thermostatic fluid is disposed in an annular chamber which is concentric to the axial line of the valve and that therefore the force of its expansion will be exerted to lift the valve directly, and there will be no tendency of the piston or the valve to bind. This is clearly advantageous, as lubricators of this class must be so mounted as to respond quickly and positively to the variations in the expansion and the contraction of the thermostatic fluid.

It will be noted that the valve mechanism is complete in itself and is independent of the oil-cup, being attached thereto only at the point where it is screwed into the bottom thereof. It is therefore manifest that this valve device may be attached to any oil-cup now in use by merely threading it into the bottom thereof, it being entirely unnecessary to employ a specially-constructed oil-cup. It will of course be understood that the cylinder 12 may be of glass, if desired, in order that the position of the piston may be observed.

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

1. A lubricator comprising, an oil-cup, a thermostatic valve device secured therein and consisting of a valve-tube, a valve therein, a cylinder secured to said valve-tube and surrounding the upper portion thereof whereby an annular chamber is formed between the tube and the cylinder, a valve in said tube, a piston in the cylinder, means for connecting the valve to the piston, a thermostatic medium in the cylinder below the piston whereby the piston will be raised when the thermostatic medium is expanded, and a spring to return the piston to its normal position when the thermostatic medium contracts.

2. A valve device for an automatic lubricator comprising, a valve-tube adapted to be secured to the bottom of an oil-cup, inlet-ports formed therein, a cylinder secured to said tube above the ports, said cylinder surrounding the valve-tube whereby an annular space is formed between the tube and the cylinder, a piston in said cylinder, a thermostatic medium contained in the cylinder below the piston, a valve in the valve-tube, said valve normally closing the ports in said tube, means for connecting the valve to the piston whereby the valve will be lifted when the thermostatic medium expands, and a spring in the cylinder to return the valve to its closed position when the thermostatic medium contracts.

3. A valve device for an automatic lubricator comprising, a valve-tube adapted to be secured to the bottom of an oil-cup, inlet-ports formed therein, a cylinder secured to said tube above the ports, said cylinder being enlarged at its lower end and surrounding the valve-tube whereby an annular space is formed between the said tube and the cylinder, a piston in said cylinder above the enlarged part and extending down into the annular space between the tube and the cylinder, a thermostatic medium contained in the cylinder below the piston, a valve in the valve-tube, said valve normally closing the ports in said tube, means for connecting the valve to the piston whereby the valve will be lifted when the thermostatic medium expands, and a spring in the cylinder above the piston to return the valve to its closed position when the thermostatic medium contracts.

4. A valve device for an automatic lubricator comprising, a valve-tube, a valve therein, a thermostatic fluid-chamber surrounding said valve-tube, a movable device in said chamber and surrounding the valve-tube, and means connecting the valve centrally to the movable device, whereby the expansion of the thermostatic fluid will cause a direct longitudinal pull on the valve.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 25th day of May, 1903.

MATTHIAS CROWTHER.

Witnesses:
W. F. STALEY,
JAMES R. EHRET.