

Feb. 9, 1932.

G. E. BARLOW

1,844,553

DUPLEX THERMOSTATIC TRAP FOR VAPOR HEATING SYSTEMS

Filed Dec. 20, 1930

2 Sheets-Sheet 2

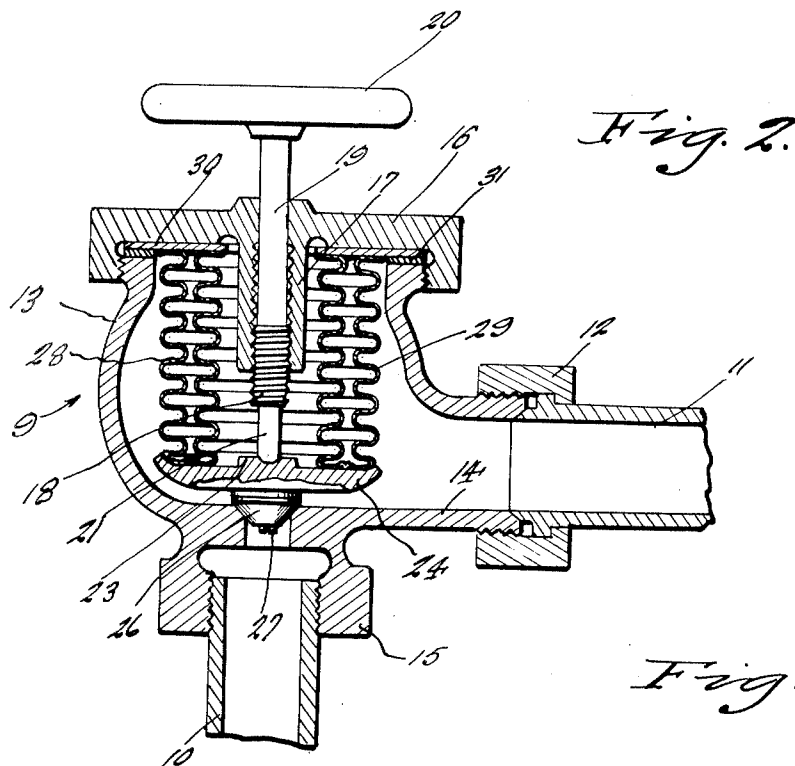


Fig. 2.

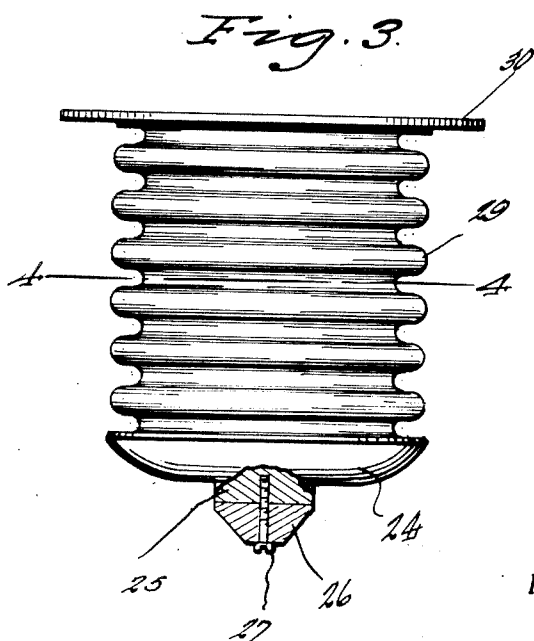


Fig. 3.

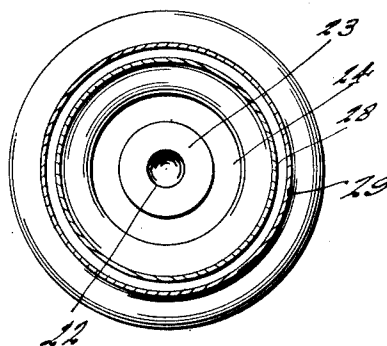


Fig. 4.

Inventor
George E. Barlow

By *Almon A. O'Brien*
Attorney

UNITED STATES PATENT OFFICE

GEORGE E. BARLOW, OF WILMINGTON, DELAWARE

DUPLEX THERMOSTATIC TRAP FOR VAPOR HEATING SYSTEMS

Application filed December 20, 1930. Serial No. 503,838.

This invention relates to certain structural improvements and refinements embodied in a simplified heating system of the species referred to in the industry and trade as a vapor heating plant.

One feature of the inventive conception is comprehended in a novel duplex thermostatic trap expressly designed for installation in the improved vapor heating system which is of the two-pipe gravity arrangement.

Otherwise stated, the principal novelty is dependent upon the incorporation in the system of a duplex thermostatic trap which is characteristically new from a structural standpoint, and susceptible of fulfilling the requirement of efficient operation in my improved two-pipe gravity vapor heating plant.

It is a matter of common knowledge that the conventional or standard vapor heating system of the two-pipe gravity variety involves the usage of standard radiators wherein the vapor supply or feed pipe is connected to the upper end of the radiator at one end thereof through the medium of a hand manipulated control known as a modulating valve. At the opposite end and at the bottom, in the present system, is a thermostatic trap which is incorporated in the return line leading back to the boiler.

The present improved system is such as to permit elimination of the usual modulating valve at the vapor feed end of the radiator to also eliminate the customary thermostatic trap at the opposite end, and to make a direct valveless vapor feed connection at the first named end of the radiator and to do away with the customary thermostatic trap and to substitute therefor an improved combination or duplex thermostatic trap.

Other features and advantages will become more readily apparent from the following description and drawings.

In the drawings:

Figure 1 is an elevational view showing

the primary factors of the system, as developed in accordance with the idea.

Figure 2 is a sectional and elevational view of the improved duplex thermostatic trap which constitutes the primary detail of the complete structural arrangement.

Figure 3 is an elevational view, partly in section, of the sylphon bellows thermostatic element.

Figure 4 is a horizontal section on the line 4-4 of Figure 3.

In Figure 1, the numeral 5 designates a conventional boiler and 6 indicates a conventional radiator supported on the floor 7 in the usual way. Under ordinary arrangements, at the left hand end of the radiator there is a modulating valve of the hand controlled type. I do away with this valve entirely.

Instead, I provide a valveless vapor feed pipe 8 which connects with this end of the radiator and which has communicating connection with the supply pipe from the boiler 5.

The usual automatic thermostatic trap at the right hand lower end of the radiator (not shown) is eliminated and the improved duplex thermostatic trap 9 is substituted therefor. This trap 9 is incorporated in the return line 10 leading back to and having communication with the boiler 5.

As observed in Figure 2, the valve 9 is connected with the radiator through the medium of a coupling pipe or nipple 11 and an associated union 12. The improved valve 9 is characterized by a globular body 13 having a connecting neck at 14 joined with the union 12 and a similar connection at 15 joined to the return pipe 10. The upper open end of the body is screw-threaded to accommodate the removable cap 16. This cap is formed with a concentric depending internally screw-threaded sleeve 17 into which the screw-threaded portion 18 of a valve stem 19 is tapped.

The upper exposed end of the valve stem is provided with an operating handle 20. The lower end 21 is nested in a depression 22 formed concentrically in the boss 23 constituting an integral part of the valve disc or head 24. This valve disc is formed on its bottom with a central depending projection 25 constituting a mounting for the replaceable valve seat 26. This seat is held in place by a retaining screw 27.

The bellows is of a dual type and includes inner and outer corrugated walls 28 and 29 respectively. These are joined together in radially spaced relationship and integrally connected at their lower ends with a valve head 24 and at their upper ends with a retention annulus 30. The peripheral edge portion of this annulus is clamped under the cap 16 and down upon a packing ring 31.

Thus the valve is "duplex" because of the fact that it is partly manually operated and partly automatically operated by expansion and contraction. In fact, these walls 28 and 29 have fluid-tight connection with their respective supporting parts and form a container therebetween which is designed to hold the expanding medium (not shown).

Under this improved and systematic arrangement, it is obvious that the single trap 9 constitutes the means for automatically regulating the flow of the heating medium through the radiator, and also functions as the means for shutting off the radiator when desired by simply turning the valve stem 19 down against the disc 24 to seat the valve 26 against the seat in the valve casing.

By thus concentrating the mechanism and eliminating the usual modulating valve at the left hand end of the radiator, the complete system is appreciably simplified, and in fact, rendered more efficient and positive in operation.

It is thought that the description taken in connection with the drawings will enable a clear understanding of the invention to be had. Therefore, a more lengthy description is thought unnecessary.

While the preferred embodiment of the invention has been shown and described, it is to be understood that minor changes coming within the field of invention claimed may be resorted to if desired.

I claim:

A device of the class described comprising a valve body, a top for closing the upper end thereof, an expansible element in the body composed of two spaced corrugated walls having their lower ends connected together to close the bottom of the annular space formed by the two walls, said expansible element containing a thermal fluid whereby the element is automatically expansible, a disk to which the upper ends of the walls are connected whereby said disk closes the upper end of the space formed by the two

walls, the outer periphery of the disk being held between the top and the valve body, a valve carrying disk to which the lower end of the expansible member is connected and manually operated means for adjusting the valve carrying disk including a valve stem passing through the top and threaded therein and having its lower end engaging the center of the valve carrying disk, said stem passing through the space formed by the inner wall of the expansible member.

In testimony whereof I affix my signature.
GEORGE E. BARLOW.

80

85

90

95

100

105

110

115

120

125

130