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ATTACHMENT FOR CONTROLS TO A TANK

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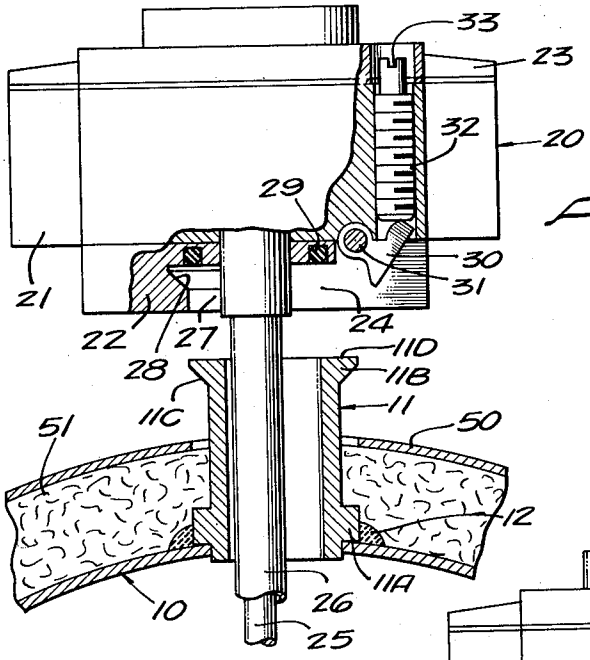


FIG. 1.

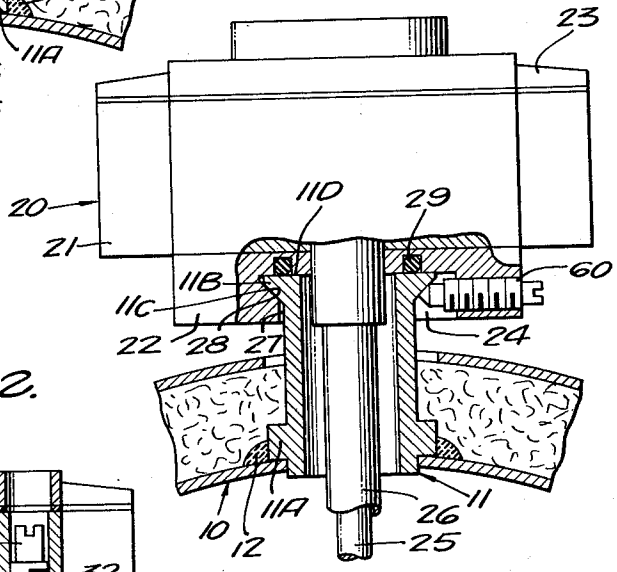


FIG. 2.

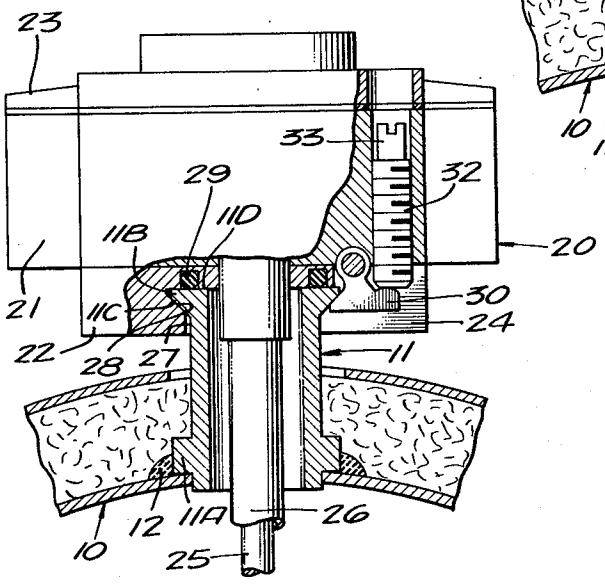


FIG. 3.

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ATTACHMENT FOR CONTROLS TO A TANK

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4 Claims. (Cl. 236—33)

The present invention relates to means for attaching or mounting devices on a tank and is particularly useful in mounting gas controls on a hot water storage tank.

Many difficulties and malfunction in gas controls have arisen as a result of their mounting on a water storage tank. In accordance with present practice, the tank is provided with a threaded opening through which a rod and tube type thermostat on the control is inserted and a threaded plug on the control is screwed into such opening. This operation necessitates a turning of the control with a relatively large amount of torque applied thereto by a wrench to assure a water tight connection between the control and tank through which water may not subsequently leak. Such application of torque to the control, particularly when not judiciously applied, sometimes results in deformation or misalignment of parts of the control such that they do not fully serve their intended functions. Also, this prior art construction requires some neighboring space within which a person may work in effecting the installation of the control and its subsequent removal if and when such removal is desired.

In accordance with the present invention, a mounting structure is provided which avoids the necessity of a threaded connection between the control and the tank thereby obviating the disadvantages indicated above.

It is therefore an object of the present invention to provide an improved mounting structure which is particularly useful in mounting a gas control on a tank which is intended to contain water heater and controlled in temperature in accordance with operation of such control.

A specific object of the present invention is to provide a mounting structure which obviates the necessity of a threaded connection between the control and tank.

Another specific object of the present invention is to provide a mounting structure for these purposes that minimizes space requirements.

Another specific object of the present invention is to provide a mounting structure which does not require turning of the control for purposes of installing it on a tank.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. This invention itself, both as to its organization and manner of operation, together with further objects and advantages thereof, may be best understood by reference to the following description taken in connection with the accompanying drawings, in which:

FIGURE 1 illustrates a control, partly in section in the preliminary stage of mounting on a tank, the tank being partially shown in section.

FIGURE 2 is a view like FIGURE 1 showing the control mounted on the tank.

FIGURE 3 is a view like FIGURE 2 but of a modified construction.

Referring to the drawings a hot water storage tank 10 is circularly apertured to receive a modified sleeve member 11 which has an annular flanged portion 11A secured, as for example, by weld annular material 12 to the outside surface of tank 10. The outer end of sleeve member 11 is formed with an annular flanged portion 11B having a conical cam surface 11C. The extreme outer end of sleeve member 11 is provided with a flat ring shaped sealing surface 11D.

The control 20 has a body or casing which is illustrated as having two parts 21 and 22 which is sealed by a cover 23. The parts 21 and 22 may be integrally formed. Internally of such casing there are conventional elements (not shown) operatively related for the control of gas flow to the main burner (not shown) and pilot burner (not shown) associated with the tank 10 in conventional manner. Extending outwardly of the control is a conventional rod and tube type thermostat having the rod 25 and tube 26 for sensing water temperature and performing conventional control operations.

The casing 21, 22 has formed therein an opening 24 sufficiently large to receive the flanged portion 11B, and within said opening a side wall is grooved to provide an arcuate grooved portion 28 or socket 27, such grooved portion having an angled surface 28 that extends circumferentially along a circle which is interrupted to allow the flanged portion 11B to be inserted into the mating grooved portion or socket 27 as illustrated in FIGURE 2.

The opening 24 extends from one side of the casing to an inner wall within which a sealing O-ring 29 is recessed within the casing 21, 22 inwardly of and coaxially with the arcuate grooved portion 28 for sealingly engaging the flat surface 11D.

A toggle double arm lever 30 is loosely pivoted on pin 31 on the casing 21, 22 with one arm thereof being engageable with the conical surface 11C and with the other arm being engageable with the fastening screw 32 threaded in such casing, the kerf 33 of the screw 32 being accessible through a circular opening in cover 23.

In installation the screw 32 is in its position shown in FIGURE 1, and the control 20 is moved to place the arcuate socket 27 into mating engagement with the flanged portion 11B, after which the screw 32 is threaded inwardly in the control to move the lever 30 into engagement with the conical surface 11C to achieve a squeezing of the retained O-ring seal 29 between the control and the abutting sealing surface 11D and to secure the control 20 to the sleeve member 11. It will be seen that the control, if desired, may be subsequently removed and this involves loosening of the screw 32 after which the control may be removed.

As illustrated, the modified nipple or sleeve member 11 is sufficiently prolonged to allow its passage through the cover member 50 that serves to retain heat insulating material 51.

The modified arrangement shown in FIGURE 3 is essentially the same as described above and for that reason identical parts have identical reference numerals, the only difference being that the lever 30 is omitted and the fastening screw 60 is threaded through a side wall of the casing for direct engagement of the conical cam surface 11C.

In each case tightening of the fastening screw 32 or 60 results in a camming action between the control 20 and nipple or sleeve 11 so as to draw these parts together with the sealing O-ring 29 being squeezed therebetween.

While the particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

We claim:

1. A water heater control having a casing, said casing having an opening therein extending from one side of said casing to an inner wall of said casing, thermostat means extending through said opening, said casing having an arcuate grooved portion within said opening, annular sealing means on said wall and within said opening a distance

further than said grooved portion and coaxial with said arcuate grooved portion, and releasable means on said control having a portion thereof movable in a general direction corresponding to the plane of said wall for use in affixing the control to an element between said movable portion and said grooved portion.

2. A control as set forth in claim 1 in which said releasable means comprises a lever pivoted on said control, and a screw threaded on said control and engaging said lever to move it towards said wall.

3. A control as set forth in claim 1 in which said releasable means comprises a screw threaded on said control with the axis of said screw being substantially coextensive with the plane of said wall.

4. A water heater control mounting structure comprising a hot water tank having a nipple extending therefrom, said nipple having a conically shaped flanged portion and an end defining an annular flat sealing surface, a control having an arcuate grooved portion mating with said flanged portion, an O-ring recessed in said control engaging said sealing surface, and releasable means on said control engaging said flanged portion and pressing said O-ring into sealing engagement with said sealing surface and also securing said flanged portion in said grooved portion, said releasable means comprising a screw threaded in said control, a double arm lever pivoted on said control with one arm thereof engaging said screw and with the other arm engaging said flanged portion.

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