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T. C. WHITEHEAD

EXPANSION VALVE

Filed June 28, 1926

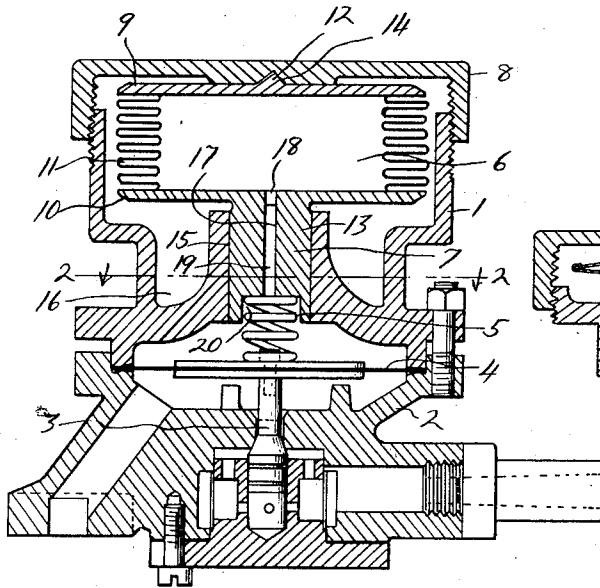


Fig. 1.

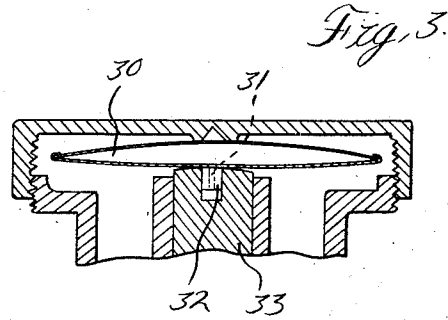
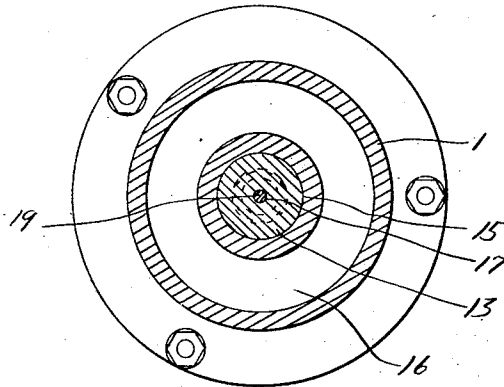


Fig. 3.

Fig. 2.



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EXPANSION VALVE.

Application filed June 28, 1926. Serial No. 119,182.

This invention relates generally to expansion valves for refrigerating apparatus and consists of certain novel features of construction, combinations and arrangements of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawing:

Figure 1 is a vertical sectional view through a thermostat embodying my invention.

Figure 2 is a cross sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a fragmentary vertical sectional view through a modified construction.

Referring now to the drawing, the numerals 1 and 2 respectively designate upper and lower cooperating sections of a valve casing, 3 is a plunger valve, 4 is a diaphragm for actuating said valve, and 5 is a coil spring for actuating the diaphragm. As shown, the diaphragm, valve, spring and lower section 2 of the casing are identical in construction to that shown in the Fred J. Heide-
man application filed Sept. 21, 1925, and bearing Serial No. 57,789, while the super-structure such as the upper section 1, ex-
pansible chamber 6, follower 7 and cover 8 comprise the essence of my invention. As shown, the upper section 1 of the casing is detachably secured to the lower section 2 in a manner similar to the connection between the parts 10 and 11 respectively of the Heide-
man construction, but is preferably cup-
shape in form and is normally closed by the inverted cup-shaped cover 8. Both the section 1 and the cover 8 are metal castings having relatively thick walls, hence these parts
will serve effectively as holdovers, for instance when the doors of the refrigerating cabinet are opened incident to the insertion or removal of foods, etc. The expansible chamber 6 is preferably located in the cup-
shaped section 1 and preferably comprises the vertically spaced heads 9 and 10 and the intermediate bellows 11. To provide an efficient construction, the ends of the bellows 11 are sealed to the heads 9 and 10 respectively, while the latter are preferably pro-
vided with aligned projections 12 and 13 respectively. As shown, the upstanding projection 12 is conical in form and engages similarly shaped recess 14 in the cover 8,

while the depending projection 13 is preferably cylindrical in form and slidably en-
gages a similar shaped opening 15 in the base 16 of the upper section. Preferably this cylindrical projection 13 and the head 10 have registering bores 17 and 18 through which a suitable fluid such as CH_3CL may be introduced to charge the bellows 11. Any suitable means such as the plug 19 may be used to close the bore 17 after the bellows have been charged. Preferably the projection 13 is provided at its lower end with a recess 20 that receives the upper end of the spring 5, hence this projection 13 will serve as a follower between the spring 5 and ex-
pansible chamber 6.

In use, the movement of the diaphragm 4 and valve 3 will be controlled automatically by the expansible chamber 6 according to temperature changes in the refrigerator cabinet.

In Figure 3 I have shown a slight modification in which an elliptical bellows or expansible chamber 30 has been substituted for the expansible chamber 6. As shown, this chamber 30 is adapted to be charged with a suitable fluid such as CH_3CL through a bore 31 in a depending stem 32. With this construction, the follower 33 is formed separate from the bellows 30 but is slidably mounted similar to the follower 13 in the opening 15.

Thus, from the foregoing description, it will be apparent that I have provided an expansion valve with a thermocontrol that is simple and compact in construction, and that can be manufactured and readily installed at a comparatively low cost. Inasmuch as the expansible chamber is enclosed by the section 1 and cover 8 which serve as holdovers, it will also be apparent that the expansible chamber 6 will operate with the maximum efficiency to regulate automatically the movement of the diaphragm and valve. Moreover the arrangement between the cover, expansible chamber and uppermost section 1 is such that the cover 8 may be readily adjusted on the section 1 to regulate the movement of the expansible chamber 6 in an upward direction.

While it is believed that from the foregoing description, the nature and advantage of my invention will be readily apparent, I desire to have it understood that I do not

limit myself to what is herein shown and described and that such changes may be resorted to when desired as fall within the scope of what is claimed.

5 What I claim as my invention is:

1. In an expansible valve, the combination with a sectional valve casing, a valve in the casing, a diaphragm for actuating the valve, and a yieldable element for actuating the diaphragm, of means for regulating the movements of said valve including a follower for the yieldable element slidably mounted in one section of the casing, an expansible chamber in said section, and a cover for said section adjustable to regulate the movement of said expansible chamber in one direction.

2. In an expansible valve, the combination with a sectional valve casing, a valve in the casing, a diaphragm for actuating the valve, and a yieldable element for actuating the diaphragm, of a cover for the uppermost section of said casing, and an expansible chamber located in the uppermost section and having substantially aligned projections engaging respectively said cover and yieldable element.

3. In an expansion valve, the combination with a valve and a casing therefor, of an expansion chamber operatively connected to said valve, and means for regulating movement of said expansion chamber including

an adjustable cover for said casing, abuttingly engaged with said expansion chamber.

4. In a mechanism of the character described, a holdover casing having an adjustable abutment, an expansion chamber having an end wall engaged by said abutment, said expansion chamber having a second end wall movable with respect to the first-named end wall, and a valve controlling a fluid passageway located exteriorly of the holdover casing having an operative connection with said second-named end wall.

5. In a mechanism of the character described, a holdover casing having an adjustable cover, a bellows enclosed within the casing and having end walls, one of which is engaged by said adjustable cover, and a valve controlling a fluid passageway located exteriorly of the holdover casing having an operative connection with the other end wall of the bellows.

6. In an expansion valve, the combination with a casing, an expansible chamber located in the casing and having end walls, a valve operatively connected to one of said end walls, of an adjustable cover for said casing abutting with the other end wall and forming a means for regulating movement of said expansible chamber.

In testimony whereof I affix my signature.

THOMAS C. WHITEHEAD.