July 20, 1926.

1,592,951

W. J. McLAUGHLIN

STEAM SUPPLY AND RELEASE DEVICE

Filed April 22, 1925

3 Sheets-Sheet 1

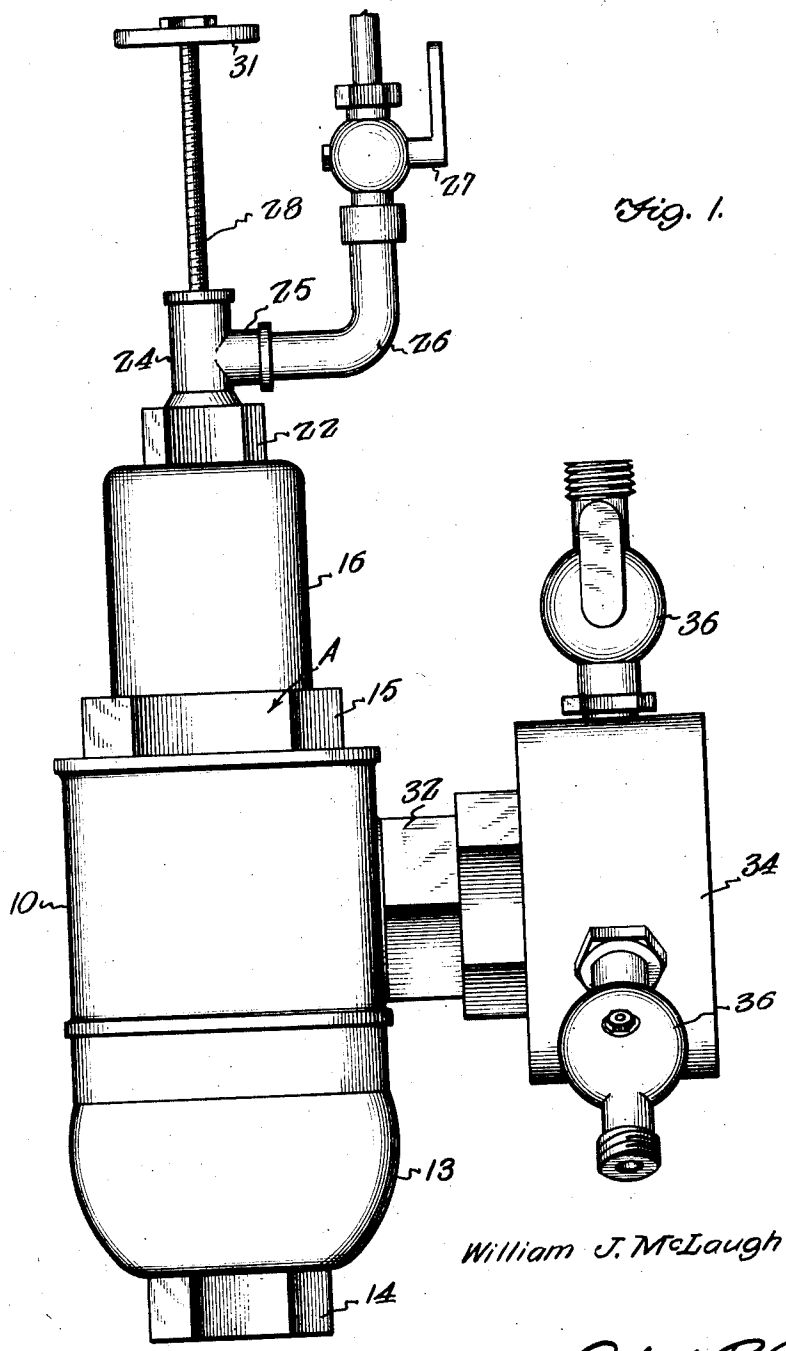


Fig. 1.

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3 Sheets-Sheet 2

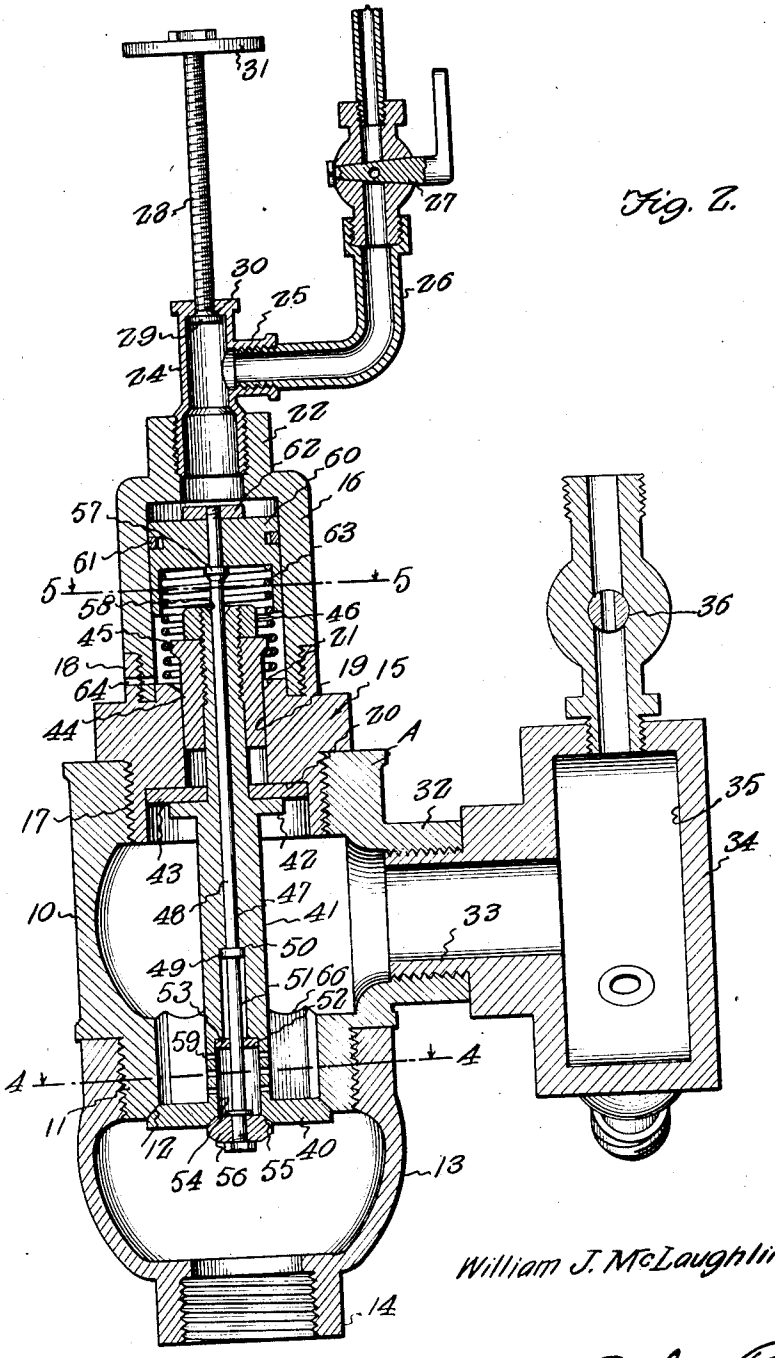


Fig. 2.

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STEAM SUPPLY AND RELEASE DEVICE

Filed April 22, 1925 3 Sheets-Sheet 3

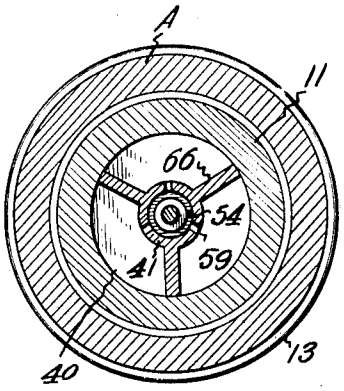


Fig. 4.

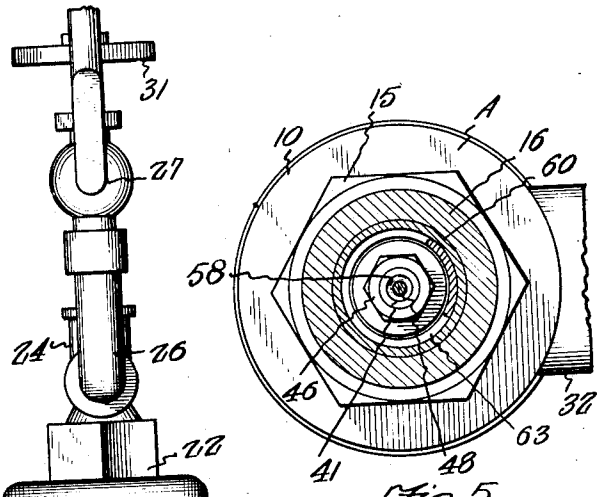


Fig. 5.

Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM J. McLAUGHLIN, OF CARBONDALE, PENNSYLVANIA, ASSIGNOR OF TWENTY-FIVE PER CENT TO ANTON REICHART, TWENTY-FIVE PER CENT TO JAMES J. BRENNAN, AND TWELVE PER CENT TO PHILIP A. CONNOLLY, ALL OF CARBONDALE, PENNSYLVANIA.

STEAM SUPPLY AND RELEASE DEVICE.

Application filed April 22, 1925. Serial No. 25,054.

This invention appertains to valves and more particularly to a novel attachment for stationary feed engines or locomotives and the primary object of the invention is to provide novel means for supplying steam to an air pump, blower or the like from the boiler for starting such auxiliary apparatus.

Another object of the invention is to provide novel means to permit the release of steam from a leaky throttle valve of a locomotive, so as to eliminate difficulty contingent with leaky throttle valves.

Another object of the invention is to provide novel means for controlling the flow of steam from the valve to the auxiliary appliances, such as air pumps, blowers and the like and to provide novel means for preventing the escape of steam from the valve, when the same is in use.

A still further object of the invention is to provide a novel device of the above character, which will be durable and efficient in use, one that will be simple and easy to manufacture and one which can be placed upon the market and incorporated with a locomotive at a small cost.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawings, in which drawings:

Figure 1 is a side elevation of the improved valve,

Figure 2 is a longitudinal section through the same,

Figure 3 is an elevation of the improved valve looking at right angles from Figure 1 of the drawings,

Figure 4 is a horizontal section through the valve taken on the line 4—4 of Figure 2, looking in the direction of the arrows,

Figure 5 is a horizontal section through the valve taken on the line 5—5 of Figure 2 looking in the direction of the arrows.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter A generally indicates the improved valve, which comprises a main body 10 provided at its lower end, with a reduced externally threaded neck 11. This threaded neck 11 has its lower face provided with a valve seat 12, for a purpose which will be hereinafter more fully described. Threaded upon the neck 11 into intimate contact with the body 10 is the steam chamber 13, which is adapted to be connected directly with the boiler of the locomotive and the lower end of the steam chamber 13 is provided with an internally threaded extension 14 for receiving any suitable connection from the boiler, whereby steam is permitted to flow directly into the steam chamber. The outer face of the extension 14 is preferably of a polygonal configuration in order that the same can be readily engaged by a wrench or the like to permit the chamber to be readily applied to or taken off from the body 10. It is to be noted that the walls of the steam chamber 13 are curved and extend beyond the neck 11, to permit the ready entrance of the steam into the body from said chamber.

The upper end of the body is internally threaded for the reception of the main body connection 15, which is utilized for connecting the cylinder bonnet 16 with the upper end of the main body 10. This connection 15 is provided with a reduced externally threaded sleeve 17 for fitting into the main body 10, while the upper end of the connection is provided with an internally threaded sleeve 18 for the reception of the threaded extension formed on the lower end of the cylinder bonnet 16. The connection 15 is provided with an axial bore 19, and the lower end of the bore is enlarged to provide the valve seat 20 for a purpose which will be also hereinafter more fully described. The upper face of the connection 15 surrounding the bore 19 is provided with a tapered valve seat 21. The cylinder bonnet 16 is reduced at its upper end and provided with a collar 22 into which is threaded a T coupling 24. The laterally extending leg 25 of the T coupling has threaded into the same a steam inlet pipe 26 and the steam through the said pipe is controlled by a three way valve 27 as clearly shown in Figure 2 of the drawings. The upper end of the coupling 24 is threaded for the recep-

tion of a threaded stem 28 which is provided with a valve 29 in its lower end, which is adapted to close upon a seat 30 at the upper end of the coupling so as to prevent the leakage of steam from the coupling when the stem is in its uppermost position. A handle 31 is provided for the upper end of the stem for permitting the operation thereof and the purpose of the stem will be hereinafter more fully described.

The main body 10 is provided with the outlet nipple 32 at a point intermediate its ends and this outlet nipple 32 has threaded into the same the nipple 33 carried by the cluster valve body 34. This cluster valve body 34 is provided with an interior circular chamber 35 with which communicates a plurality of outlet one-way valves 36. These valves can have connected therewith steam lead pipes which can be run to extraneous apparatus, such as blowers, air pumps and the like. A plunger valve 40 is adapted to close upon the seat 12 at the lower end of the body for controlling the flow of steam into the said body and the plunger valve is provided with a stem 41 which extends through the main body 10 and the connection 15. The stem 41 is reduced at a point intermediate its ends and is provided with a circular solid shoulder 42 and mounted upon the stem above the shoulder is a flat floating valve 43, which is adapted to close upon the seat 20 of the connection 15 in order to prevent the escape of steam from the chamber or valve body 10 when the plunger valve 40 is open. Threaded upon the upper end of the stem 41 is a valve sleeve 44 provided with a valve body 45 which is adapted to fit upon the valve seat 21 when the plunger valve 40 is unseated, so as to prevent the flow of steam into the cylinder bonnet 16. The valve sleeve 44 is maintained on the stem by the use of a suitable nut 46. The plunger valve stem 41 is provided with an axial bore 47 through which slidably extends the priming valve stem 48. This priming valve stem 48 is provided at a point intermediate its ends with a rigid valve 49 which is adapted to fit upon the shoulder 50 formed by the enlarging of the bore 47, as indicated by the reference character 51. This priming valve stem has slidably mounted thereon a floating valve 52 which is adapted to fit upon the shoulder 53 formed by again enlarging the bore, as at 54. This bore opens out through the lower end of the plunger valve stem 41 and the plunger valve body 40 is provided with a tapered seat 55 around the bore on which is adapted to fit the priming valve 56. This priming valve 56 is rigidly secured to the stem in any preferred way. The stem adjacent to its upper end is provided with a valve body 57, which is adapted to fit upon the valve seat 58 formed on the upper end of the plunger valve stem 41, when the priming valve 56 is moved off of its seat. The plunger valve stem 41 between the plunger valve 40 and the shoulder 53 is provided with a plurality of radially extending steam openings 59.

The priming valve stem 48 has rigidly mounted thereon the piston 60 which is slidably fitted within the cylinder bonnet 16 and if preferred the piston can be provided with any preferred type of packing or piston ring 61. It is to be noted that the piston 60 is fitted against the valve 57 and held on the stem by the use of a suitable nut 62.

An expansion spring 63 is placed within the cylinder bonnet and bears against the piston 60 and the connection 15 for normally holding the piston in a raised position as well as the priming stem 48 and valve 56.

The collar 18 of the connection 15 and the cylindrical bonnet 16 are provided with alined outlet openings 64 in order to permit the escape of any steam, which might collect within the cylinder bonnet 16 inward of the piston 60 during the changing of the position of the priming valve stem 48 and the plunger valve stem 41. Radially extending guide fins 66 are formed on the plunger valve stem 41 for engaging the collar or sleeve 11 on the lower end of the body 10 in order to guide the said stem during its sliding movement to permit the effective and proper seating of the plunger valve 40.

When steam is admitted into the device from the three way valve 27, the steam will force the piston 60 to move downward, and as the priming valve and stem 48 are connected therewith, the said priming valve 56 will be moved off of the seat to allow pressure from the boiler to enter through the bore of the plunger valve stem 41 into the valve body 10 through the openings 59. When steam enters the bore of the plunger valve stem the same will force the floating seat 52 against its seat 53 making a steam tight joint and the steam will then flow to the cluster valve body 34 to the outlet pipes carried thereby for the purpose of setting the air pump, lubricator, generator and the like slowly in motion.

The first move of the piston 60 is governed by the three way valve 27, which moves the priming valve 56 off of its seat to start the extraneous apparatus in slow movement. Upon continued movement of the piston 60 under the influence of the steam from the three way valve the same will press down on the plunger valve stem 41, which will unseat the plunger valve 40 allowing the free flow of steam from the boiler into the valve cluster head 34 and allow the said extraneous apparatus, such as the air pump, lubricator and the like to be run full speed under the boiler pressure. The pressure of

the steam against the floating valve 43 will prevent the escape of steam from the body into the connection 15.

When the steam is cut off from the piston 60 by three way valve 27 the spring 63 will return the piston 60, stem 48 and priming valve 56 as well as the plunger valve 40 to their normal positions.

When the three way valve 27 is wide open, and the priming valve 56 is first lifted off of the seat, the steam is allowed to flow into the body 10 as heretobefore described, and pressure will be substantially equalized on each side of the plunger valve 40, in order to permit the ready opening of the plunger valve 40 upon the continued inward movement of the piston 60. As stated the valve 27 is a three way valve and is so constructed as to permit the escape of steam from above the piston 60, to the atmosphere when the steam is cut off from the piston in order to permit the piston to be readily returned to its normal position.

In case of breakage of a pipe line or the like the handle 31 is manipulated so as to thread the screw 28 down on the piston valve 60. This will permit the unseating of the priming valve 56, which will allow the escape of the steam.

In order to permit the improved device to be used as a release valve, the same is connected on the superheater pipe above the cylinder. When the engine stops in the round house, the engineer can open the three way valve numbered 27 and release all steam from the leaky throttle.

The various parts of the device, such as the priming valve, piston and the like can be made in various sizes, according to the character of work for which the device is used, as can be readily understood.

Changes in details may be made without departing from the spirit or the scope of this invention, but:

What I claim as new is:

1. A device for controlling the flow of steam from a locomotive to the auxiliary apparatus comprising a body, means for connecting one end of the body to the boiler, an outlet for the body, a cluster valve head connected with the outlet, a plurality of valves carried by said head for the auxiliary apparatus, a main valve for controlling the flow of steam into the body, a priming valve associated with the main valve for permitting the initial flow of steam into the body when in its unseated position, means normally holding the valves in a closed position, and means for permitting the opening of the valves in proper sequence including a cylinder, a piston mounted in the cylinder and connected with said valve, and means for permitting the flow of steam into said cylinder.

2. In a steam supply and release valve, a body, a steam chamber connected with and communicating with one end of the body, a steam outlet nipple for the body, a main valve for controlling the flow of steam from the steam chamber into the body, a priming valve associated with the main valve for permitting the initial flow of steam from the chamber into the body, a cylinder carried by the upper end of the body, means for controlling the flow of steam into said cylinder, a piston reciprocably mounted in the cylinder, means rigidly connecting the piston with the priming valve, and means for operating the main valve from the priming valve, after the same has been moved off of the seat a predetermined distance.

3. A steam supply and release valve comprising a body, a steam chamber communicating with one end of the body, a valve seat carried by the mentioned end of the body, a main valve adapted to fit upon the seat, a hollow valve stem for said main valve, a priming valve stem mounted within said main valve stem, said main valve stem being provided with openings communicating with the body, a priming valve rigidly carried by the priming valve stem for controlling the flow of steam to said openings, a cylinder carried by the upper end of the body, means for controlling the flow of steam into the cylinder, means rigidly connecting the piston with the priming valve stem, means normally holding the piston in a raised position and the priming valve on its seat, and means for operating the main valve stem from the priming valve stem when the priming valve has been moved off its seat a predetermined distance.

4. A supply and release valve comprising a body provided with a steam outlet at a point intermediate its ends, a steam chamber communicating with one end of the body, a valve seat formed on the mentioned end of the body, a cylinder bonnet, a connection connecting said cylinder bonnet with the end of the body remote from said steam chamber, said connection being provided with a seat, a plunger valve arranged to normally fit upon the seat formed on the first mentioned end of the body, a hollow plunger valve stem connected with said valve, a solid shoulder formed on said stem, a floating seat mounted upon the stem arranged to close upon the seat formed on said connection, the hollow plunger valve stem being provided with a seat and having openings communicating with the interior of the stem and the body arranged between said seat and said plunger valve, a priming valve stem carried by the hollow plunger valve stem, a priming valve rigidly secured to the stem associated with said plunger valve for controlling the flow of steam through the openings formed in said

plunger valve stem, a piston reciprocably mounted within the cylinder bonnet, means rigidly connecting the piston with said priming valve stem, spring means arranged within the cylinder bonnet normally holding the piston in a raised position and the priming valve on its seat, a valve plug formed upon the priming valve stem for engaging the plunger valve stem for permitting the operation of the plunger valve when the piston has been moved inward to a predetermined position, and means for controlling the flow of steam into the cylinder bonnet including a three way valve, and a floating valve on said priming valve stem for engaging said seat formed in said plunger valve stem.

5. In a steam supply and release valve, a valve body, having an outlet at a point intermediate its ends, a steam chamber communicating with one end of the body, and a cylinder carried by the opposite end of the body, a piston within the cylinder, a plunger valve for controlling the flow of steam into the body from said steam chamber, a priming valve associated with the plunger valve adapted to permit the flow of a small quantity of steam from the steam chamber into the body, a priming valve stem rigidly connected with the piston, means normally holding the piston in a raised position, means including a three way valve for controlling the flow of steam into the cylinder for operating the piston, the piston being adapted to move the priming valve into open position and the plunger valve to an open position, and a threaded stem associated with the cylinder for operating the piston manually in cases of emergency.

In testimony whereof I affix my signature.

WILLIAM J. McLAUGHLIN.