

No. 881,847.

PATENTED MAR. 10, 1908.

F. P. BUTMAN.

THERMOSTAT.

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Fig. 1.

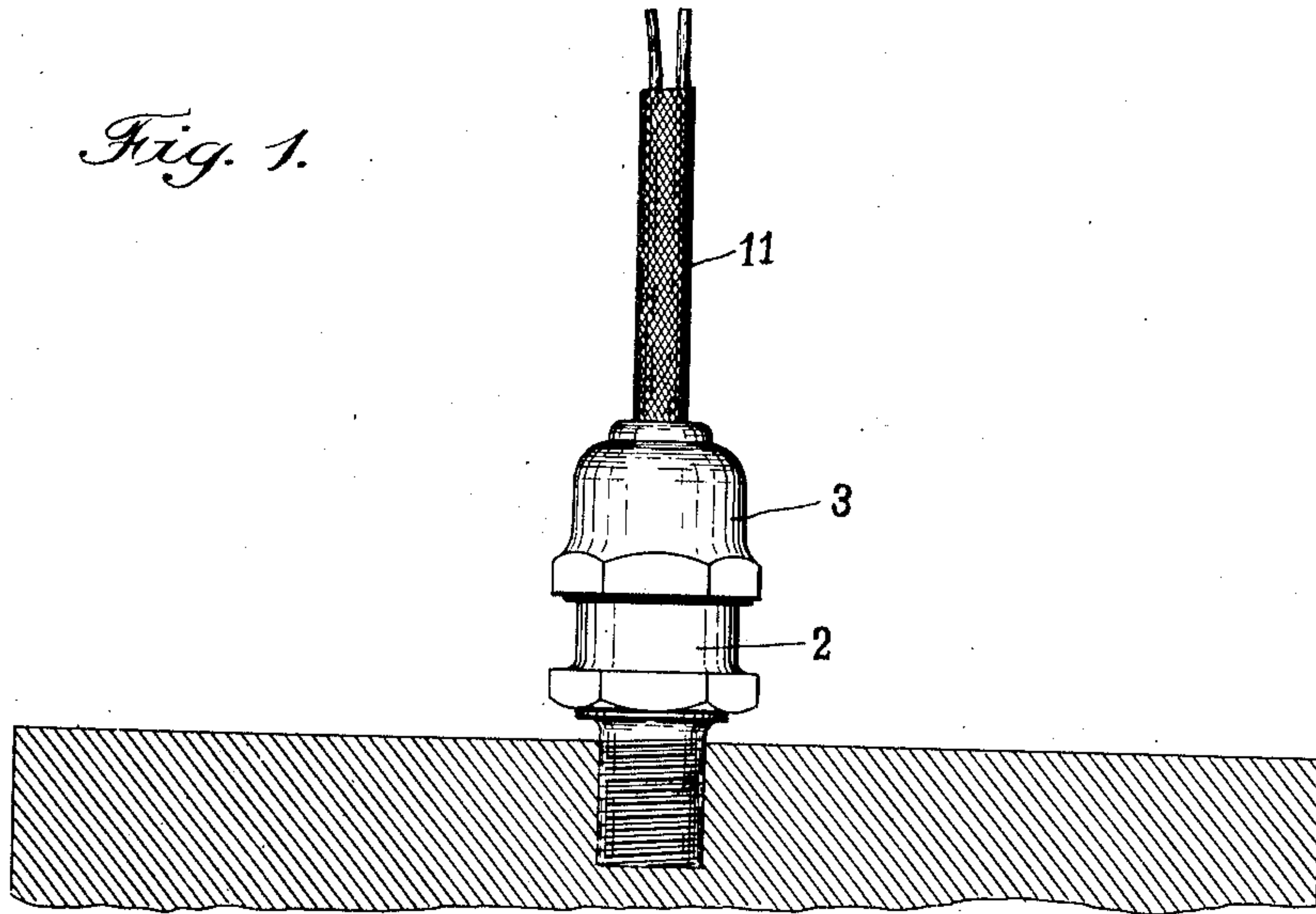


Fig. 2.

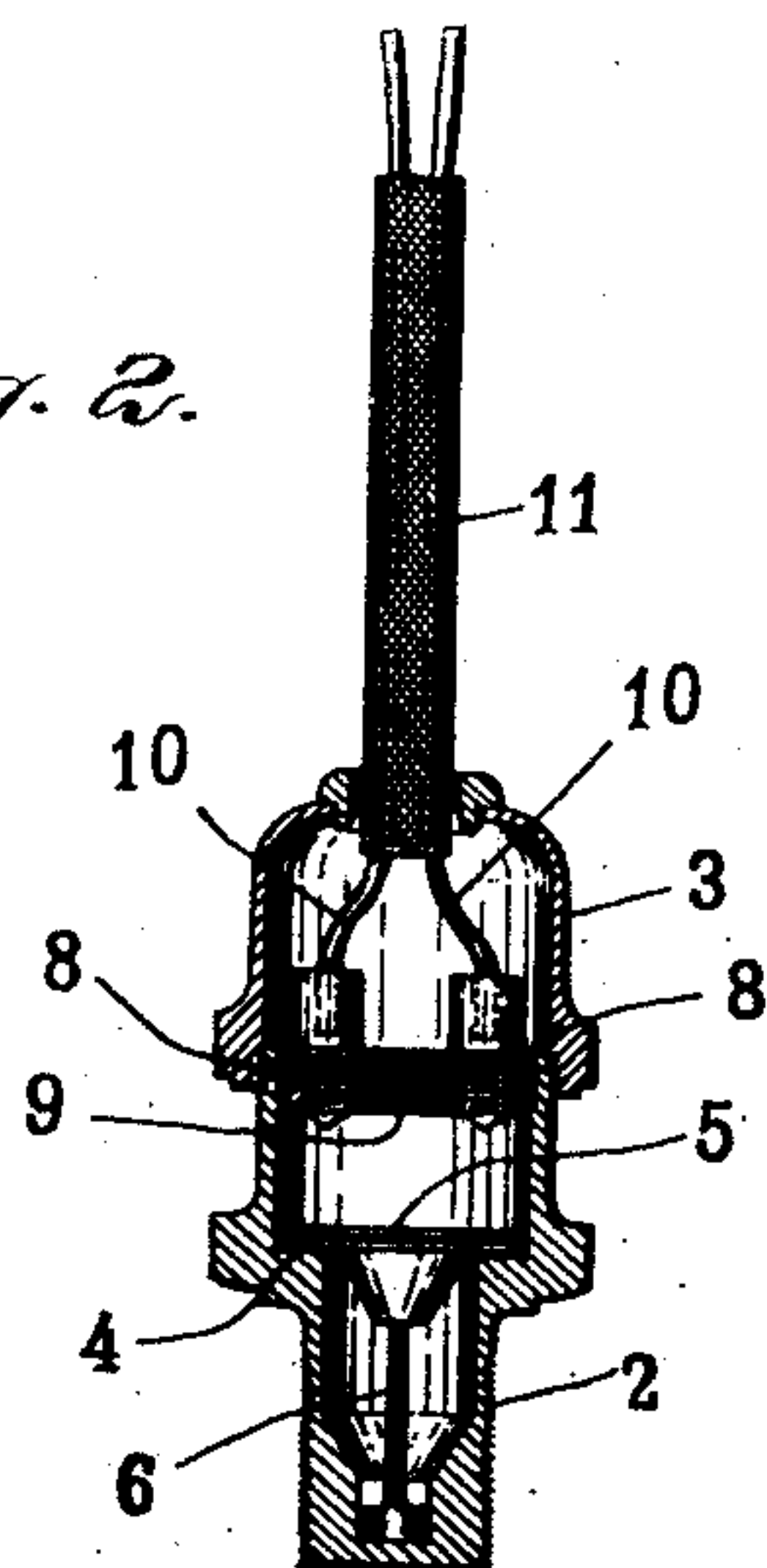
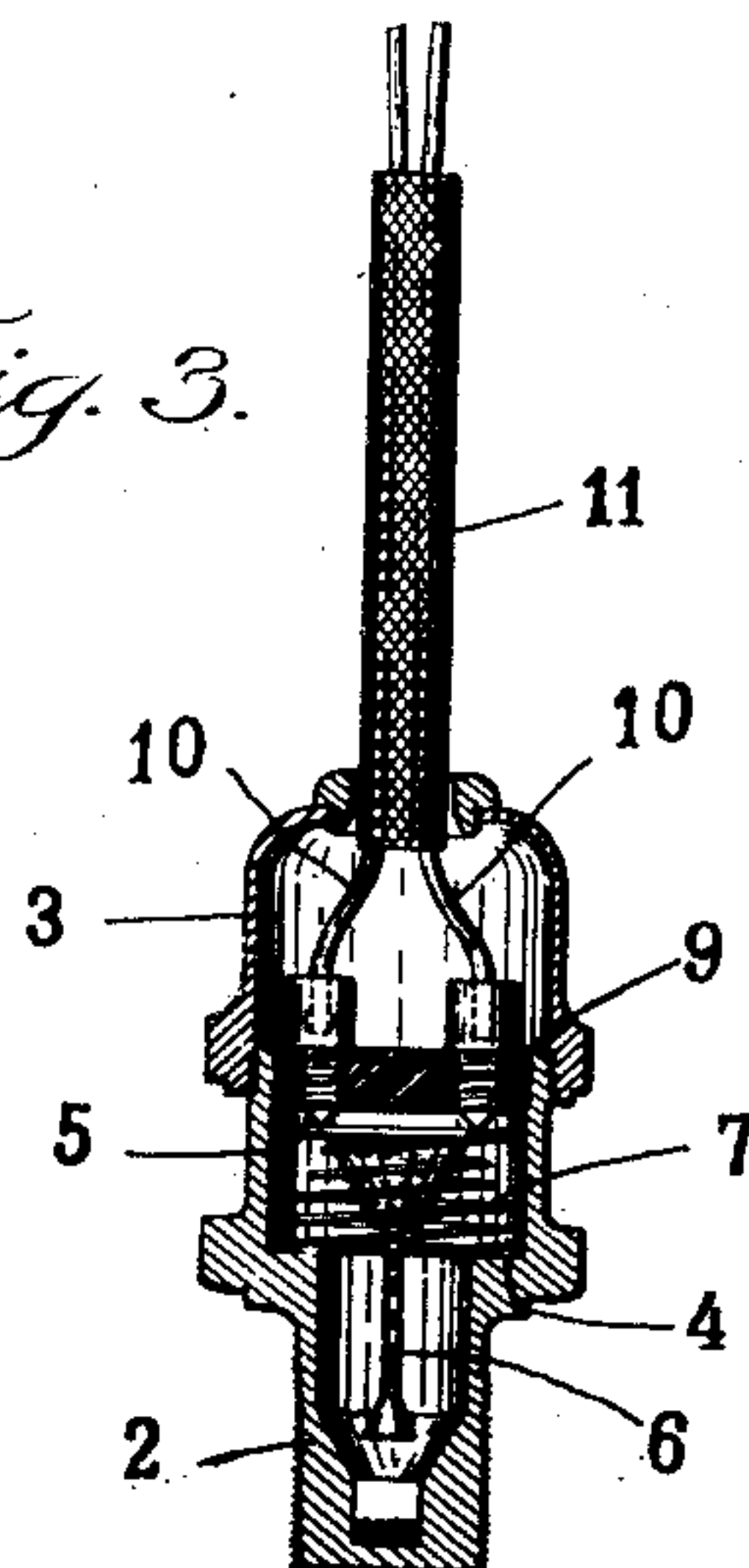


Fig. 3.



Witnesses:
Arthur F. Raudall,
Joseph T. Brennan.

Inventor:
Fred P. Butman,
By E. D. Chadwick,
Attorney.

UNITED STATES PATENT OFFICE.

FRED P. BUTMAN, OF HOLBROOK, MASSACHUSETTS.

THERMOSTAT.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRED P. BUTMAN, a citizen of the United States, and resident of Holbrook, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Thermostats, of which the following is a specification.

My invention relates to thermostatic devices of the kind which are applied to journal bearings and operate to give an alarm when the bearing becomes unduly heated, the object of my invention being to provide a device of the character referred to which shall be simpler and less expensive of construction, and more certain in its operation, than those heretofore employed.

In the accompanying drawings:—Figure 1 is an elevation of a thermostatic device embodying my invention, as applied to a journal bearing; Fig. 2 is a central, vertical section through the device itself showing the parts in their normal position; and Fig. 3 is a similar section showing the parts of the device after it has operated to give an alarm.

The working parts of my device are inclosed in and protected by a casing of suitable construction adapted to be set into a hole formed in a journal bearing, my casing being shown in the drawings as composed of a metallic, cup-shaped portion 2 and a detachable cap 3 forming a closed chamber. The cup 2 is provided with an annular ledge or shelf 4 and contains a movable member composed of a metallic disk 5 provided with a pin 6 extending downward into the hollow lower end of the cup 2. Between the disk 5 and the ledge 4 is interposed a spring 7 which, when the parts are in the position shown in Fig. 2, tends to force said disk and its pin 6 upward. This spring has the form of a tapering spiral with its larger portion or base resting upon the ledge 4. A short distance above the disk 5 are located two conducting terminals 8, 8 which are insulated from each other by being passed through a disk 9 of vulcanized fiber or similar material, which is screwed into the upper end of the cup 2. These terminals 8, 8 are respectively connected to insulated conducting wires 10, 10 which lead out through the top of the cap 3, which is screwed onto the top of the part 2, as shown. The wires 10, 10 are included in an alarm-circuit which is not herein shown, the construction and arrangement of such circuits being well understood.

In the normal condition of the device, the

lower end of the pin 6 is secured to the bottom of the cup 2 by fusible solder of such composition that it will melt at a predetermined temperature, and in case the journal bearing to which the device is applied is heated above the given temperature, by friction or otherwise, the heat is communicated through the metallic cup 2 to the fusible solder, which thereupon melts and releases the pin 6 and the disk 5. The spring 7 thereupon forces the disk 5 into contact with the terminals 8, 8 and thus completes the circuit through the alarm device.

In order to prevent the detachment of the device from the journal bearing to which it is applied, the lower portion of the cup 2 is preferably screw-threaded externally and screwed into a suitable hole provided for it in the journal bearing, and it will be evident that after the disk 9 has been screwed into place and the wires 10, 10 have been connected into the alarm circuit, it will be practically impossible to detach the device from the journal bearing because it cannot be unscrewed therefrom without twisting the wires.

The peculiar shape given to the spring 7, and its employment in connection with the ledge 4, are features of my invention, as this arrangement prevents all possibility of the action of the spring being interfered with by its catching on the pin 6 or by having its coils clogged by fragments of melted solder, as has been found to occur in the operation of certain prior devices for the same purpose. When my spring 7 is compressed, as shown in Fig. 2, its coils nest one within another, presenting a substantially flat and unbroken surface without spaces between the coils, and at a considerable distance from the lower end of the pin 6 and the solder, and when the solder fuses the coils can separate without any possibility of being interfered with.

The upper portion of the part 2 is made large enough to receive one's finger, so that the device may be set by removing the cap 3, unscrewing the disk 9, using the outer ends of the terminals 8, 8 as handles, pressing the disk 5 downward by inserting a finger into the top of the enlarged top portion of the cup 2, and holding the device with its bottom surface in contact with some part heated to a sufficient temperature to melt the solder. As soon as the solder is melted, the device is removed from the heated part and the disk 5 is still held down until the

solder has cooled and set, whereupon the disk 9 is screwed into place, the cap 3 is applied, and the terminal wires are connected into the alarm circuit. Thus the device
 5 may be re-set after operation, as many times as may be necessary. The internal diameter of the extreme lower end of the cup 2, where the solder is located, is preferably made just sufficient to receive the lower end
 10 of the pin 6, as shown, so that only a very small amount of solder is required and the pin 6 is necessarily brought into contact with the solder when the device is re-set.

It will be observed that the disk 9 forms
 15 a tightly fitting cover which effectually seals the cup 2 and prevents the introduction of dirt or moisture into the same through the opening in the top of the cap 3. The wires 10, 10 are led from the terminals 8, 8 out
 20 through the cap 3 and are preferably provided for a short distance with a wrapping or cover 11, in order to protect their insulation from rubbing contact with the cap 3.

I claim as my invention:

25 1. In a thermostat for journal bearings, the combination of a cup 2 having a closed bottom forming a solder-retaining receptacle and provided above the same with a ledge 4, a disk 5 having a pin 6 normally secured in
 30 the bottom of said cup by fusible solder, a tapering spiral spring having its base resting upon said ledge and its smaller end bearing against said disk, the coils of said spring being normally nested one within another.
 35 and means for completing an electric circuit through said disk upon the melting of the fusible solder.

2. In a thermostat for journal bearings, the combination of a cup having a closed
 40 bottom forming a solder-retaining receptacle and also having an open top adapted to permit the resetting of the device, an insulating disk 9 detachably screwed into the open top of said cup, contact terminals passing
 45 through said disk and serving as a means for turning the same, a disk 5 located beneath said insulating disk and having a downwardly-extending pin normally secured to the bottom of the cup by fusible solder, and
 50 a spring tending to force said disk 5 upward.

3. In a thermostat for journal bearings, the combination of a cup 2 having a closed bottom of restricted diameter as compared with the upper portion of the cup and forming
 55 a solder-retaining receptacle, an insulating disk 9 detachably secured in the open top of the cup and provided with contact terminals passing through the same and adapted to be included in an alarm circuit,
 60 a disk 5 contained in said cup beneath the

disk 9 and provided with a downwardly-extending pin having its lower end normally secured within the restricted bottom of the cup by means of fusible solder contained therein, and a spring tending to force said
 65 disk 5 upward, the sides of the cup above its restricted bottom being tapered to act as guiding surfaces for said pin in resetting the device.

4. In a thermostat for journal bearings, 70 the combination of an externally screw-threaded cup 2 having a ledge 4 and closed at its top by a detachable insulating disk 9, a disk 5 movable in said cup above the ledge 4 and provided with a pin normally secured 75 to the bottom of the cup by fusible solder, a tapering spiral spring between said ledge and movable disk, insulated conducting pins 8 passing through the disk 9, wires leading from said pins respectively, and a cap 3 80 detachably secured to the cup 2, substantially as described.

5. In a thermostat for journal bearings, the combination of a cup 2, an insulating disk 9 detachably secured to the top of said
 85 cup and forming a tight cover for the same, a cap 3 detachably secured to the cup 2 and provided with a central perforation, the interior of said cap forming an inclosed chamber, contact terminals passing through the
 90 disk 9 and extending upward therefrom into the interior of said cap, circuit wires connected to said contact terminals respectively within said cap and passing loosely
 95 through the perforation therein, and means contained within the cup 2 for establishing a circuit through the contact terminals at a predetermined temperature.

6. In a thermostat for journal bearings, the combination of a cup 2 having a closed
 100 bottom forming a solder-retaining receptacle of restricted diameter as compared with the upper portion of the cup, an insulating disk 9 detachably secured in the open top of said cup and provided with contact
 105 terminals passing through the same and adapted to be included in an alarm circuit, and a spring-actuated disk 5 contained in said cup beneath the disk 9 and provided with a downwardly extending pin 6 having
 110 its lower end normally secured within said restricted receptacle by fusible solder contained therein.

In testimony whereof, I have hereunto subscribed my name this twenty-fourth day
 115 of March, 1903.

FRED P. BUTMAN.

Witnesses:

E. D. CHADWICK,
 JOSEPH T. BRENNAN.