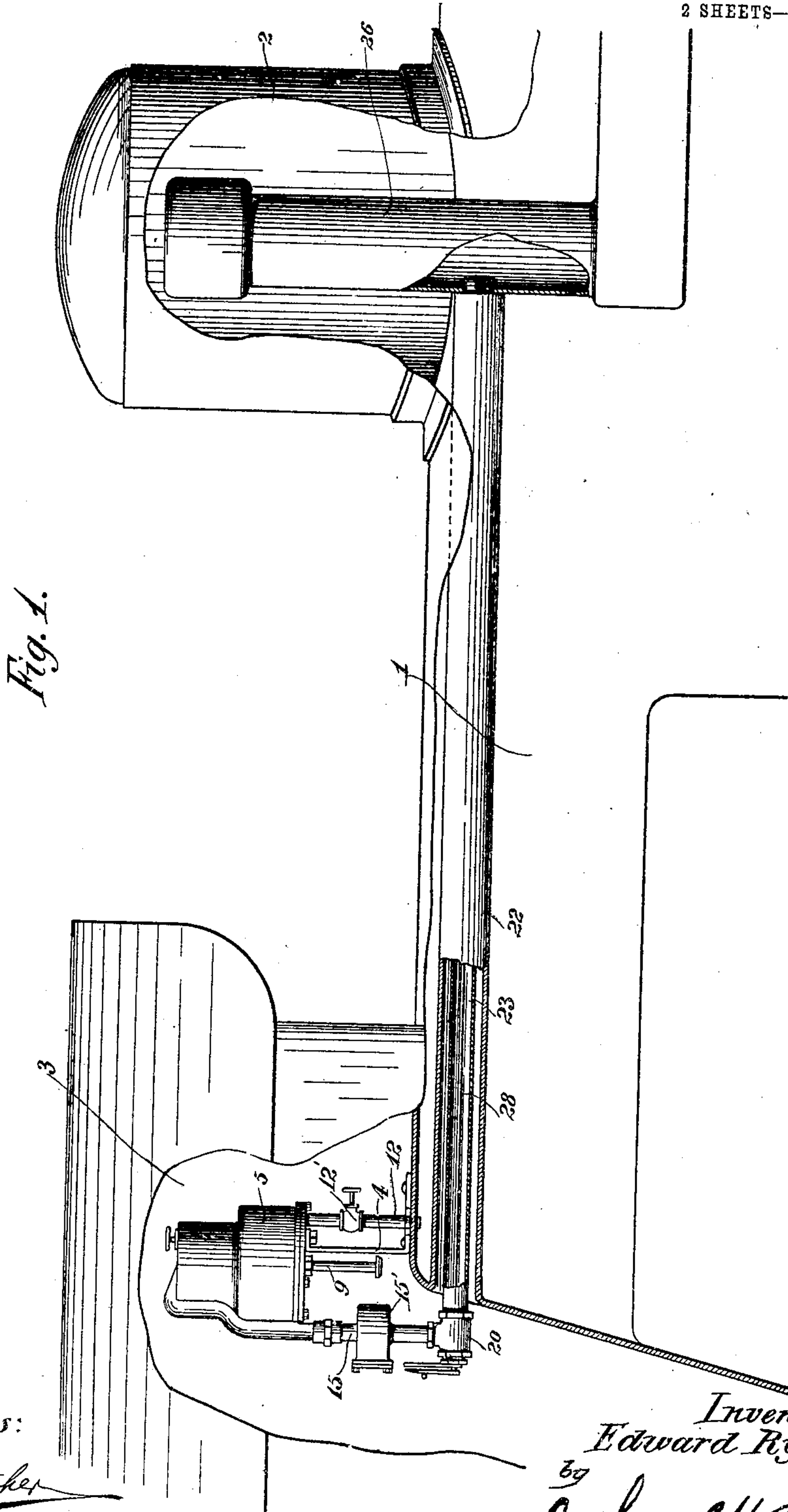


E. RYAN.
LUBRICATING APPARATUS FOR STEAM ENGINES.
APPLICATION FILED MAR. 8, 1909.

962,859.

Patented June 28, 1910.

2 SHEETS—SHEET 1.



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Edward Ryan
by *Joshua H. Potts*
His Attorney

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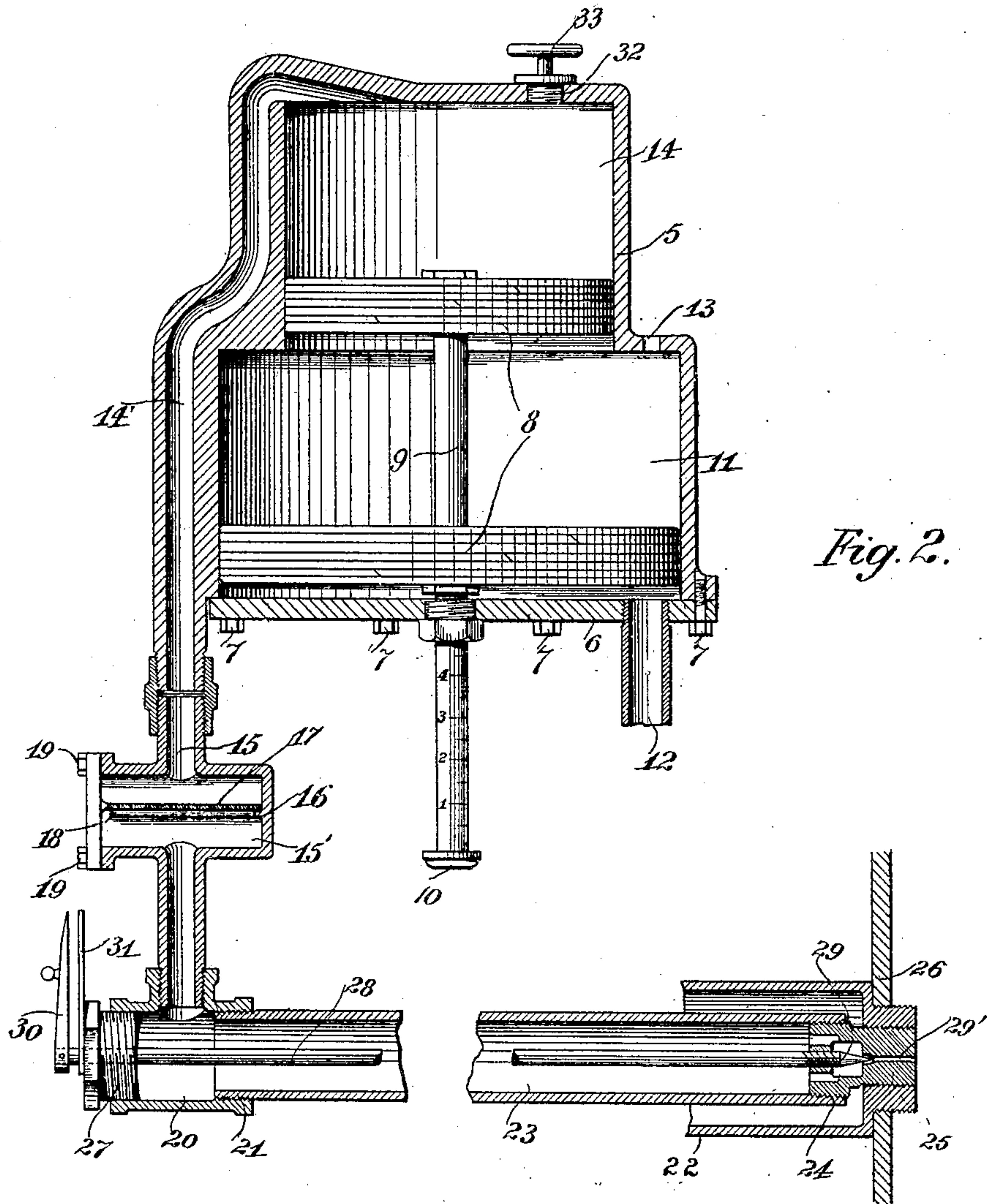


Fig. 2.

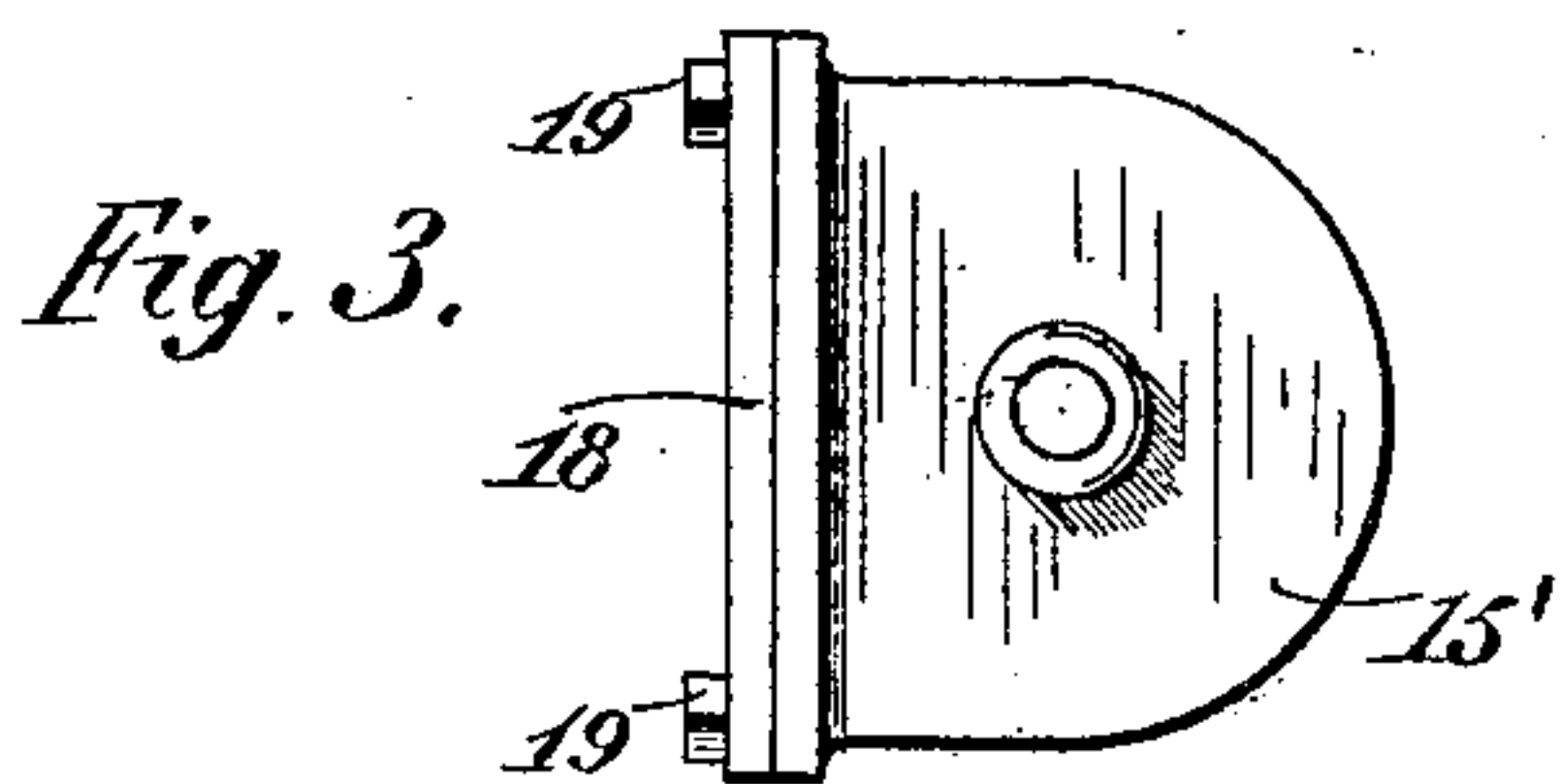


Fig. 3.

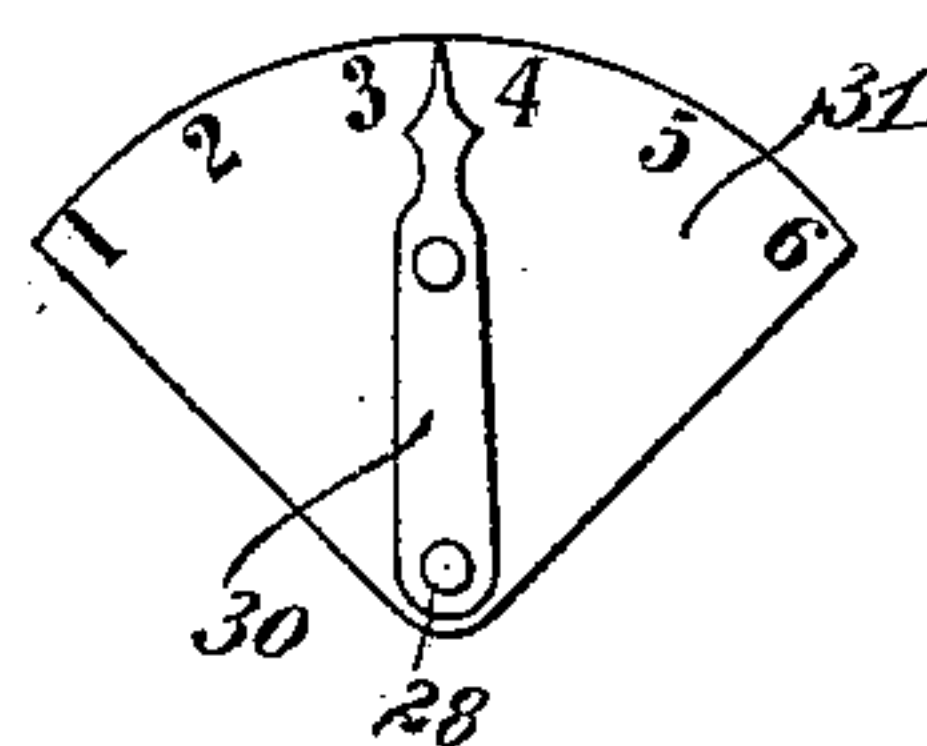


Fig. 4.

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UNITED STATES PATENT OFFICE.

EDWARD RYAN, OF CLINTON, IOWA.

LUBRICATING APPARATUS FOR STEAM-ENGINES.

962,859.

Specification of Letters Patent. Patented June 28, 1910.

Application filed March 8, 1909. Serial No. 482,139.

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
5 invented certain new and useful Improvements in Lubricating Apparatus for Steam-Engines, of which the following is a specification.

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

The object of my invention is to provide a lubricator of the character mentioned which will be of such improved construction as to be adapted to create a greater
15 pressure on the lubricating oil in the oil-chamber or reservoir and the oil-pipe leading therefrom than the pressure in the engine boiler and steam-pipe, or the pressure
20 whereby the lubricator is operated.

A further object is to provide a lubricator of the character mentioned, adapted when in connection with an engine of the class stated, to cause the saturation of the steam with
25 vaporous oil as it passes through the stand-pipe from the engine boiler on its way to the dry-pipe and thence to the steam chests, by such provision it being obvious that the lubrication of all of the parts with which
30 the steam comes in contact will be effected; the latter in such case acting as a vehicle, the oil carried thereby being deposited upon the surfaces with which it comes in contact.

A further object of my invention is to provide the lubricator with such means that the
35 oil fed therefrom can be controlled at the will of the operator against any working pressure in the engine boiler.

A further object is to provide a lubricator
40 of the nature stated which will be efficient and durable though comparatively simple of construction.

Other objects will appear hereinafter.

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

50 My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification, and in which,

55 Figure 1 is a side elevation, partly in section, of a portion of a locomotive boiler pro-

vided with the preferred form of my device, Fig. 2 is a sectional view of my device detached, Fig. 3 is a detail plan view of the strainer casing embodied in my invention, and Fig. 4 is a detail front elevation of the
60 graduated gage employed in conjunction with the needle valve of my device.

Referring now to the drawings 1 indicates a locomotive boiler which may be of any ordinary or preferred design, and 2 the
65 steam dome thereof communicating with the boiler interior. Suitably arranged in the locomotive cab 3, the same being preferably mounted upon a bracket 4 secured to the top of the rearward end portion of the
70 boiler 1 is a differential cylinder 5 of any suitable dimensions and having a larger piston chamber 11 and a smaller piston chamber 14. The head 6 of said cylinder is formed detachable, the same being secured thereto by
75 means of bolts 7. Slidably mounted in said cylinder is a differential piston 8, the extremity of the exteriorly projecting end portion of the rod or stem 9 of which is provided with a hand piece 10. Establish-
80 ing communication between the locomotive boiler and the larger chamber 11 of the cylinder 5, below or to the outward side of the piston of said chamber, is a pipe 12. An opening 13 provided in said cylinder at the
85 upper or inner extremity of the larger chamber 11 communicates with the atmosphere. Interposed in said pipe 12 is any ordinary or preferred form of valve 12', the latter being provided for the purpose of effecting
90 the regulation of the flow of steam from the engine boiler to the cylinder 5. Extending from the upper or outer extremity of the smaller chamber 14 to the lower or opposite extremity of the cylinder 5, the same being
95 preferably formed in the wall of said cylinder is a passage 14' of suitable diameter. Communicating with the lower extremity of said passage is a tubular member 15, in the enlarged semi-cylindrically formed portion
100 15' of which is provided, the same resting upon an internal flange 16 formed in the latter, a perforated plate 17 adapted to serve in the capacity of a strainer. Said strainer plate 17 is preferably formed integrally with
105 the closing plate 18, the latter being removably secured to the portion 15' preferably by means of bolts 19. In threaded connection with the lower extremity of the member 15 is a pipe tee 20. Having its extremity 21
110

threaded into said tee 20, the same extending through a coextensive tubular casing 22 formed for the reception of the same through the locomotive boiler is a pipe 23. The extremity 24 of said pipe 23 is preferably in threaded connection with a nozzle 25 communicating with the locomotive stand-pipe or steam-pipe 26, said nozzle being also preferably, in threaded connection with the reduced inner end portion of the casing 22. Having its inner extremity threaded into said nozzle, the outer end portion thereof being rockingly mounted in a plug 27 threaded into the tee 20, is a valve stem 28 carrying at its inner extremity a needle valve proper 29 adapted, when said stem is properly actuated, to close the passage 29' through said nozzle. Provided at the outer exteriorly projecting extremity of the valve stem 28 is an actuating lever 30 adapted, in combination with a graduated scale 31, to serve in the capacity of an indicator, such provision resulting in an obvious advantage.

In the operation of my device, the valve 12' being closed and the piston in a position at the lower extremity of its movement, the hand piece 10 being provided to effect such positioning of the latter, lubricating oil is supplied into the smaller chamber 14 of the cylinder through the opening 32 provided in the top wall thereof, said opening being provided with a removable plug 33. Now, upon opening the valve 12', in which event steam will be admitted to the larger cylinder chamber 11, the piston, because of the pressure applied to the under surface thereof by said steam, will be forced upwardly, thereby evidently forcing the oil contained in the upper chamber thereof into the passage 14' and down therethrough through the strainer 17 into the pipe 23, thence through the nozzle 25 into the stand-pipe 26. The oil is ejected from the nozzle 25 in a fine spray or vaporous state, such being carried by the rapidly moving steam passing through the stand-pipe, down through the dry-pipe into the engine steam chest and thence to the cylinders, valves, pistons, etc. of the engine effecting the lubrication of the same.

By placing the spraying nozzle at the juncture of the oil pipe and steam pipe, the steam rushing by the end thereof tends to assist in the spraying and atomizing of the oil.

In order that the exact amount of oil in the cylinder may be ascertained, the exteriorly projecting end portion of the piston rod may be graduated as shown.

By the provision of a device of a character as described, the effectual and thorough lubrication of an engine is effected.

While I have shown what I deem to be the preferable form of my invention, I do not wish to be limited thereto, as there might be many changes made in the details

of construction and arrangement of parts without departing from the spirit of my invention. And although I have shown my lubricator as applied to a locomotive engine, I may use the same in connection with any other engine to which it is applicable.

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

1. In a lubricator, the combination with an engine boiler and steam pipe, of a differential cylinder provided with larger and smaller piston chambers; a differential piston comprising larger and smaller connected pistons operating in said piston chambers; a steam supply pipe leading from the engine boiler to the larger piston chamber; a conduit leading from the smaller piston chamber to the engine steam pipe and a spraying nozzle at the juncture of said conduit with the engine steam pipe, substantially as described.

2. In a lubricator, the combination with an engine boiler and steam pipe, of a differential cylinder provided with larger and smaller piston chambers; a differential piston comprising larger and smaller connected pistons operating in said piston chambers; a valved steam supply pipe leading from the engine boiler to the larger piston chamber; a conduit leading from the smaller piston chamber to the engine steam pipe; a spraying nozzle at the juncture of said conduit with the engine steam pipe; and a needle valve for controlling said spraying nozzle, substantially as described.

3. In a lubricator, the combination with an engine boiler and stand pipe, of an upright differential cylinder provided with larger and smaller piston chambers and mounted upon the rearward extremity of the engine boiler, the said cylinder being provided with an opening which places the adjacent ends of the cylinder chambers in communication with the atmosphere; a differential piston comprising larger and smaller connected pistons operating in said piston chambers; a valved steam supply pipe leading from the engine boiler to the larger piston chamber; a conduit leading from the outer extremity of the smaller piston chamber to the engine stand-pipe, a removable strainer provided in said conduit; a spraying nozzle provided at the forward extremity of the latter; a needle valve at the juncture between said conduit and said engine stand-pipe and means for operating said needle valve from the locomotive cab, substantially as described.

4. In a lubricator, the combination with an engine boiler and steam pipe, of a differential cylinder provided with larger and smaller piston chambers and mounted upon the rearward extremity of the engine boiler; a differential piston comprising larger and

smaller connected pistons operating in said
piston chambers; a valved conduit leading
from the smaller piston chamber, extending
through the engine boiler, and connecting
5 with the engine stand-pipe; a tubular casing
for said conduit in said boiler; a spraying
nozzle provided at the juncture of said con-
duit with said stand-pipe; a needle valve for
operating said nozzle; a stem for operating
10 said needle valve and leading to the loco-

tive cab and means in said cab for operating
said stem, substantially as described.

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

EDWARD RYAN.

Witnesses:

LLOYD W. GALLOWAY,
BELVA HALL.