

S. S. RIEGEL.
TENDER TANK VALVE.
APPLICATION FILED MAY 8, 1914.

1,111,324.

Patented Sept. 22, 1914.
2 SHEETS—SHEET 1.

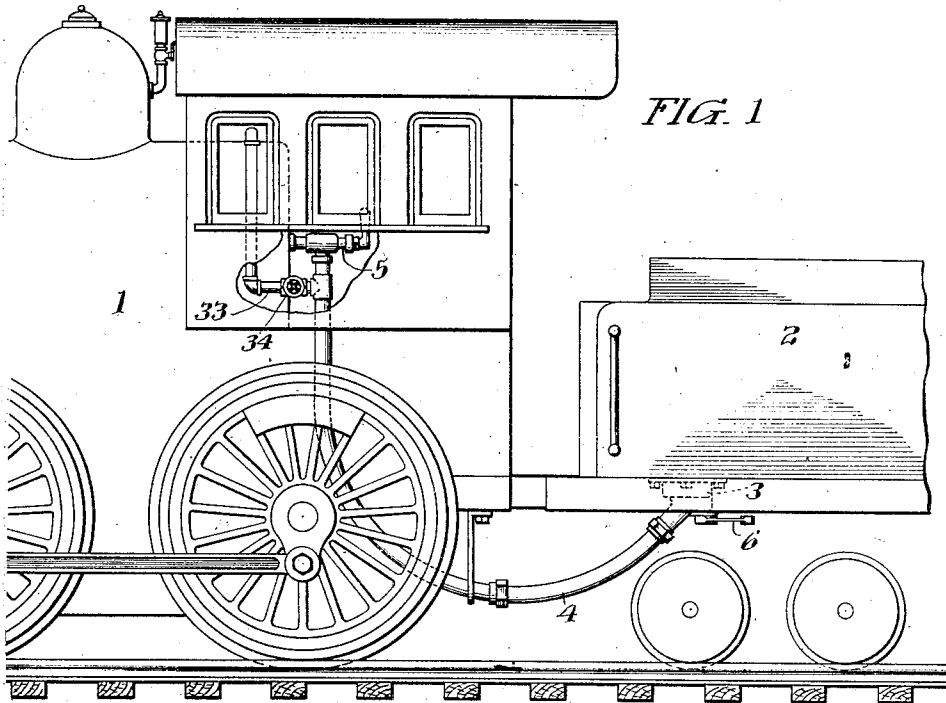


FIG. 1

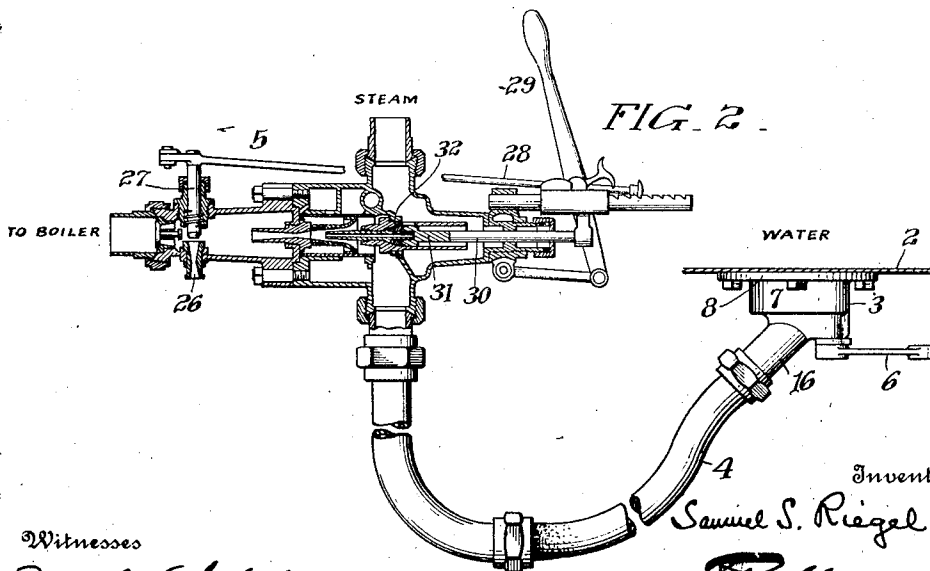


FIG. 2

Witnesses

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Inventor
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By

[Signature]

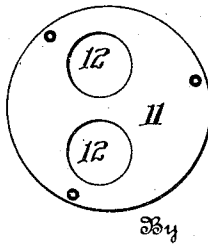
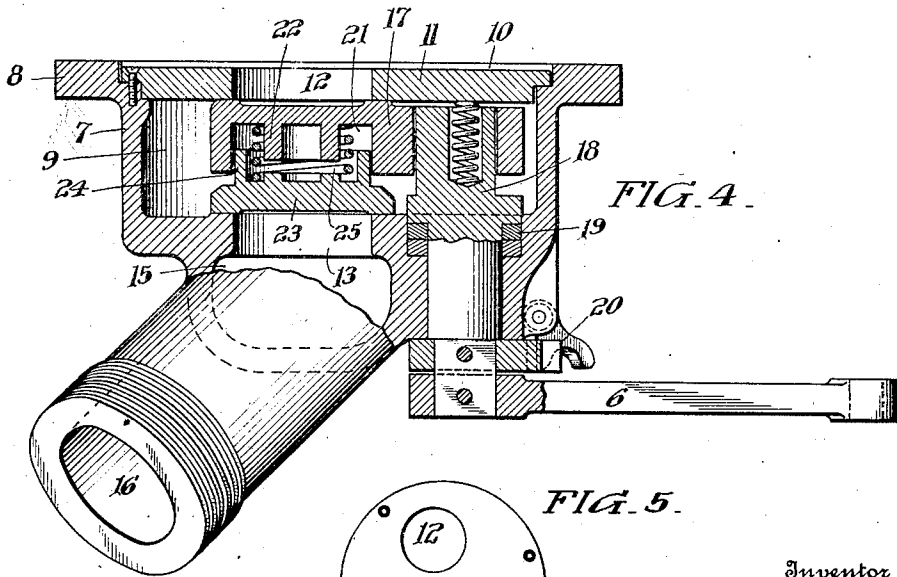
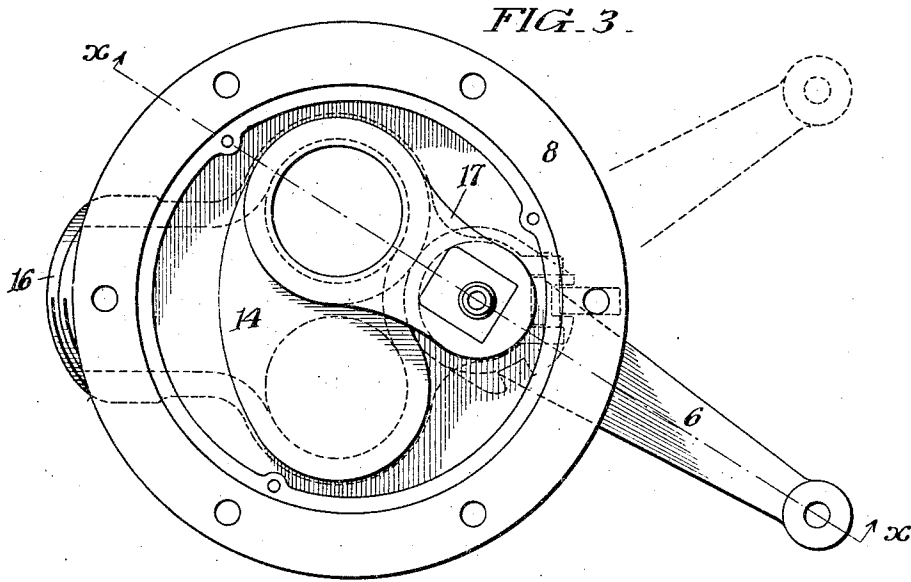
Attorney

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 E. W. Smith

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UNITED STATES PATENT OFFICE.

SAMUEL S. RIEGEL, OF SCRANTON, PENNSYLVANIA, ASSIGNOR TO PATTERSON-ALLEN ENGINEERING CO., A CORPORATION OF NEW YORK.

TENDER-TANK VALVE.

1,111,324.

Specification of Letters Patent.

Patented Sept. 22, 1914.

Original application filed December 26, 1913, Serial No. 808,738. Divided in part and this application filed May 8, 1914. Serial No. 837,123.

To all whom it may concern:

Be it known that I, SAMUEL S. RIEGEL, a citizen of the United States, and resident of Scranton, county of Lackawanna, and State of Pennsylvania, have invented an Improvement in Tender-Tank Valves, of which the following is a specification.

My invention relates to feed water controlling mechanism for locomotives and tenders, and forms, in part, a division of my application Serial No. 808,738, filed December 26, 1913.

My invention has for an object to provide a construction wherein the boiler pressure may be utilized to cause a flow of feed water from the tender to the locomotive boiler by way of the customary hose connection and may also be employed to cause the water in said hose to be blown back to the tender at desired times, whereby said hose is normally maintained free of water, thus avoiding danger of freezing in the hose and the associated metal connections.

It has for a further object to provide a simple and effective valve mechanism in combination with the hose connection between a locomotive and its tender whereby flow of water may not only be positively cut off through the hose but which may also serve as a check valve to prevent flow of water into the hose when the latter has been blown free of water.

My invention consists of certain features of construction whereby each and all of the above recited objects may be secured, the said several features of construction being fully described hereinafter and more particularly defined in the claims.

My invention will be better understood by reference to the drawings, in which:—

Figure 1 represents a side elevation of a portion of a locomotive and its tender with my improved valve and control mechanism applied thereto; Fig. 2 represents a side elevation of the control mechanism showing in section an injector used in connection therewith; Fig. 3 represents a plan of my improved valve with its top plate removed; Fig. 4 represents a sectional elevation of the same on line $x-x$ of Fig. 3; and Fig. 5 represents a plan of the guide plate removed from the valve casing.

1 designates the locomotive and 2 the tender therefor provided with the usual

water tank. In the present instance I have shown a valve structure 3 secured to the bottom plate of the tender tank and through which the water is delivered to the hose 4 under control of the aforesaid valve and by said hose is delivered to the injector 5 which forces it into the boiler in the usual manner. The valve 3 is provided with an operating lever 6 which extends just below the sills of the tender body, whereby the control of the valve may be easily had for shutting off or turning on the supply of water.

Referring now more particularly to the valve, 7 designates a cylindrical body provided with a suitable flange 8 by which it may be secured by suitable fastening devices to the bottom sheet of the tender tank, the said cylindrical body forming a well or pocket 9 below the bottom of the tank and opening into the tank by way of the aperture 10 of approximately the diameter of the interior of the body. Within the aperture 10 there is a plate 11 preferably having a plurality of openings 12 therein by way of which communication is established between the tender tank and the pocket 9, and one of which openings is in direct alinement with the thoroughfare 13 formed in the valve seat 14. The thoroughfare 13 when unobstructed by the control valve, establishes communication with a chamber 15 which has a discharge outlet in the form of an obliquely arranged nipple 16 to which the hose coupling is adapted to be connected.

17 designates a swinging arm mounted within the pocket 9 and suitably fixed to a spindle 18 which carries on its outer projecting end the operating lever 6. Suitable packing rings 19 are arranged about the aforesaid spindle to prevent leakage, and a suitable pawl control locking device 20 may be employed if desired to lock the spindle in either of its positions. The swinging arm 17 is mounted for bearing relation with the lower flat surface of the plate 11 and normally forms a closure for controlling the opening of the apertures 12 while its opposite surface or side facing the valve seat 14 is provided with an annular recess 21 and a central hub 22. A valve piece 23 preferably circular in shape rests upon the valve seat 14 and has an annular cylindrical

flange 24 which telescopes with the recess 21 of the swinging arm whereby both parts move together so that the valve piece is caused to traverse the valve seat 14. The latter, it will be noted, is of sufficient size to leave room at one side for the valve piece 23 to move transversely and uncover the thoroughfare 13. A spring 25 is arranged within the recess 21 of the arm 17 and presses upon the valve piece to force it upon its seat and at the same time maintains the desired pressure against the under surface of the arm 17 to maintain the proper contact relation with the plate 11. The space between the valve piece 23 and the central hub 22 on the arm 17 is sufficient to permit the said valve piece to be forced upward from its seat by a superior under or back pressure, when desired, so as to act as a check valve.

I have shown the preferred manner of connecting the valve piece with the swinging arm which permits a perfect sliding fit at small cost, but I do not restrict myself to the details shown, as any other suitable connection may be employed which will open and close the valve piece and also permit the latter to act under certain conditions as a check valve. It will thus be seen, by oscillating the arm or lever 6 the spindle 18 is rocked and the arm 17 oscillated for the purpose of shifting the valve piece 23 over the valve seat 14 and opening or closing the thoroughfare orifice 13.

From the foregoing description, it will be apparent that the construction and assemblage of the valve structure is very simple and inexpensive; and from the nature of the construction, the sliding valve piece will insure a tight fit with the valve seat because the parts have a regrinding effect by the natural operation of the valve piece over its seat. As the body 9 is arranged directly upon the bottom of the tank and projecting below the same, it acts as a pocket or well for draining the tank completely, and by removing the hose, the tank may, from time to time, be flushed out through the valve to keep it in a clean condition, especially in those cases where the feed water is impure and from which sediment settles in the tank. Where the water is allowed to remain in the hose 7 and its associated parts during cold weather and when the locomotive is out of commission, there being no way for draining said hose and its connection without disconnecting the parts the water is liable to freeze and much damage has heretofore been caused through this defect. By my present invention I have devised a construction wherein in conjunction with the valve structure 3, the water in the hose may be blown back into the tank, thus leaving the hose empty while the locomotive is in the round house

or in the yard for the night. In accomplishing this end I utilize as the preferred form the injector 5 in the following manner, and only such parts of the injector will be described as are necessary to understand the operation, since any well known type of injector may be employed for the purpose. 26 designates the auxiliary vent in the injector for starting purposes, and which is controlled by the valve member 27 operated by the push rod 28. 29 designates the main operating lever which controls the movement of the valve rod 30 for shifting the auxiliary valve 31 and main valve 32, the latter as customary in this type of injector being controlled by a lost motion connection in order to delay its opening until the column of water has been raised from the hose to the injector. In operating the injector to blow the water from the hose toward the tender tank, which is of course a reversal of the usual operation, the valve 27 is moved to close the vent opening 26 and the main lever 29 shifted to full open position so that the steam from the boiler is directed under full head into the injector, thus preventing the formation of the initial vacuum to lift the column of water and consequently forcing the water out of the hose into the tank. The pressure in the hose 4 during this operation unseats the spring pressed valve 23 and permits the free flow of water into the tank, though the valve 23 prevents back flow or return of water from the tank to the hose owing to the fact that the valve acts as a check valve under these conditions and thus leaves the hose and its parts free of water. As a modification of this operation I may, if desired, employ a by-pass pipe 33 leading directly from the steam space of the boiler to a point in the hose 4 below the injector, this branch being provided with a hand valve 34 to control the admission of steam directly to the hose in lieu of operating the injector as already described. The action in the two cases is of course identical and the water driven out of the hose as heretofore explained. In this manner the hose is kept clear of water when the weather conditions make this desirable, but at all other times the water may be permitted to remain in the hose as heretofore.

I have shown the general construction and details of my improved valve device in the form I have found most desirable in commercial practice, but I do not wish to restrict myself thereto, as the details may be varied within reasonable limits without departing from the spirit of the invention defined in the claims.

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

1. The combination of a locomotive and its tender tank, an injector for forcing

water into the boiler, a hose for supplying water from the tender tank to the injector, a hand controlled valve between the tender tank and the hose for positively controlling the discharge of water from the tank to the hose but when in closed condition acting as a check valve to permit water to be forced from the hose into the tank, and means for supplying a pressure into the hose between the injector and the valve.

2. The combination of a locomotive and its tender tank, an injector for forcing water into the boiler, a hose for supplying water from the tender tank to the injector, a hand controlled valve between the tender tank and the hose for positively controlling the discharge of water from the tank to the hose but when in closed condition acting as a check valve to permit water to be forced from the hose into the tank, and means for supplying a pressure into the hose between the injector and the valve consisting of a by-pass steam pipe from the boiler for delivering steam into the end of the hose connecting with the injector, and a valve to control the flow of steam therein.

3. The combination of a locomotive, a tank for holding feed water for said locomotive, an injector for forcing water into

the locomotive boiler, a hose for supplying water from said tank to the injector, a valve for controlling the discharge of water from said tank to said hose said valve being constructed to act as a check valve permitting water to be forced from the hose into said tank in operative position of said valve but acting as a check valve to prevent flow of water in the opposite direction, and means for supplying a pressure within the hose between said injector and said valve.

4. The combination of a locomotive, a tender, a pipe for supplying water from the tender to the locomotive boiler, a valve on the tender for positively controlling the flow of water from the tender into the pipe but acting as a check valve when closed for permitting water to be forced from the pipe through the valve into the tender, and hand controlled means for causing a circulation of water through the pipe into the boiler or through the pipe into the tender.

In testimony of which invention, I hereunto set my hand.

SAMUEL S. RIEGEL.

Witnesses:

HARRY E. POWELL,
ALVIN M. POWELL.