

W. H. SHOCK & R. H. THURSTON.

Combined Cocks and Valves for Steam-Heaters.

No. 150,899.

Patented May 12, 1874.

Fig. 1.

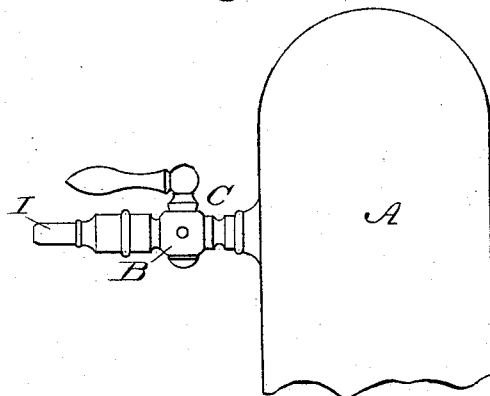


Fig. 2.

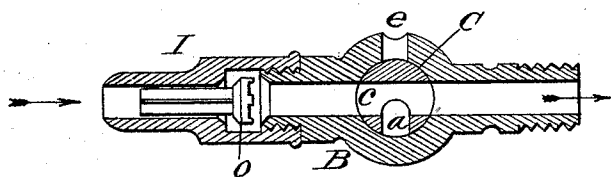
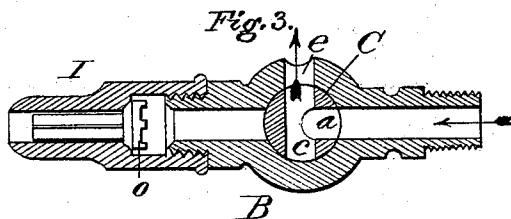


Fig. 3.



Witnesses.

H. H. Dodge
C. F. Murdock

Inventor.

Wm. H. Shock
Robt. H. Thurston
by Dodge & Co.
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM H. SHOCK, OF BALTIMORE, MARYLAND, AND ROBERT H. THURSTON,
OF HOBOKEN, NEW JERSEY.

IMPROVEMENT IN COMBINED COCKS AND VALVES FOR STEAM-HEATERS.

Specification forming part of Letters Patent No. **150,899**, dated May 12, 1874; application filed
March 23, 1874.

To all whom it may concern:

Be it known that we, W. H. SHOCK, of Baltimore, Maryland, and ROBERT H. THURSTON, of Hoboken, in the county of Hudson and State of New Jersey, have invented certain Improvements in Combined Cock and Valve for Steam-Heaters, of which the following is a specification:

Our invention consists of an improved valve and cock for use in connection with steam heaters or radiators, as hereinafter more fully described.

Figure 1 is a side elevation, showing the device attached to a radiator. Fig. 2 is a longitudinal section of the apparatus taken on a horizontal plane, as arranged to admit air by means of the valve. Fig. 3 is a similar view, showing the cock turned to permit the escape of air when steam is let on.

The object of our invention is to provide for the speedy removal of the water formed by the condensation of steam in the radiator, and also for the escape and admission of air. It also has for its object the prevention of an excessive or dangerous heating of the radiator, by automatically permitting the escape of steam whenever the heat rises above a certain fixed point or degree.

As ordinarily constructed, when the steam is shut off from the radiator, that which remains, as also that which through improper fitting of the valve leaks by the latter, condenses, thereby filling the interior more or less with water, which is prevented, by atmospheric pressure, from escaping, even though a drip-cock or other similar opening be provided at the bottom. In consequence of such accumulation of water within the pipes or radiator, when steam is turned on it has to make its way through the mass, and its passage is attended with a loud crackling or snapping sound, and this noise, by conduction along the pipes, is communicated to a considerable distance, and to other parts of the building, and is very annoying and disagreeable. The contact of the inflowing steam with the water also causes a considerable loss by condensation. Another bad effect of the standing water is to corrode the metal in contact with it, and this

in time creates scale or sediment which tends to clog the valves and passages, and also to cause unnecessary wear on the valves, thereby tending to make them leak, thus creating an escape of steam, which, condensing, drips upon the floor or carpet. It is also well known that steam may be so highly heated as to char and ultimately ignite the wood or other combustible material in contact with the pipes or radiator containing it. To remedy these evils, we attach to the steam radiator or heater, of whatsoever form or kind it may be, a combined two-way cock and check valve, constructed as follows:

In the drawings, B represents the body of a cock, one end of which has a screw-thread formed thereon for attaching it to the steam-radiator A, as shown in Fig. 1. This cock is provided with a plug, C, which has a passage, *c*, extending through it, as shown in Fig. 2. It also has another passage or hole, *a*, arranged at right angles to the passage *c*, extending from one side through into the passage *c*, as shown in Fig. 3, thus constituting a two-way cock. The body B has a passage extending longitudinally through it, and at a point opposite the plug C; it also has a hole, *e*, opening out through one side, as represented in Figs. 2 and 3. Upon the outer end of the stem or body B we secure a short metal tube, I, having a suitable recess in it for the reception of a check-valve, O, as shown in Figs. 2 and 3, this valve being so constructed and arranged as to seat itself and close the passage when forced outward, but leaving free passage when drawn inward toward the plug.

In order to prevent an excessive heat in the radiator, we make this valve O of a fusible alloy, which will melt at any required degree of heat, so that whenever the heat rises above the proper degree, the valve will melt, and permit the steam to escape.

The operation is as follows: The device being applied to the heater or tube at or near its upper portion, as indicated in Fig. 1, the plug is turned to the position shown in Fig. 3, so that as the steam is let in, the air in the heater escapes through the hole *e*, as indicated by the arrows in Fig. 3. When the heater has

become filled with steam, and the air all expelled, the plug C is turned to the position shown in Fig. 2, in which case the steam will press the valve O outward, thus closing the tube B, and in this condition the heater is left to perform its natural functions. When the steam is shut off that within the heater condenses as it cools down, and, as the condensation tends to create a vacuum within, the atmospheric pressure without shoves the valve O inward, as shown in Fig. 2, thereby permitting the air to enter, and this permits the water of condensation to escape freely from the heater, the pipes being so arranged as to let it flow freely away. As a consequence, when the steam is again let on, it meets with no obstruction from water within the pipes or heater, and all the difficulties heretofore mentioned are thus obviated.

Whenever the heat rises above the required

or proper degree, the valve O is fused, thereby permitting a free escape of the steam, and preventing all danger of fire, the escaping steam also serving as an alarm.

Having thus described our invention, what we claim is—

A combined stop-cock and check-valve for radiators, the same consisting of the tubular stem B, provided with the opening *e* and the two-way plug C, with the outwardly-closing check-valve O, all constructed to operate substantially as and for the purpose set forth.

WILLIAM H. SHOCK.

ROBERT H. THURSTON.

Witnesses as to WM. H. SHOCK:

G. E. SANGSTON,

WM. D. ELDRIDGE.

Witnesses as to R. H. THURSTON:

HENRY MORTON,

J. M. SHIPPHEN.