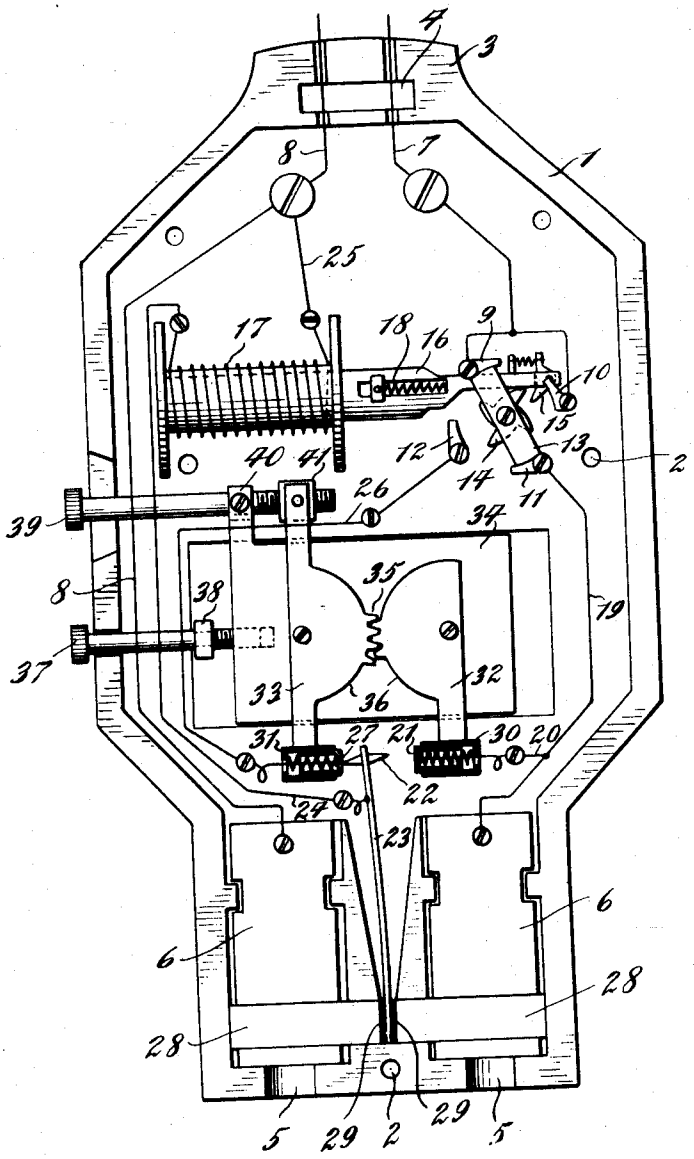
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AUTOMATIC ELECTRIC PLUG

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AUTOMATIC ELECTRIC PLUG

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This invention relates to a plug which may be inserted in a line between an electric source of power and an electrical heating device such as the well known electric iron, and which contains means for automatically regulating the heat of the device by opening and closing the circuit thereto.

The invention will be best understood from the following description and the accompanying drawing, in which the figure is a longitudinal view through a plug constructed according to my invention, with the electrical connections shown diagrammatically.

In the selected embodiment which I have shown in the drawing, the numeral 1 designates a portion of a body of insulating material forming a plug, within which the invention may be received. Plugs of this nature are usually made in two parts, fastened together by bolts or the like, and I have shown one of these parts provided with the holes 2, which may receive such bolts to unite it with a corresponding part.

The neck 3 of the plug is provided with the usual recess 4 to receive a coil spring surrounding a cord. At the other end of the plug are provided two holes 5 which are in registry with the usual contacts 6 which form sockets for the reception of plugs on an electric iron or other heating device. Passing through the neck 3 are the usual pair of conductors 7 and 8, which are normally received in the usual cord which connects the plug to a source of current. The conductor 7 is connected in parallel to the contacts 9 and 10 of a four-pole switch, the other two poles of which are shown at 11 and 12.

Pivoted centrally of the contacts 9, 10, 11 and 12, is a contact member 13 having rigidly secured thereto a ratchet 14 which is adapted to be engaged by a spring pressed pawl 15 secured to the armature 16 of a solenoid 17, this armature being urged to the normal position shown in the drawing, by means of a suitable spring 18. Leading from the contact 11 is a conductor 19 which is connected at its other end to one of the sockets 6. The other socket 6 is connected by a conductor 8 directly to the source of current.

The solenoid 17 has a circuit formed in two branches, both of which are disposed in parallel with the heating circuit which has just been described. One of these branches leaves the conductor 19 at 20, and includes a contact 21, a second contact 22 mounted upon a thermostat 23, the conductor 24, the solenoid 17 and the conductor 25 which connects the solenoid to the conductor 8. The other branch comprises the contacts 10 and 12, the conductor 26, the contacts 27 and 22, the conductor 24, solenoid 17 and the conductor 25.

The thermostat 23 is supported between two relatively heavy plates 28, these plates being of heat conducting material. The thermostat is, however, electrically insulated from these plates by strips 29 of material which will prevent the passage of electric current while permitting the passage of heat. The thermostat itself is preferably of electrical conducting material, so as to form a conductor beteween the contact 22 and the conductor 24, although equivalent means be employed.

The conductors 21 and 27 are preferably spring pressed as shown, and are received in sockets 30 and 31 respectively, which are secured to brackets 32 and 33 pivoted upon a sliding block 34 and having meshing teeth 35 upon their segment shaped faces 36. The block 34 may be slidably adjusted as by means of an adjusting screw 37 which is held against longitudinal movement by a boss 38, and is threaded into the block 34 as shown. The brackets 32 and 33 may be rotatably adjusted as by means of an adjusting screw 39 which is pivoted to an ear 40 on the block and engages a nut 41 swivelled upon the bracket 33. By this arrangement, the contacts 21 and 27 may be adjusted in unison with respect to the contact 22, and they may also be adjusted with respect to each other, in order to vary the range of temperature within which the thermostat will act.

In operation, the parts normally occupy the positions shown in the drawing. Assuming that the plug is applied to an electric iron and the current is then turned on, it will be seen that current will pass through the conductor 7, contact 9, member 13, conductor 19, sockets 6, between which is dis-

posed the heating device, and conductor 8. As the heat of the device increases, this heat will be transmitted through the plugs of the device to the sockets 6 and thence to the thermostat 23. This heat will cause the thermostat to flex to the right as viewed in the drawing, and will thus cause engagement of the contacts 22 and 21, the contact 21 yielding to avoid injury to the thermostat. The engagement of these contacts will cause the closing of one of the branch circuits of the solenoid and current will flow through the conductor 20, contacts 21 and 22, thermostat 23, conductor 24 and the solenoid 17. The armature 16 of the solenoid will then actuate the member 13 to disengage it from the contacts 9 and 11, thus breaking the heating circuit and closing at this point the other branch of the solenoid circuit, by causing the member 13 to engage the contacts 10 and 12.

The solenoid will be energized for only a moment as the breaking of the heat circuit also breaks the branch of the solenoid circuit which has caused the above operation. The spring 18 will then force the armature back to the position shown in the drawing, the pawl 15 riding over the tooth of the ratchet 14. As the thermostat now cools, the contact 22 may finally engage the contact 27 and thus complete the other branch of the solenoid circuit, the current now passing through the conductor 7, contact 10, member 13, contact 12, conductor 26, contacts 27 and 22, thermostat 23, conductor 24 and solenoid 17. Another quarter turn of the member 13 will be caused, to return the parts to the position shown in the drawing, except that the member 13 will be turned end for end to the position from which it started.

From the above, it will be seen that I have provided a plug which may be readily applied to existing flat irons or other heating devices, without the necessity of making any change in the device itself.

The opening and closing of the various circuits is a positive one, and the thermostat is used merely to cause the opening and closing of the heating circuit. The heating current does not pass through the thermostat except momentarily, thereby greatly increasing the life of the thermostat and the contacts associated therewith. The contacts 21 and 27 may yield as the contact 22 engages therewith, thus preventing undue strain on the thermostat. By manipulation of the screw 37, the contacts 21 and 27 may be adjusted in unison without varying their relation with respect to each other, and the plug may thus be adjusted to function at the desired temperature. The contacts may then be adjusted with respect to each other, so as to vary the range of temperature within which the thermostat will act.

While I have shown a selected embodiment of my invention, I am aware that various changes in detail may be made, without departing from the spirit of the invention, and therefore I do not intend to limit myself except by the appended claims.

I claim:

1. A plug having means to connect it to a heating device, conductors passing through the plug and adapted to supply current to said device, a switch in one of said conductors within the plug, a solenoid adapted to operate said swtich, a pair of spaced contacts, a thermostat having a contact disposed between said spaced contacts, and responsive to the heat of said device, and means to operate said solenoid to actuate the switch upon engagement of said thermostat contact with either one of said spaced contacts.

2. A plug having means to connect it to a heating device, a circuit adapted to supply current to said device, a solenoid having a circuit to supply current thereto, a switch having two pairs of oppositely disposed contacts, one of said pairs being in one of said circuits and the other of said pairs being in the other of said circuits, a contact member adapted to be moved by said solenoid into engagement with the contacts in either of said pairs to close the circuit therethrough, and a thermostat adapted to operate said solenoid and controlled by the heat of said device.

3. A plug having means to connect it to a heating device, conductors passing through the plug and adapted to supply current to said device, a switch in one of said conductors within the plug, a solenoid adapted to operate said switch and having a circuit in parallel with said heating circuit but normally open, and a thermostat adapted to close said solenoid circuit and controlled by the heat of said device.

4. A plug having means to connect it to a heating device, conductors passing through the plug and adapted to supply current to said device, a solenoid having a circuit with two branches in parallel with said heating circuit, a switch operated by said solenoid and adapted in one position to close one of said conductors and one of said branches and to open the other of said branches and in another position to close said other of said branches and to open said conductor and said first branch, and a thermostat adapted to close either one of said branches to operate the solenoid, said thermostat being controlled by the heat of said device.

5. A plug comprising sockets adapted to receive plugs on a heating device and spaced apart, a thermostatic element disposed between said sockets and having a contact supported thereon, heat conducting members supporting said thermostatic element and in thermal contact with both the element and the sockets, means electrically insulating the

thermostatic element from the supporting members, conductors passing through the plug and adapted to supply current to said sockets, a switch in one of said conductors, and means controlled by said thermostatic element to operate said switch.

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