

A. ROSS.
DRIFTING VALVE.
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1,145,798.

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Fig. 1.

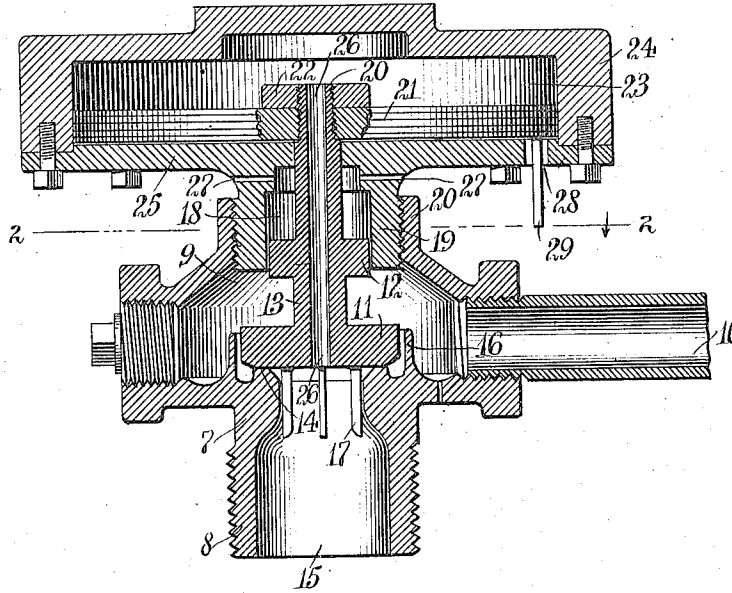
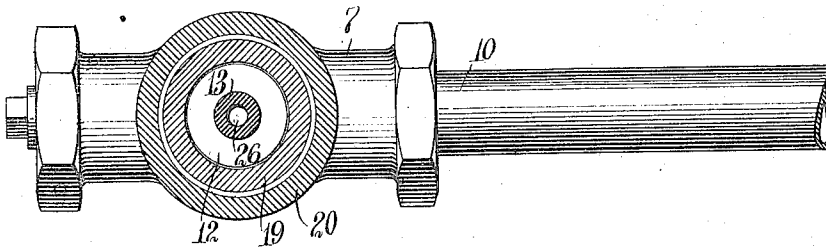


Fig. 2.



WITNESSES

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ALONZO ROSS, OF JERSEY CITY, NEW JERSEY.

DRIFTING-VALVE.

1,145,798.

Specification of Letters Patent.

Patented July 6, 1915.

Application filed August 25, 1913. Serial No. 786,428.

To all whom it may concern:

Be it known that I, ALONZO ROSS, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and Improved Drifting-Valve, of which the following is a full, clear, and exact description.

Among the principal objects of the present invention are: to avoid sudden cooling of the cylinders when the power steam is cut off; to avoid the overheating or dry-heating of the cylinders, with the consequent carbonizing and burning of the cylinder coating; to lubricate the cylinder during the period in which the engine is running on its momentum; to provide a mechanism to automatically supply steam to the cylinders for the accomplishment of the above-stated objects, when the power steam is cut off; and to provide means for automatically suspending the operation of the above-mentioned mechanism when the engine is brought to a standstill.

In the drawings:—Figure 1 is a vertical section, taken on the median line, of a valve constructed and arranged in accordance with the present invention; Fig. 2 is a horizontal section taken on the line 2—2 in Fig. 1.

Heretofore steam cylinders have been provided with some form of relief valve to avoid the effect of the vacuum, otherwise caused by the operation of the piston in the cylinder subsequent to the closing of the throttle of a locomotive. When the steam supplied to the cylinders was of a relatively low heat or pressure, this method operated sufficiently well to accomplish the purpose for which it was intended. In late times, however, since the introduction of superheated steam and the higher pressure steams, the increased heat thereof, being transmitted to the cylinders, raises the temperature of the walls thereof to a degree where they will crack when the relatively cool air from the inlet valves is received within the highly heated cylinder. A large proportion of cylinder troubles has been traced within the last few years to this deficiency in the structure, and it is the object of the present invention primarily, to overcome this by permitting a diminished supply of steam, insufficient to operate the engine but sufficient to break the vacuum caused by the piston within the said cylinders, to enter the cylinder. With this

object in view, a valve casing 7 is provided with a neck 8, screw-threaded as shown in Fig. 1 of the drawings, for mounting at any convenient station for connection with the cylinder, steam-chest or saddle, of the locomotive. The casing 7 is provided with a valve chamber 9, wherein a valve 11 is disposed, and opening into which is a relatively small steam pipe 10. The valve 11 is connected rigidly to an equalizing piston 12 by means of a valve stem 13.

The valve 11 is provided with a seat 14 adjacent the opening of the enlarged chamber 15 with which the neck 8 is provided. Surrounding the valve 11 an upstanding flange 16 operates to prevent cocking the valve. The spider wings 17 are pendent from the valve 11, and serve as guides therefor. The valve is further guided in service by the piston 12, which operates in the chamber 18 formed in the screw-threaded neck 19. The neck 19 forms a closure member for the chamber 9, the opening in the neck thereof being sufficient to permit the introduction of the valve 11 therethrough.

The disparity in size of the piston 12 and the valve 11 provides for an excess of pressure on the valve 11 over and above that under the piston 12 when introduced thereon by the steam in the chamber 9, admitted thereto by the pipe 10. The lift on the piston 12, however, approximates the pressure on the valve 11 sufficiently close to nearly balance or float said valve, to permit the lift thereof quickly and readily. The valve 11 is lifted by a vacuum formed by the operation of the piston in the power cylinder and transmitted to the steam-chest or other steam supply of said cylinder.

The stem 13 is extended above the portion 12, and is provided at the upper end with a screw-threaded section 20, whereon is mounted a piston 21 and a holding nut 22. The piston 21 is contained in the chamber 23, the solid cap 24 forming which is bolted to the plate 25 to form a substantially airtight and steam-tight joint therewith. The piston 21 is suitably packed or fitted in the chamber 23 to hold the vacuum formed in the chamber 23 by the withdrawal of the air therefrom through the tubular passage 26 formed in the stem 13 of the valve 11. The tubular passage 26 is open-ended, placing thereby in direct communication the chambers 15 and 23, or the cylinder and

steam-chest of the engine and the chamber 23. Therefore, when a partial vacuum is formed in the cylinder or steam-chest, a like effect is produced within the chamber 23.

5 This vacuum is sufficient to lift the valve 11, due to the equalizing effect of the piston 12 within the chamber 9. When the valve 11 is lifted, the supply of steam from the pipe 10 flows through the seat 14 and by way of the chamber 15 to the cylinder and steam-chest. As above stated, the supply of steam furnished by the pipe 10 is insufficient to operate the engine, but is ample to prevent any rapid reduction in heat of the walls thereof, and is also sufficient to provide any necessary lubrication to prevent wear of the piston and valve in the cylinder and chest.

15 When, in the course of operation, the engine is stopped, the vacuum formed by the operation of the piston in the power cylinder determines, and the weight of the piston 21, stem 13, piston 12 and valves 11 operates to seat the same until the excess of pressure, due to the extra area of the valve 11 over the area of the piston 12, operates to positively seat said valve. Thus the determination of the operation of the drifting valve constructed and arranged as herein described is automatic, as well as the inauguration thereof.

30 When the power steam is admitted to the power cylinder and steam-chest, it passes from thence to the chamber 15 through the tubular passage 26 to the chamber 23, and exerting thereafter a pressure on the relatively large area of said piston 21, it maintains seated the valve 11. It is only after the suspension of the supply of power steam that the above described action occurs.

40 It is to prevent the possible accumulation of pressure in the chamber 18, due to leakage of the high-pressure steam past the piston 21 and the stem 13 to the chamber 18, that I furnish the passages 27. If the steam itself passes into the chamber 19, it will find exit by way of the passages 27, and so apprise the engineer, inspectors or others of the fact that the piston 21 needs attention.

45 To permit the retraction of the piston 21, and to avoid the formation of a vacuum therein, I have provided an opening 28, which is sufficiently large to avoid the formation of any vacuum or suction under the said piston, while permitting the extension therethrough of a tell-tale pin 29. By means of the tell-tale pin 29, the engineer, inspectors or others may readily and quickly ascertain whether the valve is in operative

condition by noting the rise and fall of said pin.

It will be understood that while I have described and shown the construction in detail, many modifications of the same may be made without modifying the invention. Also, it will be understood that though the tubular passage 26 communicating with the chamber 23 and the cylinder, or steam-chest, of the engine, is shown as passing through the stem 13, it will, nevertheless, be understood that the chamber 23 may be placed in communication with the cylinder or steam-chest directly, or by a connecting pipe.

It is suggested that, should it be found desirable to mix oil, for lubrication purposes, with the steam admitted to the cylinders by the drifting valve, this could be readily accomplished by placing an oil cup or other suitable supply on the cap 24, to be drawn therefrom by the suction of the vacuum produced in the cylinder, down through the stem 13, and mix with the steam coming from the drifting valve, which would carry it along and distribute the oil the same as when the engine is using throttle steam.

I claim:

The combination of two steam supplies, said supplies having different pressures; and a drifting valve comprising a valve casing having two inlet openings adapted to be operatively connected with said steam supplies; a valve seat formed in said casing intermediate said inlet openings; a valve corresponding with said seat for closing the passage under said seat, said valve being adapted to receive pressure of the steam delivered to said casing through the other inlet opening; a pressure chamber concentric with said valve seat; a piston reciprocally mounted in said chamber; an open-ended tubular valve stem operatively connected and forming a passage through said piston and said valve; and means mounted on said stem for providing lifting pressure on said stem and parts connected therewith to partially balance the seating pressure of said valve.

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

ALONZO ROSS.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."