No. 869,460. PATENTED OCT. 29, 1907.

W. RICHMOND.

ELECTRIC HEATING FABRIC.

APPLICATION FILED JUNE 16, 1905.

2 SHEETS—SHEET 1.

Fig. 2.

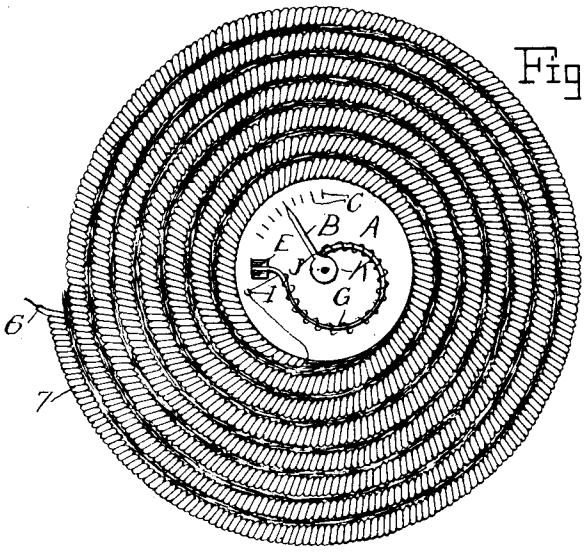
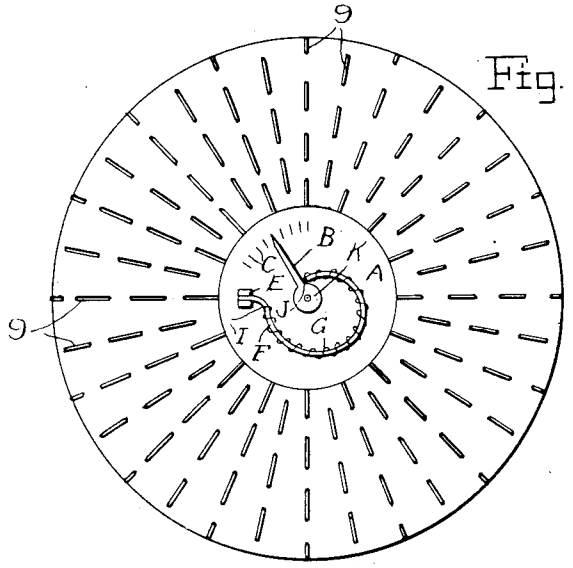


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

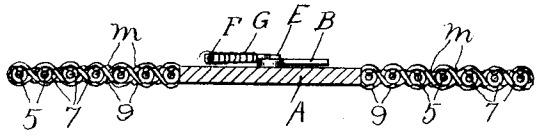


Fig. 4.

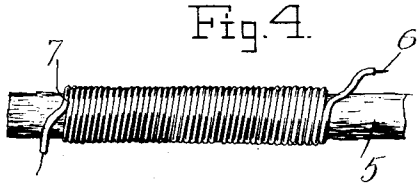
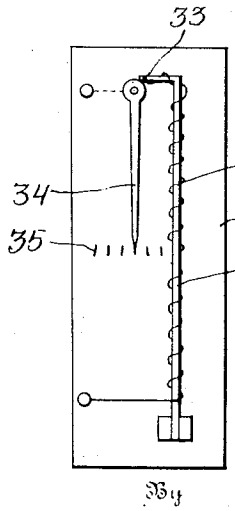


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ELECTRIC HEATING FABRIC.

No. 869,460. Specification of Letters Patent. Patented Oct. 29, 1907.

Application filed June 16, 1905. Serial No. 265,584.

To all whom it may concern:

Be it known that I, WALTER RICHMOND, a citizen of the United States, residing at Memphis, in the county of Shelby, State of Tennessee, have invented certain new and useful Improvements in Electric Heating Fabric; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to electric heating fabrics or pads and regulators for controlling heat and maintaining a practically constant temperature.

The object of the invention is to provide a pad which will be electrically heated for use under the various conditions to which it is adapted and which will have a large heating capacity while it will occupy a small space.

A further object of the invention is to provide in connection with the pad, means for regulating the consumption of current in the pad so that the quantity of heat given off will be automatically adjusted. Thus, when the pad is subjected to air currents or is exposed so that the heat may pass quickly from it, the current flows steadily and maintains the temperature, and when the pad is covered so that the heat passes from it very slowly and the temperature is thereby raised, the governor acts so as to open the circuit and keep an even temperature of the pad.

Other objects and advantages of the invention will be understood from the following description.

In the drawings forming a portion of this specification and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a plan view of a mat or pad embodying the present invention. Fig. 2 is a top plan view similar to Fig. 1 with the top portion of the covering removed. Fig. 3 is a view taken diametrically through the mat or pad. Fig. 4 is a detail view of a portion of the asbestos core with the conducting wire wound around. Fig. 5 is a top plan view of a different form of governor regulator or controller.

Referring now to the drawings, the pad or mat is formed around a central member comprising a base A, of insulating material, upon which is pivoted an eccentric K, operated by an indicating lever B, for regulating the degree of heat, said lever can be moved over the graduated scale *c*, and can be set to indicate the required degree of heat.

Fixed at one end to a plate E, mounted on the base A, is a convolute spring F, on the opposite end of which is a contact point J, at which point the circuit is made and broken, as the spring is coiled or uncoiled by the variations of temperature. A high resistance conducting wire G, is wound upon, and insulated from the spring F, except at the contact point, where it is electrically connected to the spring F; the opposite end of the wire G, is connected to a binding post I, on the base A; the lever B, with the eccentric K, is electrically connected through its pivot forming the other binding post. Thus it will be seen, that a current of electricity passing from the post I, to the eccentric K, will heat the wire G, so that it will in turn heat the spring F, and the latter will uncoil and open the circuit at the contact point J, stop the generation of heat and cause a falling temperature which will cause the spring F, to coil again, thus renewing the contact at J, and this making and breaking of circuit will occur as often as the temperature rises to the required degree indicated on the scale C by the lever B. The lever B can be shifted to show any desired degree of heat on the scale C, and to operate the eccentric K, and increase or diminish the pressure on the spring F, thus requiring a greater or less degree of heat to cause it to uncoil and break the circuit.

About the regulator above described, is formed the mat or pad which consists of asbestos rolled in cylindrical form to make a core 5, Fig. 4, about which is wound a wire 6 of German silver or other metal of high resistance, the wire being provided with an insulating covering 7. The unit thus formed is wound around the base of the regulator into spiral form as illustrated in Fig. 2, the convolutions of the spiral being separated by a strip of asbestos 8 which serves to insulate the wire thoroughly and prevent chafing of the contiguous convolutions.

A cloth covering *m*, Fig. 3, is provided and serves only to make a protection or finish for the mat or pad, from which it is separate and distinct. The convolutions of the unit are held in close relation by radial lines of stitching 9, Figs. 1 and 3, the stitches passing between the convolutions of the conductor. Woven lines, the threads passing alternately over and under the contiguous convolutions, may be substituted for the radial lines of stitching if desired.

One end of the conducting line is attached to the binding post I, or directly to the wire G, so that the wire 6 and G will be in series. In use wires from a suitable source of electricity are connected respectively to the pivot of eccentric K, and the outer end of the wire 6, the regulator controller or governor as above described serving to regulate the temperature by making and breaking the circuit. In Fig. 5 of the drawings there is shown a structure embodying a different form of controller regulator or governor embodying the same principle as shown above, including a base 30 of insulating material having a straight bar 31 mounted thereon the co-efficient of expansion of which is very high. This bar has a contact point 33 which presses on the eccentric 37, which eccentric is operated by the indicating lever 34. The pressure on the eccentric 37 at the contact point 33 is regulated by shifting the lever 34 over the graduated scale of degrees 35, a conducting wire 36

is wound on, and insulated from the bar 31 except at the contact point 33 where it is electrically connected to the bar. A current of electricity passing through the wire 36 heats the bar 31, the bar on application of heat will draw away from the eccentric 37 and break the circuit, the resulting falling of temperature causes the bar to straighten, and assume its original position, thus closing the circuit again. This operation is repeated as often as the temperature rises to the original degree of heat, as shown by the indicating lever on the scale 35.

It will be understood that in practice, other modifications of the specific construction shown may be made, and any suitable materials and proportions may be used for the various parts without departing from the spirit of the invention.

What I claim is:—

1. The combination with an electric heating mat or the like composed of a high resistance conductor wound about a core, of an expansible controller mounted upon the core, a high resistance conductor in circuit with the expansible controller and with the conductor which is wound about the core, and means arranged upon the core and in circuit with the expansible controller for adjusting the tension of the same, the said controller being arranged when expanded to break its contact with the member.

2. An electric heating mat or the like comprising a core, a high resistance element wound about the core, a resilient controller mounted upon the core, a high resistance conductor wound around the controller and in circuit therewith at its free end, said resistance conductor being in circuit with the resistance conductor wound about the core, and a movable contact arranged upon the core, said contact being movable to adjust the tension of the expansible controller, said controller being arranged to break its contact with the contact member when expanded.

3. A fabric for mats or pads consisting of a high resistance conductor wound about a core and bent spirally about a central member, and having its convolutions insulated from each other and a controller, regulator, or governor mounted on the central member and said controller in circuit with said conductor, automatically maintaining any desired temperature in the heating fabric.

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

WALTER RICHMOND.

Witnesses:
CLAUDE JOHNSTON,
CHARLES JOHNSTON.