

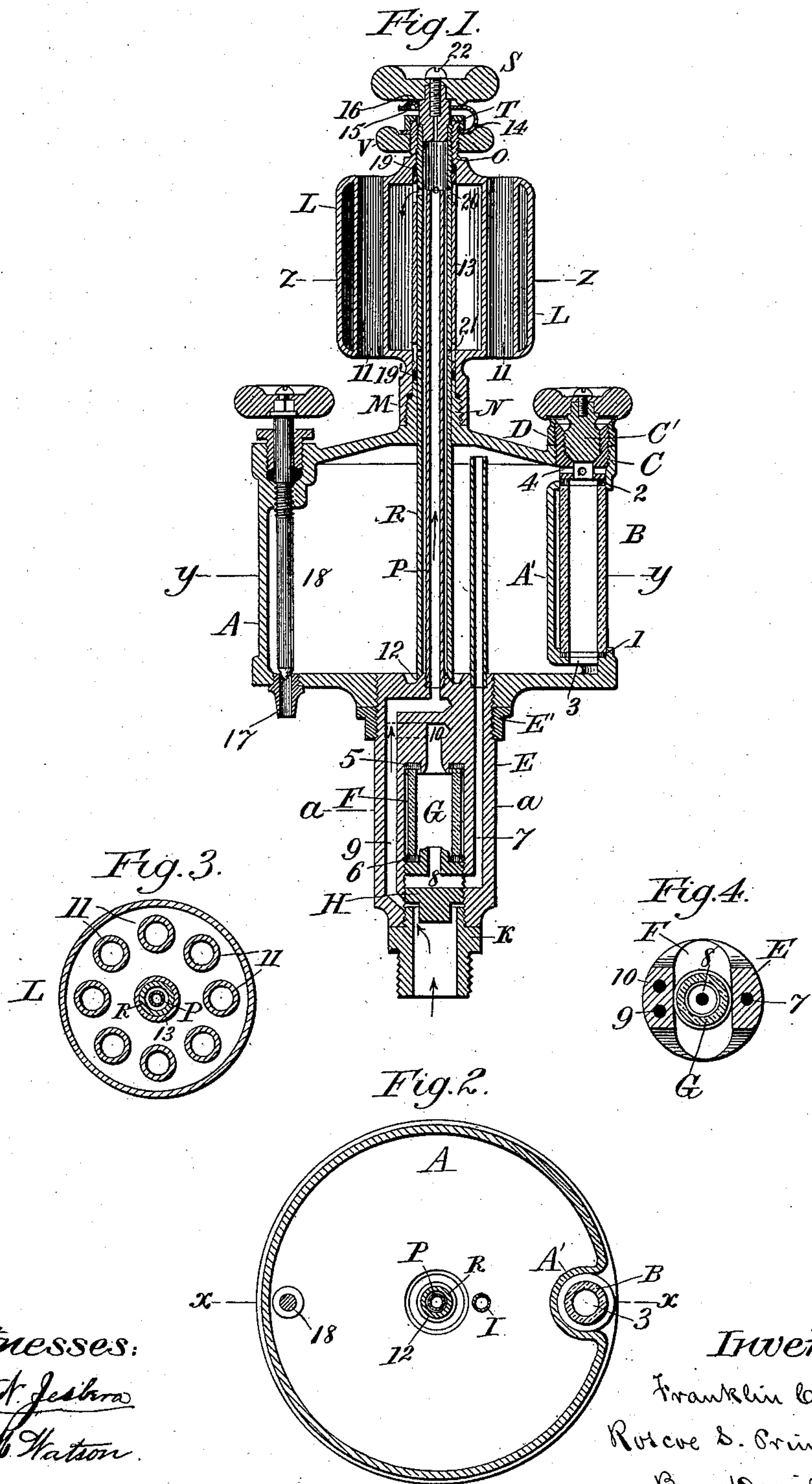
(Model.)

F. C. & R. S. PRINDLE.

HYDROSTATIC SIGHT FEED LUBRICATOR.

No. 389,528.

Patented Sept. 11, 1888.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANKLIN C. PRINDLE AND ROSCOE S. PRINDLE, OF EAST ORANGE, NEW JERSEY.

HYDROSTATIC SIGHT-FEED LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 389,528, dated September 11, 1888.

Application filed May 10, 1887. Serial No. 237,684. (Model.)

To all whom it may concern:

Be it known that we, FRANKLIN C. PRINDLE and ROSCOE S. PRINDLE, both of East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Hydrostatic Sight-Feed Lubricators; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, making a part of this specification, in which—

Figure 1 is a vertical central section of the lubricator on line *xx* of Fig. 2; Fig. 2, a cross-section on line *yy* of Fig. 1; Fig. 3, a cross-section through the condenser on line *zz* of Fig. 1; Fig. 4, a cross-section through the neck of the lubricator and the sight-feed glass included therein in line *aa* of Fig. 1.

Our invention relates to that class of lubricators in which a displacement of the oil in the oil-cup is effected by means of water obtained from the condensation of steam above the cup and the oil is made to pass upward through water contained in a glass sight-tube, and is delivered therefrom to the steam-passage, wherein it commingles with the steam and is carried therewith to the parts to be lubricated. Its object is to obtain a simpler and more compact and efficacious lubricating device at a less cost than those now commonly in use.

It consists in a novel organization of the lubricator, as hereinafter fully described.

In the accompanying drawings, A represents the oil-cup, cylindrical in form and having a vertical recess, A', formed in its periphery, within which is fitted a vertical gage-glass, B, which, being included within the circle described by said periphery, is thereby protected, although fully in view. The glass cylinder for the gage B, is open at both ends. Its lower end rests upon a washer, 1, in an annular seat at the bottom of the recess A', and its upper end is confined by means of an annular or hollow plug screwing down thereon upon an interposed annular washer, 2, through a threaded aperture in the portion of the top plate of the oil-cup A, which overarches the recess A', thereby securing a tight joint at

each end of the glass. The plug C is held in place and a tight joint secured by means of a lock-nut, D, which screws onto the projecting threaded end of the plug C.

Apertures or ducts, 3 4, are formed in the wall of the oil cup to communicate with the center of the annular seat at the bottom of the glass B and with the central aperture in the plug C, so that the upper and lower ends of the gage-glass communicate freely with the interior of the oil-cup. A feed-opening for the oil-cup is made through the center of the plug C, and this feed-opening is closed by a stopple, C'. The neck or shank E of the lubricator is exteriorly threaded at its upper end to screw into a central opening in the bottom of the oil-cup A, and when screwed into place is locked, and a tight joint secured, by means of a lock-nut, E'.

A wide central slot or opening, F, (see Fig. 4,) is cut transversely through the shank E, and is made long enough and wide enough to receive a cylindrical glass sight-tube, G, which is inserted into the transverse aperture through an interiorly-threaded central opening in the lower end of the shank. The upper end of this sight-tube G fits against an annular seat at the upper end of the recess F, and a tight joint is secured by means of an interposed washer, 5. The glass sight-tube is held in place by means of a screw-threaded plug or nut, H, made to screw into the central opening in the lower end of the shank and to follow up against the tube, a tight joint being made between the nut and the glass tube by an interposed washer, 6.

A lateral duct or conduit, 7, is formed longitudinally in the body of the shank E on one side of the transverse opening F, in which the sight-tube G is confined, to extend from the upper end of the shank to a point opposite the nut H. A channel, 8, is formed through the nut H, to connect said duct 7 with the lower end of the sight-tube, whereby free communication is established between the sight-tube and the oil-cup, this channel of communication being made to open into the upper part of the oil-cup by means of a vertical tube, I, which is screwed into the mouth or upper end of the duct 7 to form an extension thereof.

A threaded coupling, K, is fitted in the lower end of the shank, by means whereof it may be readily connected to any steam pipe or cylinder, as required.

5 A lateral steam supply duct or conduit, 9, is formed longitudinally in the body of the shank E on the side of the opening for the sight-feed therein opposite to that in which the oil-feed duct 7 is formed, and is extended
10 from a central recess in the upper end of the shank to a point at the lower end of the shank below the plug H, where it communicates freely with the lower opening in the shank and its coupling K. A third discharge duct or con-
15 duit, 10, is formed in the shank parallel with the steam-supply conduit 9 and by the side thereof, to communicate at one end with the upper end of the annular seat, against which the upper end of the sight-tube G is fitted, and
20 at the other with the lower end of the shank inside of the coupling K.

A condenser, L, consisting of a cylindrical vessel having a series of open vertical tubes, 11 11, extending through it, is attached, by
25 means of a neck, M, at its lower end, to the top of the oil-cup A, the connection of the two being formed by means of an internal thread on the end of the neck M fitting and screwing upon a collar, N, on the oil-cup. The con-
30 denser L has also a collar, O, on its upper end, which, together with the neck M at the lower end thereof and the collar N of the oil-cup, is perforated with a central opening, so as to form a continuous central passage from
35 the oil-cup up through the top of the condenser. Within this passage is fitted a central tube, P, whose lower end screws into the central opening in the upper end of the shank E, which forms the mouth of the steam-sup-
40 ply duct 9, so that the tube P forms practically an upward extension of said duct or conduit, terminating just below the level of the top of the condenser. A second tube, R, is fitted to encircle concentrically the central
45 tube, P, the difference in diameter of the two tubes being such as that a concentric open space is left between them. The lower end of the encircling tube R is made to rest upon an annular seat, 12, on the upper end of the
50 shank E, and to form in connection therewith a valve controlling communication between said concentric space and the bottom of the oil-cup. A third tube, 13, is loosely fitted around the tube R and wholly within the con-
55 denser, with its lower end resting upon the upper end of a collar, N, (reduced here to same thickness as said tube 13,) and its upper end resting against an internal shoulder or seat in the collar O, an annular packing-
60 washer or grommet, 19 19', being interposed between the tube and its seat at each end to render the joints steam-tight. The ends of the tube 13 project into the interior of the neck M and collar O of the condenser far enough
65 for it to serve the purpose of a double-ended gland for these two interior stuffing-boxes, as above described, and suitable pressure upon

the packing-washers 19 and 19' is secured by screwing down the condenser-neck M over the oil-cup collar N.

The upper end of the tube or valve stem R is closed and is externally threaded and made to engage and extend through an internally-threaded opening in the collar O on the top of the condenser. Its outer solid end is pro-
75 vided with a hand-wheel, S, by means whereof the tube may be readily rotated, the engagement of its threads with the collar O serving, when it rotates, to raise or lower its lower
80 end from or to the annular valve-seat 12.

The outer periphery of the collar O is also threaded, and an annular cap, T, which is centrally perforated to allow the stem of the upper end of the tube P to pass through it, is
85 screwed down firmly upon the outer end of the collar. A lock-nut V is also fitted upon said collar to work up against the cap. An annular plate, 14, having a spring-arm, 15, projecting therefrom and bent over to be
90 nearly parallel with the face thereof, is interposed between the lock-nut V and the lower face of the cap T, so that the spring-arm shall project over the cap and under the hand-wheel
95 S to engage a lug or notch, 16, thereon. This lug 16 operates, in connection with the spring-arm, as a stop and catch to determine the extent to which the valve tube R shall be turned
100 to give a proper feed-opening at its lower end and to retain it in position, the proper relative position of the arm and lug being first adjusted by loosening the lock-nut V, so that
105 the disk 14, carrying the arm, shall be free to turn with the lug and wheel, and when the proper opening for the valve is determined locking the nut V, so as to fix the disk and arm. The tube may then be turned to close the
110 valve and the valve be readily opened again to the proper extent, without need of special care, by simply turning the wheel S until the arm 15 engages with the lug 16.

Lateral openings 20 21 are pierced through the tubes R and 13 on a level with both the top and bottom of the condenser L, to com-
115 municate with the interior thereof.

The oil-cup A may be provided with a dis-
115 charge-opening, 17, in the bottom thereof, to be closed in the customary manner by a valve at the lower end of a vertical rod, 18, which is made to work through a threaded opening
120 in the top of the cup, or with other suitable devices for emptying the oil-cup of the water of condensation.

An air-vent screw, 22, is fitted to close a duct through the top of the tube R for the re-
125 lease of any confined air which may accumulate from time to time in the condenser. In the use of the lubricator the steam, as shown by the arrows, entering through the coupling K, will pass up freely through the duct 9 into the fixed central tube, P, and out through its
130 upper end into the tube R, and thence through the opening 20 into the condenser L. The tubular construction of the condenser will cause the steam to rapidly condense therein,

and the water of condensation will flow through the openings 21 into the concentric space between the tubes P and R, so as to fill the same, and will then fill the condenser also until there shall be no steam-space left therein. If, now, the tube R be turned so as to lift its lower end more or less from its seat, the water supplied to the space between the tubes will flow into the bottom of the oil-cup A, under the oil therein, and will cause the oil to overflow through the tube I. The overflowing oil, passing down through the tube I and ducts 7 and 8, will enter the bottom of the sight-tube G and pass up through it and the water of condensation contained therein drop by drop, and thence down through the duct 10 to the steam-pipe, where it will be more or less vaporized by the hot steam and taken up and carried with it to the cylinder and other parts to be lubricated. The hydrostatic pressure of the column of water and of oil reaching from the upper part of the condenser L to the bottom of the sight-tube G so far counterbalances the steam-pressure exerted on the opposite ends of the column that it produces a certain positive feed of the oil through the sight-tube and its discharge into the steam-supply pipe at such rate as the opening of the valve-tube R may permit, the discharge of oil being controlled by the discharge of condensed water, which may be permitted through the opening between the bottom of said tube and its seat, the opening being governed by means of the hand-wheel S on the upper end of the tube, in manner as described. When the engine is not at work, or it is desired for other reasons to cut off entirely the oil-supply, the valve R is closed by means of the wheel S, and when it is desired to open the valve it may be opened to the extent previously determined upon by turning the wheel until it is arrested by the arm 15, previously adjusted to serve as a stop and catch for this purpose.

We claim as our invention—

1. The combination, with an oil-cup, a steam-condensing chamber above the oil-cup, a central steam-supply pipe extending up through the oil-cup and opening in the upper part of the condenser, and an oil-delivery duct leading from the upper part of the oil-cup to the steam-supply pipe below it, of a longitudinally-moving tube encircling the steam-supply pipe within the oil-cup and condenser, so as to leave a concentric passage between them, and whose lower end fits upon a seat at the bottom of the oil-cup to control communication between the oil-cup and said concentric passage, and through it, by means of suitable openings, with both lower and upper ends of the condenser, said tube being made to pass with steam-tight joints through the neck-coupling, the oil-cup, and condenser, and out through the top of the condenser, all substantially in the manner and for the purpose herein set forth.

2. The combination of a closed oil-cup, A, adapted to be connected to the engine to be

lubricated, a condenser, L, placed above the same to communicate therewith, a steam-supply pipe, P, from the engine communicating with said condenser, and a series of condensing-tubes, 11 11 11, extending through the condenser and open to the air, substantially in the manner and for the purpose herein set forth.

3. The combination, with a shank, E, adapted to be connected to the engine to be lubricated, of a closed oil-cup, A, fitted upon said shank, a condenser, L, fitted above the oil-cup and communicating therewith, a steam-supply pipe or conduit extending through the shank and communicating with the condenser, a glass sight-tube fitted within an opening in the shank and communicating through its upper end with the source of steam-supply in the lower end of the shank, and a pipe or conduit extending from the upper end of the oil-cup through the shank to the bottom of the sight-tube, all substantially in the manner and for the purpose herein set forth.

4. The combination, in a lubricator, of a closed oil-cup, A, adapted to communicate from its upper part with the pipes or passages of a steam-engine, a condenser, L, fitted upon said oil-cup, a central tube, 13, fitted within the condenser and forming, in connection with collar O of the oil-cup, an open cylindrical passage to extend from the oil-chamber out through the condenser, an inner tube, R, closed at its upper outer end, open at its lower end, and fitted closely within the central cylindrical passage in the condenser to have longitudinal play therein, and which, resting upon an annular valve seat at the bottom of the oil-cup, extends thence to the upper outer end of the condenser, and a steam-pipe, P, projecting up centrally through said valve-seat and the central cylindrical passage in the condenser to a point near the top of the condenser, leaving a concentric space between the steam-pipe and the valve-tube to communicate through suitable openings with the top and bottom of the condenser, substantially in the manner and for the purpose herein set forth.

5. In a hydrostatic-column lubricator, the combination, with its oil-cup A, of a steam-supply pipe, P, extending up centrally through the cup and above the same, a larger longitudinally-moving tube, R, closed at its upper end and inverted over the steam-pipe to form a concentric space or chamber about the same, and a condenser, L, formed with a central cylindrical opening to receive and closely encircle the outer movable tube, and which is fitted to the oil-cup with a tight joint, through which said tube projects, the concentric space between the tube and steam-pipe being made to communicate with the top and bottom of the condenser through openings in the central tube 13 of the condenser and in the movable tube R, substantially in the manner and for the purpose herein set forth.

6. A sight-feed lubricator having a single shank or stem for attachment to the engine to

be lubricated, and combining in its construction the following elements, viz: an oil-cup above the shank, a condenser above the oil-cup, a sight-feed glass in the shank, an oil-
5 passage from the top of the oil-cup to the bottom of the feed-glass and from the upper end of the feed-glass to the lower end of the shank, a steam-passage leading through the shank and through a central pipe in the oil-cup to a
10 point near the top of the condenser, a concentric chamber encircling said central pipe formed by an adjustable tube closed at the top and inverted over the end of the steam-pipe to rest upon an annular seat on the bottom of

the oil-cup, and communicating ports formed 15 between the upper and lower ends of the condenser and said concentric chamber, substantially in the manner and for the purpose herein set forth.

In testimony whereof we have signed our 20 names to this specification in the presence of two subscribing witnesses.

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Witnesses:

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