

Aug. 29, 1944.

C. L. FUNTAN

2,357,097

VALVE STRUCTURE FOR STEAM CONDUCTING SYSTEMS

Filed June 11, 1943

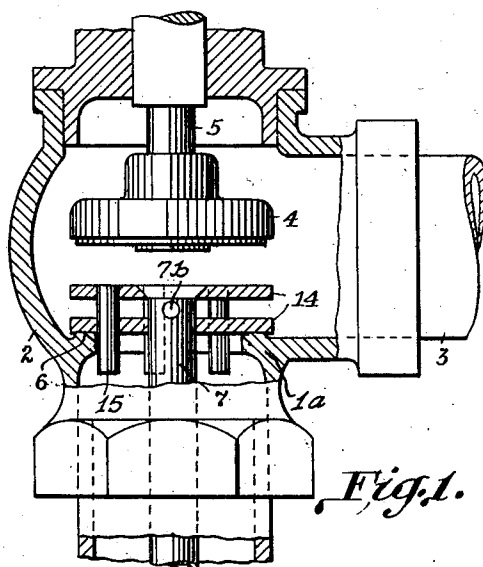


Fig. 1.

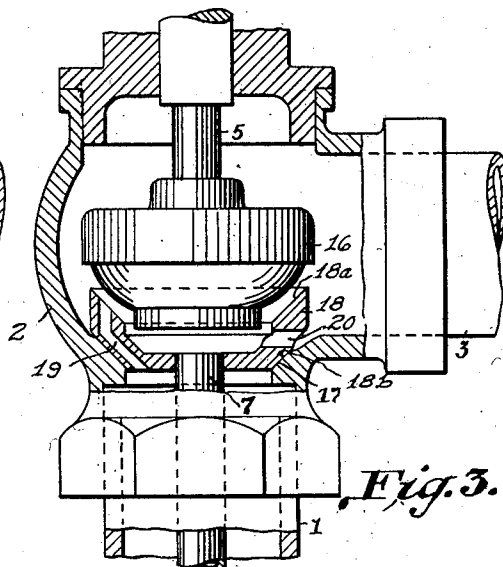


Fig. 3.

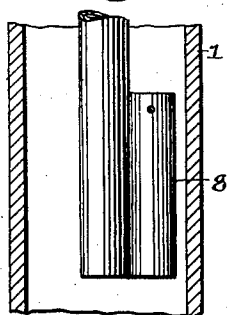


Fig. 4.

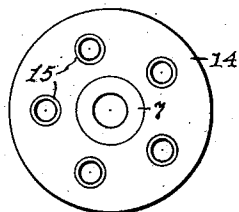
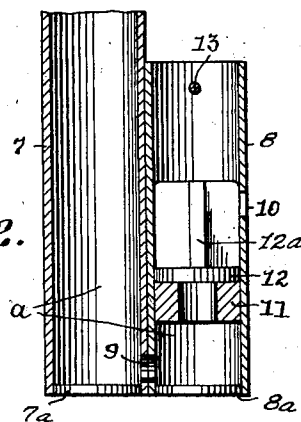


Fig. 2.



INVENTOR,
Charles L. Funtan,
BY John W. Howard,
ATTORNEY.

UNITED STATES PATENT OFFICE

2,357,097

VALVE STRUCTURE FOR STEAM
CONDUCTING SYSTEMS

Charles L. Funtan, Paterson, N. J.

Application June 11, 1943, Serial No. 490,425

2 Claims. (Cl. 277—55)

This invention relates to steam-conducting systems of the class in which, for instance, leading from and to a radiator there is a single pipe or conductor which serves to supply steam to the radiator and by which the water of condensation collecting in the radiator finds return to the steam source. The primary object of the invention is to eliminate the cause of the hammering which occurs when, the valve having been closed and water of condensation having collected beyond the valve relatively to the steam source, the valve is opened. This I accomplish by structure which may be applied to an existing steam-conducting system without structural alteration thereof.

In the drawing,

Fig. 1 shows in side elevation so much of a steam-conducting system as includes, immediately, my improvement, parts of which and the conductor are shown in section;

Fig. 2 is a fragmentary vertical sectional view of the drainage passage portion and contained check valve;

Fig. 3 is a view generally similar to Fig. 1 but showing a different type of conductor valve and my improvement in modified form; and

Fig. 4 is a plan of the structure 7—14—15 of Fig. 1.

The usual steam pipe or conductor is shown comprising an upright part or pipe proper 1 and a valve-casing 2 affixed to the pipe proper and joined to a pipe 3 for connecting the valve-casing to a radiator. Character 4 denotes the conductor valve and 5 the stem thereof, being movable up or down whereby the valve acts to permit or check the flow to the radiator, the valve in the standard system when devoid of my improvement being adapted to engage the usual valve-seat 6 when the valve is in closing position, said valve-seat being there the upwardly facing surface of what I term an annular support 1a formed around the axis of the upright part 1 of the conductor.

Describing the examples shown and having reference, first, to Figs. 1 and 2;

1 designates a tube whose bore may be open at the upper but is closed at the lower end, as at 7a, and 8 another tube whose bore is also open at the upper and closed at the lower end, as at 8a, and being shorter than tube 7. The tubes are rigidly secured together, as by welding, in parallelism and with their closed ends here flush with each other. Near their lower ends they are formed with a connecting port 9 and between this port and the upper end of tube 8 the latter has

a port 10, open to the exterior. An apertured valve-seat 11 exists in tube 8 between ports 9 and 10 and arranged to seat thereon is a check valve 12 which may have a known type of up-standing portion 12a (formed cross-shaped in plan) simply to confine the valve to axial relation to the bore of the tube. This valve is free to move, past port 10, between limits defined by the valve-seat and a stop-pin 13. What is formed by the two tubes provides a J-shaped drain passage a which extends from an intake port 7b near the upper end of tube 7 to port 10, being incidentally in this example restricted where it is in part formed by port 9 and the aperture of the valve-seat, so much of the passage as extends from its deepest part to the level of port 10 forming a liquid trap or collector. When the check valve 12 rests on its valve-seat flow of fluid (as steam) entering port 10 and seeking to pass the valve-seat is prevented by said valve; but if liquid in sufficient quantity be entered at port 7b of tube 7 the valve will be raised by the liquid from the valve-seat to a level more or less to uncover port 10, whereby escape of the liquid at such port will occur.

The structure including the two tubes and check valve is completed by what I term a head fast to the upper end portion of tube 7 and including a pair of horizontal spaced superposed disks 14 and one or more tubes 15 connecting the disks, their upper ends not projecting above the upper disk and their lower ends preferably projecting below the lower disk if, as shown, they are several in number and squally spaced from tube 7 and each other. The tubes 7—8 are of such aggregate diameter as to enter the aperture formed by the annular support 1a but the lower disk is of greater diameter than such aperture whereby the mentioned head may seat on said support as shown so that the upper disk then provides the valve-seat for valve 4. When the said structure is in operative position, as shown, in the conductor liquid may flow to the tube 7 from the radiator via port 7b in the tube (or the part of the tube between the disks may be removed).

In Fig. 3 the conductor valve 16 is of frustro-conical form and the valve-seat 17 similarly formed. The head of my said structure is in effect a solid or single thick disk 18 formed with surfaces 18a and 18b to fit the conical surfaces, respectively, of the valve and valve-seat. The disk is formed with one or more ports 19 for steam flow, extending up through it, and a water-drainage port 20.

In either of the forms shown the conductor may be regarded as having a passage for flowing steam (afforded by any tube 15 or by a port 19) closable by the conductor valve. The drain passage *a* is independent of the steam passage, having its intake (at 7b or at the upper end of tube 7 in Fig. 3) below the peak, or here the upper end, of the steam passage, so that drainage may ensue, and open to the conductor space at that side of said steam passage to which the latter discharges and at a point removed from the valve when the latter is in closing position, whereby the valve when closed will not then prevent drainage. And the check valve is normally urged to close said outlet but is displaceable, by liquid accumulating in passage *a*, out of closing relation to said outlet. Passage *a* being preferably J-shaped and port 10 being provided in its short leg and the check valve being normally held depressed in such leg below said port, as here by gravity, steam may not enter the latter to flow through passage *a*, as when the conductor valve is closed.

Having thus fully described my invention, what I claim is:

1. The combination of the upright part of a steam conductor having an annular support formed around its axis and providing an annular valve-seat, structure in the conductor comprising a head resting on said support and a portion depending from said head, said head having a passage permitting flow of steam through the conductor upwardly past said support and said structure having a passage, independent of the first-named passage and permitting flow of water

downwardly past said support, which depends into and has its discharge outlet in said portion, said structure coacting with said support to prevent fluid-flow past said support except via said passages, a check-valve normally urged into closing relation to said outlet but displaceable therefrom by liquid accumulating in the second-named passage, and a conductor valve movable into closing relation to the first-named, independently of the second-named, passage.

2. The combination of the upright part of a steam conductor having an annular support formed around its axis and providing an annular valve-seat, structure in the conductor comprising a head resting on said support and a portion depending from said head, said head having a passage permitting flow of steam through the conductor upwardly past said support and said structure having a generally J-shaped passage, independent of the first-named passage and permitting flow of water downwardly past said support, which depends into and has its discharge outlet in said portion and in the shorter leg of the J-shaped passage, said structure coacting with said support to obstruct fluid-flow past the support except via said passages, a check-valve for said outlet arranged in said shorter leg and normally urged to a position therein below, but displaceable by liquid accumulating in the second-named passage upwardly past the outlet, and a valve movable into closing relation to the first-named, independently of the second-named, passage.

CHARLES L. FUNTAN.