A. ROESCH.

SENSITIVE MEMBER.

APPLICATION FILED JULY 25, 1919.

1,359,107.

Patented Nov. 16, 1920.

Fig. 1.

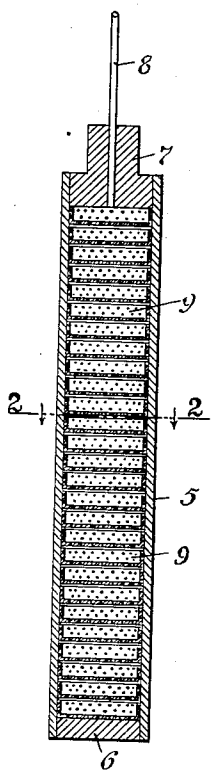


Fig. 2.

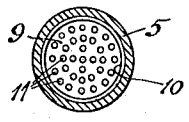


Fig. 3.

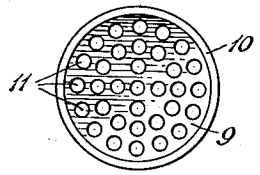


Fig. 4.

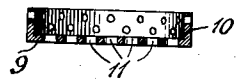
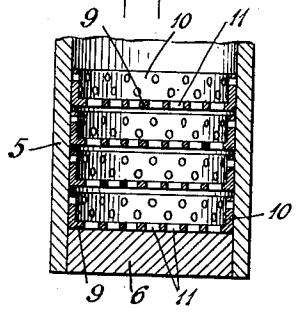


Fig. 5.



WITNESSES

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SENSITIVE MEMBER.

1,359,107. Specification of Letters Patent. **Patented Nov. 16, 1920.**

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To all whom it may concern:

Be it known that I, ALFRED ROESCH, a citizen of the United States, and resident of the borough of Brooklyn, county of Kings, city and State of New York, have made certain new and useful Improvements in Sensitive Members, of which the following is a specification.

My invention relates to sensitive members or devices and more particularly to that type thereof which are sensitive to temperature changes and which are most generally connected by means of capillary tubes with temperature indicating, recording or regulating devices used in connection with many processes as, for instance, in vulcanizing rubber. In order that accurate and reliable operation of such indicating, recording and regulating devices may be automatically assured, it is essential that sensitive members of the character in question respond quickly to even the slightest change in temperature. Owing to the fact that such sensitive members are generally rather large when filled with gases or oils which are poor conductors of heat, they are sluggish and slow in responding to temperature variations; that is to say, the fluid expands and contracts slowly in response to the radiation of the metal of which the bulb of the sensitive member itself is constructed, this metal usually being copper or other metal which is a good conductor of heat. It has heretofore been attempted to remedy the indicated defects by changing the exterior construction of the bulb of the sensitive member, which attempts have, however, been only partly successful because the temperature of the fluid at the center of the bulb remains substantially unaffected by such exterior changes.

The particular object of my invention is the provision of a simple construction in which existing objections and disadvantages are overcome and whereby the entire sensitive member, including the fluid contents of the bulb, becomes substantially as sensitive to temperature variations as the metal from which said bulb is made.

Other more specific objects of my invention will appear from the description hereinafter and the features of novelty will be pointed out in the appended claim.

In the accompanying drawings, which for illustrative and descriptive purposes, show a practical embodiment of my invention, Figure 1 is a longitudinal section of my sensitive member, Fig. 2 is a cross-section thereof on the line 2—2 of Fig. 1, Fig. 3 is a plan view of one of the radiating disks, Fig. 4 is a section thereof, and Fig. 5 is a detail section similar to Fig. 1, but on an enlarged scale.

Referring to the drawings 5 represents a sensitive member or device which comprises a hollow, preferably cylindrical bulb of copper or other metal which is a good conductor of heat. The opposite ends of the bulb 5 are closed respectively by a closure 6 and a plug 7, the latter having an axial passage in which one end of the customary capillary tube 8 is secured in any well known way so as to communicate with the interior of the bulb 5. The capillary tube 8 may lead from said bulb 5 to any conventional type of temperature indicating, recording or regulating device or to any other device with which sensitive members of the type in question may in practice be operatively combined.

The particular means whereby the sensitiveness of the device to temperature changes is increased in accordance with my invention is located within the bulb 5 and is of such a character as to cause the heat absorbed by the bulb 5 to be uniformly and positively conducted to every part of the fluid therein. In the illustrated embodiment of my invention this means comprises a plurality of disks 9, each of which is preferably made of thin copper and provided with an annular, peripheral flange 10 to form what I have chosen to term a cup-shaped radiating disk. As shown in the drawings, the disks 9 are perforated as indicated at 11, to permit the fluid to adjust itself in the member 5, the flanges 10 being also preferably perforated to permit the fluid to contact directly with the bulb 5. The diameter of each radiating disk is such that it will snugly fit within the bulb 5 with the annular flange 10 in frictional engagement with the interior surface of said bulb 5; it will be understood that the shape of the disks corresponds to the cross-sectional form of the bulb 5 and is always such that the peripheral flanges 10 will firmly contact throughout their extent with the interior surface of said bulb 5.

As shown in the drawings a plurality of

said disks 9—10 are located within said bulb 5, in axial sequence so as to form a metallic chamber in which all parts of the fluid within said bulb 5 are in contact with and surrounded by metal which is in conducting connection with the shell which constitutes said bulb. The disks serve to quickly, uniformly and positively conduct heat from the shell of the bulb 5 to every part and portion of the fluid within the same when the temperature in the vicinity of the sensitive member rises and to conduct heat from all portions of said fluid back to the shell of the bulb in a uniform and positive manner and in a minimum of time when said temperature falls. In this manner the responses by the sensitive member to temperature variations, no matter how slight or how great, are quick, positive and accurate with the result that an accurate operation of the instrument which is operatively connected with the sensitive member is at all times assured. As a matter of fact, all parts of the device, including the fluid in the bulb, become substantially as sensitive, with my arrangement, as is the metal, generally copper, from which the bulb is made.

The sensitiveness of the device to temperature changes may be varied by increasing or decreasing the thickness of the radiating disks or by using a greater or less number of disks within a given bulb or by spacing them closer together or farther apart therein; the peripheral flanges 10 govern the minimum distance which may exist between adjacent disks, which minimum may be decreased by reducing the width of said flanges in an axial direction, if this should be desired.

My invention is simple in construction and operation, is readily combined with existing sensitive devices or members, is economical to produce, and increases the efficiency of the sensitive member and its responsiveness to temperature changes to a maximum extent.

Various changes in the specific form shown and described may be made within the scope of the claim without departing from the spirit of my invention.

I claim:

In a device of the character described, the combination of a tubular shell sensitive to temperature changes and containing a fluid, a closure at one end of said shell, a plug at the other end thereof, a capillary tube having an end secured in said plug and communicating with the interior of said shell, a plurality of disks spaced from each other within said shell and perforated throughout their entire surfaces, and peripheral perforated flanges on said disks in frictional engagement with the inner surfaces of said shell whereby said disks are positioned therein and whereby the minimum distance which may exist between adjacent disks is determined.

In testimony whereof I have hereunto set my hand.

ALFRED ROESCH.