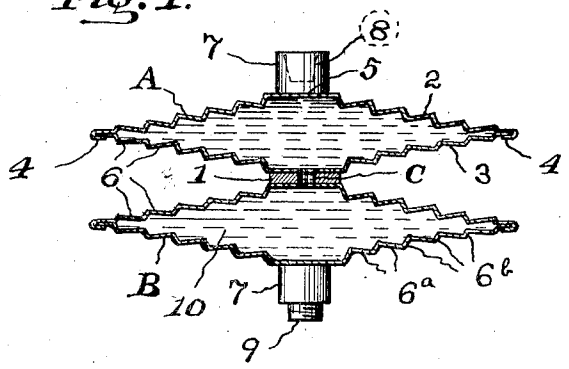
May 31, 1927. 1,630,733

P. F. DODUNSKI

THERMOSTAT DIAPHRAGM

Filed Aug. 29, 1925

Fig. 1.



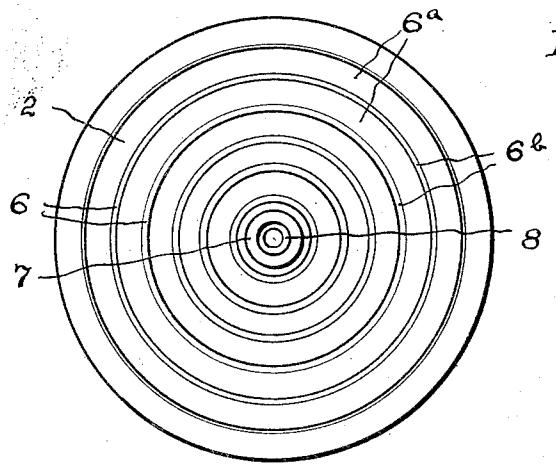
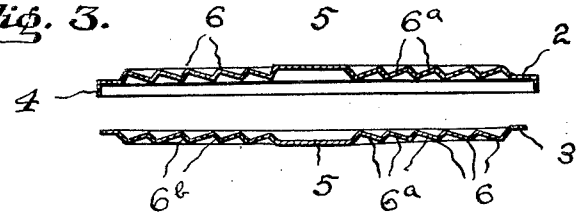


Fig. 2.

Fig. 3.



Inventor,

P. F. Dodunski

By Robb & Robb & Hill

Attorneys

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UNITED STATES PATENT OFFICE.

PETER F. DODUNSKI, OF SOLON, OHIO.

THERMOSTAT DIAPHRAGM.

Application filed August 29, 1925. Serial No. 53,234.

The present invention relates in general to the art of thermostats and has for its object to provide a thermostatic device having a diaphragm plate which embodies novel features of construction whereby extreme accuracy is obtainable.

Further objects of the invention are to provide a thermostatic device of this character which will expand and contract in a uniform manner and will always return to its original position after expansion, which will give accurate results, and which can be made small in size.

One particular embodiment of the invention will be shown and described in detail for illustrative purposes, although it will be understood that many modifications and changes can be made in the details of construction without departing from the spirit of the invention.

For a full understanding of the invention reference is to be had to the following description and accompanying drawings in which,

Figure 1 is a sectional view through a thermostatic device which is constructed in accordance with the invention and has a plurality of diaphragms properly assembled to provide two fluid chambers.

Figure 2 is a top plan view of the thermostat, and Figure 3 is a sectional view through two of the diaphragm plates which have a complemental formation so that they can be assembled to provide a fluid chamber, the thermostat plates being shown as separated from each other and in a flat condition.

Corresponding and like parts are referred to in the following description and indicated on all of the views of the drawings by like reference characters.

The thermostatic device which is illustrated by Figure 1 of the drawings comprises two fluid chambers, A and B, which are similar in construction and communicate with each other through a passage C formed in a dividing plate 1 which connects the two fluid chambers. Each of the fluid chambers is formed with complemental diaphragm plates 2 and 3, the plate 2 being provided at its periphery with a flange 4 which is folded around the edge of the plate 3 to provide a peripheral joint between the plates. The flange 4 is crimped tightly around the edge of the plate 3, and if necessary solder or the like may be employed to obtain a tight joint.

The diaphragm plates 2 and 3 are circular in shape and each have a flat seat 5 at the central portion thereof. Surrounding the flat seat 5 are concentric annular corrugations 6 which have a peculiar formation which facilitates the flexing of the diaphragm plates when the thermostat device is in operation. The corrugations 6 have long walls 6^a which are inclined at a comparatively small angle and short walls 6^b which are inclined at a sharp angle. The long walls 6^a are located at the inner sides of the corrugations, while the short walls 6^b are located at the outer sides of the corrugations. The long sides 6^a and short sides 6^b of the corrugations meet at a comparatively sharp angle and form concentric angular ridges extending around the diaphragm plate. In a like manner the walls of adjacent corrugations meet at a comparatively sharp angle so that there are angular valleys extending around the plate between the ridges. The long sides 6^a of the corrugations are inclined outwardly from the center of the plate at a comparatively small angle to the surface of the plate, while the short sides 6^b are inclined downwardly from the long sides 6^a at a sharp angle.

A pair of complemental diaphragm plates 2 and 3 is assembled to form each of the fluid chambers. The opposite seats 5 of adjacent fluid chambers may be connected by a division plate 1 and a passage C is formed through the division plate and diaphragm plates to connect the fluid chambers. A stud 7 may be secured to the flat seat 5 at the top of the upper fluid chamber A and also to the flat seat 5 at the bottom of the lower fluid chamber B. In the present instance the upper stud 7 is shown as formed with a socket 8, while the lower stud 7 has a screw member 9 threaded therein. These studs provide means for attaching the fluid chambers to any suitable or conventional mechanism which is to be actuated by the expansion and contraction thereof.

The interior of the fluid chambers is intended to be filled with a suitable thermostatic fluid. Any suitable fluid may be employed, although it has been found that splendid results are obtained where the fluid comprises six parts of ether and one part of pure alcohol. The fluid will expand when

subjected to heat and the expansion of the fluid in the chambers will force the diaphragm plates of each fluid chamber apart. Similarly, the fluid will contract when it is cooled and the diaphragm plates will then move toward each other. The peculiar formation of the corrugations in the diaphragm plates facilitates the expansion and contraction thereof and enables great accuracy to be obtained. The diaphragm plates may be formed of any suitable material, although it may be mentioned that good results may be obtained where the plates are formed of hard brass having a thickness of .005 of an inch. Hard brass gives superior results to either spring brass or soft brass. Where the diaphragms are constructed in the manner which has been described, they will expand and contract uniformly and will always come back to the original condition after expansion, this being necessary in order to obtain accurate results. This manner of constructing the diaphragm has the further advantage that accurate results can be obtained with even a small thermostat.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is.

1. A thermostat including a pair of circular diaphragm plates having spaced central seats and converging toward their peripheries where they are connected to form a closed chamber, each of the diaphragm plates being formed with concentric annular corrugations having flat sides arranged in an angular relation to provide sharp ridges and angular valleys, one side of each of the corrugations being longer than the other side and the short side being arranged at an angle to the direction of movement of the plate.

2. A thermostat diaphragm plate constructed of hard brass and formed with a central flat seat and annular corrugations having substantially flat sides both of which are arranged diagonally to the horizontal plane of the plate to provide sharp ridges and angular valleys, one side of each of the corrugations being longer than the other side and the long side being arranged at a smaller angle to the plane of the plate than the short side.

In testimony whereof I affix my signature.

PETER F. DODUNSKI.