Oct. 25, 1927. 1,646,835

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AUTOMATIC CUT-OUT FOR HEATING CIRCUITS

Original Filed Dec. 4, 1924

Fig. 1

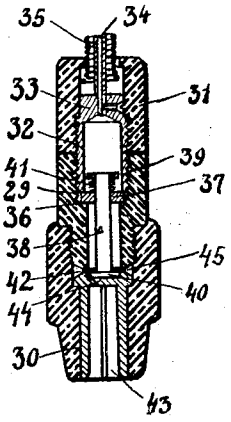
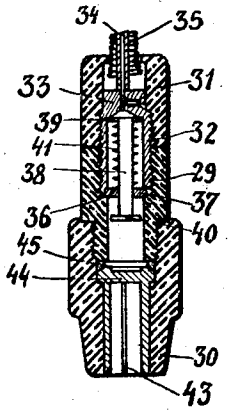


Fig. 2



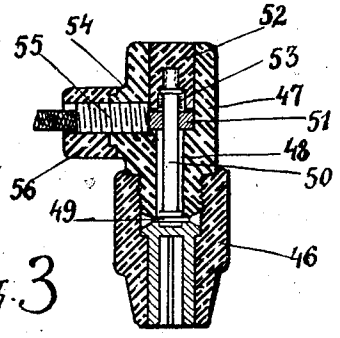


Fig. 3

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Patented Oct. 25, 1927. 1,646,835

UNITED STATES PATENT OFFICE.

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AUTOMATIC CUT-OUT FOR HEATING CIRCUITS.

Original application filed December 4, 1924, Serial No. 753,320, and in Germany December 31, 1923. Divided and this application filed April 1, 1926. Serial No. 99,173.

It has already frequently been attempted to construct socket devices for heating apparatus such as flat-irons, cooking apparatus, etc., which socket devices contain an automatic cut-out which cuts off the current when the heating apparatus reaches a temperature which is too high and is dangerous for itself and its surroundings. These known socket devices with automatic cut-outs for protection against overheating all suffer from two disadvantages, viz, that they necessitate making the socket device of considerable magnitude and of very different size from that of the usual socket devices and that the transmission of heat from the heating apparatus to the automatic switch is very deficient and very slow inasmuch as this transmission only takes place through the electrical conducting wire which naturally is only of small cross-section.

The subject of the present invention is a socket device for heating apparatus with an automatic cut-out for protection against overheating in which the above-mentioned disadvantages are avoided inasmuch as the size of the socket device is hardly greater than the normal size of a standard socket device and inasmuch as the heat transmission takes place over a metallic cross-section which is not restricted to the diameter of the conducting wire.

These results are obtained by forming the socket which is to pass over the contact pin or plug into a cup at the end which lies within the socket, on which cup the fusible disc is pressed by means of an insulating member which forms a part of the socket device, whereby the fusible disc retains in electrically and thermally conductive contact a rod carrying the current to the socket against the influence of a spring which acts on the rod, so that the fusible disc receives heat over its whole surface.

The drawing shows by way of example two constructional forms of the invention.

Figs. 1 and 2 show the first constructional form in axial section in the "in" and "out" positions respectively.

Fig. 3 shows the second constructional form in axial section.

A case or housing consists of an enclosing member made in three parts and constructed of insulating material. The middle part of the said case forms a holder 29, to which at the one end the socket connecting member 30 and at the other end a closing cap 31 are screwed by means of a metal tube 32, which tube 32 is arranged in the axial hole of the holder 29. The upper end part of the tube 32 is adapted to form the terminal 33 for the conductor 34 which passes through the cap 31 and is protected by being constructed in the form of a cable. In the hole of the holder 29 a metal ring member 37 is fixed, which ring member rests on a ledge 36. The ring member 37 is provided with a rod 38 which maintains good connection for the electric current and has a head 39 and 40 respectively at each of its two ends. A helical spring 41 is arranged around the rod 38 between the disc 37 and the head 39, whereby a fusible disc 42 fixed at the lower end of the rod 38 is pressed by the head 40 against the lower end surface of the holder 29. A longitudinally slotted socket 43 with a contact plate 44 is inserted in the socket connecting member 30, the said slotted socket 43 being so dimensioned that when the device is screwed up the plate 44 presses against the under surface of the fusible disc 42 and the head 40 rests in a hollow in the contact plate 44. By tightly screwing the parts 29 and 30 together a good electrically and thermally conductive connection is obtained, whilst when the fusible disc is melted, the melted mass is enabled to penetrate into an open space provided between the contact plate 44 and the end surface of the holder 29.

The fusible disc is adjusted to a definite temperature independently of the electric current passing through it.

The interruption of the circuit results from the melting of the fusible disc 42 through the agency of the rod 38 (Figs. 1 and 2) which springs back in the hole in the holder 29 under the influence of the spring 41. If it be desired to insert a new fusible disc the closing cap 31 with the tube 32 on the one side and the socket connecting member 30 on the other side are first unscrewed from the holder 29 and the melted mass is removed from the contact plate 44. The rod 38 is then pressed forward, a new fusible disc 42 is placed on the same and the whole device is screwed together again.

Fig. 3 also shows a socket device for flat-irons, in which device a holder 47 is screwed on to the socket connecting member 46. In the axially bored hole 48 of the holder 47 a rod 50 provided with a fusible member 49

is arranged. The said rod is arranged in a centrally bored metal disc 51 which, for example, may be pressed into a widened portion of the hole in the holder. An insulation head 52 is screwed on to the rod 50. A helical spring 53 arranged on the rod 50 presses against the head 52 and is adapted to effect the movement of the rod when the fusible material is melted. When this occurs the head 52 projects out of the holder 47 and thus indicates the destruction of the fusible material. In order to render the indication more noticeable the said head 52 may be of a different colour from the holder 47. The holder is provided with a side arm or projection 54. A terminal 55 which presses against the disc and is thus in conductive contact with it is provided and an insulating protecting cover 56 is screwed over the said terminal 55.

The rod 50 may be arranged on a continuation of the terminal 55, said continuation projecting into the hole 48. It is also intended that this cut-out may be constructed in a double pole type, in which case usually only the one pole would be protected against excess temperature as the fuse member is not dependent on or adjusted to the current strength.

I claim:

1. Socket device for heating or heat developing apparatus with automatic switch for protection against overheating, in combination with a socket, the interior of which is formed into a cup at the opposite end to that which passes over a contact-pin or plug, a fusible disc pressed by means of an insulating member which forms part of the socket device on said cup, the lower end of the insulating member and the rim of the cup being bevelled off in such a way that a chamber running circularly round the exterior edge of the fusible disc is formed into which the melted matter flows when the fuse blows, a rod carrying the current to said socket, a spring acting on said rod so as to lift the rod from the cup, a metal ring, on which ring the spring rests, the rod being arranged in an electrically conductive manner in said metal ring, the ring being held in its position for the proper guiding of the rod by means of a metal tube connected with the wire carrying the current, said fusible disc retaining the rod in electrically and thermally conductive contact with the socket and receiving heat over its whole under surface.

2. Socket device for heating or heat developing apparatus with automatic switch for protection against overheating, in combination a housing consisting of an enclosing member made in three parts and constructed of insulating material, the middle part of said housing forming a holder to which at the one end a socket-connecting-member and at the other end a closing cap are screwed, the latter by means of a metal tube, said tube being arranged in the axial hole of the holder, the upper end part of the tube being adapted to form the terminal for a conductor passing through the cap, a metal ring member provided with a rod which maintains good connection for the electric current and having a head at each of its two ends, a helical spring arranged around the rod between the metal ring member and the one head of the rod, a fusible disc fixed at the lower end of the rod and being pressed by the head of the rod against the lower end surface of the holder, a longitudinally slotted socket with a contact plate inserted in the socket connecting member, the said slotted socket being so dimensioned that when the device is screwed up the plate of the longitudinally slotted socket presses against the under surface of the fusible disc and the head rests in a hollow in the contact plate of the longitudinally slotted socket, substantially as described.

In testimony whereof I have signed my name to this specification.

OTTO PLETSCHER, JUN.