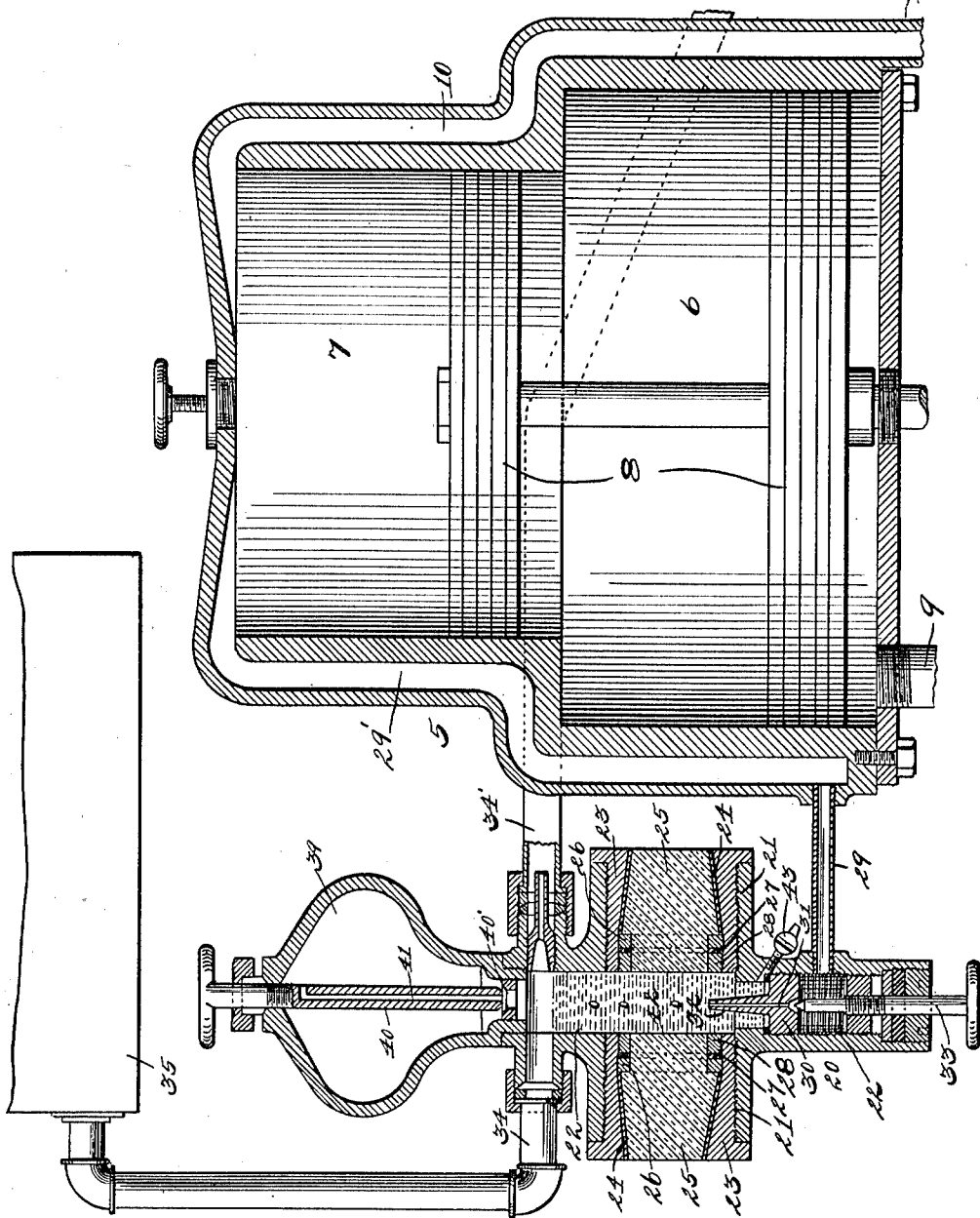


E. RYAN.
LUBRICATOR.
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UNITED STATES PATENT OFFICE.

EDWARD RYAN, OF CLINTON, IOWA.

LUBRICATOR.

1,001,559.

Specification of Letters Patent.

Patented Aug. 22, 1911.

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To all whom it may concern:

Be it known that I, EDWARD RYAN, a citizen of the United States, residing at Clinton, county of Clinton, and State of Iowa, have invented certain new and useful Improvements in Lubricators, of which the following is a specification.

My invention relates to devices designed for the lubrication of the valves, cylinders, pistons, etc., of steam engines.

The object of my invention is the provision of a device of this character of the class commonly known as sight feed lubricators wherein the feeding or passage of oil therethrough on its way for introduction for lubrication may be viewed from without; whereby the accurate regulation of the quantity of oil fed is facilitated.

A further object is the provision of a lubricator adapted when in connection with an engine of the class stated, to cause the saturation of the steam with vaporous oil in its passage from the engine boiler to the engine cylinders, the lubrication of the parts with which the steam comes in contact being thereby effected, since the vaporous oil carried by the steam will be deposited upon the surfaces with which the latter comes in contact.

A further object is to provide a lubricator which will be of economical construction and reliable and efficient in operation.

Other objects will appear hereinafter.

With these objects in view my invention consists in a lubricator characterized as above mentioned and in certain details of construction and arrangement of parts all as will be hereinafter fully described and particularly pointed out in the appended claims.

My invention will be more readily understood by reference to the accompanying drawing forming a part of this specification, and which is a section of a device embodying the invention.

The preferred form of construction as illustrated in the drawing comprises a differential cylinder 5 having a larger piston chamber 6 and a smaller piston chamber 7. Slidably mounted in said cylinder is a differential piston 8. Establishing communication between the engine boiler and the larger chamber 6 of the cylinder is a pipe 9. Formed in the wall of said cylinder is a passage 10 communicating at its upper end with the upper or outer extremity of the

smaller chamber 7. Leading from the lower extremity of said passage is a pipe 11 which connects with the engine standpipe. With this arrangement, oil having been supplied to the chamber 7 through a screw plug in the top, upon the admission of steam to the larger cylinder chamber, the piston, because of the pressure applied to the under surface thereof by said steam, will be forced upwardly, evidently forcing the oil contained in the chamber 7 into the passage 10 and down therethrough, through the pipe 11 to the locomotive standpipe.

The above is but a cursory description of my lubricating apparatus for steam engines disclosed in my patent granted June 28th, 1910, No. 962,859. Hence no claim is here made thereto, except in so far as it co-acts with my present sight feed lubricator application for patent for which is hereby being made.

With the construction above disclosed, the governing of the flow or feeding of oil for lubrication is entirely dependent upon mechanism, such flow being invisible. In the following, wherein will be set forth the description of my present invention, will be described the device wherein, as before mentioned, the flow of oil fed may be clearly viewed if desired.

20 indicates the body of the sight feed mechanism which is of a general form similar to that of a double elbow pipe fitting, the same being provided with horizontally alining passages 21—21 and vertically alining passages 22—22. Threaded into each of the passages 21 is a metal bushing 23 the interior of which tapers toward its outer extremity. Arranged in each of the bushings 23, a packing 24 being interposed between the same and the former, is a transparent tapering glass plug 25 which is held in position by a preferably rubber gasket 26, a metal washer 27, and an annular screw plug 28 provided at the inner extremity of each of said plugs. By the provision of plugs of a tapering form as shown and by mounting the same as shown and described, all possibility of blowing out thereof because of excess pressure within the lubricator will be obviated. By this arrangement the plugs may be readily removed if desired for cleaning or replacing. Communicating with the lower extremity of the body 20 is an oil supply pipe 29 which communicates, by

means of a passage 29' formed in the walls of the cylinder 5, as shown, with the upper end of the oil chamber 7 of the latter.

30 indicates a screw plug having a comparatively fine passage 31 through which the oil, upon entering the body 20, is required to pass in its upward passage through the latter. Said plug is preferably provided with a projecting nipple 32 surrounding the upper extremity of the passage there-through. A needle valve 33 mounted preferably as shown governs admission to the passage 31.

Communicating with the upper end portion of the body 20 is a live steam pipe 34, the latter preferably communicating as shown, with the steam fountain 35 in the locomotive cab. Extending from the body 20 in alinement with said pipe 34 is a pipe 34', the latter communicating either with the stand-pipe of the locomotive, or with the engine. Arranged at the upper extremity of the body 20 in alinement with the passages 22 is a condensing chamber or reservoir 39. 40 indicates a needle valve and 40' a valve seat co-acting therewith, the same governing the passage from said reservoir to the interior of the body 20. Formed through the stem of the valve 40 is a passage 41 opening at its lower end at the lower extremity of said stem and at its upper extremity at the upper end of the chamber 39.

The operation of the device is as follows: Live steam in passing from the pipe 34 to the pipe 34' passes through the upper end of the body 20. In its passage through said body some of the steam is condensed and settles in the pocket 42 within said body. The lubricating oil fed through the pipe 29 is forced through the passage 31 into this water of condensation, such injectment of the oil into the latter being made possible and positive because of the excess pressure upon the oil over the boiler pressure to which the upper surface of the water of condensation is subjected, such excess pressure upon the oil being occasioned, as is clear, through the differential action in the cylinder 5. The oil rises in the water of condensation in globules or drops, as indicated, until it reaches a position in alinement with the pipes 34 and 34'. When the oil globule has reached this position it is carried by the steam rushing from the pipe 34 to the pipe 34' and carried thereby to the steam pipe of the boiler or to the engine, as the case may be. As these oil globules rise in the water of condensation the same may be viewed through the glass plugs 25; thus the engineer or operator may ascertain the amount of oil being fed to the above named parts and regulate the feeding as desired. Should this water of condensation become dirty and hence opaque for any reason, this viewing of the oil globules is prevented. When said water becomes

so contaminated it must be drawn from the cavity 42, such drawing may be effected through a stop-cock 43. When this water is removed lubrication will evidently cease until said cavity has again been filled by condensing steam, which operation, if no other means were provided, would evidently occupy a considerable length of time. It is in order to prevent this loss of time and this cessation of lubrication that the reservoir 39 is provided. With this provision of said reservoir, the valve 40 being normally closed, steam will rise through the passage 41 therein and be condensed and collected within said reservoir. Hence water will always be stored therein. Now, with this provision upon exhausting the water from the chamber 42, as before mentioned, the valve 40 needs only to be opened whereupon water will be supplied to the pocket or cavity 42 from said reservoir.

The oil conductor so enters the steam passage in either the stand-pipe or the engine that oil will be discharged therein in the same direction as the steam passing there-through, and whereby the steam will tend to actually draw the oil from the former and to carry the same to the operative parts of the engine. Because of such disposition of the oil conductor relative to the direction of movement of the steam passing by the same, although the pressures in both the oil conductor and the steam passage may be equal the oil will nevertheless be injected into said passage, the steam moving at a great velocity creating an induced suction at the extremity of the oil pipe.

While I have shown what I deem to be the preferable form of my lubricator I do not wish to be limited thereto as there might be many changes made in the details of construction and arrangement of parts described without departing from the spirit of the invention comprehended within the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a lubricator provided with an oil supply and a live steam pipe, a primary steam condensing chamber communicating with said oil supply and with said steam pipe, transparent walls for said chamber, an auxiliary steam condensing chamber located above said primary chamber, a constantly open steam connection between the upper portion of said auxiliary chamber and said primary chamber, there being a water passage connecting said chambers, and a manually controlled valve in said water passage, substantially as described.

2. In a lubricator provided with an oil supply and a live steam pipe, a primary condensing chamber communicating at its lower end with said oil supply and at its upper

end with said live steam pipe, transparent plugs aliningly arranged in the walls of said chamber, an auxiliary steam condensing chamber located above said primary chamber, a constantly open steam connection between the upper portion of said auxiliary chamber and said primary chamber, there being a water passage connecting said condensing chambers, and a manually controlled valve in said water passage, substantially as described.

3. In a lubricator, the combination with an oil supply and a live steam-pipe, of a steam condensing chamber communicating at its lower end with said oil supply pipe, and at its upper end with said live steam-pipe means for governing the flow of oil to said chamber, outwardly tapering glass plugs aliningly arranged in the walls of said chamber, an auxiliary steam condensing chamber located above and communicating with said first named chamber, a valve governing the passage between said chambers, and an open passage in said valve communicating at its lower end with said first named chamber and at its upper end with said auxiliary chamber at the upper end thereof, substantially as described.

4. In a lubricator, the combination with

an oil supply pipe and a live steam-pipe, of a tubular body, a steam condensing chamber formed in said body, said chamber communicating at its lower end with said oil supply pipe and at its upper end with said live steam-pipe, a valve governing the oil passage to said chamber, said body being formed with alining openings registering with said chamber, bushings threaded in said openings bearing outwardly tapering interior openings, correspondingly formed glass plugs arranged in said bushings, an auxiliary steam condensing chamber located above and communicating with said first named chamber, a valve governing the passage between said chambers, an open passage in said valve communicating at its lower end with said first named chamber and at its upper end with said auxiliary chamber at the upper end of the latter, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD RYAN.

Witnesses:

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