May 1, 1923. 1,453,769

H. SANDVOSS

THERMOSTAT

Filed Aug. 29, 1921

FIG 1

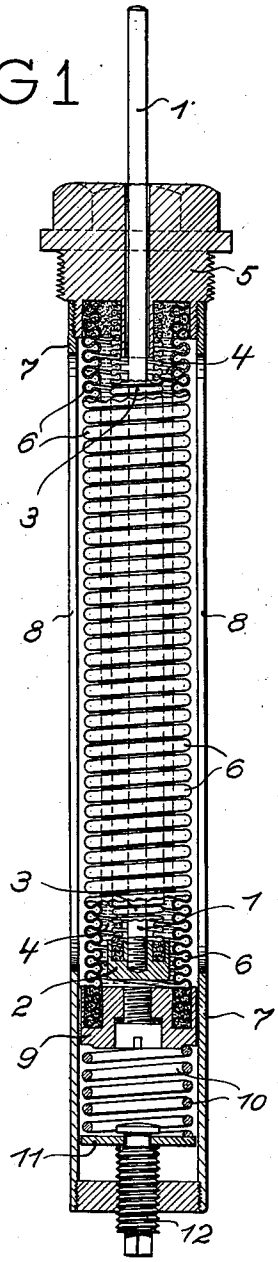
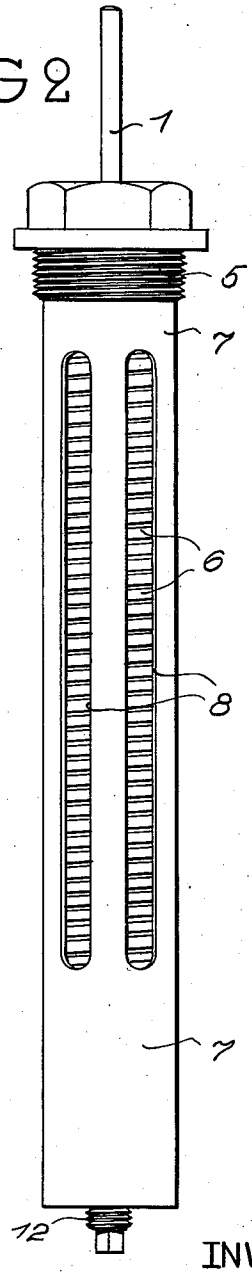


FIG 2



INVENTOR

Hermann Sandvoss

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UNITED STATES PATENT OFFICE.

HERMANN SANDVOSS, OF FRANKFORT-ON-THE-MAIN, GERMANY.

THERMOSTAT.

Application filed August 29, 1921. Serial No. 496,565.

To all whom it may concern:

Be it known that I, HERMANN SANDVOSS, a citizen of the German Republic, and residing at Frankfort-on-the-Main, in the German Republic, have invented certain new and useful Improvements in Thermostats (for which I have filed an application in Germany, January 2, 1918), of which the following is a specification.

My invention has reference to improvements in thermostats extensively used for operating other instrumentalities, such as for instance heating devices, fire alarms, water feeders for boilers, recorders, and the like, and it relates more particularly to a new and improved compact form of thermostatic device of the type in which an accordion member is influenced by an expansible medium, which device combines simplicity, cheapness, quick response to temperature changes and relatively extended operative displacement of the member intended to actuate the instrumentality in question, and the particular object of my invention is to so arrange the several parts of the device that a self-contained, one-piece unit results, which can readily be mounted on, or demounted from, the instrumentality operable thereby, and which can be regulated from without, by simply turning a bolt head, as to its compensating or safety feature, and I attain this object by accommodating all parts in close association in relative axial alinement within a tubular protective casing, with only the operative end of the accordion-influenced member and the regulator bolt head protruding from the opposite ends of the casing.

My invention will best be understood when described in connection with the accompanying drawing, in which Fig. 1 is a longitudinal section and Fig. 2 a side elevation of the new device.

In the example shown in the figures the apparatus consists of a rod 1 connected with the apparatus to be controlled and slidably mounted in the head 5 of a cylindrical protective casing 7, a piston head 2 secured to the inner end of the piston rod 1, and an accordion member 3 whose individual corrugations are of relative small cross-section and are arranged closely adjacent to one another, which member 3 is secured fluid-tightly to the boss 5 and the piston head 2 in suitable manner, for instance by casting a fusible material around the wall ends for completely filling the wall corrugations. The accordion member 3 is surrounded in spaced relation by a second accordion member 6 of respectively larger diameter and its individual corrugations being of substantially larger extent than those of the inner accordion member 3 and more widely spaced. This outer accordion member 6 is secured at one end to the boss 5 and with the opposite end to a piston 9 slidable within the casing 7 and supported on a strong spring 10 bearing on a disk 11 secured to a screw 12 adjustably fitted in the bottom of the protective casing 7. The protective casing 7 is formed with slots 8 through which air or liquid has access to the outer accordion member 6.

The liquid subject to expansion by heat is confined within the annular chamber 4 formed between the tubular members 3 and 6. The transmission of heat through the outer member 6 is very effective and rapid by reason of the large surface of the member, which is particularly important in case of fire alarms. The piston head is at all times out of contact with the piston 9.

The operation of the apparatus is as follows: The heat is transmitted through the slots 8 and the accordion member 6 to the expansible liquid, and in case of an increase of the temperature the inner tubular member 3 is compressed longitudinally of its axis. The outer member is ordinarily not expanded, so that the whole effect is transmitted to the inner member 2. If the piston rod 1 meets an excessive resistance, the spring 10 permits expansion of the outer tubular member 6 in downward direction against the pressure of spring 10, so that the objectionable bending of the tubular members 3 and 6 is avoided. By means of the screw 12 the cushioning effect of the spring 10 can be regulated.

I claim:

A thermostat of the character set forth, comprising in combination, an accordion member of relatively small diameter and narrow individual corrugations in close relation, and an accordion member of substantially larger diameter and respectively larger individual corrugations spacedly surrounding the first said accordion member, a fluid-tight joint between the two said accordion members at one end, a fluid-tight closure at the other end of said larger accordion member somewhat below the respec-

tive extremity of said inner member, a piston head forming a fluid-tight closure at the relatively shortened accordion member end, an expansible fluid within the space formed between said two accordion members and the said closures at either end thereof, a piston rod in rigid connection with said piston head and extending through said inner accordion member and out beyond the respective fluid-tight joint between the said two accordion members, an apertured protective casing spacedly surrounding said outer accordion member, and safety means for compensating excessive pressure in said expansible fluid, comprising a fixed bottom in said casing, a screw bolt centrally threading therein, a washer in said casing adapted to be axially displaced therein by said screw bolt, and said fluid-tight closure at the free end of said larger accordion member adapted for axial sliding displacement within said protective casing in close guiding contact therewith, and resilient means interposed between said larger accordion member and said bolt-operated washer.

In testimony whereof I affix my signature in presence of two witnesses.

HERMANN SANDVOSS.

Witnesses:
ALFRED LEIMCKE,
KARL SALLWEG.