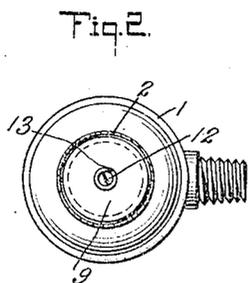
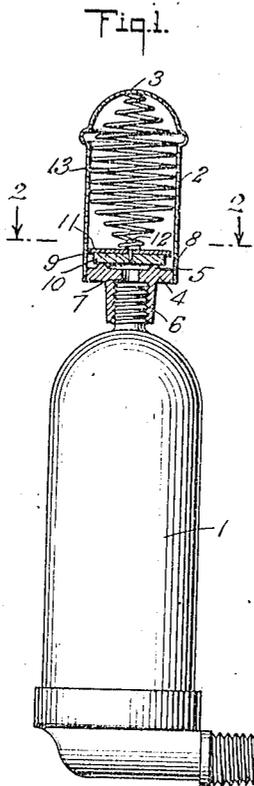


J. H. BOYD.  
VACUUM BONNET.  
APPLICATION FILED JULY 6, 1918.

1,298,446.

Patented Mar. 25, 1919.



WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN H. BOYD, OF MOUNT VERNON, NEW YORK.

VACUUM-BONNET.

1,298,446.

Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed July 6, 1918. Serial No. 243,717.

*To all whom it may concern:*

Be it known that I, JOHN H. BOYD, a citizen of the United States, and a resident of Mount Vernon, in the county of Westchester and State of New York, have invented a new and Improved Vacuum-Bonnet, of which the following is a full, clear, and exact description.

This invention relates to heating appliances and has for an object the provision of an improved construction used in connection with a radiator or a radiator valve whereby the air may freely be exhausted, but no air may be drawn in.

Another object in view is the provision of a removable bonnet or cap for a radiator valve formed with a spring seated structure which will become unseated for releasing air when the steam pressure brings the air under pressure, but it will automatically reseat itself when the steam pressure has been reduced to a certain extent.

In the accompanying drawing:

Figure 1 is a side view of a radiator air valve with an embodiment of the invention shown applied thereto.

Fig. 2 is a section through Fig. 1 on line 2-2.

Referring to the accompanying drawing by numerals, 1 indicates an ordinary air valve provided for most radiators now in use which is intended to allow the air to escape as the steam pressure rises, but to close when the steam attempts to escape. This construction when in proper working order will accomplish the result aimed at, namely the releasing of the air and the confining of the steam, but when the steam pressure has been reduced the valve mechanism will automatically open and consequently air will be drawn again into the radiator. To heat a radiator supplied with air an appreciable pressure of steam must be provided above atmospheric pressure in order to drive out the air so that the steam may contact with all parts of the radiator. If air is prevented from entering the radiator the vacuum produced therein by a decrease in pressure of the steam will cause the hot vapors to pass upwardly from the steam boiler into the radiator and maintain the radiator in a heated condition even though the vapors or steam are below atmospheric pressure. In order to assist in accomplishing the desired results suggested a bonnet is provided for the valve 1 which is constructed

with a tubular casing 2 having a closed upper end 3, which may be rounded as shown in the drawing, and the lower end 4 formed with a valve seat 5 and a threaded extension 6 adapted to be screwed over the threaded end of valve 1. An opening 7 is provided so that air or steam escaping from valve 1 will pass into the casing 2 and from thence out the discharge opening or vent 8. A valve member 9 is provided in casing 2, said valve member consisting of a washer 10 and a plate 11, said plate being provided with a screw 12 which connects the lower end of the spring 13 with the valve member 9 while the opposite end presses against the closed end 3 of casing 2. This spring is comparatively light, though of an appreciable length to allow a considerable movement of the valve member 9 without an appreciable variation in the pressure exerted thereon by the spring. It will be noted that the central part of the spring is tubular so that the spring will be guided in its up and down movement in the casing 2, while the lower part tapers, so that the valve member 9 may have a substantially universal movement in order to produce a proper seating or unseating of any part as the pressure is exerted thereon.

In operation, when the steam first enters the radiator air will be brought under pressure to a greater or less extent and as the pressure increases the air will escape through valve 1 and will raise valve member 9 to a greater or less extent so as to escape through the vent 8. If the valve 9 is out of order steam will pass therethrough and also out through vent 8 as the vacuum bonnet provided in the invention is not intended to prevent the escape of steam or air, but as the steam reaches atmospheric pressure plate 11 will cause valve 9 to close so that no air can enter the radiator. In this way means are positively provided which will permit the air to escape or even steam to escape, but will not allow air to enter again into the radiator. The valve member 9 in casing 2 always closes in advance of the automatic opening of air valve 1 thereby causing a perfect vacuum in the radiator and also in the system.

What I claim is:—

1. A vacuum bonnet for radiators comprising a casing, means for connecting the casing with a radiator so that air may pass from the radiator into the casing, said cas-

ing having a vent whereby said air will pass out of said casing, a valve member arranged between the vent and the means for connecting the casing with the radiator, and a spring 5 guided by the casing acting on said valve for normally closing the valve, said spring having a conical shaped end connected to said valve whereby the valve is permitted a universal movement while under spring 10 pressure.

2. A vacuum bonnet for radiator valves comprising a casing, a spring arranged in said casing having a substantially tubular section fitting in said casing whereby it is 15 guided in its movement, said tubular section merging into a conical end section, said casing having a vent and an inlet opening in one end, a valve seat surrounding said opening, and a valve member connected with the cone

shap . section of said spring coacting with said seat, said valve member closing said inlet opening under the action of said spring. 20

3. A vacuum bonnet for radiator valves comprising a tubular casing closed at one end, a connecting nipple secured to the opposite end, said connecting nipple having an internally threaded extension merging into a passageway which opens into said casing, said casing having a vent, a valve member normally closing said passageway, said 25 valve member closing over said passageway and away from the vent, and a spring guided by the casing acting on said valve member, said spring being of a strength to close the valve member when the pressure on each 30 side thereof is substantially equal.

JOHN H. BOYD