

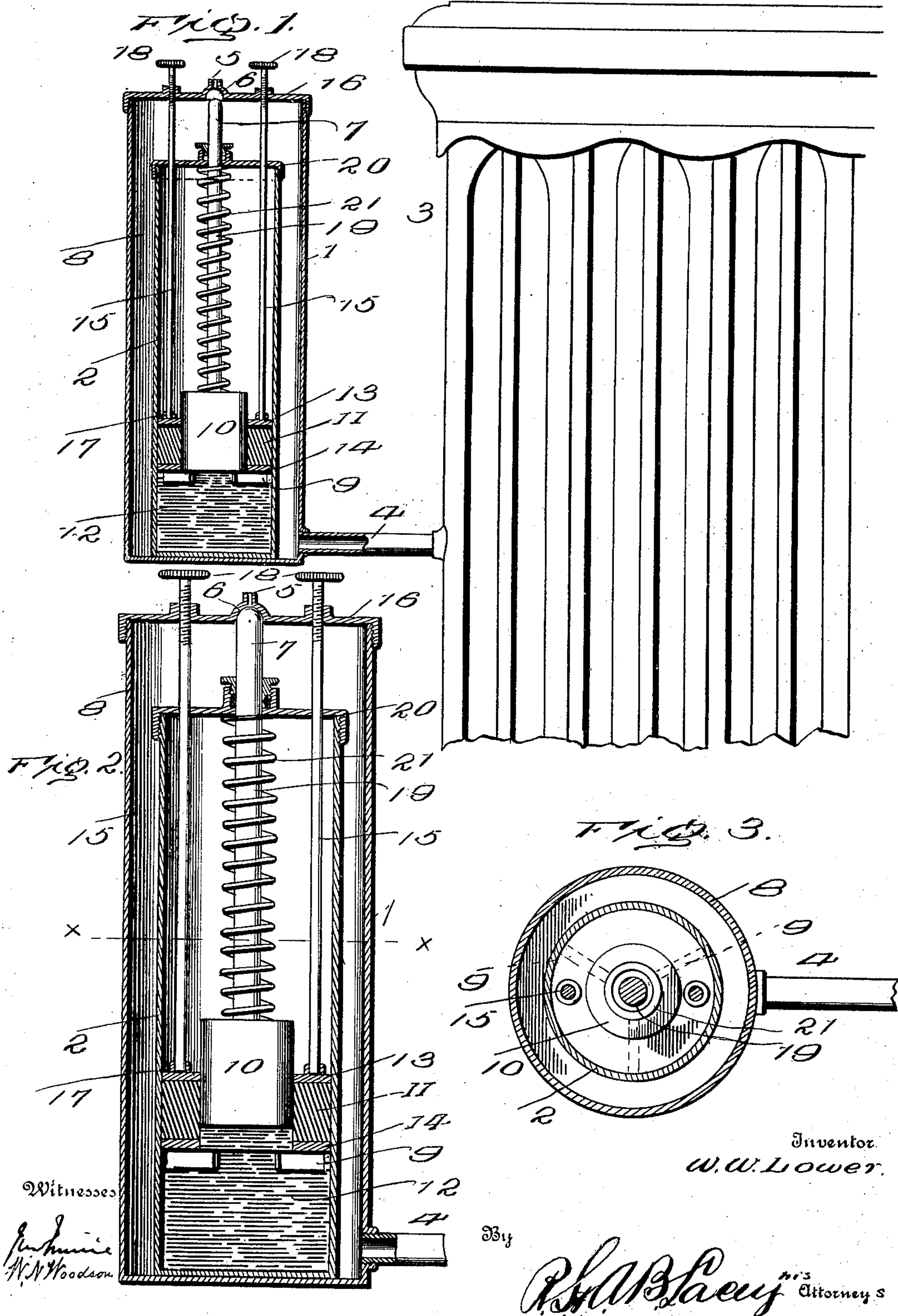
No. 756,795.

PATENTED APR. 5, 1904.

W. W. LOWER.
RADIATOR VENT.

APPLICATION FILED OCT. 22, 1903.

NO MODEL.



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By

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UNITED STATES PATENT OFFICE.

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RADIATOR-VENT.

SPECIFICATION forming part of Letters Patent No. 756,795, dated April 5, 1904.

Application filed October 22, 1903. Serial No. 178,109. (No model.)

To all whom it may concern:

Be it known that I, WARREN WILSON LOWER, a citizen of the United States, residing at Keystone, in the county of McDowell and State of West Virginia, have invented certain new and useful Improvements in Radiator-Vents, of which the following is a specification.

Heating apparatus embodying a radiator, a system of piping, and means for circulating a heating medium, such as steam, requires venting to obviate injurious pressure upon the parts and to insure a quick response to the turning on or shutting off of the heating medium.

This invention provides a novel form of vent entirely automatic in operation for permitting escape of the air when the heat is turned on and for admitting air into the radiator and pipes when the heat is shut off to prevent the formation of a vacuum therein, said vent consisting of the peculiar construction and combination of the parts, which hereinafter will be more fully set forth, illustrated, and finally claimed.

In the annexed drawings, illustrative of the invention, Figure 1 is a vertical central section of the vent, showing it applied to a radiator and open. Fig. 2 is a view similar to Fig. 1, on a larger scale, showing the vent-opening closed. Fig. 3 is a plan section on the line X X of Fig. 2.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The device comprises an outer shell or casing 1 and an inner shell or casing 2, both being preferably of cylindrical form in horizontal section. The shell or casing 1 is connected to the radiator 3 by means of the short tube 4 and is provided at its upper end with the vent-opening 5, surrounded upon its inner side by the valve-seat 6, against which the valve 7 is adapted to close. The shell or casing 2 is smaller than the casing 1, and a space 8 surrounds the same and is in connection with the radiator through the tube 4. Lugs 9 project inward from the sides of the casing 2 a short distance from its lower end and normally support the piston 10 and pack-

ing 11. The lower portion of the casing 2 receives a quantity of mercury 12 or other expansible liquid, which is readily susceptible to changes of temperature and is appreciably increased in bulk under the influence of heat and decreased upon being cooled. The expansible liquid fills the space below the piston 10 and packing 11, whereby the piston is quickly moved upon a slight increase in the temperature of the mercury or like liquid 12. The packing 11 is compressible and is confined between metal rings 13 and 14, the latter resting upon the lugs 9 and receiving the packing 11 and the ring 13 being arranged upon the packing and held against upward displacement by means of rods 15, which are threaded near their upper ends in reinforced openings of the head or cap 16 of the casing 1, the lower ends of said rods 15 being inserted in sockets 17, formed with or applied to the top side of the ring 13. Knobs or handpieces 18 are provided at the upper projecting ends of the rods 15 and are gripped when it is required to turn said rods either to compress or reduce the pressure upon the packing 11, so as to cause it to bear against the sides of the piston 10 with greater or less pressure. The packing 11 is of annular form and fills the space between the piston 10 and the inner walls of the shell or casing 2 and serves to prevent any of the mercury passing above the piston and packing.

The piston 10 is preferably of metal and is provided with a stem 19, which passes through an opening of the head 20 of the casing 2 and is provided at its upper end with the valve 7. An expansible spring 21 surrounds the stem 19 and is confined between the head 20 and piston 10 and normally exerts a downward pressure upon the piston, so as to hold the valve 7 unseated when the heat is turned off from the radiator or like device.

A vent device constructed substantially as shown and connected to the radiator or like heating apparatus normally has the vent-opening 5 uncovered when the heat is shut off, and when the heat is turned on the air confined within the radiator or apparatus passes through the tube 4 into the space 8, thence out through the vent-opening 5, and after all

the air has been expelled it is followed by the heating medium, which upon entering the space 8 warms the mercury 12 and causes it to expand and to force the piston 10 upward and compel the valve 7 to close upward against the valve-seat 6, thereby closing the vent-opening 5 and preventing escape of the heating medium so long as the radiator is in operation. When the heat is shut off, the mercury 12 cools and contracts, and the spring 21 reacting forces the piston 10 downward and moves the valve 7 away from its seat 6 to uncover the vent-opening 5, through which air enters and passes into the radiator through the space 8 and connection 4, thereby preventing the formation of a vacuum in the radiator or heating apparatus.

Having thus described the invention, what is claimed as new is—

1. In an air-vent for heating apparatus, the combination of an outer shell provided in its upper portion with a vent-opening, an inner shell containing in its lower portion a quantity of expansible liquid, a piston vertically movable within the inner shell, a packing surrounding the piston and confined between it and the walls of the inner shell, a valve for closing the vent-opening, and connected with the piston to move therewith, and means for compressing the packing more or less, substantially as set forth.

2. In a vent device for heating apparatus, the combination of an outer shell provided in its upper portion with a vent-opening, a second shell arranged within the outer shell and adapted to contain in its lower portion a quantity of liquid readily expansible under the influence of heat, a piston and annular packing therefor, means for supporting said piston and packing within the inner shell, a stem extended upward from the piston and provided with a valve for closing upward against the said vent-

opening, a spring surrounding said stem and exerting a downward pressure upon the piston, and means for compressing the packing and operable at a point without the outer shell, substantially as set forth.

3. In a vent device for heating apparatus, the combination of an outer shell provided at its upper end with a vent-opening, an inner shell adapted to receive a quantity of liquid readily expansible under the influence of heat, supporting means extended inward from the walls of the inner shell, a piston and annular packing sustained by said supporting means, a spring normally exerting a downward pressure upon the piston, a valve connected with said piston adapted to close upward against the aforementioned vent-opening, and a rod threaded into the head of the outer shell for holding the packing upon its support and adapted to compress the same, substantially as set forth.

4. In combination, an outer shell provided at its upper end with a vent-opening, an inner shell having an inner support, a piston, a packing surrounding the piston, upper and lower rings confining the packing, rods threaded into the head of the outer shell and exerting a downward pressure upon the topmost ring of the packing, a valve connected with the piston and adapted to close upward against the aforementioned vent-opening, a spring for normally exerting a downward pressure upon the piston, and an expansible medium confined in the lower portion of the inner shell below the piston and packing, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WARREN WILSON LOWER. [L. s.]

Witnesses:

R. C. COOPER,
C. E. HANCOCK.