No. 742,195. PATENTED OCT. 27, 1903.

H. F. JONES.

HEAT ALARM.

APPLICATION FILED FEB. 3, 1903.

NO MODEL.

Fig. 2.

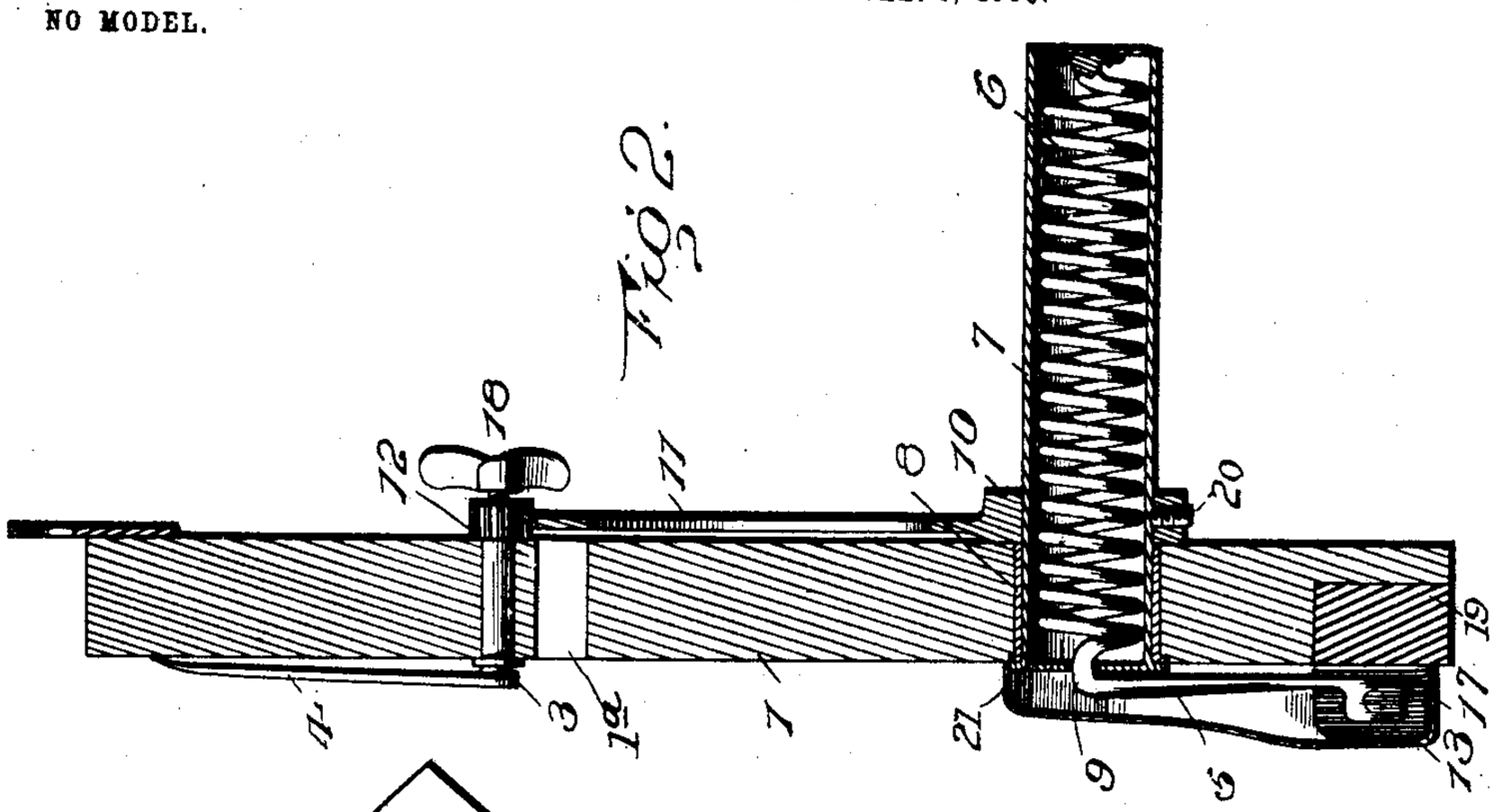
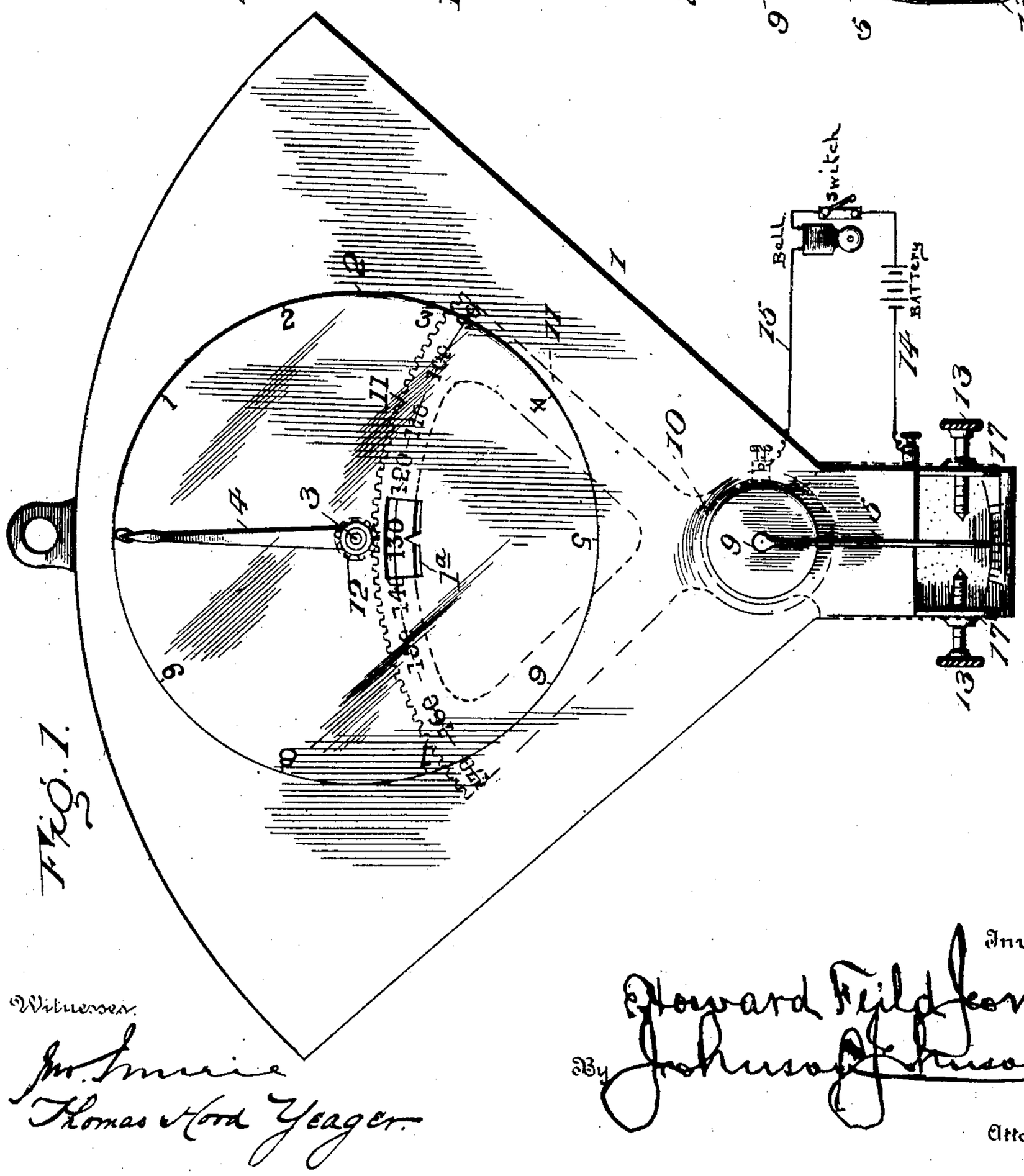


Fig. 1.



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No. 742,195. Patented October 27, 1903.

UNITED STATES PATENT OFFICE.

HOWARD FEILD JONES, OF WILSON, NORTH CAROLINA.

HEAT-ALARM.

SPECIFICATION forming part of Letters Patent No. 742,195, dated October 27, 1903.

Application filed February 3, 1903. Serial No. 141,638. (No model.)

To all whom it may concern:

Be it known that I, HOWARD FEILD JONES, a citizen of the United States, residing at Wilson, in the county of Wilson and State of North Carolina, have invented certain new and useful Improvements in Heat-Alarms, of which the following is a specification.

I have produced an improved temperature-alarm device especially adapted for tobacco-barns for giving an alarm by an electrical contact-maker when the heat rises above or falls below a temperature that is best suited to the tobacco in the curing operation and for indicating such temperature; and my improvement consists of certain parts and combination of parts which will be pointed out in the claims appended hereto in connection with the accompanying drawings, in which—

Figure 1 represents in front elevation an electric heat-alarm device embodying my improvement. Fig. 2 is a vertical section of the same.

The parts of the device are mounted in operative relation upon a base or back hanger 1, which may be of wood or metal, hung within the curing-closure of the barn. On the upper part of its front face the back-hanger has a fixed dial 2, divided into units. Centrally with the dial a shaft 3 is mounted to pass through the back-hanger and has a pointer or hand 4 for traversing the dial-degrees. An electric contact-arm or circuit-maker 5 is rigidly connected to the end of a thermostatic coil 6, whereby the contact-arm is actuated by the varying degrees of the temperature of the barn. For this purpose the coil is inclosed within a case 7 and terminates in an axial extension 9, to which the contact-arm is connected, while the other end of the coil is fixed to the end of the case, so that the heat expands and contracts the contact-arm-connected end of the coil, and thereby moves the arm and makes the contact to ring the bell by such movement. In this relation of these two indicating-pointer parts the thermostatic coil is between them and is inclosed within the case or shell 7, which is fitted to rotate within a sleeve or thimble 8, fixed in an opening in the back-hanger, so that the ends of the sleeve are at the front and rear faces of the back. Within this sleeve the coil-casing is fitted and supported to freely rotate, with its front end flush with the end of the sleeve and projecting through and beyond the sleeve, and to its inner end the coil is fixed. The terminal axial end of the coil 9 passes centrally and freely through the closed end of the coil-case for rigid connection with the electric contact-arm. This construction therefore gives a thermostatic coil having its case-connected end rotatable with the case and its other end free to move the contact-maker under the temperature changes. At its inner or rear side and close to the back a ring 10 is adjustably fixed upon the coil-case and has a toothed quadrant 11, which extends to and engages a pinion 12 on the shaft of the dial-pointer, so that rotative movement of the coil-case is imparted to the toothed segment, contact-hand 5, and dial-pointer. The arc portion of this toothed segment has thereon figures denoting tens, which are rendered visible through an opening 1^a, having a tooth central with its lower side to insure correct reading. For operation with the contact-making arm the back is provided with set-screws 13 13 on each side of the arm 5, which form the electric contact-points, and for this purpose these screws are fitted into opposite sides of a metal cover fixed to the back and which cover incloses the contact-making arm, the contact-points, and preferably the end of the coil-case. These contact-points can be set nearer together or farther apart to determine the range of movement of the contact-making arm, and with the wires 14 and 15 connecting this metal cover, the fixed metal sleeve or thimble, the battery, the switch, and the bell the alarm-circuit is closed by the platinum-tipped arm making contact with the points of the screws and the temperature indicated by a scale on the quadrant graduated in tens—say from "90" to "170"—on a line parallel with its toothed edge, and these degrees are rendered visible on the quadrant by the opening in the back, so that the degrees can be read as the quadrant is moved to bring the degree-numerals at the opening, as in Fig. 1, wherein the contact-arm and the dial-pointer are set at "0," showing on the quadrant the degree of "130." Therefore one complete circle in the movement of the dial-pointer 4 moves the toothed quadrant to the right or to the left,

as the case may be, say, ten degrees. The temperature is shown by the scale of tens exhibited at the sight-opening and also by the units indicated by the position of the pointer 4 with reference to the figures on the dial.

The front of the metal covering-case 17 of the contact-arm may be of glass, through which the position of the contact-arm may be seen to determine what adjustments to make of the contact-points to determine the range of movement of the contact-arm.

From the foregoing construction it will be seen that the thermostatic coil by its containing and connecting case is fixed to the rotatable toothed quadrant, which is moved by the pinion of the dial-pointer, which engages the quadrant, and it will be seen, looking at Fig. 2, that the shaft of this pinion has a knob 18, by which the dial-pointer is set by hand to the starting zero-mark or at any desired degree as the curing operation progresses, as I shall presently state. It is obvious that a very slight movement of the quadrant will be indicated on the units-scale by a wide range of movement of this scale-pointer by reason of the multiplying function of the toothed quadrant and pinion and that the contact-making end of the coil will be moved slightly in effecting such wide range of movement and in this way quickly show the action of the temperature upon the coil. In setting the device by hand the contact-arm scale gives the advantage of allowing the contact-points to be adjusted to limit the range of movement of the contact-making arm for the purpose of calling attention to any predetermined degree above or below the desired temperature, and in this adjustment one contact-point may be set farther in or out than the other, according as the dial-pointer may be set to the right or to the left of the units-scale.

It will be noted that the coil-containing case is fitted and movable within a fixed sleeve or thimble, so that it will always keep a good bearing and electrical contact between the coil-case and fixed thimble, so that one pole of the electric battery being fixed to the thimble and the other pole fixed to the insulated cover which has the contact-points it is apparent that any contact between the set-screws and the arm will complete the circuit and ring the alarm-bell and indicate the temperature for the attention of the attendant.

The cover containing the contact set-screws if of metal can be mounted on a block 19, of hard rubber or suitable insulating material. If back board or base be of impregnated wood, then the cover will need no insulation.

The adjustment of the coil-containing case in connection with the toothed quadrant is made by the ring 10 and the clamp-screw 20, and this ring and the rim 21 at the end of the case serve to confine the case within its bearing-thimble and to keep the terminal end of the coil from binding in the opening of the cap, through which it passes.

It is important that the coil should terminate in the center of the case or shell to allow the latter to have a free rotative movement, while also allowing the end of the coil to turn freely as an axis of the coil in the central opening in the end of the case through which it passes, so that the rotative movement of the free end of the coil and the rotative movement of the case or shell coöperate with the contact-arm and with the contact-points to render effective an electric circuit to give an alarm when the temperature has reached a predetermined point by reason of the axial end of the coil being free to elongate and contract, according as the temperature rises or falls. The fixed dial and an indicating-hand controlled by the rotation of the case gives the advantage of indicating the degrees in sections by tens without interference with the rotation of the contact-arm, and the use of the rotatable case gives the advantage of providing a movable scale of units and the multiplying-gear in order to show by a slight movement of the contact-arm a wide range of degree and the temperature by the movable scale of tens.

The operation of the heat-alarm in a tobacco-barn is as follows: The wires being in circuit with the battery, the bell, and the switch, say it is desired to maintain a temperature of 100°, which is above the normal temperature in the barn, the knob is turned to bring the scale on the quadrant to indicate 100° at the opening. Therefore the contact-hand would be pressing against that contact-point which indicates that the temperature is too low and would cause the bell to ring. To prevent this ringing, however, the switch had been purposely opened, and as soon as the temperature in the barn had risen to the degree desired the contact-arm would move away from the contact-point and stand at "0." The switch is now closed, connecting the bell and the battery. The temperature is at 100° and the instrument is set at "100." Any change in the temperature high or low will cause the contact-arm to move to make contact with the contact-point to close the battery-circuit and ring the bell, alarming the attendant. This is repeated step by step as the curing process progresses, the knob being turned and moves the coil-case and coil to mecanically indicate a higher degree on the scale of the quadrant, and the contact-arm is pressed against the contact-point. The attendant opens the switch and simply waits until he can make the temperature high enough in the barn to again move the arm away from the contact set-screw and then closes the switch. Thus step by step the case and its coil-arm are rotated to move the arm away from the contact-screw as fast as the temperature acting on the coil moves the arm to make the contact. Obviously the units-indicating device may be dispensed with. When the contact is made with either point, the pressure of the contact-arm is firm

and constant, thus rendering the alarm certain and uniform as distinguished from a contact liable to uncertain pressure; but it will be understood that the degree of pressure necessary to give the alarm need not necessarily be sufficient and is not intended to rotate the coil-case, as the friction of the units device will prevent such rotation by the action of the coil.

I claim—

1. In a heat-alarm and in combination, a back-support, a thermostatic coil, a contact-making arm attached to the coil, contact-points, a case rotatively mounted having a fixed connection with the coil and provided with a movable heat-indicating scale, the contact-points and the case being electrically connected for operation in the way described.

2. In a heat-alarm, a thermostatic coil and a rotatable case, one end of the coil being attached thereto and a contact-making arm fixed on the other end of the coil and movable with it and a temperature-indicating scale movable with the case.

3. In a heat-alarm and in combination, a back-support, a thermostatic coil, a contact-making arm attached to the coil, contact-points, a thimble or sleeve fixed in the support, a case rotatively mounted within said sleeve and fixed to the coil, and an alarm electrically connected with the sleeve and arm.

4. In a heat-alarm and in combination, an electric circuit and contact-points, a thermostatic coil, and a rotatable case, one end of the coil fixed to and rotatable with the case, the other end of the coil having a contact-arm, a heat-indicating scale movable with the case, a fixed dial of units and a pointer therefor actuated by the rotative movement of the case.

5. In a heat-alarm and in combination, a back-support having a fixed face-dial, a thermostatic coil, contact-points, a contact-arm fixed to the coil, a case fixed to and rotatable with the coil, a toothed quadrant fixed to and rotatable with the case and having a heat-indicating scale, a shaft mounted in the back having a pinion engaging the toothed quadrant, and a pointer traversing the dial, and electrical connections in the alarm-circuit.

6. In a heat-alarm and in combination, a back-support having fixed face-dial, contact-points, a contact-arm fixed to the coil, a case fixed to and rotatable with the coil, a quadrant at the inner side of the back-support, mounted on the case and rotatable with it and having a heat-indicating scale visible through an opening in the back, a shaft having a pinion engaging the toothed quadrant, a pointer traversing the dial, means for adjusting the quadrant on the case, and electrical connections in circuit with the alarm.

7. In a heat-alarm, a fixed dial divided into units, a pointer therefor, contact-points and a contact-arm therefor, a scale for said contact-arm, and a movable scale of tens between the dial and the contact-points, a thermostatic coil connected to the contact-arm, a case containing the coil connected with it, and having a toothed quadrant, the coil, the case and the quadrant rotative together, a shaft carrying a dial-pointer and having a pinion engaging the toothed segment, and electrical connections in circuit with the alarm.

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

HOWARD FEILD JONES.

Witnesses:
H. H. MURRAY,
G. W. STANTON.