A. S. SMITH.
Oil-Cup.

No. 201,362. Patented March 19, 1878.

Fig. 1.

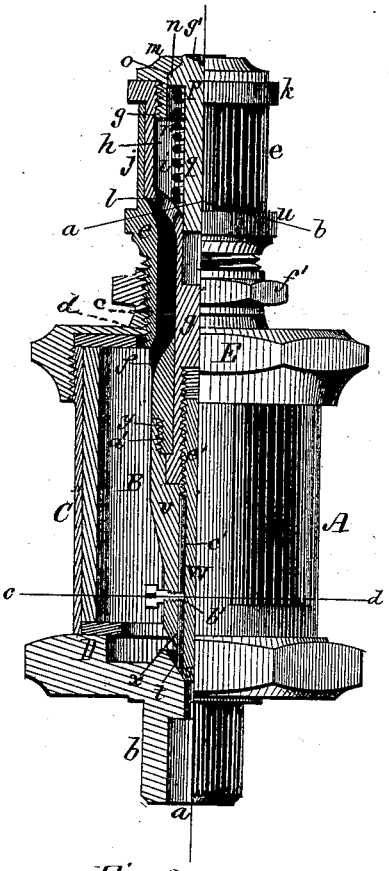


Fig. 2.

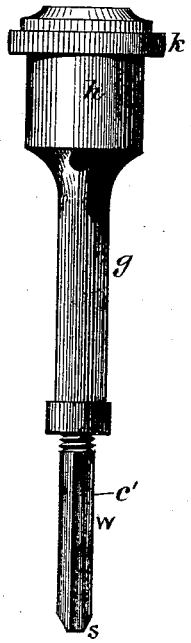


Fig. 3.
On line a.b. of Fig. 1.

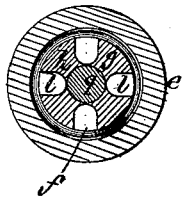
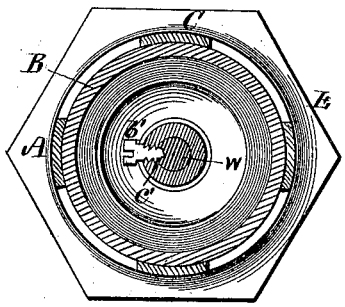


Fig. 4.
On line c.d. of Fig. 1.



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UNITED STATES PATENT OFFICE.

ALBERT S. SMITH, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN OIL-CUPS.

Specification forming part of Letters Patent No. **201,362**, dated March 19, 1878; application filed January 26, 1878.

To all whom it may concern:

Be it known that I, ALBERT S. SMITH, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Oil-Cups, of which the following is a specification:

My present invention relates to "oil-cups," so called, or vessels which contain and automatically feed a lubricant to a bearing; and consists in a compound or double valve, operating with the escape port or orifice of the cup, one portion of such valve serving to gage the amount of oil permitted to escape through such orifice and the other to open and close such orifice independent of the first, the portion of the valve first named being a tube, having a valve at bottom to engage the outer portion of a valve-seat formed about the escape-orifice, while the second-named portion of the valve is a rod closely filling and sliding within the first, and having a valve at bottom capable of closing the orifice before named.

The drawings accompanying this specification represent, in Figure 1, a sectional elevation of an oil-cup embodying my improvement. Fig. 2 represents a side view of the sliding valve-rod, to be explained, while Figs. 3 and 4 are horizontal sections of the cup.

In the above-named drawings, A represents the body of the oil-cup as composed, in the present instance, of a glass cylinder, B, supported within a metal frame, C, the latter having a solid bottom, D, with the exception of the escape-orifice *a*, and a screw-cap, E, while the ends of the cylinder B are tightly confined between such cap and bottom, with suitable packing material interposed.

The under side of the bottom D of the cup is continued into a hub, *b*, by which connection is made with the bearing to which the cup is applied, while the openings in the frame C permit the interior of the cup to be seen, in order to ascertain when it needs replenishing.

The cap E has a central opening, *c*, formed with a female screw, *d*, and into this female screw I screw a tubular plug or cylinder, *e*, having ports or an annular space, *f*, cut through or about its lower part, while within this tubular plug *e*, and loosely filling the same, I dispose a round rod or bar, *g*, the upper part *h* of this rod being enlarged and tubular, in order to provide a small chamber, *i*, and being received within and so as to turn in a tubular enlargement, *j*, of the plug *e* before named, it being observed that this latter portion of the plug protrudes above the top of the cap E, and so that the upper part of the rod *g* extends above the top of such enlargement *j*, and is provided with an annular milled head or rib, *k*, by which it may be readily turned or rotated within the plug.

The chamber *i* constitutes a preliminary or intermediary oil-receptacle, and communicates with the oil passage or port *f* of the plug *e* by openings *l l*, &c., created in its lower part in such manner that when oil is poured into such chamber *i* it shall flow through the orifice *f* and *l l*, &c., into the main receptacle or transparent cylinder B.

The chamber *i* is covered by a screw-cap, *m*, having a central orifice, *n*, the lower part *o* of which latter constitutes a valve-seat, while operating with this seat is a plug-valve, *p*, formed upon the upper end of a stem, *q*, which is disposed within the chamber *i*, and is forced up to the seat, and so as to close the orifice *n*, by a spring, *r*, which exerts its stress between the valve and the bottom of said chamber. The upper end of the valve *p* is or may be concave or recessed, as shown at *g'*, the more readily to receive the end of the nose or spout of an oil-can, and when it becomes desirable to replenish the oil-cup the nose of the can is placed in such cavity and the valve pushed down until the orifice *n* is unclosed from below, when oil from the can flows into the chamber *i*, thence through the ports *f* and *l l*, &c., into the main reservoir B, until the latter is filled, when the nose of the can is removed and the valve, by the stress of its spring, rises and closes the aperture *n*.

The plug-valve *p*, operating with the cap *m* and its orifice and valve-seat, constitutes the second portion of my improvements.

The rod *g* extends downward to the bottom of the reservoir B by an extension or stem, W, and this stem W has at its lower end a conical valve, *s*, which operates with a valve-seat, *t*, formed about the upper part of the orifice *a* of said reservoir B, and is connected to the rod by being screwed into the latter, as shown at *e'* in Fig. 1 of the drawing, and, as this stem is

prevented from rotating with the rod by means hereinafter explained, it necessarily follows that by turning the rod *g* in one direction by means of the milled rib *k* or its head *h* the valve *s* is raised from its seat and the orifice *a* opened to permit oil to flow from the reservoir B to the bearing below, which the oil is designed to lubricate, and when turned in the opposite direction the said valve is lowered, and closes such escape-orifice *a*, and shuts off the flow of oil. The plug-valve *s* thus operates with the orifice *a* and its valve-seat to shut off flow of oil when the machinery is at rest, or to permit of flow of oil to the bearing when the machinery is in motion, and this opening and closing of the said orifice *a* is independent of the valve which operates with it to regulate or determine the amount of oil which shall thus escape.

To effect this latter object I employ a tube, *v*, which surrounds and incloses the lower part or stem *w* of the rod *g*, and is formed at its lower end with an annular concave valve, *x*, to operate with the seat *t* of the orifice *a* outside of that portion of the seat acted upon by the valve *s*. The tube *v* incloses the stem *w* before named, and is formed at its upper part with a female screw, *y*, which incloses and screws upon a male screw, *a'*, cut upon the lower part of the tubular plug or support *e*, and the stem is prevented from rotating with the tube by a spline-and-groove connection, *b' c'*. It will now be seen that by rotating the rod *g* (by means of its milled head or rib *k*) in one or the other direction the stem *w*, owing to the spline *b'* and groove *c'*, cannot rotate with it, but is raised or lowered, and the orifice *a* opened or closed, as the case may be, and this takes place without interfering with the tubular valve *x*, which, as before stated, determines the quantity of oil permitted to escape through such orifice.

When it is desired to vary the quantity of oil escaping by the orifice *a*, which would seldom occur, the plug *e* is to be raised or lowered by means of its milled rib *u*, and then screwed in position by a check-nut, *f'*, which envelops it and screws down upon the cap E.

One important advantage attaching to my invention will be found in the fact that the opening or closing of the escape-orifice when starting up or shutting down the machinery does not affect the valve which determines the amount of oil which escapes when the orifice is open. Therefore, after the quantity of oil for a given bearing is ascertained, it is not disturbed by the opening and closing of the valve in starting or shutting down.

In the combination of the two valves *s* and *x* and their operative devices with the oil-reservoir B will be seen the first portion of my improvements.

Having thus described the nature, purposes, and operation of my invention, I desire to secure by Letters Patent of the United States the following:

1. The combination, with the lubricating-reservoir, provided with an escape-orifice surrounded by a valve-seat, as described, of two valves, arranged concentrically, or one within the other, and operating in connection with said valve-seat, but independently of one another, the one to open and close the escape-orifice of the reservoir and the other to regulate the flow of lubricating material through said orifice when open, the combination being and acting substantially as set forth.

2. The two valves, arranged concentrically, or one within the other, to operate in connection with a valve-seat around the discharge-conduit of the reservoir, and adjustable independently of one another from the exterior of the reservoir, as set forth.

3. The construction of the cup as a whole, substantially as herein explained, consisting of the body A, formed in a suitable manner, the plug *e*, with its ports *f f* and tubular head *j*, and the valve-tube *v*, screwed upon said plug, and operating with the orifice *a*, the rod *g*, with its chamber *i* and ports *l l*, and its valve-stem *w*, sliding in the tube *v*, and with its valve *s*, operating also with said orifice *a*, and the whole being substantially as and for purposes stated.

ALBERT S. SMITH.

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