Oct. 25, 1927. 1,646,640

R. W. DANIEL

WHISTLE CONTROL VALVE

Filed Dec. 2, 1926

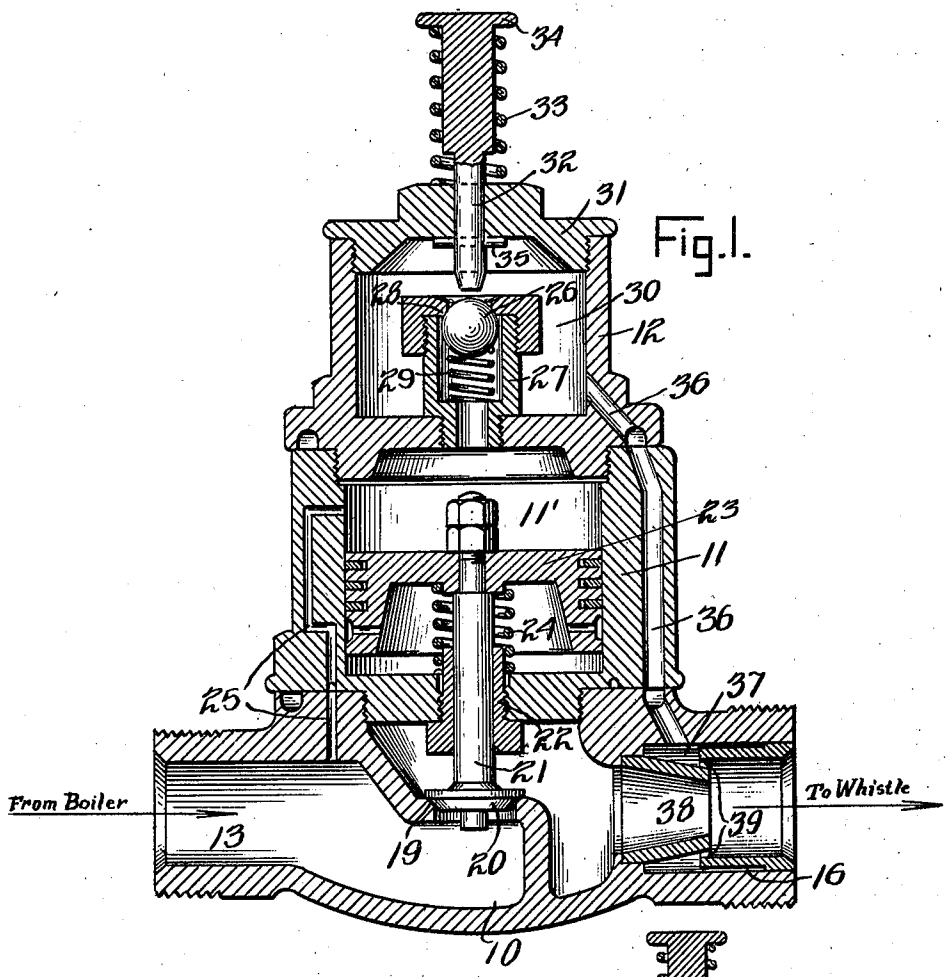


Fig. 1.

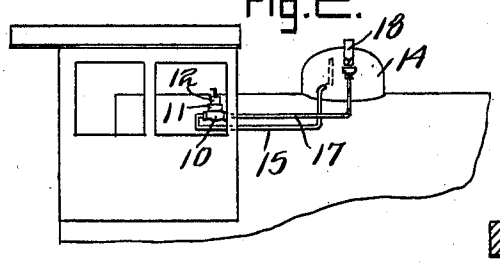


Fig. 2.

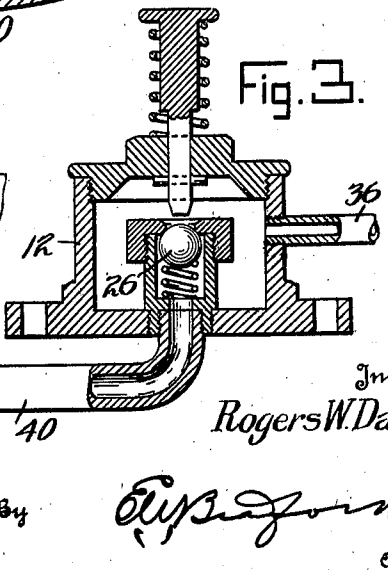


Fig. 3.

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UNITED STATES PATENT OFFICE.

ROGERS W. DANIEL, OF INDIANAPOLIS, INDIANA.

WHISTLE CONTROL VALVE.

Application filed December 2, 1926. Serial No. 152,208.

My said invention relates to valves and more particularly to the whistle valves of locomotives or other vehicles using fluid pressure whistles. The steam whistles of the present time are usually connected directly to a pipe leading from the steam dome and are provided with an integral valve mounted beneath the bowl and operated by a system of rods and levers which finally become worn out or are shaken loose causing considerable loss motion and also leakage of steam. Also the whistle is located in a position that should it become broken, it is necessary to draw the fire and blow off the steam in order to replace a new one. It is therefore an object of my invention to overcome these difficulties by placing the valve in a convenient point in the cab and entirely eliminating the levers and rods usually required to operate the whistle and using every particle of steam at the whistle bowl without any possibility of leakage.

Referring to the accompanying drawing forming a part hereof and in which like numerals designate similar parts in the views of which:

Figure 1 is a vertical sectional view through my improved valve,

Figure 2, a diagrammatic view of the connections of the valve and whistle, and

Figure 3, a diagrammatic view of a modified arrangement thereof.

In the drawings, the numeral 10 designates the main valve body, 11 the cylinder and 12 the control valve casing. The body 10 has an inlet opening 13 which receives the steam from the usual steam dome 14 through a pipe 15, and an exhaust opening 16 which is connected by a pipe 17 to any suitable form of whistle 18 shown in Fig. 2. A valve seat 19 is formed in the body 10 and receives a relatively small valve 20 secured on the end of a piston rod 21 which extends upward through a bearing sleeve 22 into the cylinder 11. A large piston 23 is secured to the upper end of the rod 22 and controls the movement of the valve 20. Interposed between the lower side of the piston 23 and the base of the cylinder 11 is a spring 24 which normally tends to force the piston upward and open the valve as will be hereinafter more fully explained.

A small port 25 leads from the inlet opening 13 up through the body of the cylinder 11 and communicates with the cylinder at a point above the upward limit of movement of the piston 23. The steam entering through the inlet opening 13 will exert pressure beneath the valve 20, but the same pressure passes through the port 25 to the chamber 11′ above the piston 23 which has a much larger area than the valve 20, thereby compressing the spring 24 and maintaining the valve 20 closed. This valve will remain closed as long as the pressure is maintained in the chamber 11′ above the piston 23.

The pressure in the chamber 11′ is governed by a control valve which comprises a ball 26 mounted in a tube 27 which communicates with the chamber 11′, said ball being normally held against a seat 28 by means of the steam pressure and also a spring 29. The tube 27 with its ball valve is located within a chamber 30 formed by the casing 12 and a cover plate 31. A plunger 32 is slidably mounted in the cover plate 31 directly over the ball 26 and is normally held upward away from the ball by a spring 33 interposed between the top of the plate 31 and a head 34 formed on the plunger. The upward movement of the plunger 32 is limited by means of a pin 35 which strikes the under side of the plate 31.

In order to drain the chamber 30 and also cause a more rapid movement of the piston 23, a port 36 leads downward through the casing 12 and cylinder 11 and into a chamber 37 which surrounds a venturi mounted in the exhaust opening 16 of the valve body. This venturi is provided with a central throat 38 through which the major portion of the steam passes and a series of small openings 39 through which is siphoned the steam from the chamber 30. In this way all of the steam is utilized in blowing the whistle as it is impossible for any leakage of waste.

The operation is as follows:

In Fig. 1 of the drawings the parts are in the position assumed when under pressure. When it is desired to blow the whistle, pressure is exerted downward on the plunger 32 unseating the ball valve 26 which relieves the pressure in the chamber 11′ allowing the spring 24 to force the piston 23 upward. This movement opens the valve 20 which seats itself against the under side of the bushing 22 and permits the steam to pass directly from the boiler to the whistle. The passage of the steam through the venturi, siphons the steam from the chamber 30 at a greater speed than it would ordinarily flow thereby creating a partial vacuum in the

chamber 11′ and causing a rapid movement of the piston 23 and valve 20.

In Fig. 3 of the drawings is shown a modified arrangement of the device in which the control valve 26 is shown separated from the main valve cylinder 11 and connected thereto by a tube 40. The port 36 is also replaced by a tube which connects to the chamber 37. In this arrangement the control valve can be mounted in a convenient location inside of the cab and the main valve parts may be placed outside.

The device as here shown and described is operated by direct manual pressure on the head 34 of the plunger 32, but I wish to have it understood that other operating means as electric or pneumatic means may be used instead if preferred. When the device is manually operated, the control valve would necessarily be located within reach of the operator, whereas, with electrical or pneumatic operation, the control valve may be placed in any convenient location with the operator's switch or other medium within easy reach.

It will be obvious to those skilled in the art, that various changes may be made in my device without departing from the spirit of my invention, and therefore I do not wish to be limited to the exact structure described and shown, but only as indicated in the appended claims.

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

1. A quick acting fluid pressure control valve comprising a main valve casing having an inlet and an exhaust port, a valve between said ports, an auxiliary casing detachably connected to said main valve casing, a piston in said casing having a connection with said valve for controlling the same, a passage through said main valve casing, a passage through said auxiliary valve casing, said passages forming communication between the inlet port and said casing at the remote side of the piston, an annular channel in one of said valve casings in communication with said passages to permit the passage of fluid therethrough in any relative position of rotation of the contiguous parts, a detachable closure for the outer end of said auxiliary casing, a chamber in said closure, a relief valve mounted in said chamber, a manually controlled plunger for opening said relief valve, and a drainage passage forming communication between said chamber and exhaust port, substantially as set forth.

2. A fluid pressure controlled valve comprising a main valve casing having an inlet and an exhaust port, a valve between said ports, an auxiliary casing detachably connected to said main valve casing, a piston in said casing having a connection with said valve for controlling the same, a passage through said main valve casing, a passage through said auxiliary valve casing, said passages forming communication between the inlet port and said casing at the remote side of the piston, a detachable closure for the outer end of said auxiliary casing, a chamber in said closure, a relief valve mounted in said chamber, a manually controlled plunger for opening said relief valve, a venturi on the discharge side of the main valve, and a drainage passage forming communication between the said chamber and a region of low pressure in the venturi whereby passage of steam through the main valve and the venturi will create a reduced pressure in the said passage and in the chamber above the piston, substantially as set forth.

3. A fluid pressure controlled valve comprising a main valve casing having an inlet and an exhaust port, a valve between said ports, an auxiliary casing detachably connected to said main valve casing, a piston in said casing having a connection with said valve for controlling the same, a passage through said main valve casing, a passage through said auxiliary valve casing, said passages forming communication between the inlet port and said casing at the remote side of the piston, a detachable closure for the outer end of said auxiliary casing, a chamber in said closure, a relief valve mounted in said chamber, means for operating said relief valve, a venturi on the discharge side of the main valve, and a drainage passage forming communication between the said chamber and a region of low pressure in the venturi whereby passage of steam through the main valve and the venturi will create a reduced pressure in the said passage and in the chamber above the piston, substantially as set forth.

In witness whereof, I have hereunto set my hand at Indianapolis, Indiana, this 30th day of November, A. D. nineteen hundred and twenty-six.

ROGERS W. DANIEL.