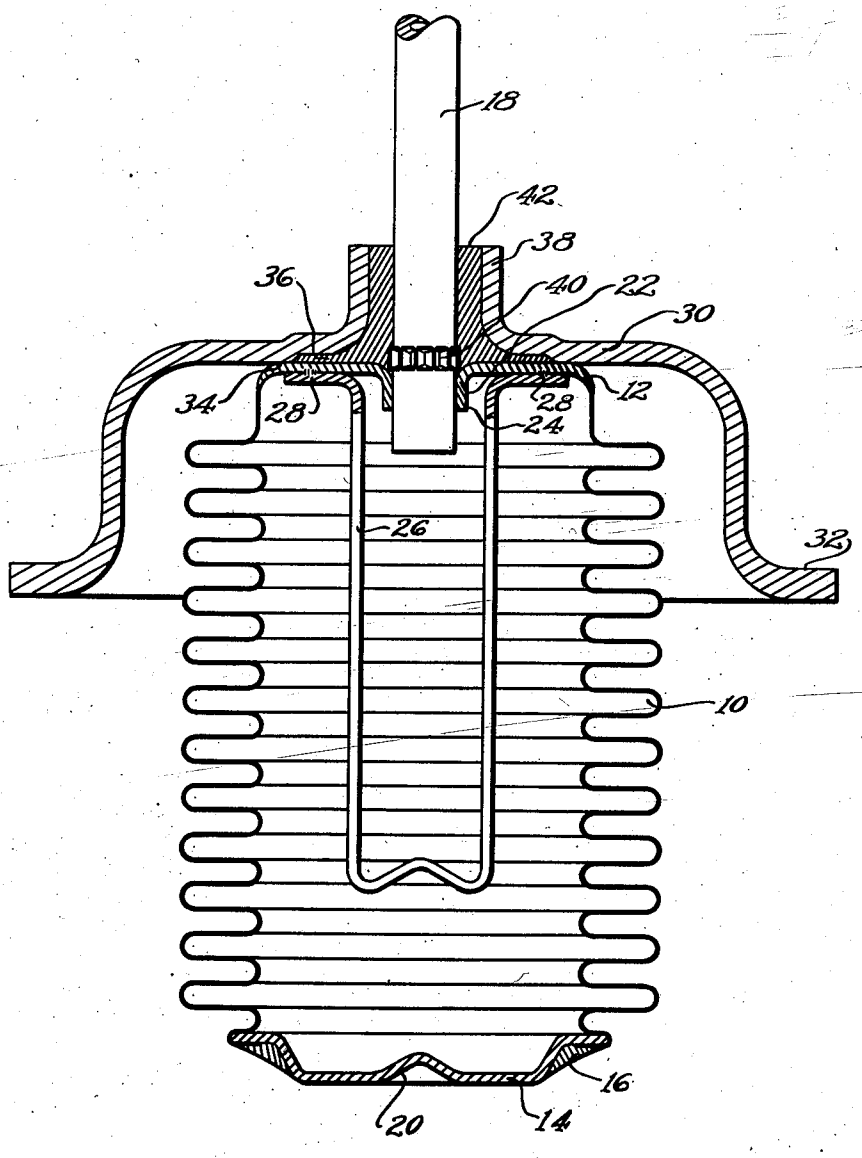
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THERMOSTATICALLY CONTROLLED UNIT

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THERMOSTATICALLY CONTROLLED UNIT

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1 Claim. (Cl. 297—8)

The present invention relates to improvements in thermostatic units of the general type employing a diaphragm or bellows hermetically sealed to a length of capillary tubing which reflects the temperature at a remote point, causing the free end of the bellows unit to operate a switch or valve in a manner which will be obvious to those skilled in the art.

The purpose of the invention is to reorganize and improve such a unit in a manner to best adapt it for commercial production and improve its economy of manufacture, while at the same time substantially strengthening and improving the bond between the capillary and the expansible unit.

For the attainment of the above and other objects, the various features of the invention consist in certain novel features of construction, combinations and arrangements of parts hereinafter described and claimed, the advantages of which will be obvious to those skilled in the art from the following description.

The accompanying drawing illustrates a longitudinal section upon an enlarged scale of a unit satisfactorily embodying the features of the invention, and useful for a variety of purposes.

Units such as those shown in the illustrated embodiment of the invention are commonly employed for the remote control of refrigerating mechanism and the like, these units comprising a bellows or diaphragm with a suitable length of capillary tubing sealed thereto. The interior space within the bellows and capillary is filled with thermostatic fluid which expands and contracts under the influence of temperature. The capillary at its end removed from the bellows is placed within the space to be controlled, which may be the interior of the refrigerator, and leads therefrom to the bellows which is assembled with the control mechanism. Commonly this mechanism is in the form of a switch controlling the usual motor and refrigerating apparatus. Obviously this control mechanism may be located either interiorly or exteriorly of the refrigerating space. In common practice the thermostatic unit, which is essentially the bellows and capillary, is anchored by a head or equivalent means, and the movable or opposite end of the bellows is in contact with the switch arm or the like, through which movement is transmitted to the switch to exercise proper control of the electric circuit.

The illustrated embodiment of the invention is concerned with an improvement in the thermostatic unit which does not affect its operative relationship to the controlling switch or the like, but which does improve the reliability of the unit and permit it to be handled and installed with less likelihood of damage, particularly in connection with the joint between the capillary tubing and the bellows unit.

The invention is particularly concerned with the employment of a bellows normally produced from a drawn cupped shell which is integrally closed at one end as contrasted with a bellows formed from a length of tubing or the like open at both ends. With this type of device the bellows indicated generally at **10** is provided with an integral bottom or closed end wall **12**. The bellows is normally closed at the opposite or open end by a relatively thin pressed metal head **14** secured and sealed to the bellows in the orthodox manner by a solder joint **16**. The interior of the unit is filled and sealed under a vacuum with a suitable type of thermostatic fluid which forms no part of the present invention, and the nature of which depends on the use to which the unit is to be put.

According to the present invention this unit is anchored and connected at one end to a suitable length of capillary, which may be indicated at **18**, of sufficient length to permit it to extend to the desired refrigerating region, and is provided with a form of support capable of attachment to a stationary wall or support. The opposite or movable end of the bellows, in this case the attached head **14**, may be provided with a recess **20** either for attachment of an operating stem or for engagement with a stable portion of a switch or valve, as may be desirable.

The integrally formed end wall of the bellows unit illustrated at **12** is centrally pierced and drifted at **22** to provide an accurately formed and inwardly extending sleeve **24** of substantial length. Before attachment of the end wall **14**, a pressed metal strap **26** of generally U-form and of predetermined length is assembled within the bellows and welded to the head through the areas **28**. This strap serves as a simple and inexpensive form of internal stop to limit the contracted length of the bellows unit under the influence of a vacuum.

Assembled with the bellows adjacent the head **12** and in contact therewith is a flanged supporting head **30** which, as indicated, may be generally dome shaped terminating in a circumferential flange or skirt **32** for attachment to a fixed support. The head interiorly at **34** is provided with a generally flat supporting surface for engagement and contact with the bellows head **12**.

Within this flattened area the head is bumped upwardly to provide a circular recess 36 bounded exteriorly of the flat area 34. The bumped up area of the head merges into an upwardly necked portion 38 which may be formed in the domed head by piercing and drifting to provide the neck 38 as a tubular sleeve of reasonably accurate dimensions. The attached length of capillary 18 is assembled within the neck 38, which surrounds it with an interior space and fits closely within the inwardly turned neck 24, the insertion of the capillary being limited by a knurl 40 which predetermines the length of capillary thrust within the sleeve 24. The interior of the space provided by the neck portion of the head 38 and the recess 36 is then filled with the usual type of soft solder compound indicated at 42, which in one operation and with one union serves to bond the capillary to the neck 24 and the head 30, and at the same time the bellows head 12 to the supporting head 30. This type of construction has been found exceedingly satisfactory both in its economy of manufacture and in the type of joint which is produced.

It will be understood that the accompanying drawing for purposes of clarity is much enlarged in size, and may approximate two to three times the actual dimensions of such a unit.

What is claimed is:

A thermostatic unit comprising a bellows cup closed at opposite end walls, one of said end walls being a plane surface and having a centrally disposed aperture therein, a supporting head forming a ring of contact with the plane surface of said end wall, said ring of contact surrounding and being concentric with said aperture, the portion of said supporting head inside said ring of contact extending inwardly and away from said end walls and terminating in an opening spaced a substantial distance from and larger than said aperture, a capillary tube passing through said opening and extending into said aperture in closely fitted relation thereto, and solder compound surrounding said capillary tube and filling the space formed by said end wall and said inwardly extending portion of said supporting head whereby said supporting head is bonded to said end wall over a substantial area while said capillary tube is supported relative to said supporting head and said aperture is sealed around said capillary tube.

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CERTIFICATE OF CORRECTION.

Patent No. 2,273,306. February 17, 1942.

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 5, in the claim, after "opposite" insert --ends by--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 21st day of April, A. D. 1942.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.