(No Model.)

O. WILLIAMS.

LUBRICATOR.

No. 334,323. Patented Jan. 12, 1886.

Fig. 1.

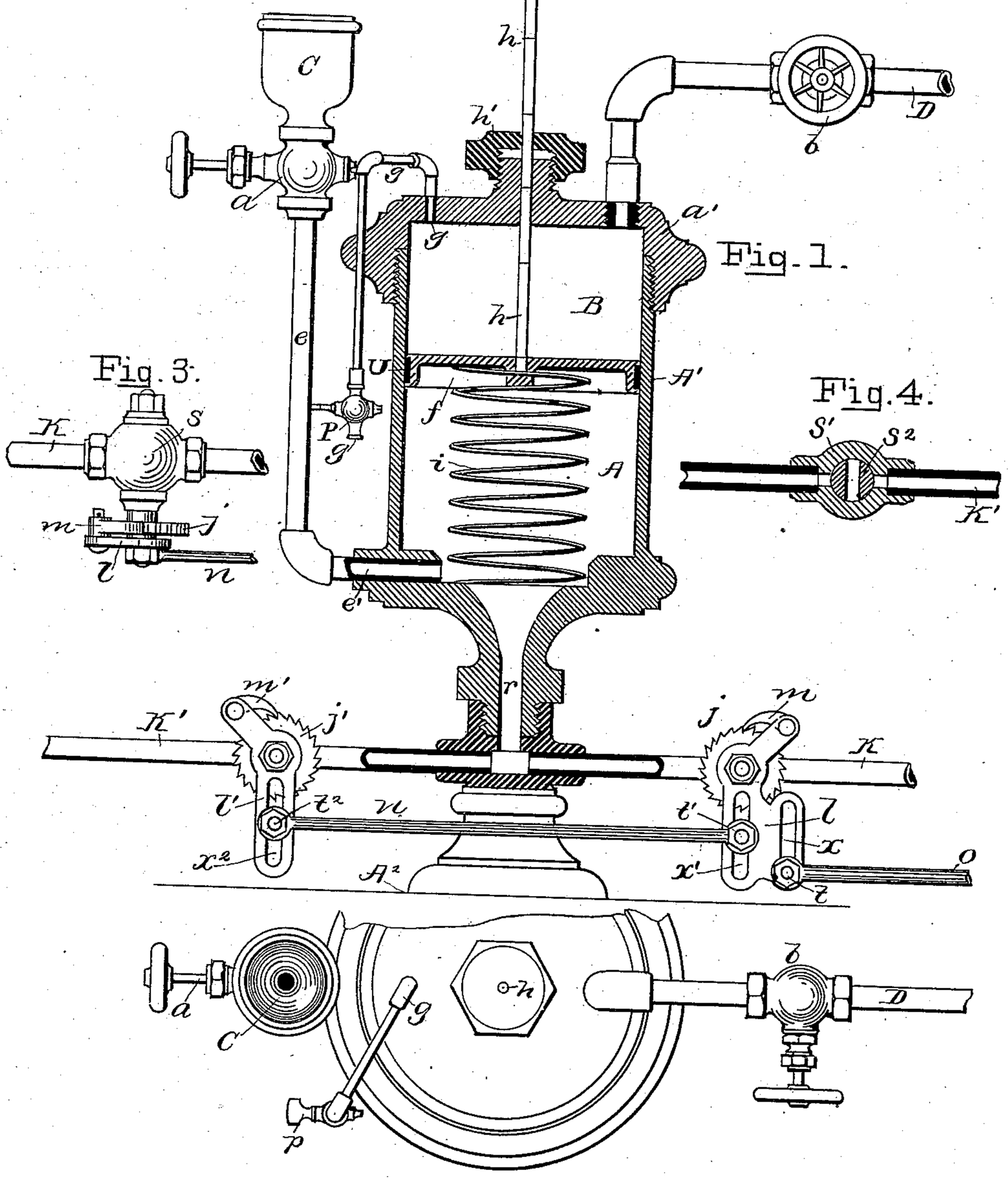

Fig. 3.

Fig. 4.

Fig. 2.

WITNESSES.

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LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 334,323, dated January 12, 1886.

Application filed November 17, 1885. Serial No. 183,109. (No model.)

To all whom it may concern:

Be it known that I, OWEN WILLIAMS, a subject of the Queen of Great Britain, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Lubricators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of a vertical transverse section. Fig. 2 is a top view. Fig. 3 is a detail view. Fig. 4 is a detail view.

This invention relates to improvements in steam-lubricators for single or compound engines, or for two engines working separately; and its objects are to prevent the oil mixing with the water of condensation of the steam, so that the lubricating power thereof may not be impaired, and to so regulate the flow of oil from the lubricator that the two cylinders of a compound engine may receive any different quantities of oil that may be desired.

The invention consists in the construction and novel arrangement of parts hereinafter described, and pointed out in the appended claims.

Referring to the accompanying drawings by letter, A′ designates the cylinder of the lubricator, the pedestal of which is secured upon any proper support, A^2.

A is the oil-chamber of the cylinder A′, and B the steam-chamber thereof, the two being separated by the piston *f*, working tightly by means of the packing-ring U.

h is a guide and gage rod passing centrally through the stuffing-box *h′* on the screw-cap *a′* of the cylinder A′, and having its lower end secured to the center of the piston. The said rod is graduated, as shown, the graduation being of any desired degree of fineness.

D is a steam-pipe from the boiler, opening into the chamber B through the screw-cap *a′*, and controlled by the throttle-valve *b*, and *g* is a discharge-pipe from the chamber B. The pipe *g* rises from the screw-cap at the opposite side from the steam-pipe, bends horizontally, and then descends vertically, having on its end a discharge-valve, P.

C is an oil-receiving cup, from which the tube *e* descends, and, bending horizontally, enters the bottom of the chamber A at *e′*. The tube *e* is controlled by the check-valve *a*. The chamber A discharges through the passages into the horizontal pipes K and K′, hereinafter referred to.

i is a coiled spring between the lower surface of the chamber A and the lower surface of the valve *f*, and acting to lift the latter.

The pipes K K′ lead, respectively, to the high-pressure cylinder and the low-pressure cylinder of a compound engine, and are provided with the similar valves *s s′*, respectively. The stem of the valve *s* has secured upon it the ratchet-wheel *j*, and has pivoted upon it, to the outer side of said ratchet-wheel, the lever *l*, the depending arm of which is provided with the two longitudinal slots *x* and *x′*. The upper arm of the lever *l* has pivoted to it the pawl *m*, which engages the teeth of the ratchet-wheel S. The stem of the valve *s′* has secured upon it the ratchet-wheel *j′*, the teeth of which point in the reverse direction to those of the ratchet-wheel S.

l′ is a lever pivoted on the stem of the valve *s′* to the outer side of the ratchet-wheel, and having pivoted to its upper arm a pawl, *m′*, engaging the teeth of said wheel. x^2 is a longitudinal slot in the depending arm of said lever.

Each valve has its plug s^2 made, preferably, with a single channel, so as to deliver oil only in two positions, diametrically opposite each other; but, if desired, there may be more. Then the lubricator will feed at more frequent intervals.

O is a reciprocating valve-rod operated from the engine, and having its end attached to the lever *l* by means of the slot *x* and the adjustable set-screw *t*. The action of the rod O vibrates the lever *l*, and, by means of the pawl *m*, rotates the ratchet-wheel *j* and turns the plug of the valve *s*. By setting the end of the rod O higher in the slot *x* the lever *l* is given a greater swing, and the pawl *m* turns the ratchet-wheel farther at each engagement.

n is a connecting-rod having its ends at-

tached to the end levers, *l l'*, by means of the slots *x' x²* and screws *t' t²*, similar to the screw *t*. The vibration of the lever *l* is imparted to the lever *l'* by means of said rod. By setting one end of the rod *n* high up in the slot *x'* and the other end low down in the slot *x²* the swing of the lever *l* is made greater than that of the lever *l'*, and consequently the valve *s* will feed at more frequent intervals than the valve *s'*. The rod is usually set to make the vibration of the lever *l* twice as great as that of the lever *l'*, so that the valve *s*, which is on the high-pressure-cylinder pipe K, will feed twice as often as the valve of the low-pressure-cylinder valve *s'*. With a single cylinder the pipe K', the parts connected therewith, and the rod *n* would not be used, and the lever *l* would have but one slot.

To use the lubricator, the valves *b* and *a* are closed so that neither steam nor oil can be admitted, and the valve P is opened. The spring *i* then lifts the piston, which drives out before it, through the pipe *g*, the water of condensation in the chamber B. The valve P is then closed and the valve *a* opened, and oil poured in until the cylinder *a* is full. The valve *a* is then closed, the valve *b* opened, and the valves *s s'* set in motion by the described mechanism. The entering steam then presses down the piston, and the valves *s s'* feed to the cylinder, as described.

The rod *h* serves both as a piston-rod to direct the piston and as a gage to indicate the amount of oil in the lubricator.

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

1. In combination with the lubricator, substantially as described, the pipe K, receiving oil therefrom, the valve *s* on said pipe, the ratchet-wheel *j*, secured to the stem of the valve, the lever *l*, pivoted on said stem and provided with a slot, *x*, the pawl *m*, controlling the ratchet-wheel, and the valve-rod O, actuating the lever, substantially as specified.

2. In combination with the lubricator, substantially as described, the pipes K K', valves *s s'*, ratchet-wheels *j j'*, levers *l l'*, pawls *m m'*, connecting-rod *n*, and reciprocating rod O, all constructed and arranged as and for the purpose specified.

3. In a lubricator, the combination, with an oil-chamber, of one or more pipes leading from the lower portion thereof and provided with valves, ratchet-wheel arranged on the valve-stem, slotted levers carrying pawls, a rod connecting the said levers, so as to regulate their openings, and an operating-rod connecting with one of the said levers, substantially as specified.

4. In a lubricator, the combination, with a chamber divided into an oil and a steam compartment, a discharge-pipe opening from the steam-compartment, an oil-cup communicating with the oil-chamber, and oil-pipes leading from the said oil-chamber, and provided with valves carrying regulating devices, substantially as specified.

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

OWEN WILLIAMS.

Witnesses:
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