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J. E. WOODS

WATER CONTROL

Filed March 17, 1927

Fig. 1

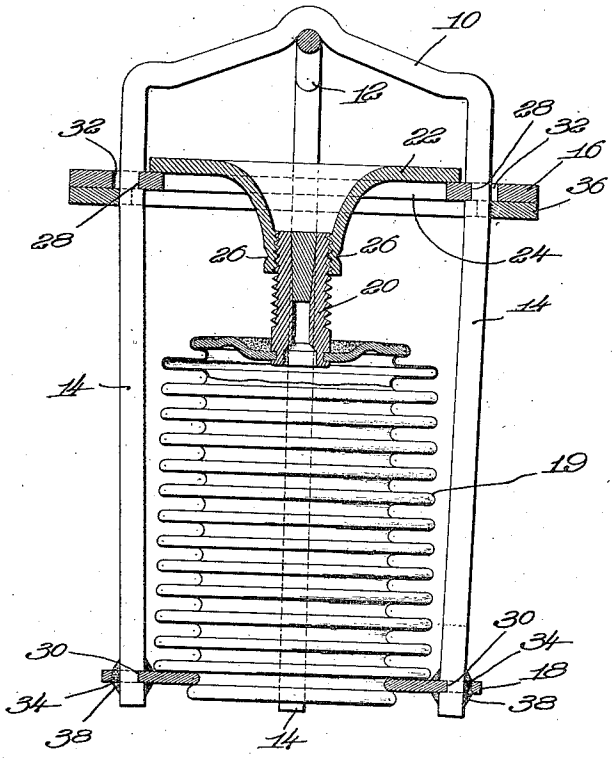
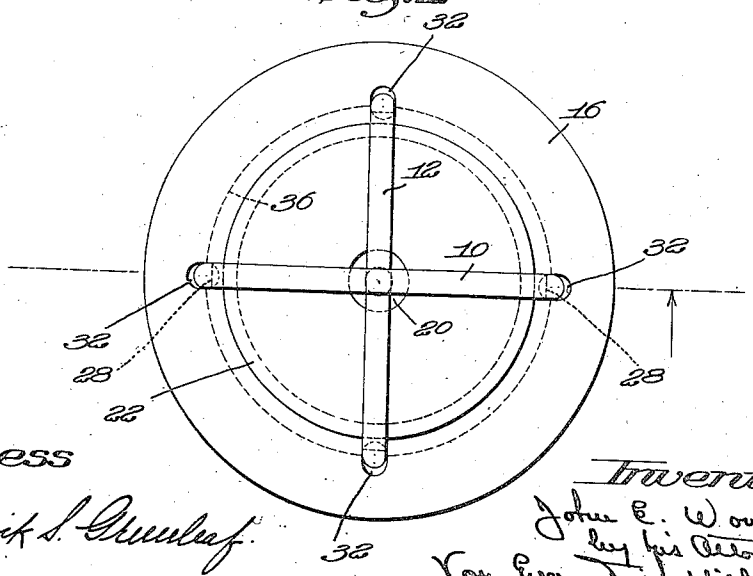


Fig. 2



Witness

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UNITED STATES PATENT OFFICE.

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WATER CONTROL.

Application filed March 17, 1927. Serial No. 176,111.

The present invention relates to improvements in temperature-controlled apparatus employed in the circulating systems of internal combustion motors, and represents more particularly improvement in the type of construction disclosed in the application of Clifford, Serial No. 150,368, filed November 23, 1926.

In the type of construction disclosed in this application, a skeleton cage supports a bellows thermostat and valve assembly directly within the circulating system. The construction is designed to accurately control the opening temperature of the valve and afford a minimum of interference with the flow of water when the valve is in full open position.

The object of the present invention is to improve and somewhat reorganize the construction described in order to increase the strength and rigidity and the resistance to vibration inevitably present with the operation of a motor vehicle.

With this and other objects in view, 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.

In the accompanying drawings illustrating the preferred form of the invention,

Fig. 1 represents an elevation partly in section of the thermostatically-controlled valve assembly; and

Fig. 2 is a top plan view of the assembly shown in Fig. 1.

The construction shown in the illustrated embodiment of the invention comprises essentially two U-shaped members 10 and 12, each provided with longitudinal legs or supports 14, forming the sides of the cage and extending lengthwise thereof. The two U-shaped members are retained in assembled relation by a partition disk 16, through which the legs 14 pass adjacent the upper ends, and a supporting disk 18 rigidly secured to the lower ends of the members. A collapsible and expansible bellows 19 is connected to the disk 18 at the lower end, as indicated, and at its upper end is provided with a stud 20 to which is directly connected a valve 22. The valve seats upon the disk 16 to close a valve opening 24 formed in the disk, as indicated. The temperature at which the valve opens is controlled by the operation of the bellows 19 in the usual manner, the valve being adjusted with relation to the stem 20 to accurately determine the opening point. When properly adjusted, the valve is locked in position upon the stem by forming elongated indentations 26 at opposite sides, which are of sufficient length to encompass at least two threads and by malforming these threads prevent any movement of the valve with relation to the stem.

The longitudinal supporting members 14 are rigidly locked to the partition disk 16 and the end supporting disk 18 in a simple and efficient manner. For this purpose each of the longitudinal members is provided at predetermined points throughout the length with recesses or notches 28 and 30, respectively, which are adapted to respectively receive and embrace a portion of the partition disk and supporting disk. In addition each of the disks is provided with openings 32 and 34, which approximately fit the longitudinal members 14 and permit the latter to be freely passed therethrough. In assembling, the partition disk 16 is first moved upwardly on the longitudinal members until opposite the notches 28, and thereafter the members are forced toward one another under tension until the notches embrace and lock in the sides of the openings 32. This locking of the longitudinal members to the partition disk is conveniently accomplished by a locking ring 36 having an opening somewhat smaller than the outer circle of the openings 32 and designed to retain the longitudinal members in the position shown in Fig. 1. When in position the locking ring not only rigidly maintains the longitudinal members and partition disk in the assembled position indicated in the drawing, but in addition substantially seals the openings 32 against any flow of water therethrough. At the lower ends the longitudinal members are locked in the openings 34 in somewhat the same manner, in this case the members being retained in the position shown, through the employment of solder 38, which serves to close the openings and preserve the assembled relationship.

The longitudinal members are preferably constructed of spring brass, or equivalent material, and the openings in the partition and supporting disks are so arranged that

the longitudinal members are maintained in tension to form a rigid, unitary construction which cannot loosen or come apart even under conditions of excessive vibration.

What is claimed is:

1. Temperature-controlled apparatus comprising a thermostat, a valve connected with the thermostat and movable thereby, a partition member provided with a valve opening and a plurality of support openings, longitudinal supports extending through the corresponding openings in the partition member and having shoulders designed to engage with the partition member on lateral movement of the longitudinal members with relation to the openings, and means for rigidly locking the longitudinal members and partition member in position with the shoulders engaging the partition member.

2. Temperature-controlled apparatus comprising a thermostat, a valve connected with the thermostat and adapted to be moved thereby, a partition member having a series of openings extending therethrough, longitudinal supports extending through the openings and having notches adapted to engage and embrace the sides of the opening on lateral movement of the longitudinal supports with relation thereto, and means for locking the longitudinal supports and partition member in position with the notches engaging the sides of the opening.

3. Temperature-controlled apparatus comprising a thermostat, a valve connected therewith and adapted to be moved thereby, a partition member provided with a valve opening and a series of support openings, a plurality of longitudinal supports extending through the openings having notches adapted to embrace the sides of the opening on lateral movement of the supports, and a locking ring engaging with all the supports and adapted to maintain the notched portions of the supports in locking position when the ring contacts with the partition member.

4. Temperature-controlled apparatus comprising a thermostat, a valve connected therewith, a plurality of longitudinal supports, means for rigidly connecting the thermostat and supports at one end, a partition member at the opposite ends of the supports having a valve opening, a series of support openings in the partition member, a series of notches in the supports adapted to cooperate with the sides of the openings to lock the supports thereto, and means for retaining the supports rigidly in locked position.

5. Temperature-controlled apparatus comprising a collapsible and expansible bellows, a series of longitudinal supports, means for rigidly uniting the bellows with the supports at one end, a valve connected with the free end of the bellows, a partition member having a valve opening cooperating with the valve, locking notches formed in the supports to embrace opposite faces of the partition member, and means for rigidly retaining the supports and partition member in locked position.

6. Temperature-controlled apparatus comprising an expansible and collapsible bellows, a series of longitudinal supports, means for rigidly connecting the bellows and supports at one end, a partition member positioned adjacent the opposite ends of the supports having a valve opening, means for limiting the travel of the valve beyond the opening, a series of notches formed in the supports and cooperating with opposite faces of the partition member to lock the supports rigidly thereto on lateral movement of the supports with relation to the partition member, and means for rigidly maintaining a lateral position of the supports of the partition member to insure the locking relation.

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