(No Model.)

E. D. BANGS.

LUBRICATOR.

No. 468,289. Patented Feb. 2, 1892.

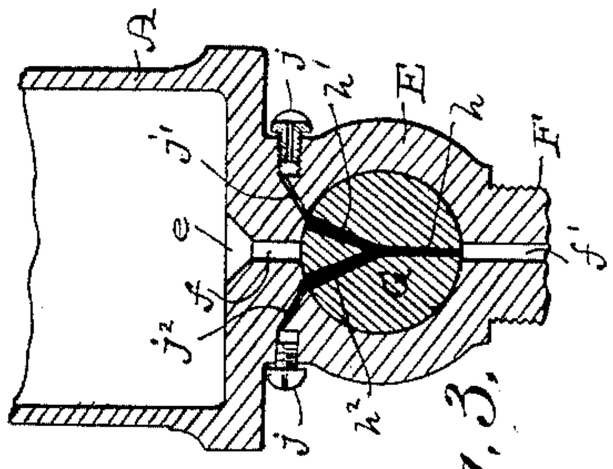

Fig. 3.

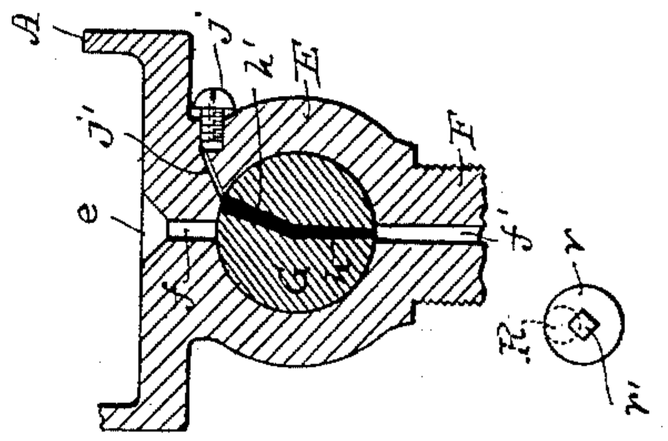

Fig. 4.

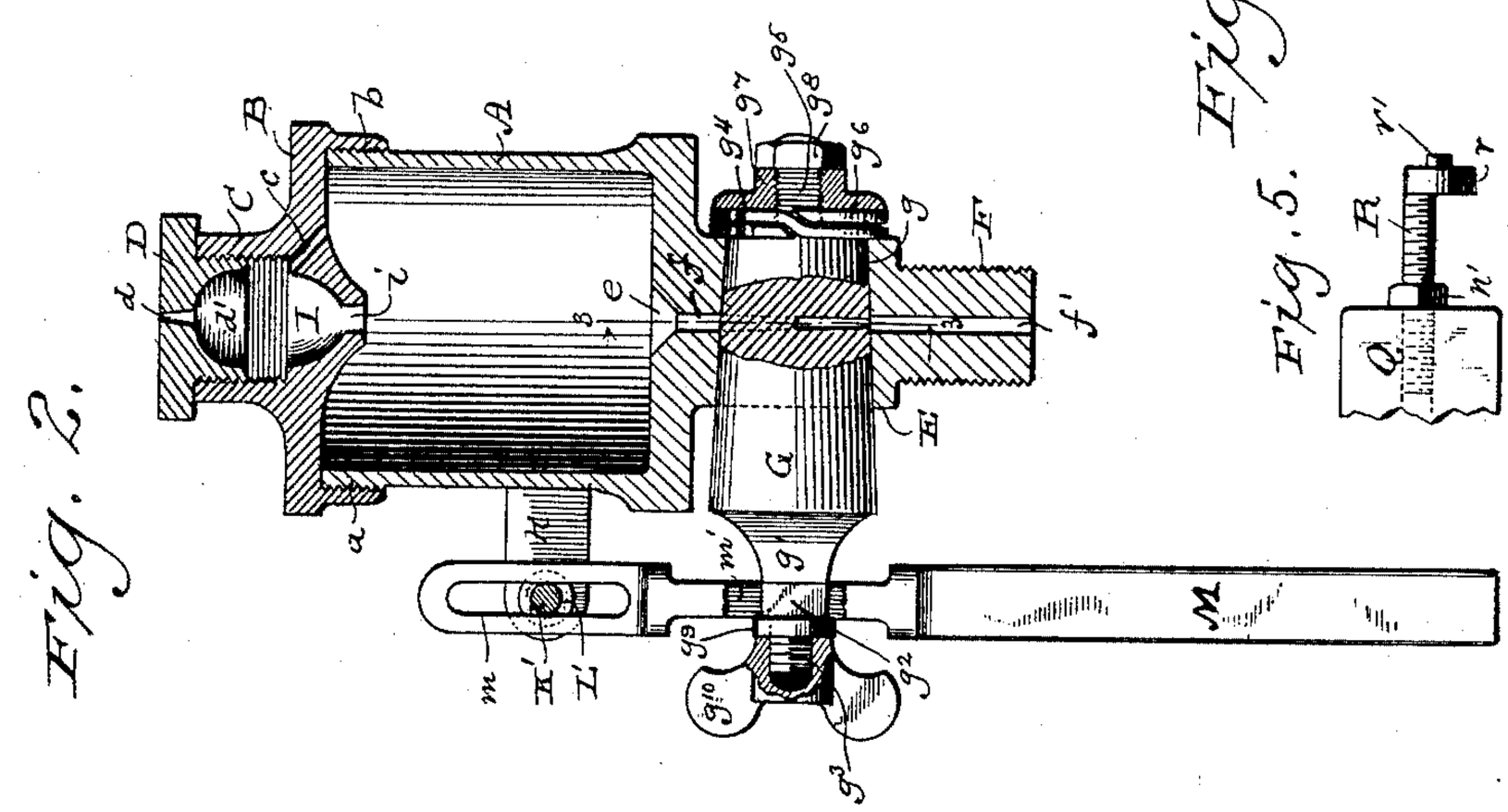

Fig. 2.

Fig. 5.

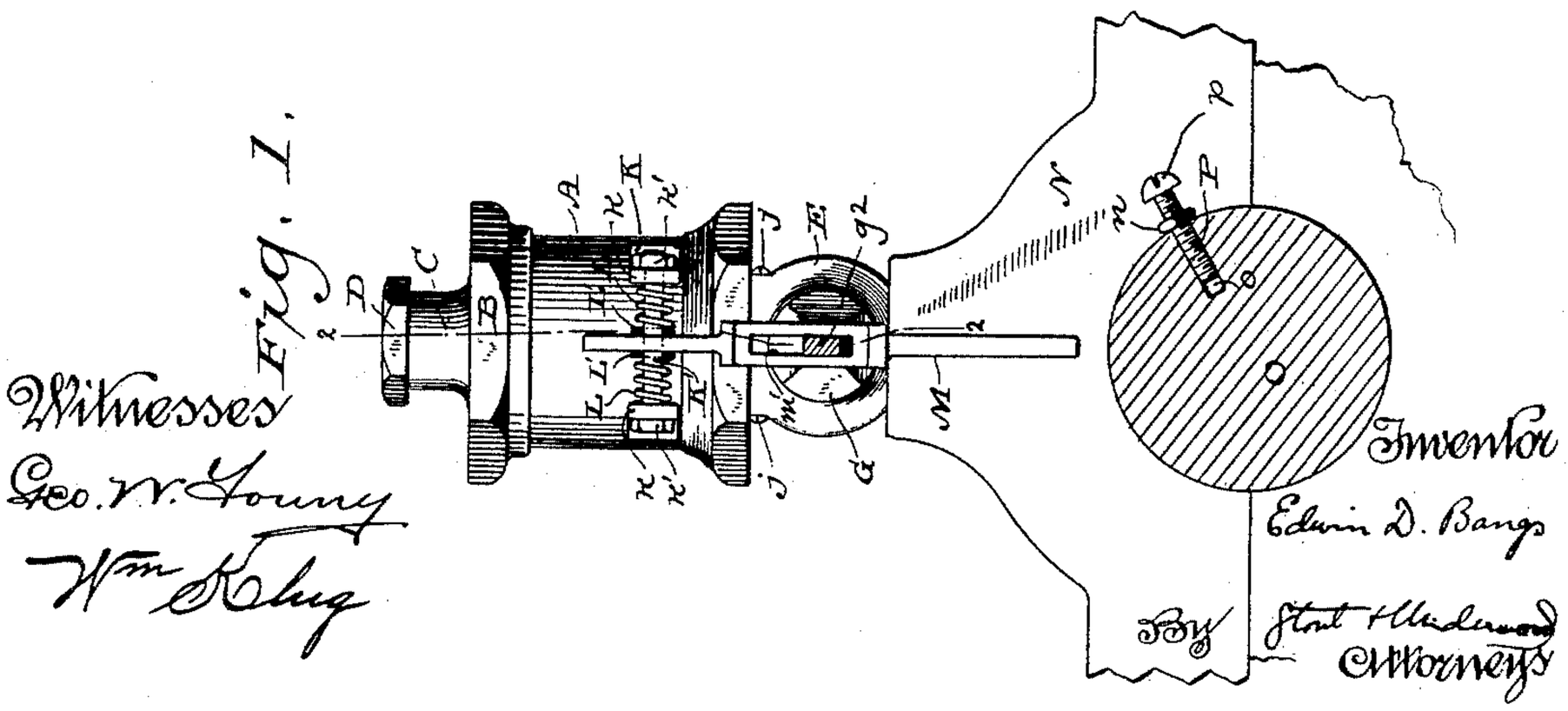

Fig. 1.

Witnesses
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UNITED STATES PATENT OFFICE.

EDWIN D. BANGS, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF THREE-FIFTHS TO MANNING H. CASE, OF SAME PLACE, AND JOHN HARVEY CURTIS, OF CHICAGO, ILLINOIS.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 468,289, dated February 2, 1892.

Application filed November 25, 1889. Serial No. 331,517. (No model.)

To all whom it may concern:

Be it known that I, EDWIN D. BANGS, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Oil-Cups for Lubricating Journals, Shafting, and other Machinery; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to oil-cups for lubricating journals, shafting, and other machinery; and it consists in certain peculiarities of construction, as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a side elevation of one form of my device shown attached to the box or bearing of a shaft or journal, the latter being represented in section. Fig. 2 is a vertical section on the line 2 2 of Fig. 1, drawn to an enlarged scale. Fig. 3 is a detail sectional view on the line 3 3 of Fig. 2, taken at right angles to the section-line of the preceding figure. Fig. 4 is a detail section similar to Fig. 3, but illustrating another form of my present device with an eccentric-headed screw beneath; and Fig. 5 is a detail view of said eccentric-headed screw.

A represents the cylinder of the cup, the upper part of which is externally screw-threaded, as shown at *a*, for the reception of the correspondingly-screw-threaded depending circular flange *b* of the cap B, which latter has an upward-extending central neck C, having interior screw-threads for the reception of a correspondingly-screw-threaded plug D, having a central vertical perforation *d* for the admission of air into the cup above the oil, and below this neck the cap B is formed into a central feed-hopper I, having a feed-opening *i*, to one side of which is a vent *c*, preferably diagonal, communicating with the interior of the cylinder A.

Thus far the construction of my present device does not differ materially from that set forth in my prior application for patent, Serial No. 296,237, filed January 14, 1889, except that I have now shown the under side of the plug D hollowed out, as at *d'*, to increase the area of the air-cushion formed above the oil in the cylinder A.

The bottom of the cylinder A is cast with a standard E, terminating in a nib F, having exterior screw-threads, by means of which the cup is secured in the desired position, there being a channel *f f'* extending from a depression *e* in the bottom of the cylinder down through the said standard and nib, and the said standard is provided with a tapered transverse bore *g* for the reception of a plug G, tapered, as shown, to correspond to the bore *g*, and this plug G is provided with an angled channel *h h'* and in the form shown in Fig. 3, with another branch h^2 to said channel for communication with the oil-channel *f f'* and with the air-vent *j'* or vents *j' j'*, as the case may be, the said vents being bored through the standard E and communicating with the transverse bore *g*, and the outer ends of said vents being enlarged and screw-threaded to receive the screws *j j*, which have holes of less diameter than that of said vents bored therethrough, so that the vents *j' j²* need not be of so minute a diameter as to render their boring difficult, and at the same time the fine holes in the screws will serve to admit just the requisite amount of of air needed and also serve to keep out the dirt. The large end of the plug G is preferably reduced, as shown at *g'*, and hence offsetted, continuing in a squared shank g^2 of less diameter and terminating in a screw-threaded end g^3. The small end of said plug is reduced or offsetted, as shown at g^4, and then again reduced and terminated in a screw-threaded bolt g^5, and when the plug G is in place within the bore *g* of the standard E a flat spiral spring g^6 is slipped on around the offset portion g^4 against the end of the plug and the standard, (to take up any slack occasioned by wear,) and then a nut g^7 is screwed on the bolt g^5 against the said spring and a lock-nut g^8 screwed on against the nut g^7, as shown.

Secured to the outside of the cylinder A is a frame K with two projecting bracket-arms *k k*, whose ends are perforated to receive the ends of a rod K' and having screw-threads formed thereon and retained in position by nuts *k' k'*.

M is a feed-lever having in its upper end a slot *m* by which it is suspended from the said rod K', there being a spring L and washer

L′ on each side of the said lever surrounding the said rod K′. Below this first slot *m* and at right angles thereto the said lever M is provided with another slot *m′*, which receives the squared shank g^2 on the adjacent end of the plug G, next to which is placed a washer g^9, and against this is screwed (on the end g^3) a nut g^{10}, thus insuring a secure connection between the plug G and feed-lever M.

In Fig. 1 I show, as stated, my improved cup applied to the box or bearing of a shaft or journal, the nib F being screwed into the cap N of said box and the shaft or journal O being provided with a screw-threaded socket *o* for the reception of a screw P, having a cam-shaped head *p*, said screw P being adjusted to the desired depth in said socket *o* and then locked with a lock-nut *n*, the said head *p* being in line with the lower end of the feed-lever M, so that as the said shaft or journal revolves the head of the screw P will strike and move the lower end of the feed-lever M, and thus open the port or channel *h′* or h^2, (depending upon which way the said shaft is revolving) by bringing it in line with the channel *f* in the base of the cylinder A, and permitting this channel *h′* or h^2 and its angled continuation *h* to become filled with oil, and then as the lower end of the lever M is released from contact with the said screw-head *p* the springs L L will instantly bring said lever M to its original perpendicular position, thereby bringing the part *h* of said channel in line with the part *f′* of the channel in the standard E and nib F and the said channel branches *h′* h^2 in line with the air-vents *j′* j^2, thereby enabling the oil which was in the said channel *h′* or h^2 *h* to drop down and out through the channel *f′* to the point to be lubricated, this action being repeated with every revolution of the said shaft or journal, and as the part *h* of the channel in the plug G must necessarily be against some closed part of the wall of the bore *g* when either the branch *h′* or h^2 is taking oil from the cylinder, (through the upper part *e f* of the channel leading from the bottom of the cylinder A,) it follows that the oil cannot be fed out through the lower part of the channel *f′* until the part *h* of the plug-channel is restored to its normal position, (shown in Fig. 3,) with the channel branches *h′* h^2 in communication with the air-vents *j′* j^2, so that the feeding is entirely automatic and dependent upon the operation of the machinery, and hence no oil can be fed while the machinery is at rest, and therefore there is no possible waste of oil.

The object of the described adjustment of the screw P is to regulate the feed, as required, by increasing or decreasing the time that the lower end of the feed-lever is in contact with the cam-head of the screw, and thus increasing or decreasing the stroke of said feed-lever, and hence the branch *h′* or h^2 of the plug-channel will be wholly or partly in register with the channel *f* above and a greater or less quantity of oil fed to the plug-channel at each revolution in consequence. The slots *m* and *m′* in the feed-lever are made longitudinally (or vertically) of considerable length to permit of the necessary adjustment of the said lever, as when there is considerable distance between the oil-cylinder and the cam-headed screw in the shaft or journal beneath, and in view of this adjustment of the feed-lever my device will be equally operative if the part which the lower end of said feed-lever engages with is a fixed one instead of an adjustable screw, as described, the adjustment of the feed-lever being only the work of a moment, the nut g^{10} being loosened for this purpose and then retightened.

In Fig. 4 I show the channel *h* in the plug G as being provided with only a single branch *h′* and the standard E consequently having only a single air-vent *j′* in communication therewith. This form of oil-cup is especially designed for use in connection with the guides for the cross-head of a locomotive or other engine, to which guides the nibs of two of these oil-cups are secured, and beneath each oil-cup the cross-head Q is provided with a cam-head screw R, (in this instance projecting horizontally, as indicated best in Fig. 5,) the cam-head *r* of this form of screw differing, as shown in Figs. 4 and 5, from the form shown in Fig. 1, but the said screw being capable of turning around to vary the length of contact between its head and the lower end of the feed-lever above for precisely the same purpose as that set forth in connection with the other form. As less oil is needed to lubricate a cross-head than a shaft or journal in this form, the cup feeds only with every other movement of the cross-head—that is, with every forward stroke only or every return stroke only, as the case may be.

The screw R is provided with a lock-nut *n′* to hold it firmly in the desired position after adjustment, which adjustment is easily accomcomplished by means of the squared end *r′* on the cam-head.

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

1. In an oil-cup, the combination, with the oil-cylinder and its standard provided with an oil-channel and a transverse bore, of a plug fitted in said bore and provided with an angled channel the end openings of which are adapted to be brought into register with the said oil-channel in the standard alternately above and below the plug, and a spring-controlled feed-lever suspended from said oil-cup and connected to said plug, substantially as set forth.

2. In an oil-cup, the combination, with the oil-cylinder and its standard provided with an oil-channel, air-vent, and a transverse bore, of a plug fitted in said bore and having openings adapted to be brought into register with said oil-channel and air-vent, a feed-lever suspended from said cylinder and connected to said plug and adapted to be moved and to

thereby turn said plug, and springs for restoring said feed-lever to its normal position after each movement thereof, substantially as set forth.

3. In an oil-cup, the combination, with the oil-cylinder and its standard provided with an oil-channel and transverse bore, of a plug fitted in said bore and having openings adapted to be brought into register with said oil-channel, a frame projecting from said cylinder and carrying a transverse rod, with a pair of springs mounted thereon, and a feed-lever provided with longitudinal slots in its upper end and suspended from said rod between the said springs, said rod passing through its upper slot and one end of said plug passing through its lower slot and adjustably secured thereto by a lock-nut, substantially as set forth.

4. The combination of an oil-cup and its standard provided with an oil-channel and transverse bore, a plug fitted in said bore and having openings adapted to be brought into register with said oil-channel, a spring-controlled feed-lever suspended from said oil-cup and connected to said plug, and a contact device secured to the shaft or other moving part of the machinery beneath the oil-cup and adapted to impinge against the free end of the feed-lever and cause it to turn said plug, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

EDWIN D. BANGS.

Witnesses:
H. G. UNDERWOOD,
WM. KLUG.