

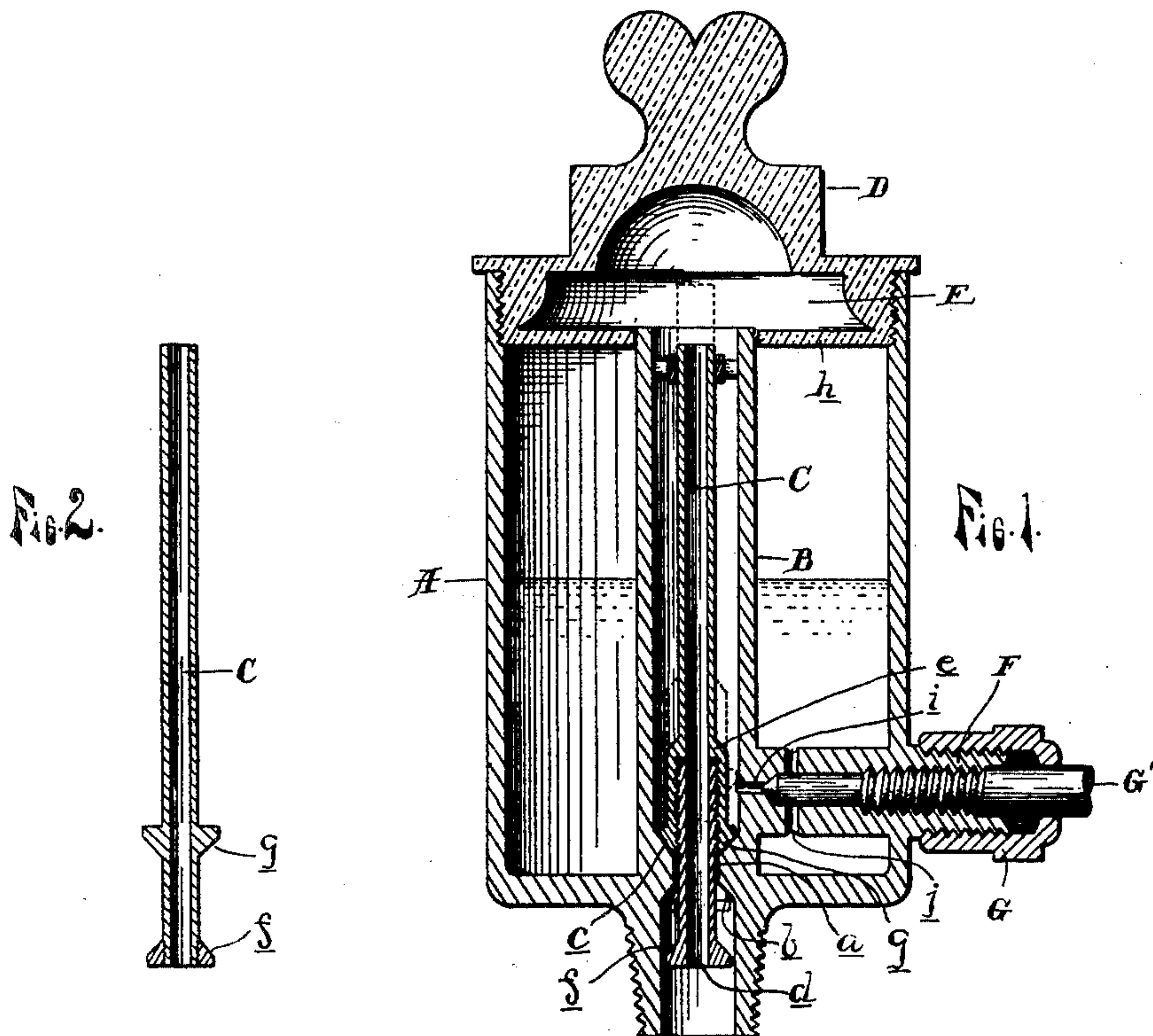
No. 679,560.

Patented July 30, 1901.

R. E. HARDY.
LUBRICATOR.

(Application filed Mar. 29, 1901.)

(No Model.)



WITNESSES.

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UNITED STATES PATENT OFFICE.

ROY E. HARDY, OF DETROIT, MICHIGAN, ASSIGNOR TO DETROIT MOTOR WORKS, OF SAME PLACE.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 679,560, dated July 30, 1901.

Application filed March 29, 1901. Serial No. 53,443. (No model.)

To all whom it may concern:

Be it known that I, ROY E. HARDY, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Lubricators, of which the following is a specification, reference being had therein to the accompanying drawings.

10 My invention relates to new and useful improvements in lubricators, and refers more particularly to that class wherein the pulsation of pressure is utilized to actuate the lubricator-valve, and has for its object to make
15 a lubricator more especially adapted for use in connection with gas or gasoline engines; and to this end the invention consists in so constructing a lubricator that a predetermined quantity of oil will be fed to the engine-cylinder at each explosion, and consists,
20 further, in the use of a tubular plunger-valve within the oil-supply pipe in constant communication with the air-space of the cup and the part to be lubricated and in the provision
25 of a diaphragm across said cup to form a closed air-space above the oil-space and at the same time keep the products of combustion from contaminating the oil.

The invention consists, further, in the novel
30 construction, arrangement, and combination of parts, all as more fully hereinafter described, and shown in the accompanying drawings, in which—

Figure 1 is a vertical central section through
35 my improved oil-cup, showing in full and dotted lines the different positions of the parts when in use. Fig. 2 is a modified construction of plunger.

As shown in the drawings, A represents an
40 oil-cup having a screw-threaded stem at its base to screw into the cylinder of an engine, and B is a hollow standard or feed-tube, preferably formed integral with the bottom of the cup and extending to near the top thereof
45 above the oil in the cup, its bore being a prolongation of that of the stem and at or near its junction therewith is provided with a restricted port or feed-opening *a*, having the taper valve-seats *b c* formed on the opposite
50 sides thereof, and C is a tubular valve com-

posed of the two sections *d e*, adjustably united by means of a screw-thread engagement with each other, each section being provided at their lower ends with a taper valve
55 *f g* on opposite sides of the port *a* and adapted to seat against the valve-seats *b c*, respectively. The hollow stem of the section *e* extends to near the top of the cup and is suitably guided within the standard B near its upper end, as shown. I may, however, as
60 shown in Fig. 2, make the plunger of one piece and by means of a screw-thread engagement adjustably hold one of the valves in place to regulate the vertical movement of
65 the plunger.

D is a filler-plug adapted to close the upper end of the cup by means of a screw-thread engagement, as shown, and is provided with a diaphragm or partition *h*, preferably formed
70 integral therewith, adapted to fit over the upper end of the feed-tube to form a closed air-space E in constant communication with the part to be lubricated, which aids in lifting
75 the valve from its seat and momentarily delays its closing until the pressure in the air-space is equalized with that in the cylinder, when the action of gravity will return the
80 plunger to its seat. This partition-wall extending across the top of the oil-space at the same time prevents the products of combustion from coming in contact with the oil in
the cup.

F is a horizontal arm terminating in the stuffing-box G and is preferably formed integral with the hollow standard B and the side
85 of the cup, near the bottom thereof, and is provided with the oil-duct *i*, communicating with the feed-tube, and one or more ducts *j*, communicating with the oil-space or reservoir, a suitable needle-valve G' being pro-
90 vided for controlling the supply of oil to be fed.

Having thus fully described my invention, it is intended to operate as follows: The reservoir being filled with oil and the valve G
95 opened, the oil will rise within the feed-tube to the level of the oil in the reservoir. The engine now being started, the explosive impulse will force the piston to the lower end of the cylinder, and as a part of this force or
100

products of combustion leaks by the piston-rings and is emitted at the open end of the cylinder, (the oil-cup being preferably placed so that the piston normally covers it,) and as
 5 a portion of this force or escaping products of combustion in passing between the piston-head and cylinder-casing passes the inlet-opening for the oil-cup it immediately rushes up the same, striking the lower end of
 10 the plunger-valve *G*, and passing up through the valve-stem raises the valve *g* from its seat, as shown in dotted lines, and allows the oil to fill the space beneath the same, the valve *f* at the same time seating against its
 15 seat, thereby preventing the gases from driving the oil away from the passage *a*, and as the pressure equalizes itself in the air-space above it will react like an elastic cushion and with the aid of the action of gravity cause
 20 the valve *g* to move to its seat, thus pumping in a charge of oil, one of the conical valves *f g* always being seated except when in the act of pumping, thus admitting oil only as required by the engine, the quantity of the
 25 oil being regulated by means of the valve *G'* and by adjusting the section *d e* from or toward each other, thus limiting the amount of vertical movement. The cup may of course be connected to the cylinder at any point,
 30 although I prefer to have the piston normally cover the inlet-port.

What I claim as my invention is—

1. In an oil-cup, the combination of an oil-reservoir divided by a partition-wall into an
 35 oil-space and an air-space above the oil-space, of a feed-tube communicating with the outlet of the cup, and with the air-space at its upper end, a restricted feed-opening at or near the bottom of the tube formed with
 40 upper and lower valve-seats, and a hollow plunger vertically guided in said feed-tube and provided with two valves adapted to the valve-seats, and a valve-controlled inlet-opening leading from the oil-space of the

cup into the feed-tube at a point above the upper valve-seat. 45

2. The combination with an oil-cup, of a feed-tube communicating with the outlet of the cup, and extending upwardly above the level of the oil, a transverse partition dividing said cup into an oil-space, and an air-space above the oil-space communicating with the upper end of the feed-tube, but separated from the space containing the oil by said partition, a restricted opening at or
 55 near the bottom of the tube, formed with upper and lower valve-seats and a hollow plunger vertically guided in said feed-tube, and provided with two valves adapted to alternately seat against the valve-seats, and an
 60 inlet-opening connecting the oil-space with the feed-tube at a point above the upper valve-seat.

3. The combination of a cup, provided with an outlet at the bottom, and a filler-plug
 65 adapted to close the cup, a transverse partition-wall carried by said plug adapted to form an air-space in the plug above the oil in the cup, of a feed-tube communicating at its lower end with the outlet of the cup and at
 70 its upper end with said air-space, a restricted feed-opening in the feed-tube at or near the bottom of the tube, and provided with valve-seats on opposite sides of said opening, and a hollow plunger vertically guided in said feed-
 75 tube, and provided with two valves on opposite sides of said opening adjustable from and toward each other and adapted to alternately close said opening, and an oil-inlet opening in the feed-tube at a point above
 80 the upper valve-seat.

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

ROY E. HARDY.

Witnesses:

OTTO F. BARTHEL,
 JOSEPH A. NOELKE.