

R. C. HOLMAN & G. I. THEILE.
STEAM ENGINE LUBRICATOR.
APPLICATION FILED MAR. 9, 1911.

1,018,112.

Patented Feb. 20, 1912.

4 SHEETS—SHEET 1.

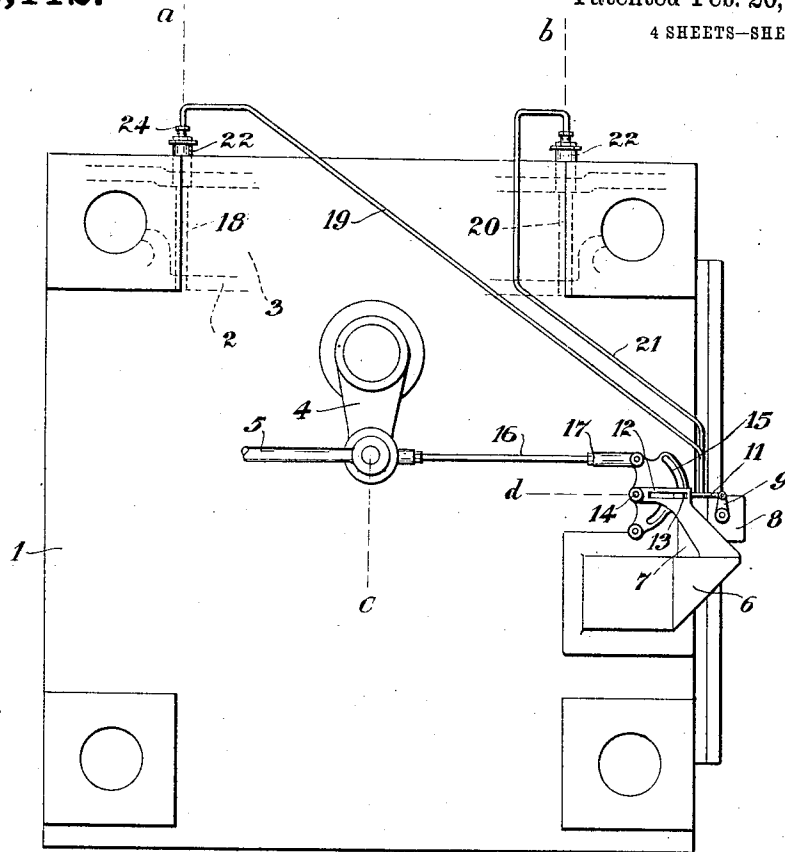


Fig. 1

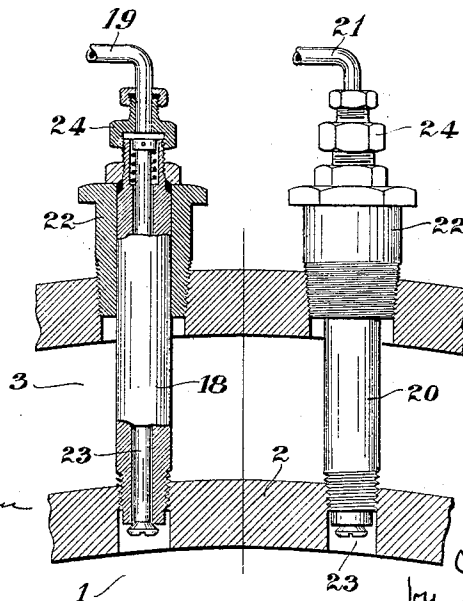


Fig. 2.

Witnesses

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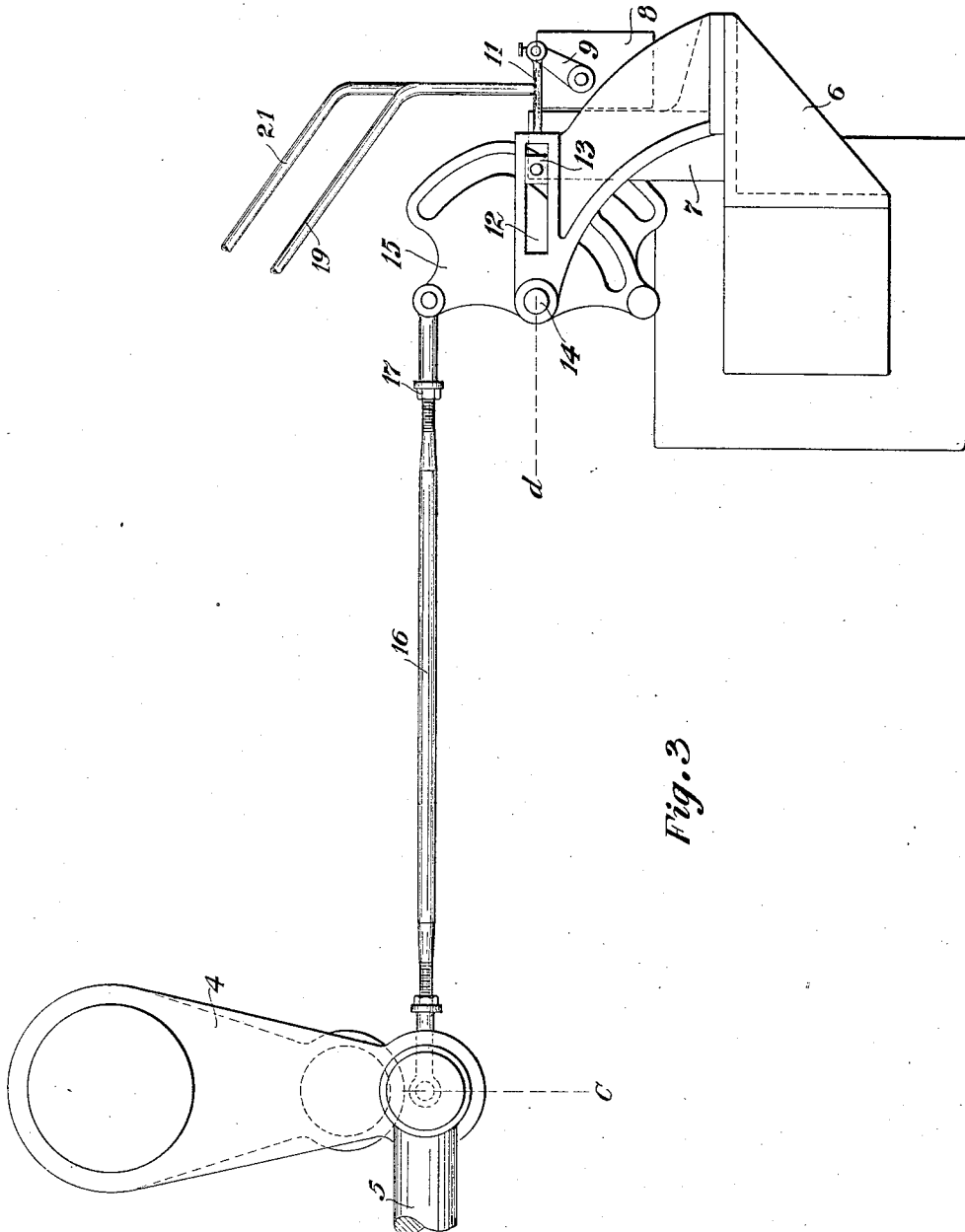
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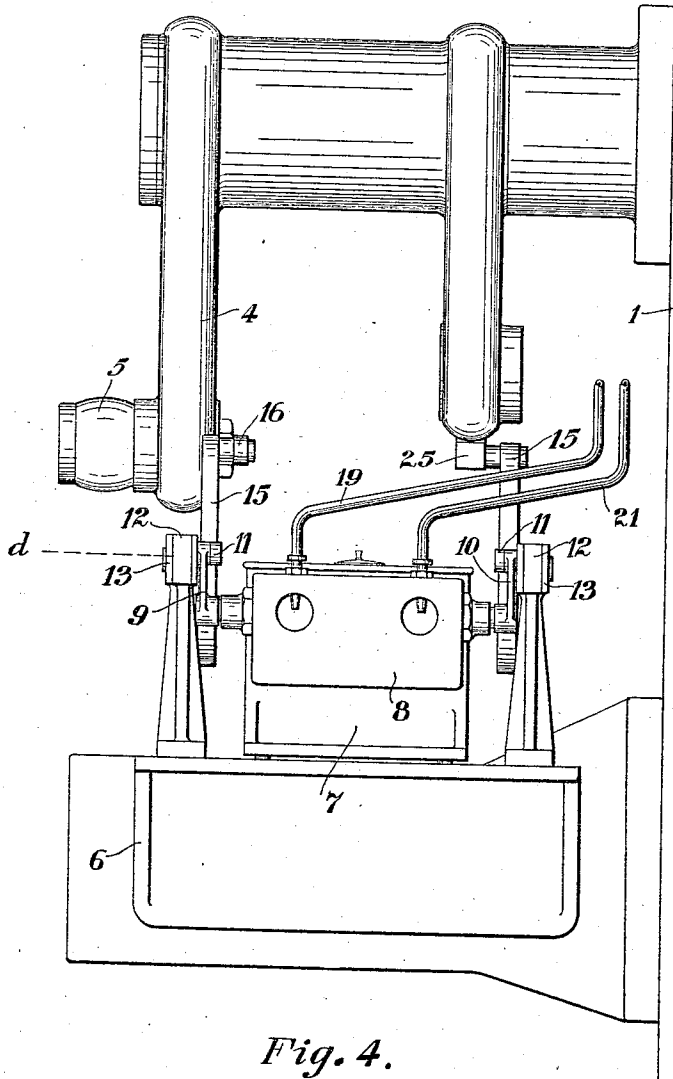


Fig. 4.

Witnesses

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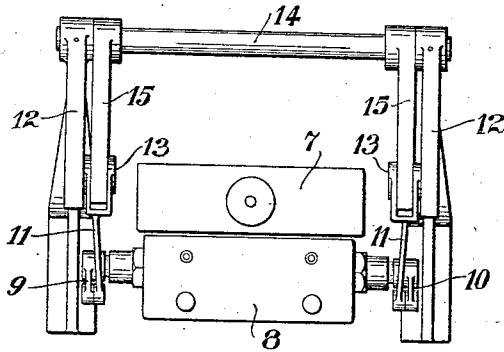


Fig. 5.

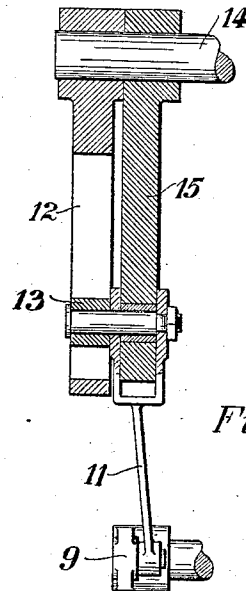


Fig. 6.

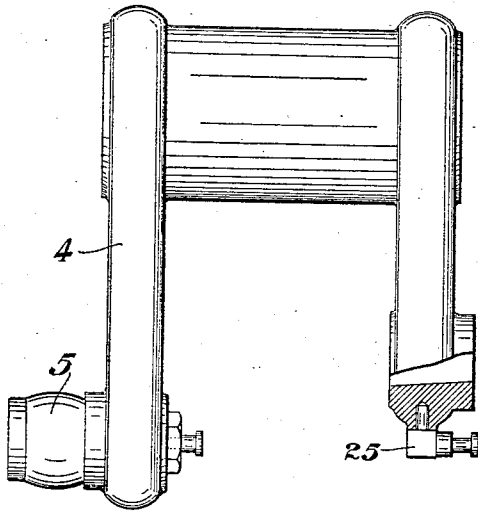


Fig. 8.

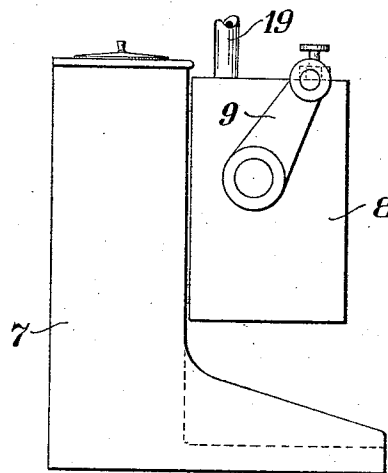


Fig. 7.

Witnesses

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UNITED STATES PATENT OFFICE.

ROBERT C. HOLMAN AND GEORGE I. THEILE, OF HAMILTON, OHIO, ASSIGNORS TO THE
HOOVEN, OWENS, RENTSCHLER COMPANY, OF HAMILTON, OHIO.

STEAM-ENGINE LUBRICATOR.

1,018,112.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed March 9, 1911. Serial No. 613,271.

To all whom it may concern:

Be it known that we, ROBERT C. HOLMAN and GEORGE I. THEILE, citizens of the United States, residing at Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Steam-Engine Lubricators, of which the following is a specification.

This invention pertains to improved apparatus for lubricating the inner surface of the cylinder of a steam engine and will be readily understood from the following description taken in connection with the accompanying drawings in which:—

Figure 1 is a side elevation of a steam engine cylinder, of Corliss or four-valve type provided with our improved lubricator: Fig. 2 a vertical transverse section through the upper portion of the cylinder in the planes of lines *a* and *b* of Fig. 1: Fig. 3 a side elevation, on an enlarged scale, of the valve-rocker and pump-mechanism seen in Fig. 1: Fig. 4 a front elevation of the valve-rocker and pump-mechanism: Fig. 5 a plan of the pump-mechanism: Fig. 6 a horizontal section of one of the pump-cams in the plane of line *d* of Figs. 1, 3 and 4: Fig. 7 a side elevation of the pump and tank: and Fig. 8 a front elevation of the valve-rocker.

A diversity of scale is employed in the drawings.

In the drawings:—1, indicates the cylinder of a horizontal engine of Corliss or four-valve type: 2, the upper portion of the cylinder-wall: 3, the usual steam-passage formed in the cylinder casting over the cylinder proper: 4, the usual double rocker pivoted to the cylinder and adapted to give motion to the valve-arms in the usual manner: 5, the usual rod for oscillating the rocker, this rod receiving its motion direct from an eccentric on the engine shaft, or from an intermediate rocker oscillated by the eccentric: 6, a bracket rigidly supported alongside one end of the cylinder: 7, an oil-tank supported by the bracket: 8, a double lubricating pump, of known construction, supported against the oil-tank and receiving its supply of oil therefrom: 9, a rocker-arm at one end of the pump, the oscillations of this arm serving to reciprocate one of the plungers of the pump: 10, a similar rocker-arm at the other end of the pump, for independently reciprocating

the second plunger of the pump: 11, a link connected with each of the rocker-arms of the pump and extending rearwardly therefrom: 12, a slotted guide supported by the bracket at each side of the pump and tank structure: 13, a pivot-block sliding in each of the guides and having connected to it the appropriate one of the links 11: 14, a pivot-shaft supported by the rear portions of the guides, parallel with the axis of oscillation of the pump rocker-arm: 15, a pair of cams mounted to rock on shaft 14, one inward of each of the guides 12, these cams having cam-grooves engaging the pivot-blocks 13 in such manner that the oscillation of the cams brings about the reciprocation of the pivot-blocks and the rocking of the rocker-arms of the pump: 16, links connecting the arms of valve-rocker 4 with the cams: 17, length-adjusting devices on the links 16: 18, a tube screwed into the upper portion of the cylinder wall near one end of the cylinder and to one side of the plane of the axis of the cylinder, this tube delivering into the cylinder: 19, an oil-discharge pipe leading from the pump and into connection with tube 18, this pipe being adapted to convey to the cylinder the oil forced out of the pump by one of the pump plungers: 20, a tube screwed into the upper wall of the cylinder near the end of the cylinder opposite tube 18 and on the side of the plane of the axis of the cylinder opposite the side at which tube 18 is located: 21, an oil discharge-pipe connecting tube 20 with the pump and serving to convey from the pump the oil discharged by the action of the second plunger: 22, stuffing boxes screwed into the top of the cylinder casting to serve in packing the upper ends of tubes 18 and 20, which tubes pass through the steam space 3 over the cylinder proper: 23, a downwardly opening check-valve in tubes 18 and 20, these valves being located at the lower ends of the tubes, near the bore of the cylinder, and being held normally closed by springs: 24, couplings connecting oil pipes 19 and 21 with tubes 18 and 20: and 25, an extension of length of the inner arm of the valve-rocker.

Looking at Fig. 4, pump 8, while an integral structure, may be considered as two independent pumps, having two plungers, independently driven by their respective rockers 9 and 10, each pump delivering a

drop or two of oil at each excursion of its plunger. As the engine piston leaves an end of its stroke a drop or two of oil is to be forcefully delivered upon it, this oil being dragged along the cylinder by the movement of the piston and running down the surface of the piston so that one-half of the cylinder becomes properly supplied with lubricant during the stroke. Before beginning the return stroke the piston is to receive a proper supply of oil for the other side of the cylinder. One plunger of the pump supplies the oil for one end of the cylinder through the medium of pipe 19 and tube 18, while the other pump serves for the other end of the cylinder through pipe 21 and tube 20. The pipe and tube system between the pump and the cylinder-bore will be full of oil, and under pressure, and the pump plungers, upon the completion of each of their strokes will have forced a drop or two of oil out of the pipe and tube system past the check-valves, the check-valves closing and leaving the pipe and tube system full of oil under pressure as before.

The rocker arms of the pump are oscillated in an obvious manner by the cams 15, and these are caused to oscillate by the action of valve-rocker 4 through the medium of links 16. Considering one of the cams, the nearest one in Fig. 3, this cam pertains to pump-rocker 9. At each excursion of the valve-rocker the cam will be given an oscillation, and the cam-groove is of such form that, as the valve-rocker moves, the pump-rocker will remain stationary and then make its swing in one direction and then remain stationary, thus giving to the pump-plunger its active stroke, the operation of the pump-rocker being reversed as the valve-rocker swings back. The movements of the valve-rocker will bear certain relationship in time to the movements of the engine piston and the parts may be so proportioned and adjusted that the pump-plunger actuated by pump-rocker 9 will deliver the proper charge of oil to the cylinder while the piston is under the appropriate one of the oil-delivering tubes, and the adjusting devices on links 16 serve in providing for a nice adjustment of the time of oil delivery. Giving consideration, now, to the more distant cam in Fig. 3 that cam, having to deal with the opposite end of the cylinder, is to be the reverse of the nearer cam. In practice we make the two cams from one pattern and place them reversely on the shaft on which they rock. For instance, it will be noticed in Fig. 3 that link 16 takes hold of a wrist in the upper portion of the cam, and it will be noticed that at the lower portion of the cam there is an idle boss without a wrist. By taking this cam and turning it upside down and

putting a wrist in the idle boss the cam will be in reverse of its present arrangement.

As seen in Figs. 4 and 8 the inner arm of the valve-rocker is shorter than the outer arm, this being a not unusual valve-rocker construction. The nearer cam may be driven from a wrist in axial extension of the wrist engaged by eccentric-rod 5, and in order to get a wrist at proper radial distance from the center of the valve-rocker to drive the farther cam we have recourse to the extension 25 to carry the cam-driving wrist.

We claim:—

1. In engine lubricating mechanism, the combination of a horizontal cylinder having an oil inlet near each end of the upper side thereof, a valve rocker, two pumps, a cam, an operating connection between said cam and one of the pumps, an operating connection between said cam and the valve rocker, another identical cam in reversed position, an operating connection between said cam and the other pump, and an operating connection between said cam and the valve rocker.

2. In engine lubricating mechanism, the combination of a horizontal cylinder having an oil inlet near each end of the upper side thereof, said inlets being somewhat on opposite sides of the longitudinal axis of said cylinder, a valve rocker, two pumps, a cam, an operating connection between said cam and one of the pumps, an operating connection between said cam and the valve rocker, another identical cam in reversed position, an operating connection between said cam and the other pump, and an operating connection between said cam and the valve rocker.

3. A horizontal steam-engine cylinder provided with an oil-inlet near each end of its upper portion, a check-valve at each of said inlets arranged to open to the cylinder, an oil-pump provided with a pair of independently operable rockers, independent conduits from the pump to said oil-inlets, a pair of oscillating cams, links connecting the cams with a portion of the valve-gear of the engine to cause the valve-gear to rock the cams, and links connecting the pump-rockers with the cams to cause the cams to rock the pump-rockers, combined substantially as set forth.

4. A horizontal steam-engine cylinder provided with an oil-inlet near each end of its upper portion, a check valve at each of said inlets arranged to open to the cylinder, an oil-pump provided with a pair of independently operable rockers, independent conduits from the pump to said oil-inlets, a pair of oscillating cams, links connecting the cams with a portion of the valve-gear of the engine to cause the valve-gear to rock

the cams, links connecting the pump-rockers with the cams to cause the cams to rock the pump-rockers, and means for varying the length of the first-mentioned links, combined substantially as set forth.

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5. A horizontal steam-engine cylinder provided with an oil-inlet near each end of its upper portion, a check-valve at each of said inlets arranged to open to the cylinder, an oil-pump provided with a pair of independently operable rockers, independent conduits from the pump to said oil-inlets, a pair of slotted oscillating cams, links con-

necting the cams with a portion of the valve-gear of the engine whereby the valve-gear may rock the cams, a slotted guide fixedly supported alongside each cam, a pivot-block engaging each guide and the slot of the appropriate cam, and a link connecting each pivot-block with one of the pump-rockers, combined substantially as set forth.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."