J. T. WHITING.

AIR VALVE FOR RADIATORS.

APPLICATION FILED AUG. 25, 1909.

953,079.

Patented Mar. 29, 1910.

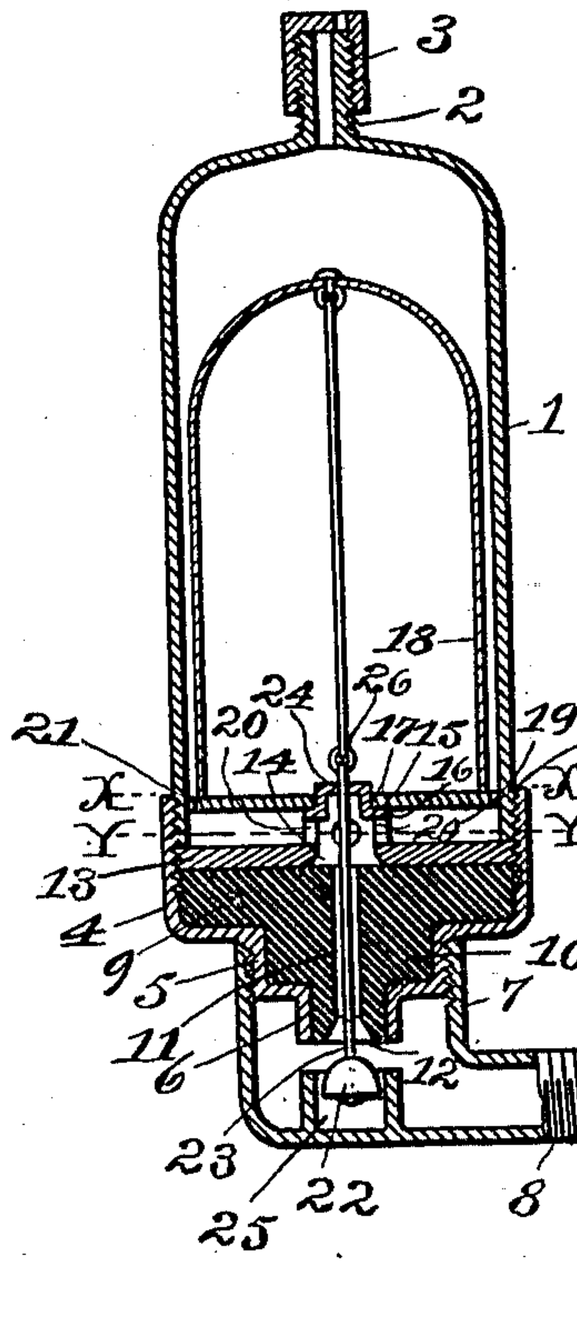
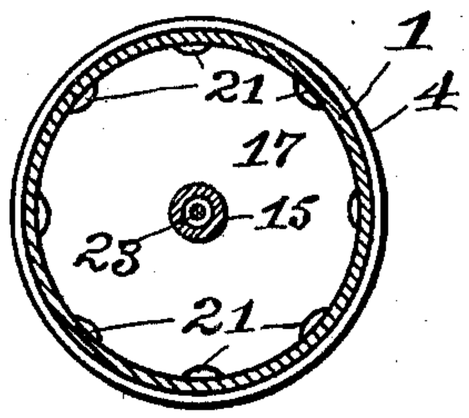


Fig. 1

Fig. 2



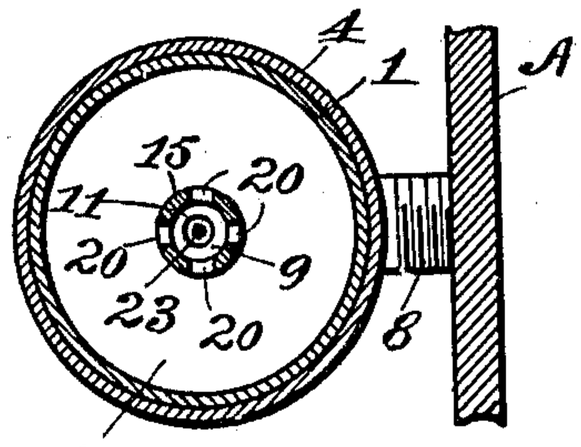


Fig. 3

13

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UNITED STATES PATENT OFFICE.

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AIR-VALVE FOR RADIATORS.

953,079. Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed August 25, 1909. Serial No. 514,519.

To all whom it may concern:

Be it known that I, JOHN T. WHITING, a citizen of the United States, and resident of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Air-Valves for Radiators, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of valves which are applied to steam-radiators for the purpose of allowing air to escape therefrom incident to turning the steam into the radiators.

The main object of the invention is to provide a radiator-valve which will operate to effectually release the air and at the same time will positively guard against the escape of water which generally exists in a radiator when cold and results from the condensation of the steam.

A further object of the invention is to provide an air-valve which will be simple in construction and also reliable in its operation.

To that end the invention consists in the novel arrangement and combination of the component parts of the valve hereinafter fully described and set forth in the claims.

In the accompanying drawings Figure 1 is a vertical sectional view of the air-valve embodying my improvements, and Figs. 2 and 3 are transverse sections on the lines —X—X— and —Y—Y— respectively.

Referring to the said drawings like characters of reference indicate like parts.

—1— denotes an upright casing which is of cylindrical shape, and constitutes a main chamber and is formed at its top with the usual nipple —2— for the exit of air, to which nipple is applied a cap —3— screwed onto the same in the well known manner. To the lower end of said casing is applied a cap —4— secured detachably thereto by screw-threading the parts. The cap —4— has its bottom disposed some distance from the end of the casing and is formed with a central downwardly extending nipple —5— which has a circumferentially reduced end portion —6—.

To the nipple —5— is secured an auxiliary casing —7— which is rendered detachable by screw-threading the parts. This auxiliary casing constitutes the inlet chamber and is formed at one side with a comparatively long horizontally extending nipple —8— which is threaded externally and is secured in an aperture in the radiator (indicated at —A—) as usual. In the aforesaid cap —4— is provided a disk —9— preferably composed of rubber and having its lower face formed with a plug —10— shaped to fit the interior of nipple —5— and reduced portion of said nipple. Said disk —9— is provided with a central vertical air and water-passage —11— which extends through the plug —10— and terminates at a valve-seat —12— formed in the bottom of plug. Said seat being preferably of conical shape. The disk is held in position by means of a circular plate —13— screwed into the cap —4—, upon which plate the lower end of the casing —1— bears, and in the center of said plate is provided an opening —14— communicating with the aforesaid passage —11—.

At the central portion of the plate —13— is formed an upwardly projecting circular housing —15— covering the opening —14—. This housing is provided at its top portion with a shoulder —16— forming a seat for a diaphragm —17— fitted to the interior of the casing —1— upon which diaphragm a float —18— normally rests.

By seating the diaphragm upon the housing a small compartment —19— is provided between the diaphragm and plate —13—, which compartment communicates with the aforesaid opening —14— through ports —20—20— formed in the housing —15—.

The float is of tubular shape and is open at its bottom and its top is preferably formed crowning. Between the float and casing —1— is provided a small space for the passage of the air and water, said space communicating with the aforesaid compartment through ports —21—21— provided at the edge of the diaphragm —17— as more clearly illustrated in Fig. 2 of the drawings.

In the lower chamber —7— is disposed a

valve —22— which is preferably of spherical shape and is provided with a stem —23— extending through the passage —11—, opening —14— and an aperture —24— in the top of the housing —15—, and is suitably connected at its upper end to the top of the float whereby the said valve is suspended normally out of its seat —12—.

The lower chamber is preferably formed with a cylindrical cavity —25— serving as a guide for the valve. To guard against binding of the valve-stem in the passage —11— and aperture —24— incident to the lateral movement of the float, I form the stem in two sections loosely connected above the diaphragm as indicated at —26—.

It will be evident that by unscrewing the cap —3— when admitting the steam into the cold radiator, the air issuing from the radiator is caused to enter the chamber —7— from which it discharges through the passage —11— and ports —20—20— into the compartment —19—, and thence passes through the ports —21—21— into the float-chamber —1— from which it escapes through the usual nipple —2—.

When the water, which is usually contained in the radiator, is discharged therefrom and rises in the upper chamber —1—, it is evident that the resultant lifting of the float —18— will close the valve —22— and thereby prevent the escape of the water through the nipple —2—.

It is obvious that after communication has been cut off between the chamber —1— and chamber —7— by the closing of the valve, the float will eventually descend to allow the water to return from the chamber —1— to the radiator.

What I claim as my invention is:—

1. A radiator vent-valve comprising an upright casing constituting the main chamber and provided at its upper end with an air-exit, a cylindrical float disposed in said chamber, an auxiliary casing secured detachably to the lower end of the main chamber and having a closed bottom and constituting an air and water-inlet chamber and formed at one side with a horizontally extending nipple for attaching the same to the radiator, a disk supported removably in the lower chamber and disposed above the nipple to completely close the upper end of the said lower chamber, said disk being provided with a small central vertical passage affording communication between the two chambers, and formed in its bottom face with a conical valve-seat surrounding the lower end of the said passage, a rod extending through the said passage and valve-seat and connected at its upper end to the top of the float, and a spherical valve disposed in the lower chamber and connected to the lower end of the rod as set forth.

2. A radiator-valve comprising an upright cylindrical casing constituting a main chamber and provided at its upper end with an air-exit, a cap secured detachably to the lower end of the casing and formed with a central downwardly extending nipple having a circumferentially reduced lower end portion, an air and water-inlet chamber secured detachably to said nipple and provided with means for connecting it to the radiator, a disk seated in said cap and formed with a downwardly extending plug fitted to the interior of the nipple, said disk being provided with a central vertical air and water-passage extending through the plug, and the lower end of said plug formed with a valve-seat surrounding the lower end of the passage, a circular plate screwed into the cap and bearing upon the disk and provided with a central opening coinciding with the passage, a diaphragm supported above said plate to provide a compartment communicating with the passage and upper chamber, a tubular float in the said upper chamber normally resting upon the diaphragm and having a surrounding space, a rod extending through the central passage and float and connected at its upper end to the float, and a valve disposed in the inlet-chamber and connected to the lower end of the rod as set forth.

3. A radiator-valve comprising an upright cylindrical casing constituting the main chamber and provided at its upper end with an air-exit, a cap secured detachably to the lower end of the casing and having its bottom remote from said end, and formed with a central downwardly extending screw-threaded nipple, an auxiliary casing secured to said nipple and constituting an air and water-inlet chamber and formed at one side with an externally screw-threaded tubular member for attaching it to the radiator, a non-metallic disk seated upon the bottom of the cap and formed with a central downwardly extending plug fitted to the interior of the nipple and provided with a central passage, extending through the plug, said plug having its lower end formed with a valve-seat surrounding the lower end of the passage, a plate screwed into the cap for holding the disk therein and having the lower end of the upper casing bearing thereon, said plate being provided with a central opening communicating with the central passage and formed on its top with a central housing surrounding the opening thereof, a diaphragm seated upon the housing to provide a compartment between said diaphragm and subjacent plate, the housing being formed with ports affording communication between the compartment and central passage, a hollow float disposed in the upper chamber and normally resting upon the dia-

phragm and provided with a surrounding space, the diaphragm provided at its edge with ports affording communication between said space and aforesaid compartment, a rod extending through the central passage and float and connected at its upper end to the top of the float, and a valve disposed in the air and water-inlet chamber and connected to the lower end of the rod as set forth.

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Witnesses:
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