

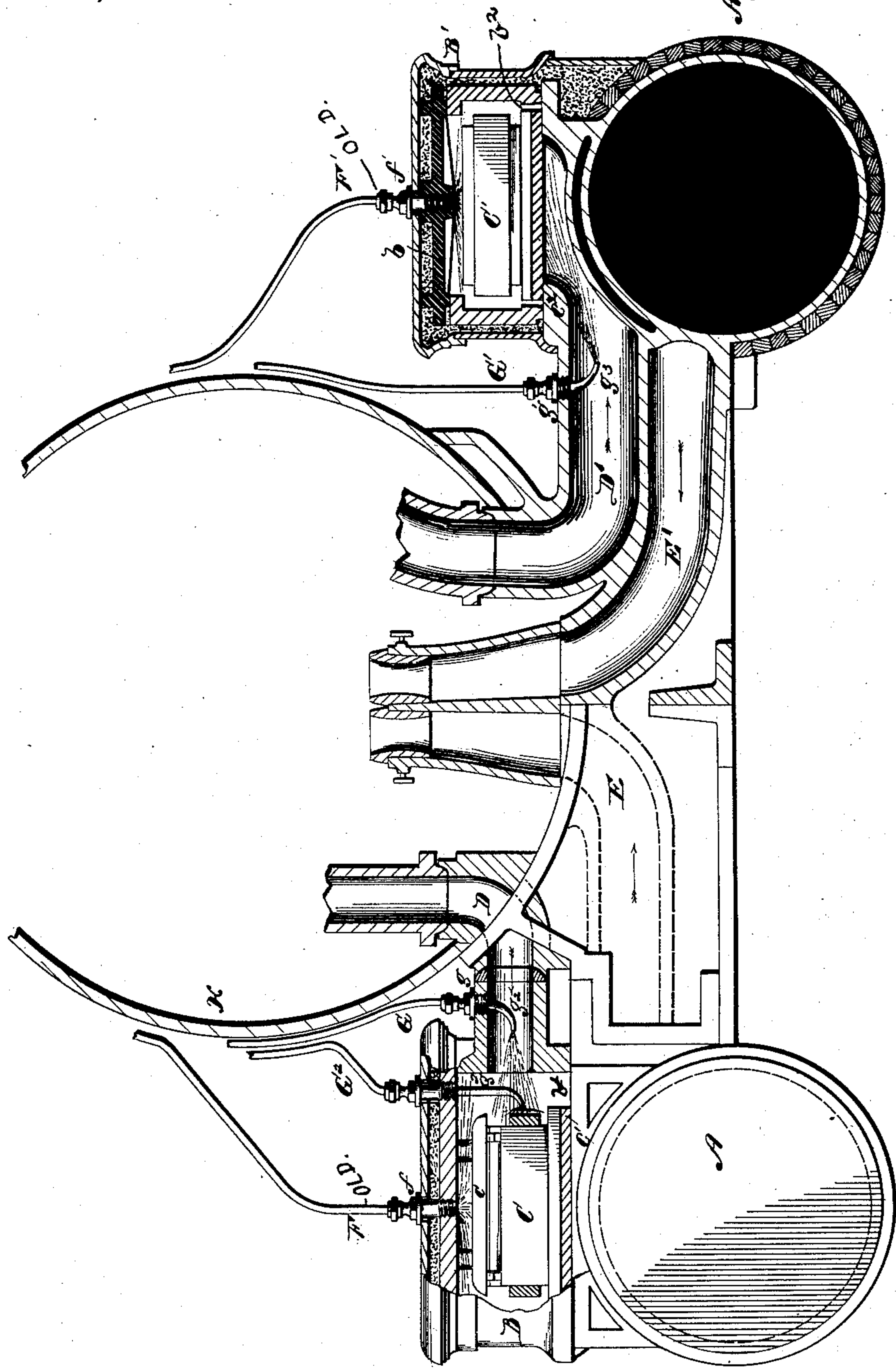
(No Model.)

E. McCoy.

LUBRICATOR FOR SLIDE VALVES.

No. 363,529.

Patented May 24, 1887.



WITNESSES

WITNESSES
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ELIJAH MCCOY, OF DETROIT, MICHIGAN.

LUBRICATOR FOR SLIDE-VALVES.

SPECIFICATION forming part of Letters Patent No. 363,529, dated May 24, 1887.

Application filed March 12, 1887. Serial No. 230,659. (No model.)

To all whom it may concern:

Be it known that I, ELIJAH MCCOY, of Detroit, county of Wayne, State of Michigan, have invented a new and useful Improvement in Lubricators for Steam Slide-Valves of Locomotive-Engines; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawing, which forms a part of this specification.

My invention relates to novel apparatus for lubricating the slide-valves and cylinders of locomotive-engines; and it consists in the construction and arrangement of devices, as more fully hereinafter specified, and more particularly pointed out in the claims.

The drawing is a view, partly in section and partly in elevation, of devices embodying my invention, and showing also the superiority of my invention over mechanism heretofore employed for oiling the slide-valves and cylinders of ordinary locomotive-engines.

A and A' represent the steam-cylinders; B and B', their respective steam-chests. As shown in the drawing the cylinder A, with its steam-chest B, and the cylinder A', with its steam-chest B', illustrate two styles of the ordinary construction of American locomotives.

C represents an improved balanced slide-valve in the steam-chest B, such as is now more generally preferred, and the main steam-pipe D communicates with the end of the steam-chest B, as in locomotives of the most approved construction as they are now more commonly manufactured.

C' in the steam-chest B' represents an old T slide-valve, and the steam-inlet pipe D' communicates with the interior of the said steam-chest at the base, as shown, conforming to certain styles of construction and arrangement of locomotive-engines now in use.

E and E' represent the exhaust-pipes leading from the cylinders A and A', respectively.

I have shown in the accompanying drawing, on the right and on the left hand of the figure, respectively, two ordinary styles of locomotive-cylinders with their respective steam-chests, and slide-valves with their steam inlet and exhaust pipes as more ordinarily constructed and arranged, in order to show more clearly the adaptability and desirability of my new

invention for oiling the slide-valves and cylinders in locomotives of ordinary construction. I have also for this purpose shown in the drawing the common mechanism and its arrangement hitherto employed for lubricating the slide-valves and cylinders. This lubrication has heretofore been accomplished by leading steam and oil conduits F and F' to communicate with their respective steam-chests B and B' at the top thereof, as shown at *f f'*, said conduits simply extending through the top of their respective steam-chests, but not projecting into the interior of said chests beneath the interior surface of the top of the chest, the chest B' being ordinarily provided on the interior of the top thereof with a strengthening-rib, *b*, the nozzle of the conduit F' only extending flush with the inner surface of said rib.

The result has been hitherto that the lubricant spreads over the inner surface of the top of the steam-chest, and is thence distributed down the sides of the chest, and is admitted also upon the top of the slide-valve where the style of valve C' is employed, or upon the top of the upper valve seat, *c*, where the improved balanced slide-valve C is used, where the oil is not needed, thereby causing a great waste of oil. The oil, moreover, not only adheres to the upper surface of the valve-seat *c*, but is sprayed off from its edges and thrown down therefrom away from the underlying valve to the sides and bottom of the steam-chest, the upper valve-seat, *c*, ordinarily projecting over the valve C, as shown in the drawing, so that the oil sprayed off thus from the top of said upper valve-seat is thrown first to the bottom of the chest, without being thrown at once upon the valves or their seats. So, also, the lower valve-seats, *c'* and *c''*, of their respective chests B and B' are also ordinarily raised, as shown, above the base of the chest, leaving channels *b' b''* around the edges of the said lower valve-seats, and the oil must thus fill in these channels before it rises to lubricate the lower valve-seats, while the valve C, with its upper valve-seat, *c*, will only take oil upon their adjacent faces as it may be communicated to said faces from the outer edges of the said valve-seat in the operation of the valve, the oil not being thrown directly upon the said adjacent faces at all. The amount of waste surface thus or-

dinarily oiled can be readily computed. For instance, if the interior surface of the upper side of the chest is eighteen inches square, as in chests of ordinary dimensions, there would here be three hundred and twenty-four square inches of waste oiling, and if the interior sides of the chest be eighteen inches by fourteen inches there would be upon the four sides one thousand and eight square inches of waste oiling. So, also, if the valve-seats were fourteen inches square, there would be one hundred and ninety-six square inches on the top of the upper valve-seat of waste oiling. Of the three hundred and twenty-four square inches on the lower interior surface of the chest, only one hundred and ninety-six square inches would need to be oiled, leaving one hundred and twenty-eight square inches (324-196) of waste oiling upon this lower surface, or a total of $324+1,008+196+128=1,656$ square inches of waste oiling in a single steam chest, to say nothing of the depth of the channel about the lower valve-seat to be filled with oil before the lower valve-seat can be properly oiled. Thus, in consequence of the oil not going direct to the valve-seats, but spreading off upon the surfaces of the chest, as above described, in devices heretofore employed, a needless amount of oil is required to do the work of lubricating the valve-seats and the interior walls of the steam-cylinder through said valves in the ordinary manner, while at the same time the upper valve-seat is imperfectly lubricated.

It is the special object of my invention to overcome this waste, and to provide means whereby the oil will be thrown into the steam-chest in such a manner that it will be communicated directly to the valves and valve-seats, and so that both the lower and the upper valve-seats will each receive their proper share of oil.

Having thus specified the ordinary apparatus hitherto employed and its radical defects, I will proceed to describe the features of my invention, which I carry out as follows, viz: By leading steam and oil conduits G G' to communicate with the interior of the steam-inlet pipes D D' , respectively, as shown at g g' , said conduits extended through and into the said pipes or provided with interior nozzles, g^2 g^3 , bent forward toward the interior of the steam-chest, so as to throw the oil forward and direct its discharge toward the slide-valves and free from the interior walls of the steam-pipes. By engaging these conduits G G' with their respective steam-pipes well forward toward the ends of said pipes adjacent to the interior of the chests, little or no oil will have contact with the interior walls of the steam-pipes themselves, while the blast of steam through the conduits with the oil and the blast of steam in the steam-pipe proceeding into the steam-chest past the bent nozzle and in direction with its discharge will carry the oil forward immediately in the form of spray upon both the upper and lower valve-seats, as shown in the drawing, where a valve

C is employed, or upon the lower surface of the valve when a valve C' is employed, and the steam is discharged into the bottom of the chest, thereby effecting the direct oiling of the valve-seat, and without occasioning any waste of oil upon the surfaces of the steam-chest and top of the upper valve-seat, as in devices heretofore employed.

Instead of leading the steam and oil conduits into the steam-pipes, a steam and oil conduit, as G^2 , may be led into the side of the steam-chest itself adjacent to the discharge of the steam-pipe, and said conduit be provided with an interior nozzle, g^2 , extended into the chest at the side of the valve, the nozzle being bent toward the valve, so as to throw the oil in a spray directly upon the valve and valve-seats. Not only does this construction and arrangement of the steam and oil conduits and their location effect a great saving of oil, but the pulsations in the feed of the oil are thus made more regular and uniform, as there is less liability to back-pressure, which may be still more effectually secured by reducing the size of the extreme end of the nozzle, as shown.

The conduits G G' G^2 may lead from any ordinary lubricator or hand-oiler. Moreover, by leading the steam and oil conduits into the steam-pipes or to the side of the steam-chest adjacent thereto, it is obvious that said conduits are brought much nearer to the smoke-arch H and more directly behind the ordinary smoke-box and pilot-braces, whereby they are more securely shielded and protected against injury by accident. So, also, by bringing said conduits nearer to the smoke arch the heat of the arch is utilized in cold weather to prevent the freezing of the contents of said conduits, which, in addition to the more regular pulsations occasioned by my improved construction, as described, insures the proper feeding of the oil and dispenses with the necessity of covering said conduits to prevent freezing.

What I claim is—

1. In a lubricating apparatus for lubricating slide-valves and cylinders of locomotive-engines, a steam-chest provided with a slide-valve, and a steam and oil conduit having communication with the interior of said steam-chest at the side of the said valve, said conduit being arranged to open within the steam-pipe and to project oil, by the force of the steam, upon the side of the valve and its seat, substantially as described.

2. In a lubricating apparatus for oiling the slide-valves of locomotive-engines, the combination, with a steam-chest having a slide-valve, of an oil-conduit, a steam-pipe within which the exit of said conduit is arranged, said steam-pipe and oil-conduit being arranged to enter the steam-chest on the same side and to deliver the oil and steam upon the valve and valve-seat at one side thereof, substantially as described.

3. In a lubricating apparatus for the slide-valves and cylinders of locomotive-engines, the combination, with a steam-chest and a

slide-valve operating therein, of a steam-inlet communicating with said chest, within which the oil-conduit is arranged, and means, substantially as described, for atomizing and projecting the oil delivered by said conduit upon one side of the valve and valve-seat, substantially as described.

4. In a lubricating apparatus for lubricating slide-valves and cylinders of locomotive-engines, a steam-chest provided with a slide-valve, a steam-inlet pipe communicating with

the interior of said chest, and a combined steam and oil conduit communicating with the interior of said inlet-pipe, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

ELIJAH McCOY.

Witnesses:

N. S. WRIGHT,
JOHN E. WILES.

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