

(No Model.)

W. H. CRAIG.
LUBRICATING STEAM ENGINES.

No. 300,348.

Patented June 17, 1884.

Fig. 1.

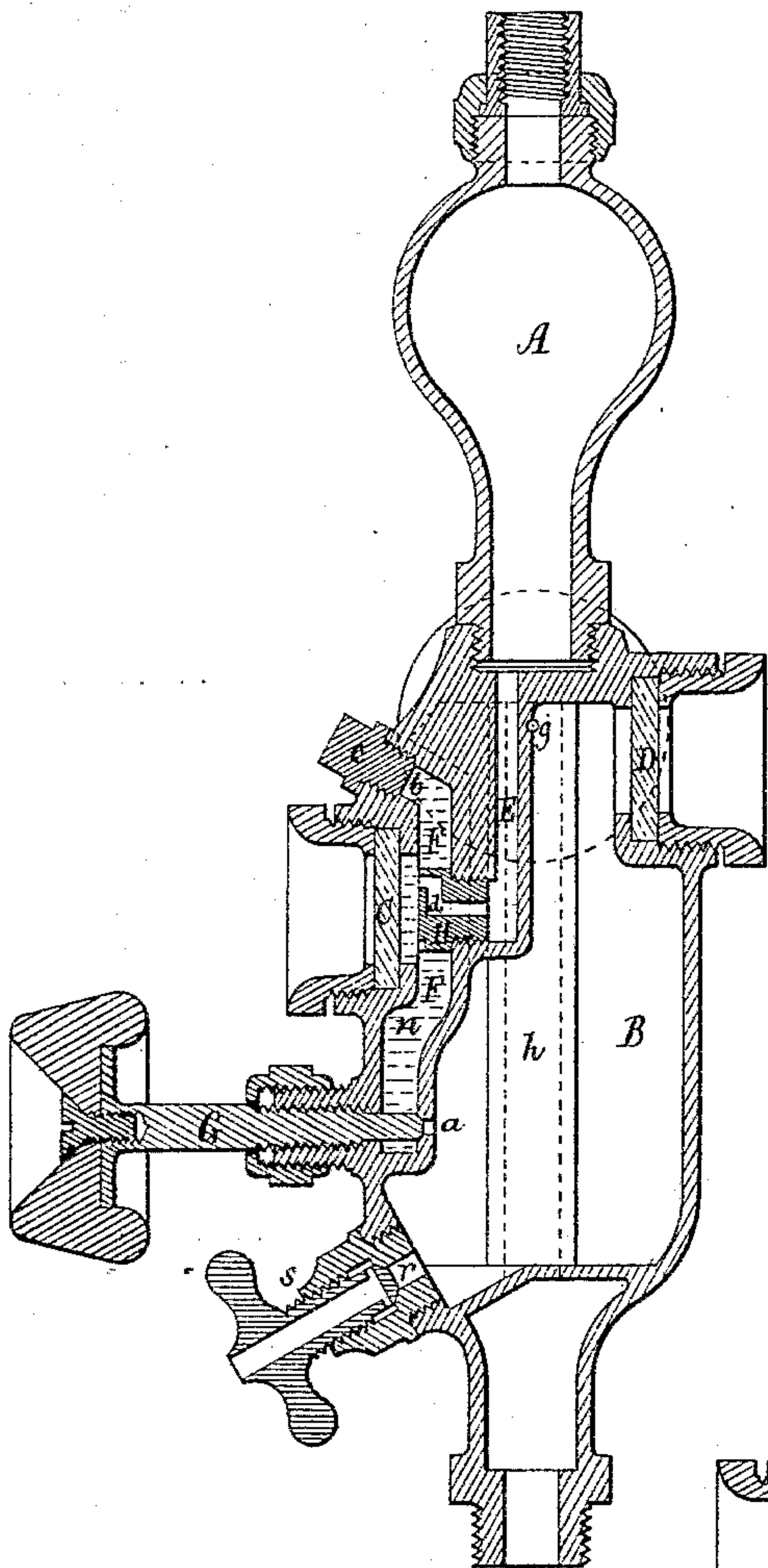


Fig. 2.

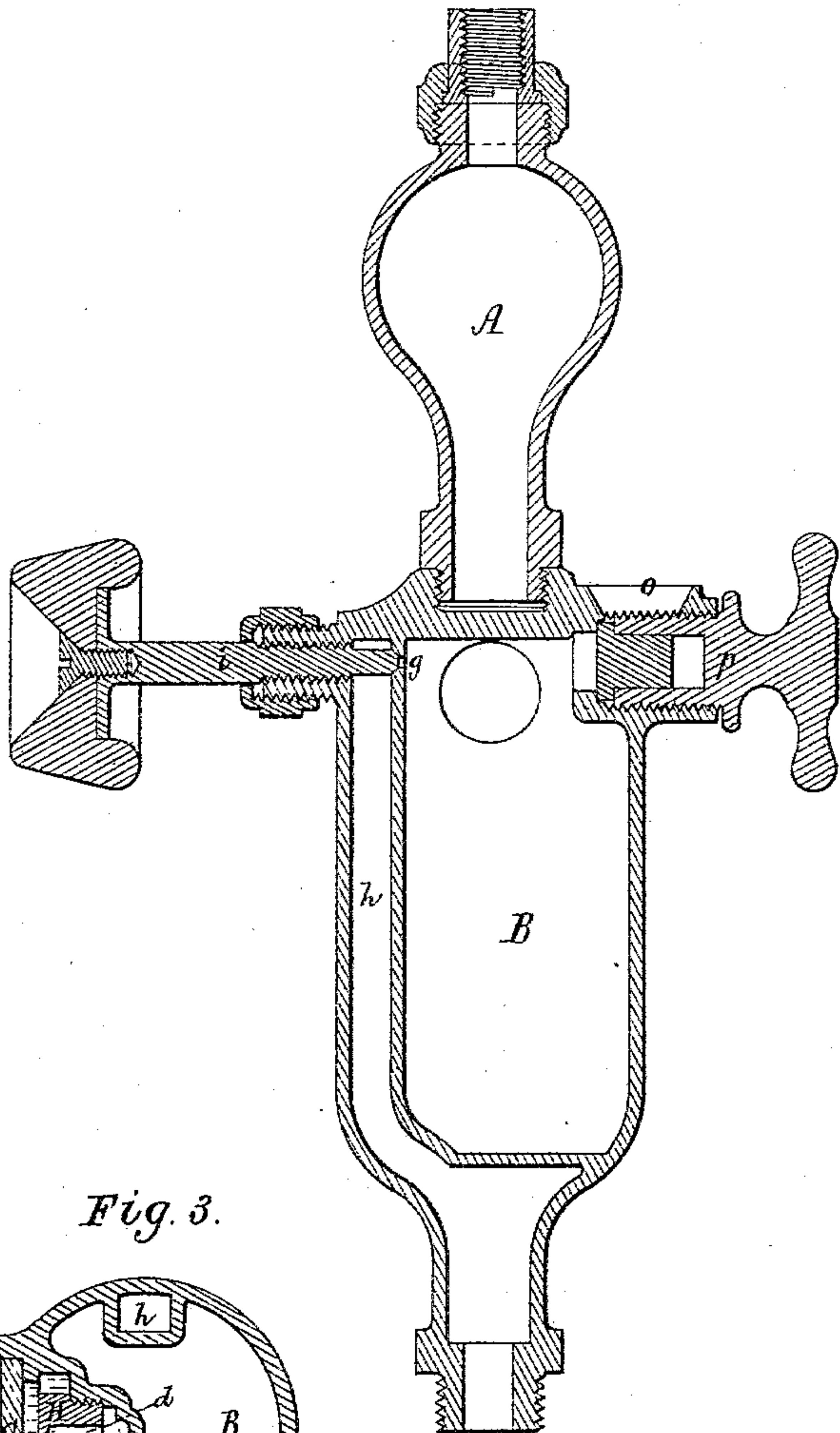
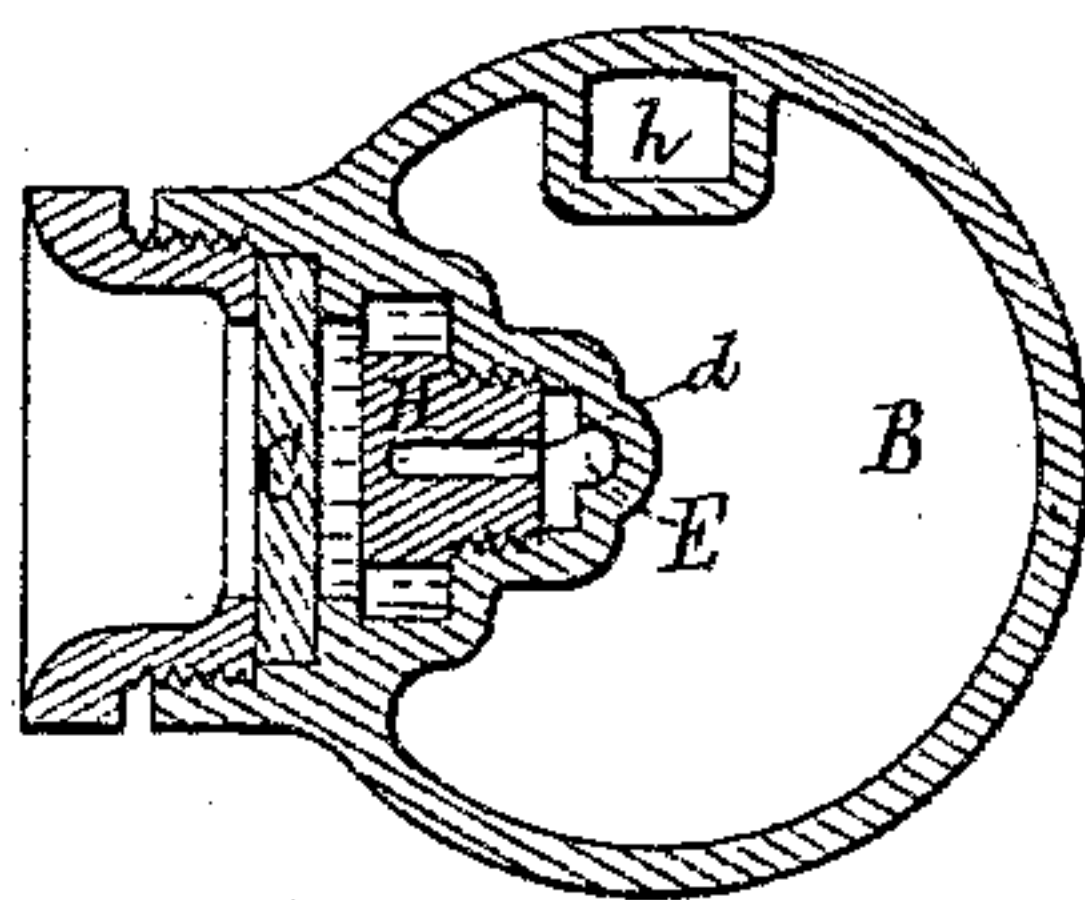


Fig. 3.



Witnesses.

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WARREN HILLIARD CRAIG, OF LAWRENCE, MASSACHUSETTS.

LUBRICATING STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 300,348, dated June 17, 1884.

Application filed April 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, WARREN HILLIARD CRAIG, of Lawrence, in the county of Essex, of the Commonwealth of Massachusetts, have
5 invented a new and useful Improvement in Lubricating Steam-Engines and in Mechanism Therefor; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—
10

Figures 1 and 2 are vertical and transverse sections, in planes at right angles to each other, of a lubricator of my invention, the nature of such invention being defined in the
15 claims hereinafter presented. Fig. 3 is a horizontal and transverse section of such lubricator, such section being taken through the center of the lower glass pane or window thereof.

20 Like various other lubricators of the class to which it belongs, mine, as represented in the drawings, is provided with a steam-condenser, A, an oil-reservoir, B, and a glass pane or window, C. Furthermore, there is in
25 the upper part of the oil-reservoir another such glass pane or window, which is shown at D in Fig. 1, its purpose being to enable a person to discover when the reservoir may have become full, or substantially so, of water,
30 or may need a supply of oil.

In making my improved lubricator I have interposed between the oil-reservoir B and the condenser A a passage, E F, communicating at its lower part with the oil-reservoir,
35 without otherwise connecting therewith; the opening shown at *a* being provided with a screw plug or stopper, G. A part of this passage is formed into a chamber, F, which has an opening, *b*, provided with a screw cap
40 or stopper, *c*. The said opening is to enable the chamber F to be supplied with liquid, the stopper G being first closed, if necessary. There is also in the passage at the lower part
45 of its portion E a water-trap, H, which, as shown, consists of a screw-plug having in and through it a passage, *d*, bent in manner as represented in Fig. 1, such passage opening close to the inner face of the glass pane C. This trap is to hold water in order to prevent
50 the oil or liquid charge of the chamber F from passing into the descending portion E of the

said passage. The said chamber F has, or should have, within it a charge of oil or liquid of a specific gravity less than that of water; and incapable alone of chemically combining with
55 water, the said oil or liquid being separate and distinct or differing from the oil used for lubricating, and sufficient in quantity to fill or nearly fill the chamber and rest against the
60 glass pane.

At the upper part of the reservoir B there is an opening, *g*, for the escape of oil from the reservoir into an educt, *h*, arranged with it, as shown in Fig. 2, there being to such opening
65 a screw-plug, *i*, for closing it more or less, as occasion may require.

The condenser A, when the lubricator is in operation, is to have steam led into it from the steam-generator or a pipe or device communicating therewith, the educt *h* at the same
70 time being in communication with the valve-chest or part to be lubricated, or the pipe for the conveyance of steam from the generator to such chest or part. The steam entering the condenser A will be condensed therein, and
75 the water of condensation will flow down through the educt or portion E of the passage E F, and thence through the trap H, from which it will pass in drops, which will descend within the charge *n* of liquid against the
80 inner face of the glass pane C, and in passing to the bottom of the chamber F will there collect below the charge of liquid in the chamber. The hole *a* being somewhat opened the water thus collected will escape through the said
85 hole into the oil-reservoir, and will flow beneath its charge of oil. As the water may accumulate in the reservoir, the oil therein will be forced upward and discharged therefrom through the hole *g* and the educt *h*, and will
90 pass from thence into the valve-chest or part to receive such oil, the said hole *g* being open to the necessary extent to allow of the escape of the oil from the reservoir.

The reservoir B has in its upper part a
95 mouth, *o*, for supplying it with oil, such mouth being provided with a screw-stopper, *p*. There is also in the lower part of the reservoir a passage, *r*, furnished with a screw-plug, *s*, such passage being for emptying the reservoir,
100 as occasion may require.

The charge *n* of the chamber F may be com-

posed of any liquid not capable alone of chemically combining with water, and having a specific gravity less than that of the drop of water that may pass through it.

5 My invention embodies an improvement in the art or method of lubricating steam-engines, which art or method is to first cause water to pass visibly in drops through a liquid of less specific gravity than that of the water, and in-
10 capable of alone chemically combining therewith, and afterward to pass into the oil used for lubricating, so as to elevate the same within the oil-reservoir to its educt and discharge it therefrom into the engine or part to be lu-
15 bricated. By this improvement it will be seen that I am enabled, at any time when desirable, to obtain a clear sight of the drops of water of condensation while they may be passing through the liquid of less specific grav-
20 ity than water to the oil-reservoir, whatever be the color or character of the oil used for lubricating.

In methods of lubricating heretofore practiced in which there has been an observation
25 of drops of water passing through the oil used for lubricating, difficulty has frequently been experienced in clearly observing these drops, when the oil through which they passed was dark or opaque. By my improved method,
30 inasmuch as the medium in which I observe the passing drop may be entirely disconnected and distinct from that used for lubricating, I have obviated this difficulty. Consequently, by such method the feeding of the darker and
35 nearly opaque oils can be measured with as much accuracy as can the very light and clear oils.

From the above it will be seen that with my invention I can use in the oil-reservoir an oil
40 or lubricant such as if employed in the observation-chamber, would render the drops of water difficult, if not impossible, to be seen on their passage through it, in which case such chamber I would charge with a liquid
45 incapable alone of combining with water, and being of a character such as would enable the drops of water in passing through it to be easily seen through the pane or window.

I have shown separate devices or plugs for
50 controlling the passage of water and oil in the operation of the lubricator, as this is the ordinary construction, although it would be possible, as will readily be observed, to control the flow with either of such devices or plugs
55 alone, the other being removed.

I have also shown the water-controlling device or plug G as located where the water enters the oil-reservoir. I prefer this location because it enables me, by one and the same
60 valve, to cut off entirely the communication between the supply of water and the oil-reservoir when desired, and also to regulate the rate of the flow of water into the oil-reservoir.

I have also shown the point of entrance of
65 the water to the oil-reservoir as being slightly above the bottom of such reservoir; but it is

obvious that the water may enter at such bottom, if desired, the liquid in the observation-chamber acting as a plug to preserve the equilibrium of the body of water, as such body
70 may gradually rise in the oil-reservoir, and thereby replace the oil which is expelled therefrom.

I would remark that I make no claim to a lubricator constructed as represented in either
75 of the United States Patents No. 187,964 or No. 291,042.

I claim in a lubricator of the character described—

1. The combination of the steam-condenser
80 and oil-reservoir with a passage leading from the said condenser to and opening into the lower part of the said reservoir, and having to its educt leading into the said reservoir a screw-plug or valve, and containing, or having in
85 common with it and said passage, an observation-chamber adapted to hold a suitable liquid, through which the water on its way from the condenser to the reservoir may pass visibly in drops, substantially as described, such suitable
90 liquid being separate and distinct or differing from the oil used for lubricating.

2. The combination of the steam-condenser A and the oil-reservoir B, (the latter having a feeding-outlet, *g*, provided with a suitable
95 valve or screw-plug,) with the chamber F, furnished with an observation-pane, C, and connecting with the said condenser and opening into the lower part of the oil-reservoir, and having to its educt leading into the said reser-
100 voir a screw-plug or valve, all being substantially as shown and described.

3. The combination of the steam-condenser A and oil-reservoir B, (the latter having a feeding-outlet, *g*,) with a chamber, F, provided
105 with an observation-pane, C, and containing a charge of oil or liquid lighter than water and incapable alone of chemical combination therewith, the said chamber having a passage to it from the said condenser, and communi-
110 cating with the oil-reservoir by another passage having a suitable screw plug or valve, all being substantially as hereinbefore described, and as represented.

4. The combination of the condenser A, educt E, water-trap H, chamber F, observa-
115 tion-window C, and oil-reservoir B, such reservoir being connected with the said chamber and provided with a suitable outlet, and all being substantially as herein set forth.
120

5. The combination of the condenser A, educt E, water-trap H, chamber F, observa-
125 tion-window C, and the oil-reservoir B, (the latter having an outlet, *g*,) with means, substantially as described, viz: the screw-plug G, for opening and closing the communication between the said chamber and reservoir, regulating the passage of water from the chamber to the reservoir and of oil from the reservoir to the part to be lubricated, all being sub-
130 stantially as set forth.

6. The improved art or method of lubri-

5 cating steam-engines, it consisting in causing
water to first pass visibly in drops through a
liquid lighter or having a specific gravity less
than that of water and incapable alone of
chemical combination therewith, and separate
and distinct or differing from the oil used for
lubricating, and afterward to pass into the
reservoir at its lower part only, containing
such oil, so as to force upward such oil to a
10 position for discharge of it from the said
reservoir, all being substantially as set forth.

7. The combination of the steam-condenser
and oil-reservoir with a passage leading out

of the former into the lower part of the latter
without having any separate communication 15
with the upper part of the said reservoir, but
containing, or having in common with it, the
said passage, an observation-chamber adapted
to hold a suitable liquid, through which the
water in its way from the condenser to the 20
reservoir may pass visibly in drops, substan-
tially as described.

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