

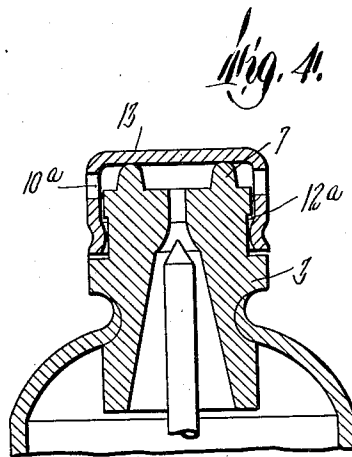
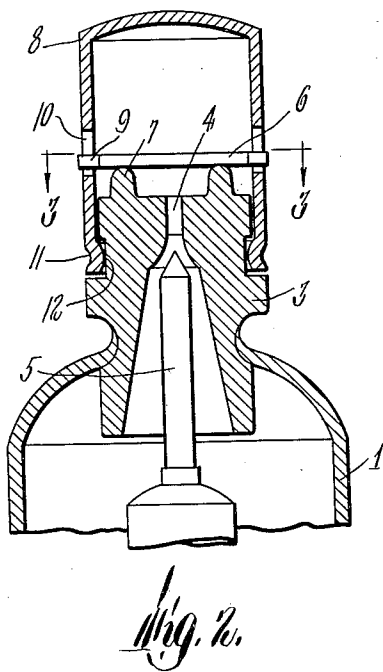
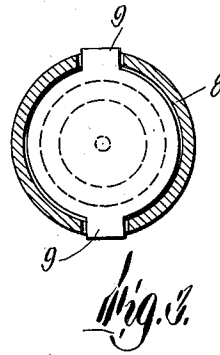
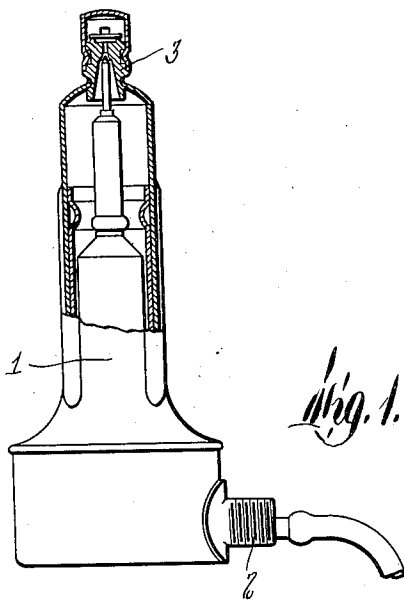
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G. D. HOFFMAN

1,871,984

CHECK VALVE

Original Filed June 6, 1924



Inventor:
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UNITED STATES PATENT OFFICE

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CHECK VALVE

Original application filed June 6, 1924, Serial No. 718,319. Patent No. 1,708,622. Divided and this application filed June 25, 1928. Serial No. 288,056.

The present invention relates to valves, with particular reference to a light easily movable check valve and to means for mounting such valve in relation to its seat and to the structure on which the seat is formed, so that it may be rotated and rubbed on the seat to displace particles of dirt, etc. which would otherwise prevent tight closing of the valve.

The embodiment of the invention herein illustrated is shown in connection with an air valve for steam heating radiators, as a check to prevent entrance of air when a vacuum condition occurs in the radiator to which the valve is applied; but the scope in which I claim protection is not limited to this particular embodiment and use. The present application is a division of my application Serial No. 718,319, filed June 6, 1924, (on which Letters Patent No. 1,708,622 were granted on April 9, 1929) entitled "Air relief and vacuum check valve for steam radiators", in which the present subject matter was originally claimed.

In the drawing herewith,—

Fig. 1 is an elevation, partly in section, of a radiator valve in which the present invention is embodied;

Fig. 2 is a similar view on an enlarged scale of the check valve and a cap interengaged therewith;

Fig. 3 is a cross section on line 3—3 of Fig. 2;

Fig. 4 is a view similar to Fig. 2 showing a modified form of associated check valve and cap.

Like reference characters designate the same parts wherever they occur in all the figures.

Describing now the article shown in the drawing, as one construction, representative of all, in which my invention may be embodied, 1 represents the casing of a radiator air valve having a nipple 2 for connection to the radiator and having at its upper end a block 3, forming the extremity of the valve casing, through which there is a vent passage 4. A valve 5 within the casing, and operated by water in the casing, by temperature, and by pressure conditions, cooperates with a seat at the inner orifice of the vent

passage 4 to release air from the radiator and to prevent escape of steam, or inflow of air, as described in the parent application above identified; but as this part of the valve is not material to the present invention, it need not be further described herein.

The new step of the invention here claimed is embodied in a check valve 6 which, in the form shown in Figs. 1, 2 and 3, is a flat metal disk, sufficiently thick to be strong and rigid under the pressures to which it is subjected, but at the same time so light in weight as to be easily displaceable by fluid issuing from the vent passage at a pressure only slightly above that of the atmosphere. This valve closes against a seat formed by the plane upper edge of a cylindrical rib 7 which surrounds the outer orifice of the vent opening. Preferably the area surrounded by the rib is much larger than the area of the passage in order to expose so large an area of the valve to the pressure within the casing that a very low pressure will suffice to raise the valve and permit escape of air from within the casing.

As here shown, the valve 6 is arranged in a horizontal plane and is seated by gravity, but it is within my contemplation to arrange it otherwise and provide other means to urge it toward its seat.

A cap 8 embraces the end of the block 3, or, in other words, the extremity of the casing in which the vent passage is located, and loosely interlocks the valve with the casing, permitting it to be opened and closed, and also permitting it to be rotated by force applied to the cap. Interlock between the valve proper and the casing is provided by tongues 9 formed on the disk at opposite sides, which project through slots 10 formed in the walls of the cap, such slots being long enough to permit the necessary movement of the valve in opening and closing, and the tongues being long enough to permit grasping by the fingers of an attendant. The loose interlock between the cap and the block 3 is provided by an indented zone 11 of the cap which is offset into a groove 12 surrounding the block.

The cap may be rotated by grasping and turning it between the thumb and finger or

between the two hands of an attendant, and the valve is rotated at the same time through its tongues 9. Thus the valve is rubbed over the surface of its seat, wiping the seat and removing loose particles which may have lodged thereon. The attendant may at such times grasp the protruding tongues of the valve and press the latter against the seat, thus exerting a stronger pressure while rotating the valve than is caused by the weight of the valve or other seating agency.

Instead of making the valve and cap structurally separate, they may be combined or associated in a unitary structure, as shown in Fig. 4 where the end wall 13 of the cap constitutes also a valve disk cooperating with the seat 7, and the sides of such cap embrace the block or casing extremity 3 and interlocked by an offset zone entering in the groove 12a. In this case, however, the groove is enough wider than the offset zone to permit rise of the entire combined valve and cap structure under pressure of escaping fluid. Slots 10a, corresponding to the slots 10 previously described, permit discharge of the escaping fluid.

The same principles may be embodied in other structures differently arranged for other specific purposes, all within the scope of the protection which I claim for this invention.

What I desire to claim and secure by Letters Patent is:

1. A casing having a vent passage provided with an outwardly facing valve seat, an associated check valve, cooperative with said seat to exclude external fluid from the casing, and a cap loosely interlocked with the casing to permit rotation relatively to the seat, and engaged with the check valve to impart rotation thereto while permitting independent movement thereof toward and away from the valve seat.

2. A casing having an extremity containing a vent passage and provided with a seating lip substantially greater in circumference than the passage, a check valve arranged to seat against said lip, and a locking means embracing said extremity loosely interlocked therewith and associated with the check valve in a manner to cause rotation of the valve on the lip by external force application on said locking means, and to permit independent movement of the valve toward and from the lip.

3. In combination with a valve casing having a vented extremity and a seat surrounding the orifice of the vent therein, a check valve arranged to cooperate with said seat, and a cap loosely interlocked with said casing and associated with said valve in a manner to transmit rotation thereto coaxially of said seat, and permit independent opening and closing movement thereof.

4. In combination with a valve casing hav-

ing a vented extremity, a seat surrounding the orifice of the vent therein and surrounding a substantially larger area than that of the vent, a cap rotatably engaged with said casing embracing the extremity, and a valve arranged across said seat and loosely interlocked with said cap in a manner to receive rotation from the cap coaxially of the seat and to be moved independently thereof toward and away from said seat.

5. In a radiator check valve, a casing having a vent passage, an external check valve of light weight arranged to seat across said passage and impelled only by gravity and atmospheric pressure toward its seat to exclude the outer air, and a cap rotatably engaged with said casing and having slots, said check valve being a disk formed with projections extending through said slots.

6. In a radiator valve, a casing having a vent passage, a cap rotatably connected to the casing and embracing said passage, and a check device arranged to seat across the vent passage within the cap; the cap and check device having interlocking means for transmitting rotary movement from the former to the latter while permitting opening and closing movement of the latter.

In testimony whereof I have affixed my signature.

GEORGE D. HOFFMAN.