Dec. 15, 1925. 1,565,499

T. A. REID

SAFETY SWITCH FOR ELECTRIC IRONS.

Filed Dec. 7, 1921

Fig. 1.

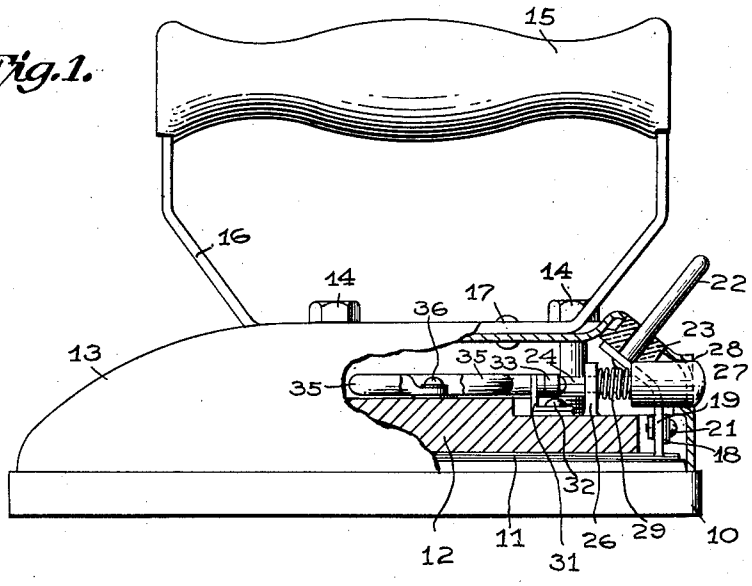
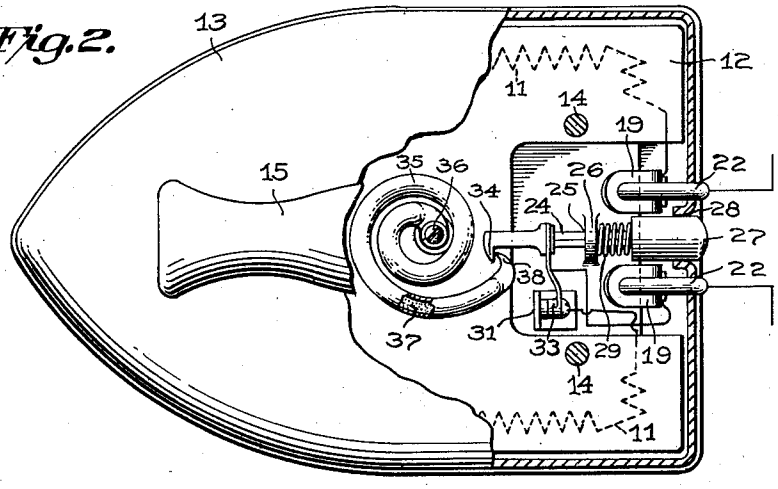


Fig. 2.



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UNITED STATES PATENT OFFICE.

THOMAS A. REID, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

SAFETY SWITCH FOR ELECTRIC IRONS.

Application filed December 7, 1921. Serial No. 520,605.

To all whom it may concern:

Be it known that I, THOMAS A. REID, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Safety Switches for Electric Irons, of which the following is a specification.

My invention relates to electrically heated apparatus and particularly to electrically heated flat irons, and it has for its object to provide a relatively simple, inexpensive, and easily manufactured temperature-limiting device for an electrically heated flat iron.

It is highly desirable to provide an electrically heated flat iron with means for interrupting the circuit through the heating element of the iron in case the iron is left unattended with current traversing the heating element, in order to prevent undue rise of temperature and the resultant possibility of causing a fire.

My invention embodies a closed tubular member of substantially spiral form secured to the body portion of the iron and operating as a locking means for a manually closable switch also mounted on the body portion of the iron. The tubular member is filled with a material which fuses at a predetermined temperature, causing a movement of the free end of the tubular member whereby the switch is released and moved to its open position by a spring member. The switch is manually closable from the outside of the iron, the handle of the switch serving to indicate whether the switch is in its open or in its closed position.

In the single sheet of drawings,

Figure 1 is a view, in side elevation, of an electrically heated iron comprising the device embodying my invention, certain portions being cut away and others being shown in longitudinal section;

Fig. 2 is a top plan view of an electric iron, portions being cut away to show the switch mechanism.

An electric iron comprises a bottom plate 10, an electric heating element 11 and a top plate 12, the three members constituting what may be termed the body portion of the iron. A cover member 13 is held in operative engagement with the body portion of the iron by a plurality of bolts 14. A handle member 15 is provided with a handle strap 16 of substantially U-shape, the intermediate portion of which is secured against the cover member by one of the bolts 14 and by a rivet 17.

The heating element 11 may be of any desired type of construction usually employed in the art and is, therefore, not further described in detail. The ends of the resistor of the heating element are provided with terminal members 18 which are suitably secured against the lower end of terminal strap members 19 by means of screws 21. The terminal straps 19 are of substantially L-shape and are provided, at their upper ends, with contact-terminal studs 22 suitably secured thereagainst. The studs 22 project through a suitable opening at the rear of the cover member 13, an insulating member 23 being provided to maintain the studs 22 and the terminal straps 19 in proper operative positions relatively to each other and to the cover member.

A switch mechanism for closing and for interrupting the circuit through the resistor of the heating element comprises a rod 24 extending longitudinally of the iron and moving in an opening 25 in a lug 26 provided on, or secured to, the top member 12 near the rear end thereof. A push rod 27 is securely mounted on the outer end of the rod 24 and extends through an opening 28 in the rear of the cover member to permit of the operator pressing thereagainst to close the switch. A coil spring 29 is located on the rod 24 between the upstanding lug 26 and the push rod 27 and is effective to resiliently bias the switch to its open position with a greater portion of the length of the push rod 27 projecting through the opening 28. The switch proper comprises a substantially stationary contact member 31 which is mounted on, but insulated from, the top plate, by means of a bolt 32, and a relatively movable contact 33 which is mounted on the rod 24. The inner end of the rod 24 is provided with a hook 34 for a purpose to be hereinafter set forth in detail.

A locking means, under the thermal control of the iron, comprises a closed tube 35 of substantially spiral form, the end of which is secured against the top plate 12 by means of a bolt 36. The tube 35 is filled with a suitable material 37 such as lead or antimony, lead alloy, or fusible salts, such

as potassium chlorate, and by its subsequent expansion causes the tube to partly uncoil. The free end of the tube is formed into a hook 38 which is located in the path of travel of the hook 34 on the rod of the switch as long as the temperature of the body portion of the iron is below a predetermined value. In case the temperature of the body portion of the iron exceeds a predetermined value the material within the tube fuses and expands, thereby causing the hook 38 of the coil to move away from the hook 34 of the switch rod, thus permitting the coil spring 29 to quickly interrupt the circuit through the heating element of the iron.

The mechanism is effective to permit the operator to close the switch but is ineffective to retain the switch in its closed position when the temperature exceeds said predetermined value, and the temperature must drop materially below the predetermined value before the mechanism is again effective to lock the switch in its closed position. The tube hereinbefore described as constituting the thermally controlled locking member is, in general, the same as the ordinary Bourdon tube but is filled with a material which expands upon fusion at a temperature which coincides substantially with the temperature to which it is desired to limit the body portion of the iron.

The device embodying my invention thus provides a relatively simple, inexpensive temperature-limiting and circuit interrupting device for an electrically heated iron in which is incorporated means for indicating whether the switch is in its open or its closed position.

I claim as my invention:—

1. A temperature-limiting means for an electrically heated device comprising a switch mounted on the body portion of said heated device, means manually actuated from the outside of a cover member of said heated device for moving said switch to its closed position, and thermally controlled means, comprising a closed tube filled with a fusible material and having one end rigidly mounted on the body portion of said heated device, for holding said switch in its closed position and for permitting said switch to open upon the occurrence of a predetermined tempeature in the body portion.

2. A temperature-limiting means for an electrically heated device comprising a switch mounted on the body portion of said heated device and spring-biased to its open position, means manually actuated from the outside of a cover member of said heated device for moving said switch to its closed position, a sealed tubular member, of spiral-coil form, for normally holding said switch in its closed position, and material in said tube fusible at a predetermined temperature and effective thereby to cause a turning movement of said tube to release said switch.

3. A temperature-limiting means for an electrically heated device comprising a switch mounted on a body portion of said heated device and spring-biased to its open position, means manually actuated from the outside of a cover of said heated device for moving said switch to its closed position, a sealed tubular member, of spiral-coil form, having one end rigidly secured to the body portion and having its entire length in heat-receiving relation thereto, for normally holding said switch in its closed position, and means in said tubular member that fuses at a predetermined temperature and causes a turning movement of said tubular member whereby said switch is released.

4. A temperature-limiting means for an electrically heated device comprising a switch mounted on a body portion of said heated device, resilient means for biasing said switch to its open position, means manually actuated from the outside of a cover member of said device for moving said switch to its closed position, and resilient means mounted on the body portion for normally holding said switch in its closed position, said means comprising a sealed tube of spiral form, and a material in said tube fusible at a predetermined temperature and operative thereby to cause said tube to release said switch.

5. A temperature limiting means for an electrically heated device comprising a switch spring-biased to its open position, means manually actuated from the outside of a cover member of the heated device for moving said switch to its closed position, and means comprising a sealed tube and a fusible material therein, under the thermal control of the body portion of said device, for normally locking said switch in its closed position and for permitting said switch to open upon the occurrence of a predetermined temperature in the body portion.

In testimony whereof, I have hereunto subscribed my name this 25th day of November, 1921.

THOMAS A. REID.