

B. H. GRAY.
WHEEL FLANGE LUBRICATOR.
APPLICATION FILED JUNE 15, 1914.

1,136,003.

Patented Apr. 20, 1915.
2 SHEETS—SHEET 1.

Fig. 1.

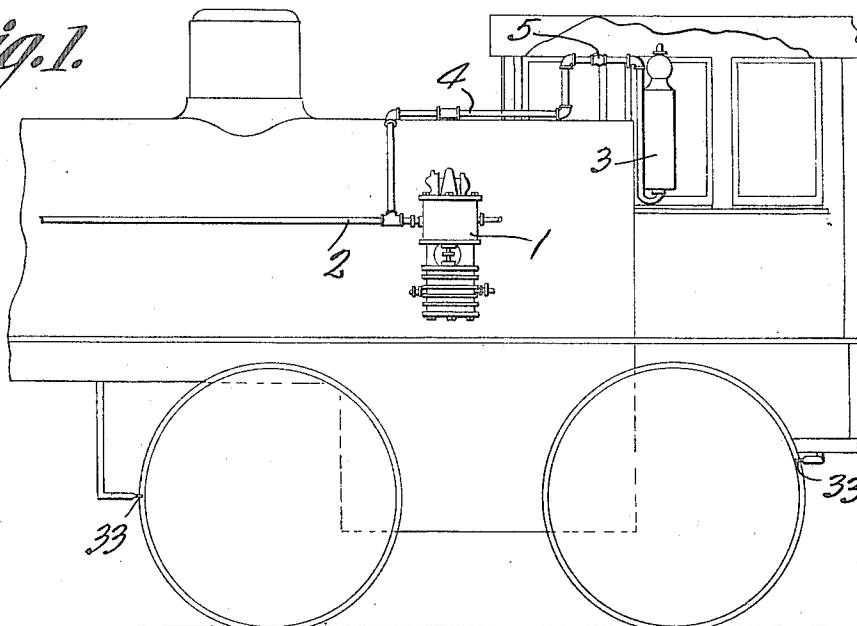
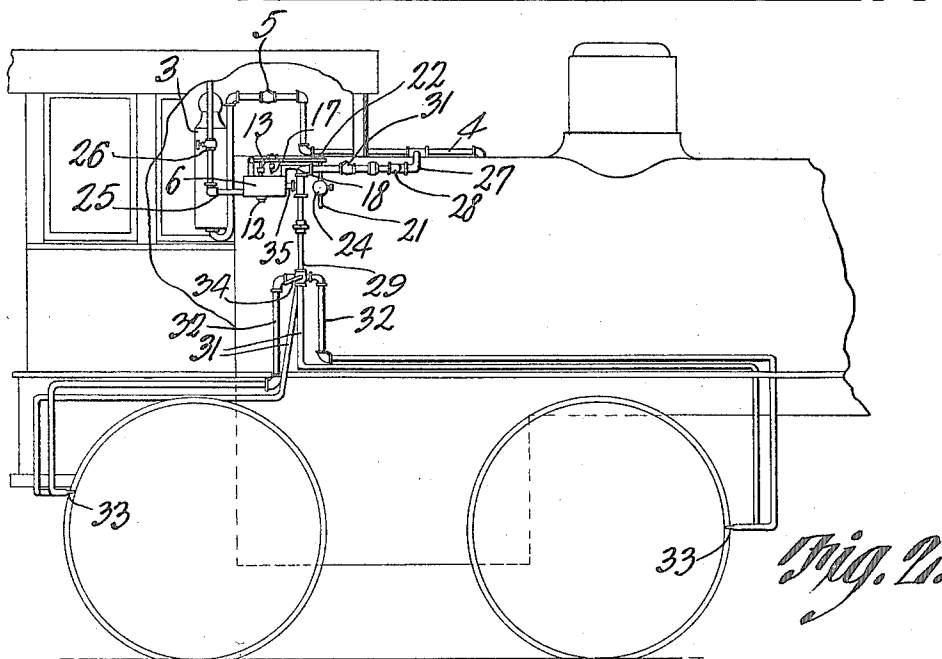


Fig. 2.

Witnesses

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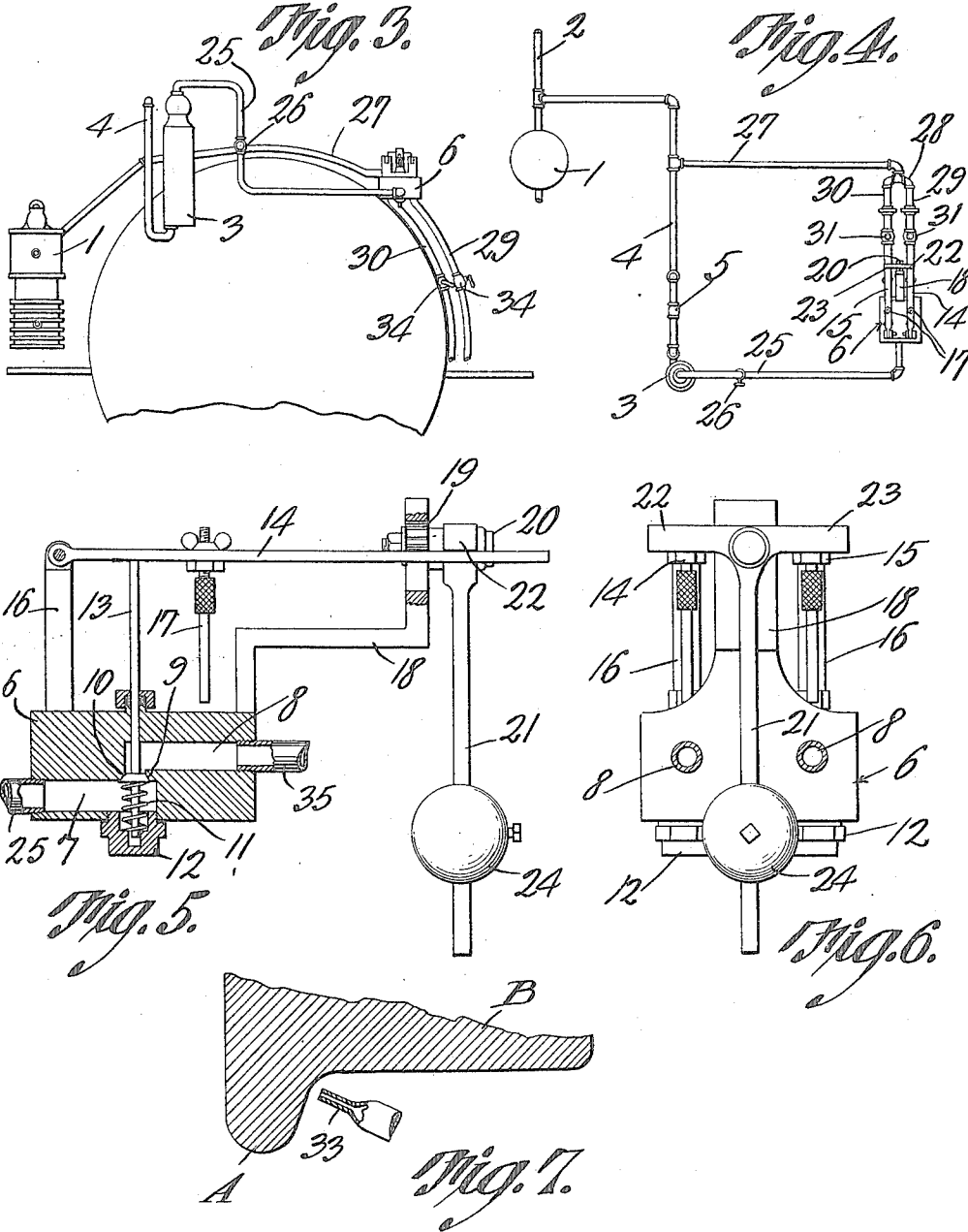
Attorneys

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UNITED STATES PATENT OFFICE.

BEN H. GRAY, OF MOBILE, ALABAMA.

WHEEL-FLANGE LUBRICATOR.

1,136,003.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, BEN H. GRAY, a citizen of the United States, residing at Mobile, in the county of Mobile and State of Alabama, have invented a new and useful Wheel-Flange Lubricator, of which the following is a specification.

This invention relates to lubricators especially designed for applying lubricant to the flanges of the wheels of locomotives and the like whereby the wear upon the rails and the wheel flanges is reduced to the minimum, means being employed for automatically controlling the discharge of lubricant so that the said lubricant will be applied to the wheel rims only during excessive tilting of the locomotive, as when rounding a curve.

A further object is to provide automatic controlling means for directing the lubricant solely against the flanges of the wheels at the outer side of the curve where the wear is greatest, thus preventing waste of lubricant such as would occur should it be applied to all of the wheels.

Another object is to provide means whereby the lubricant is sprayed under pressure against the wheels, waste fluid under pressure being utilized for this purpose as, for example, the steam usually exhausted from the air pump or air exhausted from the air brake system, this fluid, under pressure, being in constant communication with the nozzles of the lubricator so that practically a constant jet of fluid, under pressure, is directed against the wheels, this jet being constantly of an oily nature for the reason that it is necessary for the fluid under pressure to pass through pipes containing or which have contained lubricant.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a side elevation of a portion of a locomotive having the present improvements combined therewith. Fig. 2 is an elevation of a portion of the opposite side of the locomotive, a

portion of the cab being broken away to show the apparatus constituting the present invention. Fig. 3 is an elevation of the apparatus as viewed from the rear. Fig. 4 is a plan view of the apparatus. Fig. 5 is a vertical longitudinal section through the lubricant controlling valve and its operating parts. Fig. 6 is an end elevation of the structure shown in Fig. 5. Fig. 7 is an enlarged section through a portion of one of the wheels of the locomotive and showing the position of the nozzle for directing a lubricant against the wheel, said nozzle being shown partly in section.

Referring to the figures by characters of reference 1 designates the usual air pump carried by a locomotive, the same being provided with an exhaust pipe 2 for the steam. A reservoir 3 for holding a lubricant is located at any suitable point on the locomotive and a pipe 4 is provided for conducting a portion of the steam exhaust into the pipe 2, to the bottom of the reservoir 3, this pipe 4 being provided with a check valve 5 whereby loss of pressure back through the pipe 4 to the exhaust pipe 2 is prevented.

Mounted at any suitable point on the locomotive is a controlling valve including a casing 6 having an inlet port 7 and spaced outlet ports 8, these outlet ports extending above the inlet port 7 and communicating therewith through valve seats 9. Communication between the ports 7 and 8 is normally closed by means of valves 10 which are held upon the seats 9 by springs 11, these springs bearing downwardly upon plugs 12 removably mounted in the bottom of casing 6. The valves have stems 13 projecting upwardly above the casing 6 and directly under separate levers 14 and 15 which are pivotally mounted on arms 16 extending upwardly from the casing 6. These levers normally bear lightly upon the stems 13 but are not of such a weight as to unseat the valves 10. Each lever has a stop screw 17 adjustably connected to it and depending therefrom, said screw serving to contact with the casing 6 and thus limit the downward movement of the lever.

A bracket 18 extends from the casing 6 and is formed with an upwardly extending slot 19 in which a stud 20 is adjustably mounted. A hanger 21 is supported by and adapted to swing upon the stud 20, this hanger being provided at its upper end,

with oppositely extending fingers 22 and 23 which extend over the levers 14 and 15 respectively. A weight 24 is adjustably mounted on the hanger 21 so that a pendulum is thus produced. The parts are so mounted that the pendulum is capable of swinging in a plane extending transversely of the locomotive so that, when the locomotive tilts to the left, the pendulum will swing toward the left and, when the locomotive tilts toward the right, the pendulum will swing to the right.

The inlet 7 is connected to the top of the reservoir 3 by a pipe 25 in which a valve 26 may be located.

Extending from the pipe 4 between the exhaust pipe 2 and the check valve 5 is a by-pass 27 which is forked, as at 28, there being branch pipes 29 and 30 extending from the fork. Each of these branch pipes has a check valve 31' for preventing the escape of pressure back through the pipe 27. Furthermore each branch 29 and 30 is formed with branches 31 and 32 respectively, the branches 31 being extended longitudinally and downwardly to nozzles 33 while the branches 32 are extended longitudinally and thence transversely under the locomotive to corresponding nozzles 33 located at the opposite side of the locomotive. These nozzles are all of the same construction and one of them has been shown in detail in Fig. 7. As shown in this figure the nozzle is so positioned as to direct a jet against the inner surface of the flange A of a wheel B.

Three-way valves 34 are provided in the branches 29 and 30 and by means thereof lubricant can be directed into either of the pipes 31 or 32. Thus the lubricant can be applied to either of two wheels at one side of the locomotive.

Each of the outlet ports 8 is connected by a pipe 35 to one of the branches 29 and 30 so that a lubricant escaping through one pipe 35 will be discharged, for example, into the branch 29 while lubricant escaping from the other outlet 8 will be discharged into the branch 30. This construction is clearly shown in Fig. 2.

As heretofore pointed out, the valves 10 are held normally against their seats by the springs 11. Also as the lubricant is constantly held in the port 7 by the exhaust steam or other fluid under pressure, this lubricant and steam or the like will assist the springs in holding the valves 10 to their seats.

Where an air pump is used for projecting the lubricant through the apparatus, the steam exhausted through the pipe 2 from the pump is either wholly or in part directed into the pipe 4. A portion of this fluid under pressure will pass through the by-pass 27 to the branch pipes 29 and 30 and thence through the branch pipes 31 and 32 to the

nozzles 33 where it will issue in the form of jets and be directed against the flanges A of the wheels B. These jets are constantly issuing. The remainder of the fluid under pressure admitted to the pipe 4 will pass the check valve 5 and enter the reservoir 3, thus forcing a portion of the lubricant into the pipe 25 and thence into the port 7. The normally seated valves 10, however, will prevent this lubricant from escaping into the ports 8. As long as the pendulum is hanging vertically, only steam will escape through the nozzles 33. If, however, the locomotive should tilt to the left, as when rounding a curve, the pendulum will swing to the left and the finger 23 extending to the right from the pendulum will move downwardly against the lever thereunder, thus depressing the lever, the downward movement of said lever being limited by the screw 17. During its downward movement, the lever will push downwardly on the valve stem 13 thereunder and, consequently, the valve connected to the stem will be moved away from its seat. A portion of the lubricant will thus be free to pass into the port 8 thus placed in communication with port 7 and this lubricant will be expelled through pipe 35 into the pipe 29 or 30 in communication with the nozzles located at the right of the locomotive. The lubricant will be caught up by the current of exhaust steam passing the end of the pipe 35 and will be carried by the current to the nozzles located at the right of the locomotive whereupon it will be sprayed through the nozzles against the flanges of the wheels engaging the rails at the outer side of the curve. As soon as the locomotive assumes an upright position, the pendulum will shift so as to enable the depressed valve to close, thus cutting off the supply of lubricant. Should the locomotive tilt to the right, the lubricant will be supplied to the wheel flanges at the left of the locomotive so as thus to prevent grinding upon the rails at the outer side of the curve. As more or less of the lubricant will adhere to the inner surfaces of the pipes 29, 30, 31 and 32, it will be apparent that the constant jet of steam issuing from the nozzles while the locomotive is in an upright position, will be commingled with more or less of the lubricant so as a matter of fact the wheels will be constantly lubricated. However, the supply of lubricant is always cut off unless, for some cause, the pendulum is caused to oscillate a sufficient distance to open one of the valves.

It will be noted that no live steam is used in the operation of the lubricator, the desired result being obtained by the use of exhaust or waste steam. It is also possible, in lieu of utilizing waste or exhaust steam, to employ air under pressure exhausted from the air brake system.

What is claimed is:—

1. The combination with a lubricant container, a valve casing, means for directing lubricant under pressure into the valve casing, said valve casing having separate outlets, of pendulum controlled means for opening the respective outlets.

2. The combination with a valve casing having separate outlets, valves normally closing the respective outlets, and means for directing lubricant under pressure into the casing, of pendulum controlled means for opening the respective valves.

3. The combination with a vehicle having flanged wheels, a valve casing having separate outlets, nozzles for directing jets against the wheels at each side of the vehicle, and means for maintaining communication between the nozzles at one side of the vehicle and one of the outlets, and the nozzles at the other side of the vehicle and the other outlet, of valves normally closing the outlets, means for directing lubricant under pressure into the casing, and pendulum controlled means for opening the valves.

4. The combination with a vehicle having flanged wheels, and nozzles for directing jets against the flanges, of means for directing fluid under pressure into the nozzles and against the flanges, a valve casing having separate outlets, a pipe connection between one of the outlets and the nozzles at one side of the vehicle, a pipe connection between the other outlet and the nozzles at the other side of the vehicle, valves normally closing said outlets, means for directing lubricant under pressure into the casing, and pendulum controlled means for opening the valves.

5. The combination with a vehicle having flanged wheels, nozzles for directing jets of fluid under pressure against the flanges of the wheels, and separate means for directing a fluid under pressure into the nozzles at the respective sides of the vehicle, of a valve casing having separate outlets, said outlets communicating with the respective fluid directing means, separate valves normally closing the respective outlets, means for di-

recting lubricant under pressure into the valve casing, a pendulum mounted for oscillation in a plane extending transversely of the vehicle, means operated by the pendulum for opening the respective valves.

6. The combination with a valve casing having separate outlets, and an inlet, of yieldingly seated valves normally closing communication between the outlets and the inlet, separate levers normally bearing upon the stems of the respective valves, a pendulum, oppositely extending fingers movable therewith and overlying the respective levers, and means for directing a lubricant under pressure through the inlet into the valve casing.

7. The combination with a valve casing having separate outlets, and an inlet, of yieldingly seated valves normally closing communication between the outlets and the inlet, separate levers normally bearing upon the stems of the respective valves, a pendulum, oppositely extending fingers movable therewith and overlying the respective levers, adjustable means for limiting the movement of the levers, and means for directing a lubricant under pressure through the inlet of the casing, said lubricant constituting means for holding the valves to their seats.

8. The combination with a vehicle having flanged wheels, and means for directing a constant spray of fluid under pressure against said wheels, of means for holding lubricant under pressure, a valve normally cutting off the supply of lubricant to said spray, and means operated by the lateral swinging of the vehicle out of its normal position for opening said valve to direct lubricant into the path of the fluid, and, by the lateral swinging of the vehicle into its normal position, to close said valve.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

BEN H. GRAY.

Witnesses:

IVY E. SIMPSON,
J. PERCY CAMPBELL.