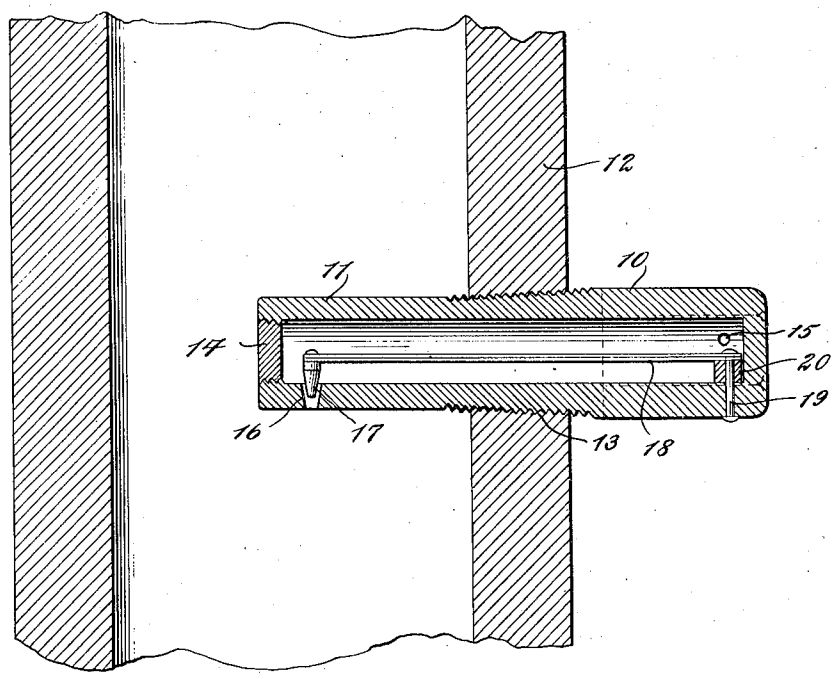
Aug. 31, 1926. 1,598,241

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AIR RELIEF VALVE

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AIR-RELIEF VALVE.

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My present invention relates to a device for releasing the air in steam radiators and the like and will be best understood from the following detailed description taken with the annexed drawing which represents on an enlarged scale an illustrative embodiment of my invention in vertical cross section.

In the above drawing, 10 represents a casing of a suitable metal having a reduced portion 11 adapted to be inserted through a wall 12 of a steam radiator or the like and engaging said wall by means of an intermediate threaded portion 13, as shown. The inside end of casing 10 is preferably stopped by a threaded block 14, while its outer end is provided with an outlet hole 15.

Adjacent said inner end of the casing 10 I preferably provide an outlet passage 16 in the form, preferably, of a valve seat tapering towards the exterior of the casing. A tapered valve 17 is provided to fit on said seat, valve 17 preferably being composed of a non-corrodible metal having good bearing qualities, such as Monel metal.

For actuating valve 17 I have provided a thermostatic element or bar 18 suitably attached to said valve at one end and secured to casing 10 at its other end, as by means of a rivet 19 and block 20. Element 18 is composed of two or more layers each of a metal having a dissimilar coefficient of expansion. For example, one layer may consist of a special brass, while the other may consist of invar, an alloy having an exceedingly low coefficient of expansion. If desired the thermostatic element may be plated with a suitable non-corrosive metal such as copper. Thermostatic combinations such as the one just described have been known for some time and per se form no part of my present invention.

Thermostatic element 18 is so chosen and adjusted that when subjected to the steam temperature somewhat less than steam pressure it will concave downwardly and insert valve 17 upon its seat 16. When, however, the steam is turned off or the boiler furnace fire becomes low the partial vacuum resulting in the radiator will cause valve 17 to remain seated against the tendency of thermostatic element 18 to lift valve 17 from its seat. Thus the vacuum is preserved and the subsequent filling of the radiator with steam facilitated. When, however, the pressure within the radiator (the temperature as yet being several degrees below steam temperature) builds up to a point near the atmospheric and still a trifle below it, element 18, due to its spring action, lifts valve 17 from its seat and allows escape of the air.

In all the prior devices in which the vacuum is held and of which I am aware there is no positive means for lifting the valve from the seat, thus requiring that the pressure within the radiator build up to a point greater than the atmospheric in order that such pressure may lift the valve from its seat. By utilizing both the thermostatic and spring properties of my actuating element 18, I accomplish the opening of the valve before such excess pressure builds up.

A further advantage of my valve resides in the fact that an increased expansion of the actuating element owing to an unexpected rise in steam temperature above that normally used does not damage the element or the valve due to the springy nature of the element. By tapering valve 17 its undersurface exposed to the steam may be made comparatively small, whereby the total force of the steam pressure acting to unseat the valve may be small and an unexpected steam pressure prevented from opening the valve.

The construction of my improved valve permits a large portion of it to be placed within the radiator. This location is of advantage in that it affords a more sightly appearance and prevents water from the radiator walls from entering the valve chamber. I have therefore shown in my illustrative embodiment a valve having such a location, but it will be understood that the valve casing may be located entirely without the radiator or the like if desired.

Various other details may be varied without departing from the spirit or scope of my invention. For example, the thermostatic element may take on other shapes from the one shown and the valve 17 located in other positions. However, it is preferred to locate the valve opening downwardly whereby water is prevented from entering the interior of the casing.

I claim:—

1. In a device of the type described, a casing adapted to be secured to a radiator or the like, and having a passage therethrough for venting said radiator, a valve seat in said passage, a valve proper movable to and from said seat, said seat and valve being disposed so that subatmospheric pressure in the radiator tends to maintain the valve

closed, and means responsive to steam temperatures to close the valve, said means being also responsive to atmospheric pressure within the radiator to open said valve at temperatures materially below steam temperatures.

2. In a device of the type described, a casing adapted to be secured to a radiator or the like, and having a passage therethrough for venting said radiator, a valve seat in the form of an outwardly tapering opening in said passage, a valve proper having a taper corresponding to that of said seat and movable to and from said seat, said seat and valve being disposed so that subatmospheric pressure in the radiator tends to maintain the valve closed, and means responsive to steam temperatures to close the valve, said means being also responsive to atmospheric pressure within the radiator to open said valve at temperatures materially below steam temperatures.

GEORGE D. CHADEAYNE.