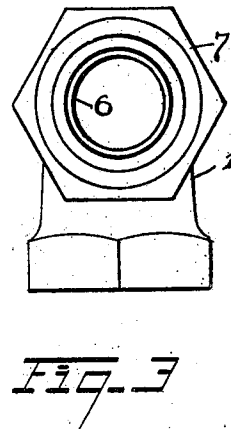
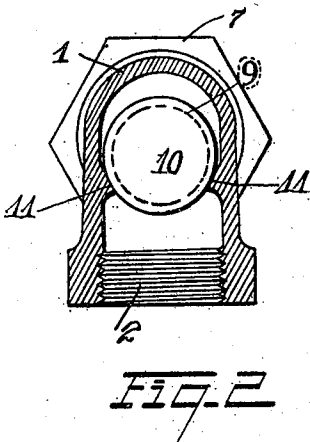
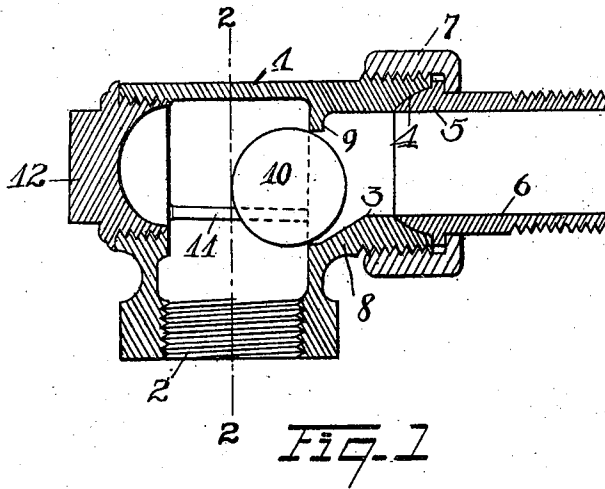


H. HITCHCOCK.
CHECK VALVE.
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975,243.

Patented Nov. 8, 1910.



Witnesses:

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UNITED STATES PATENT OFFICE.

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CHECK-VALVE.

975,243.

Specification of Letters Patent.

Patented Nov. 8, 1910.

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To all whom it may concern:

Be it known that I, HARLYN HITCHCOCK, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented a new and useful Improvement in Check-Valves, of which the following is a specification.

This invention relates to check valves, and more particularly to valves of this type wherein the valve body proper is a rolling body, preferably a sphere.

It is the object of the invention to provide a construction of check valve wherein the spherical body of the valve, while always having a tendency to be seated, will be normally held to its seat by a relatively slight pressure, due to the gravity of the body, but can be easily rolled away from its seat by the pressure of the incoming fluid.

A further object of the invention is to so construct and locate the valve seat that perfect drainage may be obtained from the inlet connection past such seat, obviating the presence of any pocket wherein sediment may accumulate to interfere with the action of the valve.

A still further object of the invention is to provide a valve of this kind which is particularly accessible for inspection, cleaning, regrinding, or repair.

With the above objects in view, the invention may be defined further and more generally as consisting of the combinations of elements embodied in the claims hereto annexed and illustrated in the drawings forming a part hereof, wherein—

Figure 1 represents a vertical longitudinal sectional view taken through a valve casing constructed in accordance with my invention; Fig. 2 represents a sectional view corresponding to the line 2—2 of Fig. 1; and Fig. 3 represents an elevation of the device shown in Fig. 1, looking from the right-hand of said figure.

Describing the parts by reference characters, 1 denotes the casing for the valve. This casing is shown as part of an elbow having a vertical branch 2 and a horizontal branch 3. The valve illustrated is particularly well adapted for use with what is known as "vapor-vacuum" heating systems and, by the use of this valve, the radiator or coil to which it is attached may be relieved of the air and water which may ac-

cumulate therein, while preventing the backward flow of steam from the return line into the radiator or coil when a partial vacuum is formed in the latter, or when there is a greater pressure on the return line than in the radiator or coil. The branch 3 is provided with a ground seat 4 for the reception of a corresponding ground end 5 of a nipple 6, the nipple being shown as secured to the end of the branch 3 by means of a nut 7. The bottom of the branch 3 is provided with a tapered surface extending at an upward inclination from the junction of the vertical and horizontal bores of the elbow, as shown at 8, and at this junction an annular valve seat 9 is provided, the bottom of the seat being at the bottom of the inclined surface 8. The seat 9 is circular, as shown, and its plane forms an angle of about 85° with the axis of the branch 3. The circular seat provided for the spherical valve body 10 is of less diameter than said body and forms a tight closure therewith.

11 denotes a pair of guides, preferably formed with the valve casing elbow and extending on each side thereof and across the bore of the vertical branch 2. Referring to the end of the elbow or casing which carries the nipple 6 as the "front" of the casing, and to the opposite portion as the "rear," the guides 11 may be described as being inclined downwardly from rear to front, such downward inclination being approximately 5°, the said guides extending substantially at right angles to the plane of the seat 9. The distance between these guides is, of course, less than the diameter of the valve body, and the opposed or inner surfaces of said guides are concaved, the said surfaces being portions of a cylindrical surface the axis of which passes through the center of the valve seat. The front ends of the guides extend approximately to the valve seat 9 and serve to bring the ball into positive operative relation to the seat. The rear end of the elbow is closed by a plug 12, by the removal of which access may be had to the interior of the casing 1 for the purpose of removing the valve body 11 and for the purpose of inspecting, cleaning and regrinding the parts.

By the construction disclosed herein, the spherical valve body is moved easily from its seat by a rolling motion, the inclination

of the guides being very slight. Furthermore, the moment the valve body leaves its seat, a clear passageway is provided for the flow fluid, which passageway is practically unobstructed. Furthermore, it is possible, by my construction, to make the guides and seat integral with the valve casing, thus making the valve comparatively inexpensive of production. A still further advantage of my invention resides in the fact that it is possible, without removing the valve casing from its position in the line of pipe to which it may be applied, to remove the ball and to regrind the valve seat. Still further, the location of the bottom of the valve seat at a lower level than the inlet, and particularly the provision of the inclined surface 8, prevents any clogging or interfering with the action of the valve through the accumulation of sediment.

Having thus described my invention, what I claim is:

1. In a valve, the combination of a casing, said casing having a substantially vertical branch and a substantially horizontal branch, a valve seat formed at the junction of said branches, one or more guides extending across the vertical branch and inclined slightly downwardly toward the valve seat, and a rolling valve body on said guide or guides.

2. In a check valve, the combination of a casing having a substantially vertical branch and a substantially horizontal branch and having a circular seat at the junction of said branches, the plane of said seat being slightly inclined toward the axis of the horizontal branch, one or more guides provided in the vertical branch and leading toward the seat at substantially right angles thereto, and a spherical valve body adapted to roll on said guide or guides toward and from said seat.

3. In a check valve, the combination of an angular valve casing having an outlet and a substantially horizontal inlet with a seat formed at the junction of the inlet and outlet, the bottom of the valve seat being at the bottom of an inclined surface formed on the bottom of the inlet branch, one or more guides extending away from said seat and inclined downwardly toward said seat, and a rolling valve body mounted on said guide or guides.

4. In a check valve, the combination of an angular casing having at one end an inlet branch and at its opposite end a removable plug and having an outlet branch at an angle to the inlet branch, a valve seat formed at the junction of the inlet and outlet branches, spaced guides extending from said seat across the outlet branch toward the removable plug, and a valve body adapted to roll on said guides and to engage said seat.

5. In a check valve, the combination of a

casing having a substantially horizontal inlet connection and having a circular seat, the plane of said seat being slightly inclined from the vertical, a plurality of guides extending away from said seat and at right angles thereto, said guides having curved surfaces forming portions of a cylindrical surface the axis of which passes through the center of the valve seat, and a spherical valve body on said guides.

6. In a check valve, the combination of a casing having an inlet branch and an outlet branch forming an angle therewith, said branches having a circular seat therebetween, a plurality of guides extending therefrom, said guides having curved surfaces forming portions of a cylindrical surface the axis of which passes through the center of the valve seat, and a spherical valve body on said guides.

7. In a check valve, the combination of an inlet branch and an outlet branch, a circular valve seat formed at the junction of the inlet branch with the outlet branch, said valve seat being slightly inclined toward the axis of said inlet branch and having its center below the center of said inlet branch, a pair of guides extending from said seat at substantially right angles thereto, and a spherical valve body on said guides.

8. In a check valve, the combination of a casing having an inlet branch and an outlet branch arranged at an angle to each other, a substantially vertical circular valve seat formed at the junction of the inlet branch with the outlet branch, guides extending from said valve seat and forming a slight angle with a horizontal plane, said guides having concaved guide surfaces, said surfaces being formed as portions of a cylindrical surface the axis of which passes through the center of the valve seat, and a spherical valve body mounted on said guides.

9. In a check valve, the combination of a casing having an inlet branch and an outlet branch arranged at an angle to each other, a substantially vertical circular valve seat formed at the junction of the inlet and outlet branches, guides extending from said valve seat and forming a slight angle with a horizontal plane, said guides having concaved guide surfaces, said surfaces being formed as portions of a cylindrical surface the axis of which passes through the center of the valve seat, a removable plug adjacent to the ends of the guides remote from the valve seat, and a spherical body mounted on said guides.

10. In a check valve, the combination of a substantially horizontal inlet branch and an outlet branch arranged at an angle thereto, a circular valve seat formed at the junction of the inlet branch with the outlet branch, the bottom of the inlet branch tapering toward the bottom of said seat, a pair of

spaced guides leading away from said seat, and a spherical valve body on said guides.

11. In a check valve, the combination of a substantially horizontal inlet branch and
5 an outlet branch arranged at an angle thereto, a valve seat formed at the junction of said branches, a pair of spaced guides lead-

ing away from said seat transversely of the bore of the outlet branch, and a rolling valve body on said guides.

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Witnesses:

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