W. C. BOYD.

VALVE FOR RADIATORS.

APPLICATION FILED JUNE 8, 1920.

1,425,940. Patented Aug. 15, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

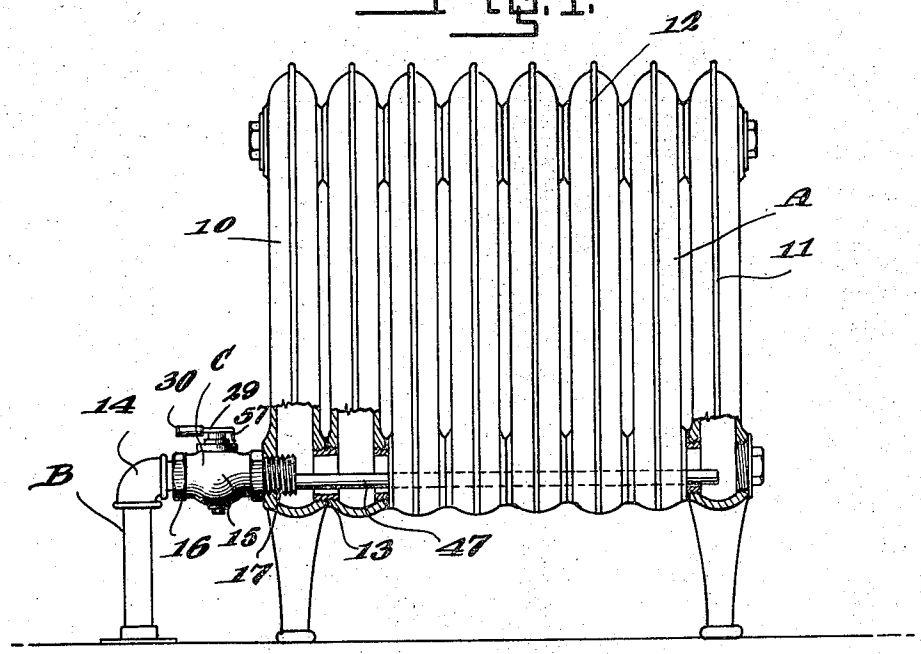


Fig. 4.

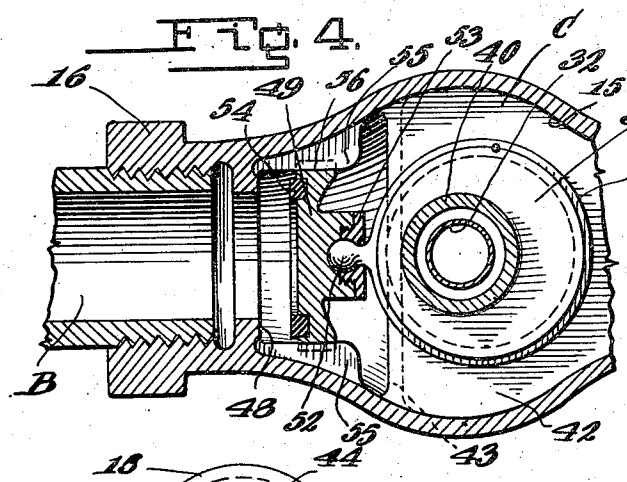


Fig. 5.

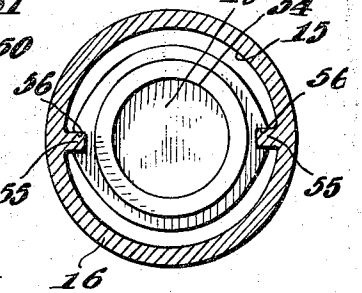
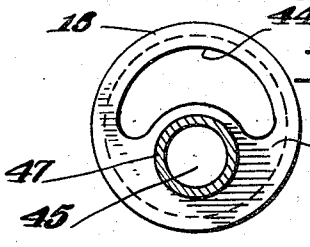


Fig. 6.



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2 SHEETS—SHEET 2.

Fig. 2.

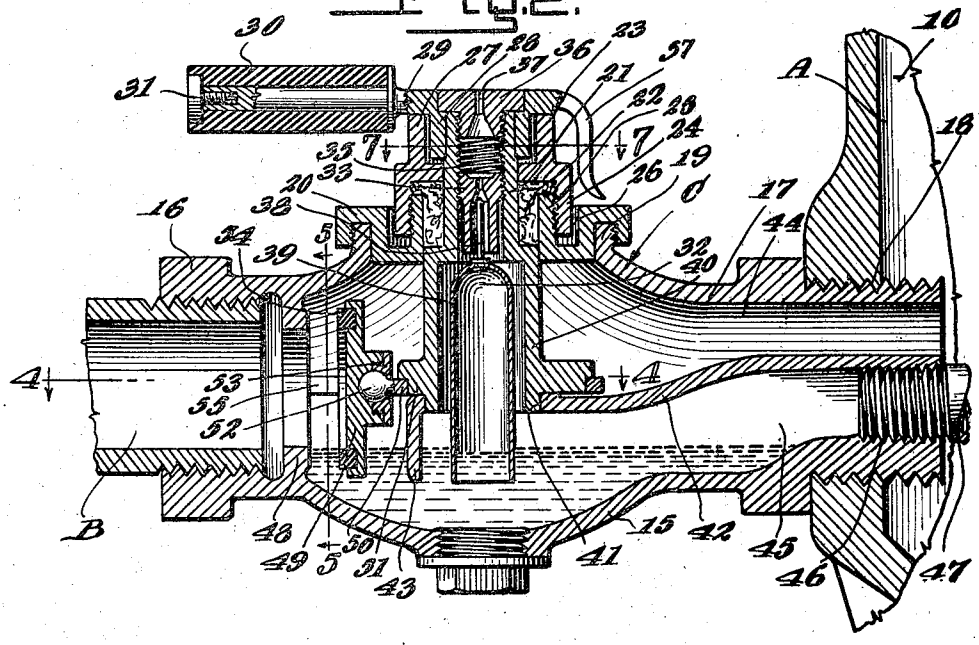


Fig. 3.

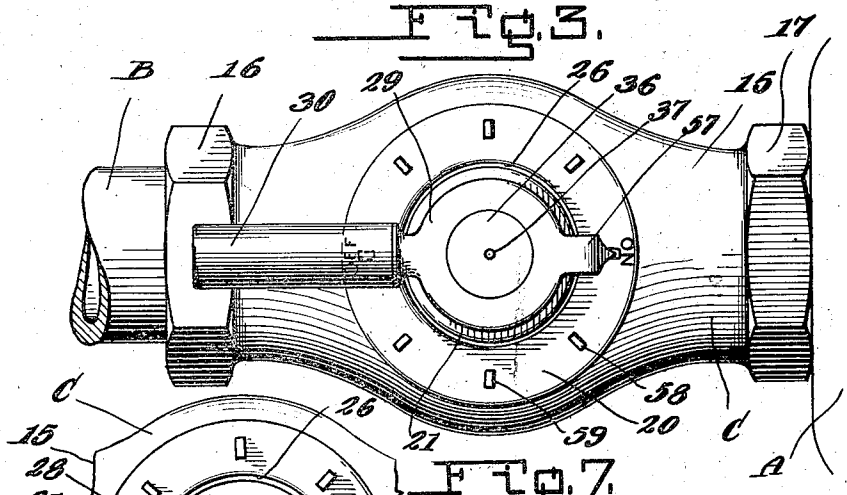
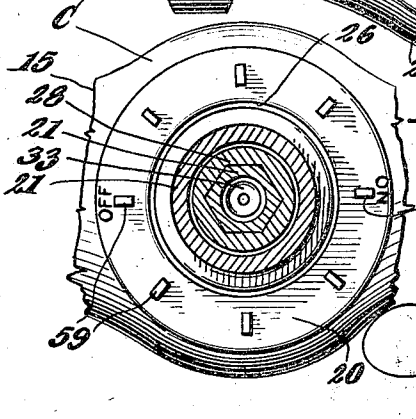


Fig. 7.



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UNITED STATES PATENT OFFICE.

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VALVE FOR RADIATORS.

1,425,940. Specification of Letters Patent. Patented Aug. 15, 1922.

Application filed June 8, 1920. Serial No. 387,428.

To all whom it may concern:

Be it known that I, WALTER C. BOYD, a citizen of the United States, residing at Shepherdsville, in the county of Bullitt and State of Kentucky, have invented certain new and useful Improvements in Valves for Radiators, of which the following is a specification.

This invention relates to valves and the primary object of the invention is to provide an improved valve for radiators, which is so constructed as to eliminate the water hammer in radiators and the usual type of air valves now in vogue, which is easily displaced and disarranged.

Another object of the invention is to provide an improved type of valve for radiators, which permits effective use of the one pipe system for radiators, thereby eliminating the return pipe and the freezing of the water of condensation and permitting of the free lengthening or shortening of the radiator, and which is so constructed as to provide a relatively large passage arranged in a vertical plane for the water of condensation and the heating elements, thereby eliminating the water hammer in the pipe.

A further object of the invention is to provide an improved radiator valve for controlling the flow of the heating element and the water of condensation from and to a radiator having an air valve located in the stem thereof, so as to prevent the tampering and disarrangement of the air valve.

A further object of the invention is to provide an improved combination radiator valve having a divided body for the flow of the heating element and the water of condensation, the passage for the water of condensation having a pipe connected thereto which is adapted to extend into the rear portion of the radiator, so as to permit the water of condensation to enter the valve only at this point.

A further object of the invention is to provide an improved radiator valve having a water seal therein, so as to prevent the escape of air into the radiator pipe and to permit the same to pass out of the valve located in the radiator valve stem.

A still further object of the invention is to provide an improved radiator valve of the above character which is durable and efficient in use, one that is simple and easy to manufacture, and one which can be placed upon the market at a reasonable 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, forming a part of this specification, in which drawings:

Figure 1 is a side elevation of a radiator showing parts thereof in section having the improved valve connected thereto.

Figure 2 is a vertical longitudinal section through the improved valve.

Figure 3 is a top plan view of the improved valve.

Figure 4 is an enlarged fragmentary horizontal section taken on the line 4—4 of Figure 2.

Figure 5 is a detail vertical section taken on the line 5—5 of Figure 2.

Figure 6 is an inner end view of the improved radiator valve, the pipe for receiving the water of condensation being shown in section, and

Figure 7 is a detail horizontal section taken on the line 7—7 of Figure 2.

Referring to the drawings in detail wherein similar reference characters designate corresponding parts throughout the several views, the letter A indicates a radiator, B, the supply pipe therefor, and C the improved radiator valve.

The radiator A is of the ordinary or any preferred construction and includes the outer sections 10 and 11, and the intermediate sections 12. The end sections 10 and 11 and the intermediate section 12 are connected in the usual manner by nipples or the like 13.

The supply pipe B extends from the boiler or other point of supply in the usual manner and is connected by means of an elbow joint 14 with the improved valve C.

The improved valve C includes the casing or body 15 having reduced terminals 16 and 17. The terminal 16 is internally threaded for the reception of the supply pipe B.

The terminal 17 is externally threaded as at 18 and is threaded into the end radiator section 10 in the ordinary manner. The upper end of the valve casing 15 is open and provided with an externally threaded neck 19, which is closed by the internally threaded bonnet 20, which rotatably carries the valve operating stem 21, which will be hereinafter more fully described. The bonnet 20 is provided with a suitable packing 22, which is held in place by the packing nut 23, which engages the valve stem and is threaded into engagement with the bonnet 20 by means of the internally threaded lower extension 24 which engages the upwardly extending annular flange 25 formed on the bonnet. The bonnet 20 around the upstanding annular flange 25 is provided with an annular depression 26 in which the lower edge of the packing nut 23 is adapted to fit.

The upper terminal of the packing nut 21 is provided with an upwardly extending annular flange 27 in which is rotatably fitted the depending annular extension 28 formed on the operating handle 29. The operating handle 29 is provided with a non-heat conducting hand grip 30 which is held in place by a suitable set screw or the like 31. The operating stem 21 for the handle 29 is formed hollow for the reception of the air valve 32, which includes the valve seat 33. The valve seat 33 is fitted in the threaded bore 35 of the valve stem 21. A lock screw 36 is provided for holding the handle in operative position on the valve stem 21 and this screw is provided with a central passage 37 for the air which is located directly above the passage formed in the valve seat 33. A needle valve 38 is adapted to fit on the seat and to close the same and this valve is carried by a hollow float 39, which is of substantially cylindrical formation. The float 39 is reciprocably mounted in the enlarged lower end 40 of the rotatable valve stem 21. The lower end of the enlarged portion 40 of the valve stem is rotatably fitted in an opening 41 formed in the transversely extending horizontally disposed partition plate 42 which extends parallel with the longitudinal center of the valve casing and extension or terminal 17. This partition 42 is arranged in a horizontal plane and ends short of the terminal 16 and is provided with the downturned vertically disposed lip 43 which terminates below the level of the water of condensation so as to prevent the escape of air into the supply pipe B and thus force the same to make its exit into the atmosphere. The horizontally disposed partition 42 divides the valve casing into a pair of compartments or passages 44 and 45 which are respectively for the passage of the heating element and the water of condensation and the passage for the water of condensation is provided with an internally threaded end 46 in which is fitted the inwardly extending pipe 47, which is positioned in the radiator A. The pipe 46 terminates short of the outer radiator section 11, and is adapted to collect the water of condensation therefrom. The terminal 16 of the valve casing 14 has formed thereon the vertically disposed valve seat 48 on which is adapted to seat the circular valve 49 which is adapted to be moved into and out of engagement with the seat, by means of the connecting link 50 which is rotatably mounted around the cam 51 formed on the valve stem 21 adjacent to its lower end. The connecting link 50 carries a ball end 52 which is swivelly connected to the valve 49 by means of a nut 53, which holds valve, an operating handle for the valve The outer face of the valve carries a removable seat 54 such as leather, fiber, hard rubber, or the like. The valve 49 is silded into and out of engagement with the seat 48 upon operation of the stem by suitable horizontally disposed ribs 55 which are received in grooves 56 formed in the side edges of the valve 49. The operating handle 29 opposite to the hand grip 30 is provided with a radially extending downwardly disposed indicator 57 which is adapted to cooperate with a dial 58 formed on the upper surface of the bonnet 20. The dial 58 includes a plurality of spaced equi-distantly disposed lugs 59 and the lugs are arranged on opposite sides of the body at the longitudinal center of the casing have scribed adjacent thereto "on" and "off" as at 60 so as to indicate the open and closed position of the valves.

In operation of the improved valve the valve 30 is moved until the indicator reaches the lug 59 adjacent to which is scribed the word "on" which rotates the valve stem 21 and the cam 51 thus moving the link rearwardly and moving the valve 49 from its seat 48. This permits the heating element to ride into the casing and owing to the water seal the same will take its course through the passage 44 and then into the radiator in the ordinary manner. As the steam or heating fluid enters the radiator the same will force the air or water of condensation to the rear portion of the radiator and then into the pipe 47 and into the passage 45. The air will then ride around the float 32 and out of the passage way 37. If the level of water of condensation rises the float will be carried therewith and thus close the air valve and prevent the escape of the water of condensation therethrough. After the air has been driven from the radiator the steam or other heating fluid will flow into the pipe 47 and the passage way 45 and around the float 32. This will heat the air confined in the float 32 and expand the same which will seat the valve and thus prevent the escape of steam

from the radiator. The valve 49 may be closed or partially closed according to the amount of heat desired.

From the foregoing description it can be seen that an improved combination radiator valve has been provided, which effectively eliminates the ordinary type of air escape valve now in vogue and permits the effective use of one pipe system of radiators and eliminates all water hammers in the radiators and pipes.

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

I claim:

1. A valve for controlling the flow of the heating fluid and the return matter in a radiator, and an air escape arranged in the stem of the valve.

2. A valve for controlling the flow of the heating fluid and the return matter in a radiator, the valve including a stem and an air escape valve arranged in the stem.

3. A valve fitting for radiators comprising a casing having a longitudinally extending passageway therein for the heating fluid, and a longitudinal passageway therein for the water of condensation, a valve seat arranged in advance of said passageways, a valve arranged to fit on said seat, a stem arranged to move the valve off or on said seat, a handle for the stem, a water seal arranged in the passageway for the water of condensation, and an air escape arranged in said stem.

4. A valve fitting for radiators comprising a casing having a longitudinally extending passageway therein for the heating element, and a longitudinal passageway therein for the water of condensation, a vertically disposed valve seat arranged in advance of said passageways, a valve arranged to sit on said valve seat, a stem for actuating the valve, a handle for the stem, and an air escape valve arranged in said stem.

5. A valve fitting for radiators comprising a casing having a longitudinally extending passageway therein for the heating element, and a longitudinally extending passageway for the water of condensation, a vertically disposed valve seat arranged in advance of the passageway, a water seal arranged in the passageway for the water of condensation, a valve arranged to fit on said seat, a valve stem for moving the valve off or on its seat, a handle for actuating the stem, and a float operated air escape valve arranged in the stem and adapted to be actuated by the water of condensation.

6. A radiator valve fitting comprising a casing having a longitudinally extending passageway therein for the heating element, and a longitudinally extending passageway therein for the water of condensation, a vertically disposed valve seat arranged in advance of the passageways, a valve arranged to move off and on said seat, a stem for actuating the valve, a handle for the stem, a second valve seat arranged in the stem, a needle valve arranged to fit on said seat, and a float carrying said needle valve and arranged to be operated by the water of condensation.

7. A radiator valve fitting comprising a casing having a longitudinally extending passageway therein for the heating element, and a longitudinally extending passageway for the water of condensation, a vertically disposed valve seat arranged in the casing, a valve arranged to move off and on said seat, a water seal in the passageway for the water of condensation, a valve stem for the valve, an operating handle for the valve stem, a second valve seat carried by the stem, and a float valve mounted in said water seal and arranged to sit on said valve seat when the water of condensation rises in said seal.

8. In a radiator valve fitting for controlling the flow of the heating element and water of condensation in a radiator, a water seal in said valve, a valve stem, a valve seat arranged in the stem, a hollow cylindrical float arranged in the water seal having its lower end opened, a needle valve carried by the float and arranged to sit on the seat.

9. A valve fitting for radiators comprising a casing having a longitudinally extending passageway therein for the heating fluid, and a longitudinally extending passageway therein for the water of condensation, a vertically disposed valve seat arranged in the casing in advance of the passageways, a rotatable valve stem, a valve arranged to fit on said seat, means operated by the stem for moving the valve off and on its seat, the valve stem being hollow, a second valve seat arranged in the stem, and a float valve arranged in the stem and adapted to fit on said seat.

10. A valve fitting for radiators comprising a casing having a horizontally disposed longitudinally extending partition therein dividing the casing into a passageway for the heating fluid, and a passageway for the water of condensation, the partition having its forward end provided with a depending rib extending into the water of condensation for forming a water seal, a vertically disposed valve seat arranged in the casing in advance of the partition, a vertically disposed valve arranged to sit on the seat and slidably supported by said casing, and a rotatable hollow valve stem supported by the passage, an operating handle carried by the valve stem, a cam formed on the lower end of the valve stem, a link receiving the cam, a head formed on the link and operatively connected to the valve, a second

valve seat arranged in the hollow stem, a needle valve arranged to fit on said seat, and a hollow cylindrical float having a lower opened end carrying said needle valve and arranged to extend into the water of condensation.

11. A valve fitting for radiators comprising a single casing having a longitudinally extending passageway therein for the heating element and a longitudinally extending passageway therein for the water of condensation, a vertically disposed valve seat arranged in said casing in advance of the passageways, a valve arranged to move on and off said seat, and means for actuating the valve exteriorly of said seat.

WALTER C. BOYD.