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The drawing consists of two parts, Fig. 1 and Fig. 2, illustrating a mechanical system, likely a steam engine or boiler component.

Fig. 1 is a side elevation of a vertical assembly. At the top, a horizontal pipe (d8) is connected to a vertical pipe (d9). Below this, a complex valve or fitting assembly (d1, d2, d3, d4, d5, d6, d7) is shown. A vertical pipe (e) extends downwards from this assembly. To the right, a vertical pipe (a) is connected to a horizontal pipe (b5) via a flange (c7). A vertical pipe (b2) runs down the right side of the assembly. A horizontal pipe (c4) connects to a vertical pipe (c3) which has a valve (c5). Below this, a horizontal pipe (f2) with a valve (f) connects to a vertical pipe (h2) with a valve (h). A horizontal pipe (g) connects to a vertical pipe (g2) which has a valve (g3). At the bottom, a cylindrical tank (b) with a vertical pipe (b6) inside is shown. A horizontal pipe (k) connects to a vertical pipe (b3) which has a valve (b4). A horizontal pipe (f3) connects to a vertical pipe (f2) which has a valve (f2).

Fig. 2 is a cross-sectional view of a vertical pipe (d1) with a valve (j) and a flange (d6). Below this, a horizontal pipe (d3) is shown with a valve (d7).

WITNESSES

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LUBRICATING APPARATUS.

937,243.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed January 23, 1909. Serial No. 473,786.

To all whom it may concern:

Be it known that I, HENRY E. JORDON, a citizen of the United States, and residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Lubricating Apparatus, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to lubricating apparatus designed for use in connection with the steam pipes of steam operated machinery; and the object thereof is to provide an improved apparatus of this class which is simple in construction and automatic in operation, and by means of which lubricating material may be automatically applied to steam pipes for the purpose of lubricating pistons and other parts connected therewith, and which may also be used in lubricating various parts of machinery not directly connected with the steam pipe or pipes; and with this and other objects in view the invention consists in an apparatus of the class specified constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which;—

Figure 1 is a side view of my improved lubricating apparatus, part of the construction being broken away and part shown in section, and;—Fig. 2 a sectional detail view of part of the construction shown in Fig. 1, and on an enlarged scale.

In the drawing forming part of this specification, I have shown at *a* a steam pipe designed for use in conveying steam to an engine of any kind or class, and in the practice of my invention I provide a tank *b* designed to contain oil or other lubricating liquid. A stand pipe *b*² is connected at *a*² with the steam pipe *a* and with the bottom portion of the tank *b* as shown at *b*³, and in the bottom part of the pipe *b*² is a valve *b*⁴, and in the top part thereof is another valve *b*⁵. The tank *b* is provided with a vertically arranged sight glass *b*⁶, and said tank is closed except as hereinafter described and communicating with the central top part thereof is an oil feed pipe *c* which is parallel

with the pipe *b*² and which is provided with two valves *c*² and *c*³, and communicating therewith above the valve *c*³ is a branch pipe *c*⁴ which also communicates with the pipe *b*² and is provided with a valve *c*⁵. An oil feed tube *c*⁶ is connected with the steam pipe *a* below the connection therewith of the pipe *b*² as shown at *c*⁷, and this pipe is also provided with a valve *c*⁸, and the pipe *c*⁶ is parallel with the pipe *c*⁴ in the form of construction shown, and mounted between the upper end of the pipe *c* and the outer end of the pipe *c*⁶ is a sight feed tube *d* composed of glass. The sight feed tube *d* is connected with the pipe *c*⁶ by a coupling *d*², and with the upper end of the tube *c* by couplings *d*³ and *d*⁴ and at each end of the sight feed tube *d* is a stuffing box *d*⁵, these stuffing boxes being formed partly in connection with the couplings *d*² and *d*³. The couplings *d*² and *d*³ are elbow couplings, and the coupling *d*³ is provided with a nozzle *d*⁶ which opens into the sight feed tube *d*, and passing vertically through the bottom of the coupling *d*³ is a needle valve *d*⁷ adapted to control said nozzle. In the top of the coupling *d*² is a threaded plug *d*⁸ provided with a fine needle, wire or similar device *d*⁹ which passes downwardly into the tube *d* and terminates a short distance above the nozzle *d*⁶. A brace or support *e* connects the couplings *d*² and *d*⁴, said brace or support being placed parallel with the sight glass tube *d*, and the parts *d*, *d*², *d*³ and *d*⁴ constitute an oil feed regulator which forms one of the essential features of my invention, and which may be used either in the relation shown, or in any other apparatus of this class.

As above described my improved lubricating apparatus is designed for supplying oil or other lubricants to the steam pipe *a* for the purpose specified, but the said apparatus may also be employed for supplying lubricating material to various parts of machinery, and in order to accomplish this result and to not interfere in any way with the operation of supplying lubricating material to the steam pipe *a* I connect with the pipe *c* between the valves *c*² and *c*³ a branch pipe *f* which is in communication with an oil receiver *f*² which is provided with a plurality of branch pipes *f*³ any desired number of which may be employed and which are designed to convey lubricating material to any

of the parts of a machine or mechanical apparatus operated by steam supplied through the pipe *a*, or through any other source or by any other means.

5 The tank *b* is provided, in practice, in the top thereof with a filling aperture *g* through which oil may be passed thereinto and which may be closed in any desired manner, and the top of the tank *b* is also provided with a vent
10 *g*², and I also connect with the pipe *c* between the tank *b* and the valve *c*² an oil supply pipe *h* provided with a valve *h*², and said pipe, in practice, is connected with a large oil supply tank or holder from which
15 oil may be fed into the tank *b* whenever desired.

One of the chief objects of my invention is to provide means whereby a large supply of oil may be maintained in position for use,
20 and from which oil is automatically fed at all times, thus avoiding the necessity of constant attention and the inconvenience of opening and supplying ordinary lubricating devices attached to various parts of machinery, and in practice the tank *b* is made
25 of such dimensions as to hold a considerable amount of oil, and a new supply of oil may be poured into said tank whenever necessary through the filling aperture *g*, or as hereinbefore described it may be supplied through
30 the pipe *h* without interfering with the operation of the apparatus as a lubricator.

The pipe *b*² is provided at the top thereof with an aperture *i* through which water may
35 be poured into said pipe, and said aperture is closed by a screw plug or similar device *i*², and the operation of this apparatus will be readily understood from the foregoing description when taken in connection with the
40 accompanying drawing and the following statement thereof. Before putting the apparatus into operation it is assumed that the valves *b*⁵ and *c*⁸ are closed thus disconnecting the lubricating apparatus from the steam
45 pressure in the steam pipe *a*. In order to put the apparatus into operation the valves *b*⁴ and *c*⁵ are closed, the screw plug or other device *i*² is removed from the aperture *i* and water is poured therein until the pipe *b*² is
50 filled above the valve *b*⁴ till it appears at the aperture *i* when the valve *b*⁴ is opened slightly and the vent *g*² is opened and the water in the pipe *b*² will then flow downwardly through the valve *b*⁴ and into the
55 tank *b* at *b*³ and will rise therein, and as soon as the level of water appears in the glass *b*⁶ the valve *b*⁴ is closed. Sufficient water is then poured into the pipe *b*² at the aperture *i* until said pipe is again filled and the screw plug *i*² is inserted and made tight.
60 The valve *h*² is now opened and oil flows from the main reservoir, not shown in the drawing, through the pipe *h*, the valve *h*² into the pipe *c* and into the tank *b*. It will
65 be understood, of course, that the oil will

not descend in the tank *b* below the surface of the water therein, and the main reservoir which is connected to the pipe *h* is preferably located at a level higher than the pipe *c*¹ so that while the apparatus is filling the oil
70 will rise from the water level in the tank *b* up through the pipe *c*, the valves *c*² and *c*³ until it reaches the needle valve *d*⁷ and appears at the point of the nozzle *d*⁶; and if the valve *f*⁴ be opened oil will flow there-
75 through and through the pipe *f* into the oil receiver *f*² and therethrough into the pipes *f*³ and on to the several lubricating valves or other devices connected thereto. The valve *h*² may now be closed until a further supply
80 of oil from the main reservoir is needed. It is understood, of course, that the vent *g*² is provided for the purpose of permitting the air to escape from the tank *b* as the same is filled with oil, and at the proper time in the
85 operation just described this vent is closed.

As will readily be seen the sight gage glass *d* serves the same purpose as similar devices in other forms of lubricators, and is, in a way similar to other devices of this class,
90 filled with water through the opening which is normally closed by the plug *d*⁸.

From this description it will be understood that if the valve *b*⁴ be opened, the oil in the apparatus from the water level in
95 the tank *b* to the needle valve *d*⁷ will be under pressure due to the column of water in the pipe *b*², and also in this case stands at a higher level at the aperture *i* than that of the oil at the needle valve *d*⁷. If now the
100 valves *b*⁵ and *c*⁸ be opened to the steam pressure in the pipe *a* the difference in pressure on the oil at the needle valve *b*⁷ and the pressure on the oil at the water level in the
105 tank *b* will be the same as before since the steam pressure at the valve *b*⁵ is practically or approximately the same as that at the valve *c*⁸. By the adjustment of the needle valve *d*⁷ the quantity of oil which flows
110 through the nozzle *d*⁶ will appear in drops at the extreme point of the needle valve *d*⁷ as indicated at *j* in Fig. 2, and will rise due to the buoyancy of water in the gage glass
115 *d*. As the drop of oil leaves the point of the needle valve *d*⁷, it comes in contact with the point of the needle *d*³, and as will be understood will surround and cling to said
120 needle and will continue floating upward never leaving the said needle until it reaches the surface of the water in the gage glass *d* where it congregates with other drops until
125 the quantity of oil has become so great that it will flow in small quantities or drops out through the coupling *d*² and the pipe *c*⁶ and the valve *c*⁸ into the steam pipe *a* mingling therein with the steam in the usual way.

The operation of supplying oil at bearings or other points where desired through the
pipes *f*³, and as described through the needle valve device, will continue as long as a sup- 130

ply of oil is maintained in the tank b , and the column of water in the pipe b^2 is maintained at a sufficiently high level. As will be understood the water in the pipe b^2 will always approximately fill the pipe b^2 , any tendency thereof to fall being counter-acted by an accumulation of condensed steam entering from the valve b^5 . After continued operation the oil in the tank b will become exhausted as will be indicated by the rise of its level in the gage glass b^6 , and at this time or at any other time when it is deemed desirable the oil can be restored in the tank b to its former quantity in the following way. The valves b^4 and c^2 are closed; the small valve k is now opened and the water in the lower part of the tank b is drained off therethrough, and if necessary through the coöperation of the vent g^2 ; when the level of water in the tank b is lowered to the lower part of the gage glass b^6 , as will be understood to be desirable, the valve k is closed and the valve h^2 opened and oil admitted to the tank b as at first, and the valve c^2 opened and the apparatus is thus restored to working condition. If this operation requires any considerable length of time or, if for other reasons, it is desirable to disconnect the tank b , and the connections thereto, from the lubricating supply pipes f^3 and c^6 , it is not necessary at the same time to discontinue the lubrication, for as will be seen, with the valve c^2 and the valve b^4 closed, the valve c^5 may be opened, and under this condition the pipe lubricating devices will operate as before, the quantity of oil remaining in the part d^4 and the pipe c down to the valve c^2 being sufficient to supply the same for considerable time depending upon the actual length of the parts and the oil in the receiver f^2 likewise sufficing to supply the connections thereto.

The oil in the receiver f^2 is at all times during the operation of this apparatus under the pressure of the steam in the pipe a , and the quantity of oil supplied therefrom may be regulated at the lubricating devices themselves, or in any other desired manner.

If desired the tank b may be filled by hand measures, cans or other oil receptacles by means of the aperture g instead of from the main reservoir through the pipe h . The purpose of the valve c^5 will be readily understood to be a means of disconnecting the rest of the apparatus from the steam pipe lubricating devices for purpose of inspection and repair; and at such times the valve c^5 is open and the valve b^4 closed.

From this description, it will be seen, that the steam pipe lubricating part of my improved apparatus may be used independent of the other parts designed for use in lubricating various parts of machinery to which steam is not conveyed, or that part of the apparatus designed for use in lubricating the

said various parts of machinery may be used independent of the parts designed for use in connection with the steam pipe; and various changes in and modifications of the construction described may be made, within the scope of the appended claims, without departing from the spirit of my invention or sacrificing its advantages.

As hereinbefore stated the oil in leaving the valve coupling d^3 does so in drops from the point of the valve d^7 and will rise vertically through the water in the tube d in which operation it follows the needle d^9 . This prevents the oil from coming in contact with the inner walls of the tube d thereby destroying their transparency and rendering the inspection of the rate of feed difficult or impossible and this retains the transparency of said tube and removes an important objection to devices of this class as usually constructed.

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

1. In a lubricating apparatus, a closed tank, a stand pipe adapted to be connected with the bottom of said tank and with a steam pipe, a main oil feed pipe connected with the top of said tank, a branch pipe adapted to be connected with the steam pipe, a coupling connected with the top of the main oil feed pipe, a coupling connected with said branch pipe, and a sight glass feed tube mounted between said couplings, the coupling connected with the main oil feed pipe being provided with a nozzle adapted to discharge into said tube and with a needle valve for controlling the same, said main oil feed pipe and stand pipe being also connected below said couplings by a supplemental branch pipe, and said main oil feed pipe being also provided below said supplemental branch pipe with two valves, a supplemental oil feed pipe connected with said main oil feed pipe between said valves, and branch pipes in communication with the supplemental oil feed pipe.

2. In a lubricating apparatus, a closed tank, a stand pipe adapted to be connected with the bottom of said tank and with a steam pipe, a main oil feed pipe connected with the top of said tank, a branch pipe adapted to be connected with the steam pipe, a coupling connected with the top of the main oil feed pipe, a coupling connected with said branch pipe, and a sight glass feed tube mounted between said couplings, said main oil feed pipe and stand pipe being also connected below said couplings by a supplemental branch pipe, and said main oil feed pipe being also provided below said supplemental branch pipe with two valves, a supplemental oil feed pipe connected with said main oil feed pipe between said valves, and branch pipes in communication with the sup-

plemental oil feed pipe, and an oil supply pipe connected with the main oil feed pipe adjacent to the top of said tank.

3. In a lubricating apparatus, a closed
5 tank, a stand pipe adapted to be connected with the bottom of said tank and with a steam pipe, a main oil feed pipe connected with the top of said tank, a branch oil feed
10 pipe adapted to be connected with the steam pipe, a coupling connected with the top of the main oil feed pipe, a coupling connected with said branch oil feed pipe, a sight glass
15 feed tube mounted between said couplings, the coupling connected with the main oil feed pipe being provided with a nozzle adapted to discharge into said sight glass feed tube and with a valve for controlling the same, and a branch pipe connected with the main oil feed pipe below said couplings
20 and adapted to be connected with the stand pipe.

4. In a lubricating apparatus, a closed

tank, a stand pipe adapted to be connected with the bottom of said tank and with a steam pipe, a main oil feed pipe connected 25 with the top of said tank, a branch oil feed pipe adapted to be connected with the steam pipe below the connection of the stand pipe therewith, a coupling connected with the top of the main oil feed pipe, a coupling con- 30 nected with said branch pipe, a sight glass feed tube mounted between said couplings, and a branch pipe connected with the main oil feed pipe below said couplings and adapted to be connected with the stand pipe. 35

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 22nd day of January 1909.

HENRY E. JORDON.

Witnesses:

C. E. MULREANY,
M. E. DOODY.