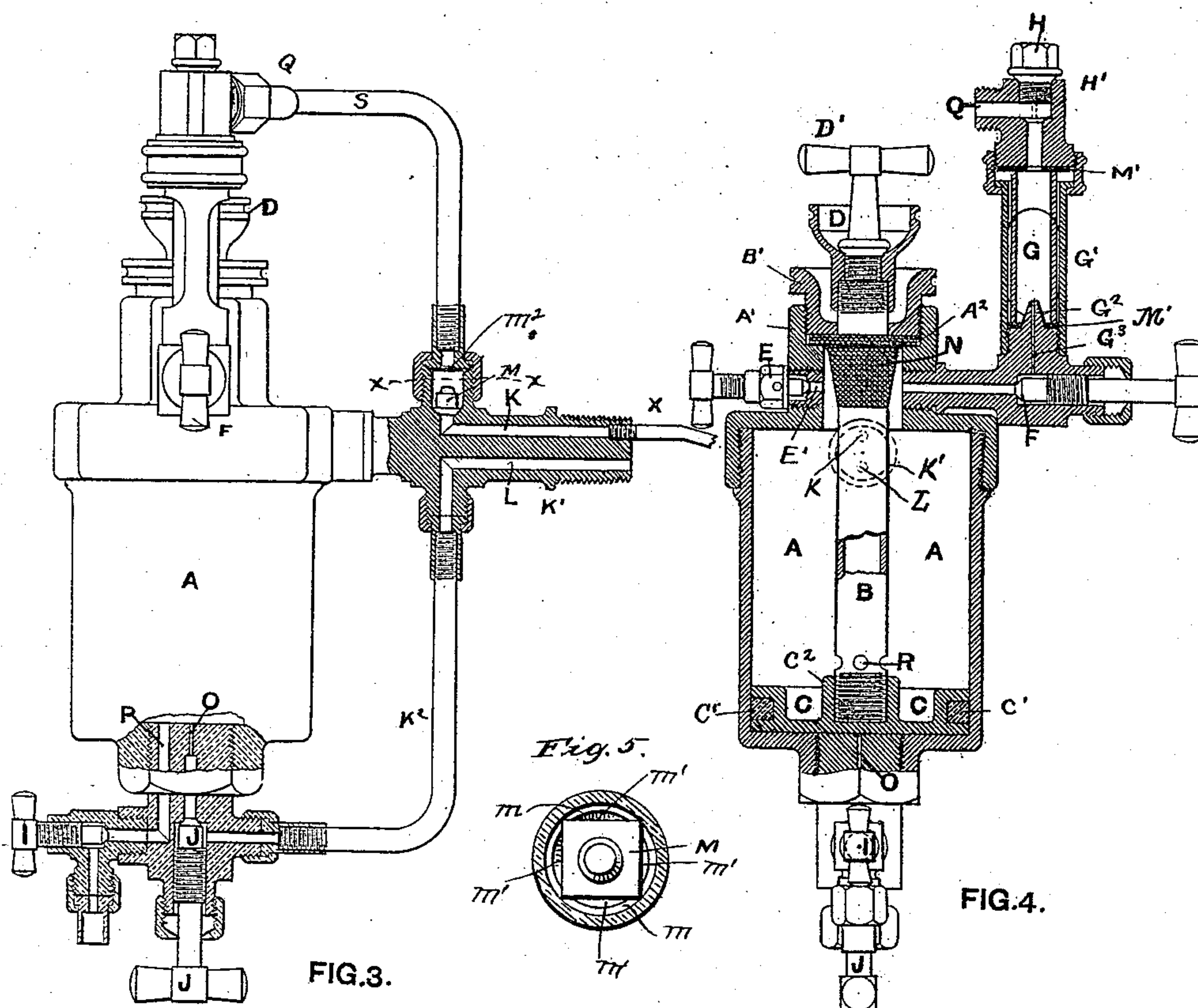
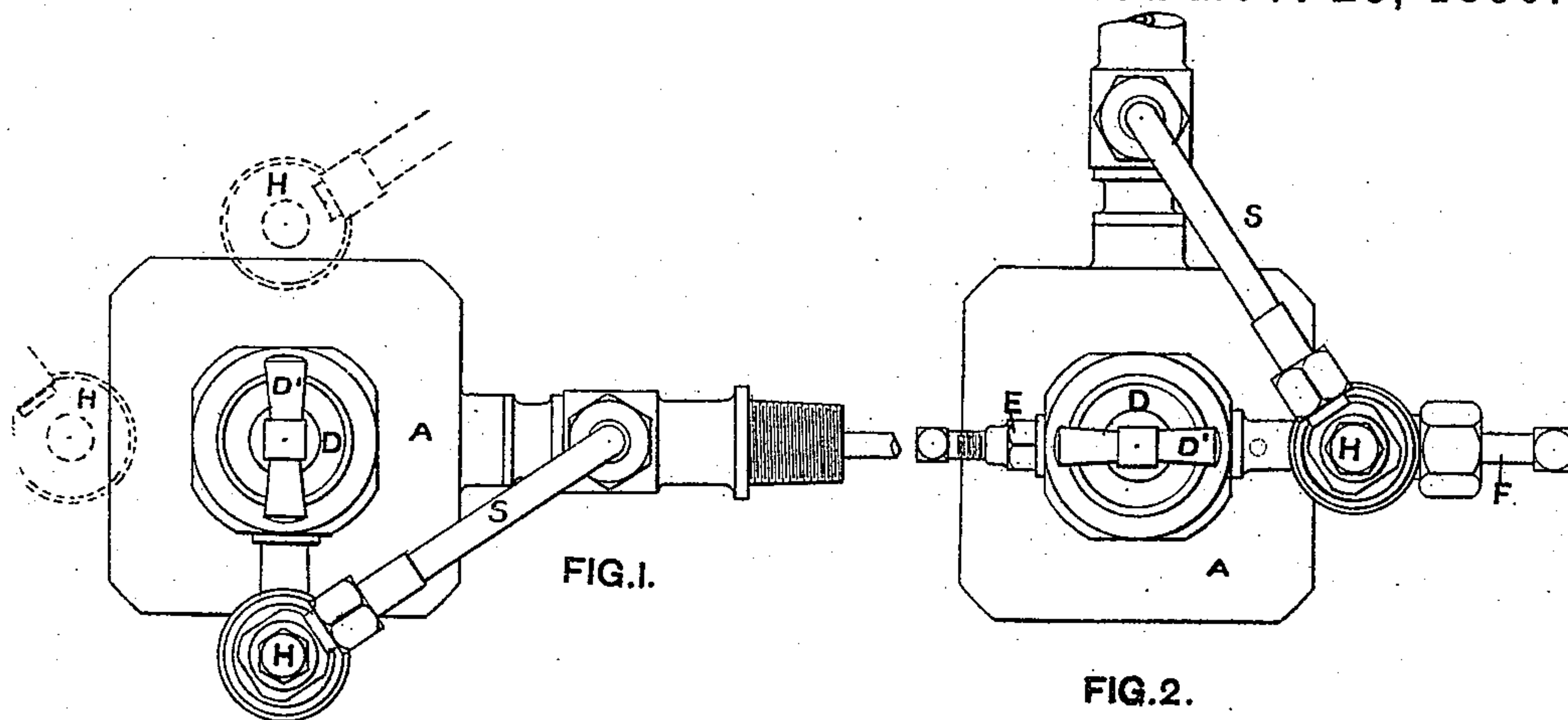


(No Model.)

J. L. GRANDISON.
LUBRICATOR.

No. 441,407.

Patented Nov. 25, 1890.



Witnesses:
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E. A. Bond.

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UNITED STATES PATENT OFFICE.

JAMES L. GRANDISON, OF MANCHESTER, ENGLAND, ASSIGNOR OF ONE-HALF
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LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 441,407, dated November 25, 1890.

Application filed January 29, 1890. Serial No. 338,543. (No model.)

To all whom it may concern:

Be it known that I, JAMES LIONEL GRANDISON, a subject of the Queen of Great Britain, residing at Manchester, in the county of Lancaster, England, 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 This invention relates to certain new and useful improvements in lubricators of that class known as "sight-feed lubricators;" and it has for its object, among others, to provide a lubricator of this class which in its general
15 construction shall embody improvements upon the prior devices having provision to prevent the escape of steam in case of breakage of the glass, thus avoiding injury to the engineer or other person in case of accident.
20 It aims, also, to provide for the displacement of the oil by direct pressure acting upon the under side of the piston, whose surfaces are of unequal areas.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be particularly pointed out in the appended claims, the novelty residing in the peculiar combinations and the construction, arrangement, and adaptation
25 of parts whereby the above ends are accomplished, all as more fully hereinafter set forth.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part
35 of this specification, and in which—

Figure 1 is a top plan of my improved lubricator. Fig. 2 is a like view showing but one sight-feed. Fig. 3 is a side view with
40 parts broken away and in section of the device shown in Fig. 1. Fig. 4 is a vertical section through Fig. 2. Fig. 5 is an enlarged cross-section on the line *xx* of Fig. 3.

Like letters of reference indicate like parts
45 throughout the several views.

Referring now to the details of the drawings by letter, A designates the cylinder of the lubricator, in which reciprocates the piston C, provided with a packing C', preferably
50 of asbestos, although other suitable materials

may be used, and connected with this piston, preferably, by means of a screw-threaded end engaging a screw-threaded boss C². Upon the upper face of the piston is the hollow piston-rod B, provided with a plurality of
55 holes R near its lower end, through which the oil flows from the interior of the hollow piston-rod into the cylinder when charging the same.

N is a packing-ring of any suitable material—such as woodite, vulcabeston, or any other material adapted for the purpose—to allow the piston-rod to reciprocate. Upon the upper end of the cylinder is an internally-threaded boss A', formed with a shoulder A²,
60 upon which said packing-ring rests, and B' is a cup-shaped cap externally threaded to engage the threads of said boss, and serves also as a drip-cup. It is screwed down upon the top of the packing-ring, as shown in Fig.
65 4. Upon the upper end of the piston-rod B there is screwed a filling-cup D, which has a screw-threaded engagement with the said rod, and has an aperture therein, as shown, the said aperture being closed by means of
70 the plug D', having a suitable handle by which it may be turned to remove it when desired.

E' is a passage-way or aperture from the cylinder, and is governed by means of the
75 valve E, which should be opened for the escape of air while filling the cylinder A of the lubricator, but should be closed after the said cylinder has been filled.

F is a valve for regulating the flow of oil
80 from the lubricator A to the engine through the sight-feed glass hereinafter described. This sight-feed glass G is carried in a suitable socket piece or support or guard G', as shown in Fig. 4, and has extending up a short
85 distance within the same the nipple G², formed on the part provided with the valve F, and through the passage-way G³ of which the oil is designed to pass. The turning of the valve F determines the quantity supplied to the engine, and this may be varied
90 from one drop to sixty per minute, more or less. To the top of this guard G' is affixed a piece H', the aperture in the upper end of which is closed by means of a plug H, which,
95 100

when removed, provides for the filling of the glass G with cold water.

Q designates the oil-outlet from the sight-feed.

5 M is a small check-valve located between the pipes S and the passage-way K. This valve is of a shape other than circular, as seen in Fig. 5, so that while it may be seated at its corners to rest upon the seat *m*, as seen in
10 Fig. 5, passage-ways *m'* for the passage of the oil will be provided, as seen in said Fig 5; but should the glass be broken from any cause the pressure of steam will force upward the valve against its seat *m*² (see Fig.
15 3) and serve to prevent sudden rush of steam from the engine.

M' are suitable packing-rings at the top and bottom of the glass tube G to render the same perfectly tight at the ends.

20 S is a pipe leading from the oil-outlet Q to the steam-pipe or other device to which the oil is to be led through the passage K in the nipple or pipe K', which is provided with a passage L in addition to said passage K, and
25 this passage L forms the steam-inlet to the under side of the piston C through the pipe K² and the passage-way O.

J is a valve to regulate the pressure of steam through said pipe K² onto the bottom
30 of the piston C.

Leading from the bottom of the cylinder A is a passage-way P, controlled by means of the valve I, and is for the purpose of drawing off the water of condensation, which accumulates during the working of the lubricator, which water of condensation should be
35 drawn off before the cylinder is charged.

Two or more cylinders may be fed from the same lubricator by attaching one or more
40 sight-feeds like the one above described and operating in a similar manner. I have indicated such construction in dotted lines in Fig. 1.

The operation is simple and will be readily
45 understood. The motive power is the difference of area of the piston above and below, being greater upon the under side. The action of the lubricator is thus positive and is not liable to derangement, as with ordinary
50 sight-feed devices. The piston rising and falling with the amount of oil in the cylinder, its rod serves as a tell-tale to indicate the gradual consumption of the oil and showing when it requires to be replenished. The apparatus
55 being operated by the positive pressure of the steam, it can be regulated with great precision to deliver large or small quantities of

oil. There is no water of condensation to come into contact with and mix with the oil. Hence the sight-glasses do not become soiled and
60 breaking of the glasses is avoided, due to the absence of temperatures that would cause unequal expansion or contraction of said glass and guard.

In order to charge the lubricator, the valve
65 J is closed, shutting off the pressure of steam through the pipe K². The valve I is opened to draw off the water of condensation within the cylinder A and the piston C forced down to the bottom of said cylinder, the valve E previously having been opened to admit air to
70 the upper face of the piston. The valve I is then closed, the plug D' removed from the upper end of the piston-rod B, and oil poured into the cup D, which runs down through the
75 piston-rod B to the openings at R, when it fills the cylinder, forcing the air out through the valve until the oil has reached that point. Then the valve E is closed, the plug D' replaced, the valve J opened, and the feed goes
80 on as usual until the piston-rod B again indicates the necessity for a charge by its elevation above the top of the cup B'.

Having thus described my invention in its preferable form, what I claim as new is—
85

1. In a lubricator of the class described, the combination of the cylinder, the piston, and its hollow piston-rod apertured at or near its lower end, and a boss at the upper end of the cylinder, having a shoulder A², the conical
90 packing-ring supported on said shoulder, and the cup-shaped cap within the boss and bearing on the packing-ring, with a space surrounding said ring, with a valve-controlled passage-way E' from the cylinder adjacent to
95 said packing-ring, substantially as described.

2. In a lubricator of the class described, the combination, with the cylinder and piston, of the valve-controlled steam-passage to the under side of the piston, the valve-controlled
100 outlet from the upper end of the cylinder, the air-inlet valve at the upper end of the cylinder, said cylinder having a valve-controlled outlet at the bottom thereof, the drip-cup, plug, and filling-cup at the upper end of the
105 piston-rod, all substantially as and for the purpose specified.

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

JAMES L. GRANDISON.

Witnesses:

HENRY JAMES HUDD,
H. S. O'BRIEN.