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W. J. COOK

AIR VALVE FOR RADIATORS

Filed April 2, 1925

FIG. 1.

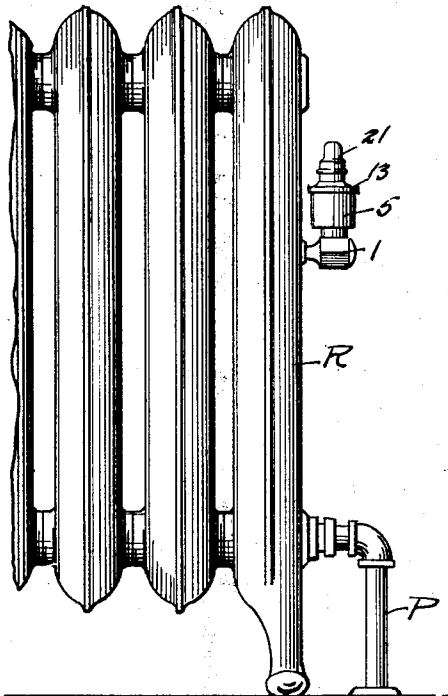


FIG. 2.

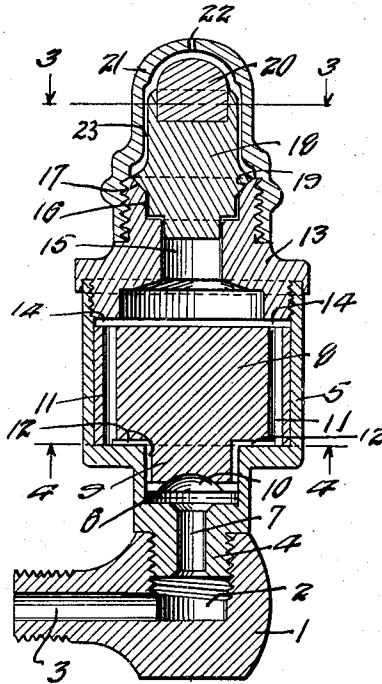


FIG. 3.

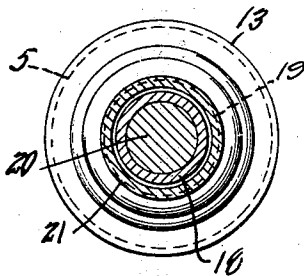
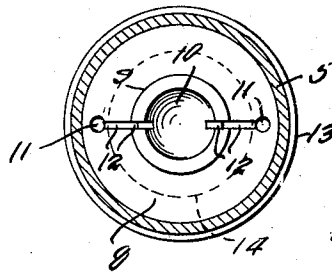


FIG. 4.



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AIR VALVE FOR RADIATORS.

Application filed April 2, 1925. Serial No. 20,178.

To all whom it may concern:

Be it known that I, WILLIAM J. COOK, a citizen of the United States, and resident of Charlotte, in the county of Mecklenburg and State of North Carolina, have invented a new and useful Air Valve for Radiators, of which the following is a specification.

The object of my invention is to provide an improved air valve for radiators which will take care of all the water that may accumulate from time to time caused by the shutting off of the radiator, and which therefore will result in a more efficient operation of the radiator and a less expenditure for fuel. I attain these and other objects of my invention by the device illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my invention applied to a radiator;

Fig. 2 is a vertical section through my invention;

Fig. 3 is a horizontal section on line 3—3 of Fig. 2, and

Fig. 4 is a horizontal section on line 4—4 of Fig. 2.

Like characters of reference designate like parts in each of the several views.

Referring to the accompanying drawings, I provide an air valve base 1 which has a threaded connection with the radiator R. I provide a cup 5 having a threaded end 4 which is screwed into the threaded channel 2 of base 1. Mounted in cup 5 is a float 8 which is provided with a cylindrical extension 9. The opposite passages 11 which extend through lower float 8 are positioned with their openings under the bottom face of cover 13, as shown in Fig. 2, so that when lower float 8 is raised that operation will close the passages by reason of the contact of lower weight 8 with the bottom surface of cover 13. Screwed on the top of cup 5 is the cover 13 to which in turn is screwed a cap 21. The cover 13 is provided with an annular slanting top surface which provides a seat for the annular flange 19 of the upper float 18. The latter member carries a lead or other soft metal packing member 20 in its upper portion, as shown in Fig. 1. I do not make use of composition packing for the reason that it does not work satisfactorily inasmuch as it heats up and expands which would cause the valve to stick and not seat itself when the pressure is low. A lead packing works much better than any composition packing, and a

composition packing therefore is not the equivalent for the purpose of this invention.

In operation the steam flows through the channel 3 of base 1 and thence through channel 7 of cup extension 4 striking against the dome-shaped recess 10 of member 9 and being diverted from chamber 6 to the opposite grooves 12 in extension 9 and float 8, which grooves communicate with the passages 11 which extend through float 8. It then may pass through the space 14 between float 8 and cover 13 to the central passage 15 through cover 13, and thence through the annular space 16 between upper float 18 and cover 13 and will raise the upper float 18 when there is sufficient pressure and escape through the space 23 which separates upper float 18 and cap 21, and thence pass out through the aperture 22 in the top of cap 21.

It is a well-known fact that there is no system, either steam or vacuum or vapor, that will give satisfactory results and permit of saving of fuel unless the system is clear of water that may accumulate in it. Often radiators are turned off from time to time and water accumulates in the radiator and then when the steam is turned on, before the steam can get into circulation through each section air will begin to escape from the air valve and as soon as the air is out of the radiator water will follow before the steam can get in front of the water. By providing a heavy weight in the base and a small weight in the cap of my radiator valve I take care of all condensed water that may accumulate from time to time by reason of the main steam valve being closed. When the steam is turned on the air passes through the channels 11 of the bottom float and into the annular passage 16 under the upper float, raising that float to permit of the escape of steam past the annular seat 17 into the space 23 and through the vent 22. As soon as the air passes out water follows, in case there is water in the radiator and then the pressure of water raises the upper float 18 and its lead packing 20 presses against and closes the vent opening 22 in cap 21 and keeps it closed until the steam circulates into every section of the radiator. Then the water begins to circulate and returns to the boiler.

It takes only from three to five pounds of steam to raise the float or weight 8 in the lower portion of the valve and thus to close

the passages 11. When the pressure is high enough to raise this float 8, it will permit the upper float 18 to lower itself and float or weight 8 in turn will also seat itself again, and the operation will be repeated with the increase in pressure on float or weight 8.

My valve will not only work on a steam system but will operate on a vacuum system, because unless the air is drawn out of the vacuum system by a pump that is running all the time it will cause trouble when more or less air accumulates. This valve provides a means for the escape of air when a certain pressure is exceeded.

What I claim is:

1. In a radiator air valve, the combination of an air valve base, a cup mounted on the base and having a passage extending through the bottom of a cup, a float seated in the cup, said float having opposite passages extending therethrough and positioned near its outer surface, a cover detachably secured on the cup, the cover having a passage through same, said cover having its bottom surface of sufficient area to seat over the passages through the lower float when that member is raised, an upper float having a lead packing mounted on its top portion, and a cap detachably secured to the cover member covering the upper float and in spaced relation thereto, the said cap having an opening positioned directly over the lead packing element carried by the upper float.

2. In a radiator air valve, the combination of an air valve base, a cup mounted on the

base and having a passage extending through the bottom of the cup, a float seated in the cup, said float having a passage extending therethrough and positioned near its outer surface, a cover detachably secured on the cup, the cover having a passage through same, said cover having its bottom surface of sufficient area to seat over the passage through the lower float when that member is raised, an upper float having a lead packing mounted on its top portion, and a cap detachably secured to the cover member covering the upper float and in spaced relation thereto, the said cap having an opening positioned directly over the lead packing element carried by the upper float.

3. In a radiator air valve, the combination of an air valve base, a cup-like casing mounted on the base, said casing having a passage in communication with the passage through the air valve base, a float seated in the aforesaid casing, a cover detachably secured to the casing and positioned in spaced relation to the float, said cover having a passage therethrough, a cap detachably secured to the cover, the cap having an opening therethrough, an upper float member contained within the cap and seated on the cover member the aforesaid upper float having a soft metal packing member mounted thereon and positioned to seal the opening in the cap when there is sufficient pressure in the valve to raise the upper float.

WILLIAM J. COOK.