Nov. 21, 1950 R. A. DOAK 2,531,115

TEMPERATURE SENSITIVE CIRCUIT BREAKER

Filed Dec. 29, 1949

Fig. 1.

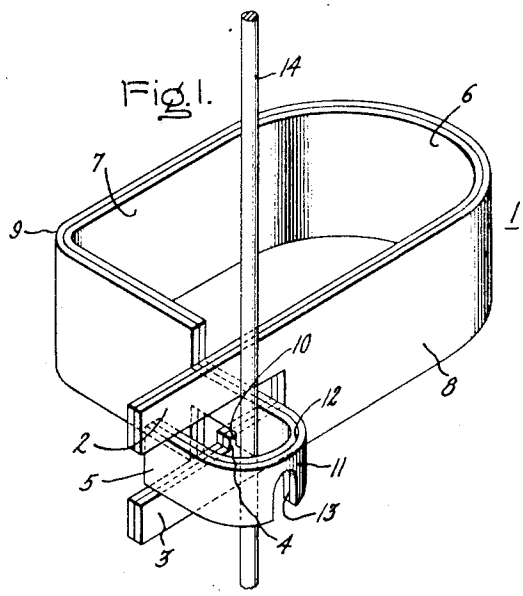
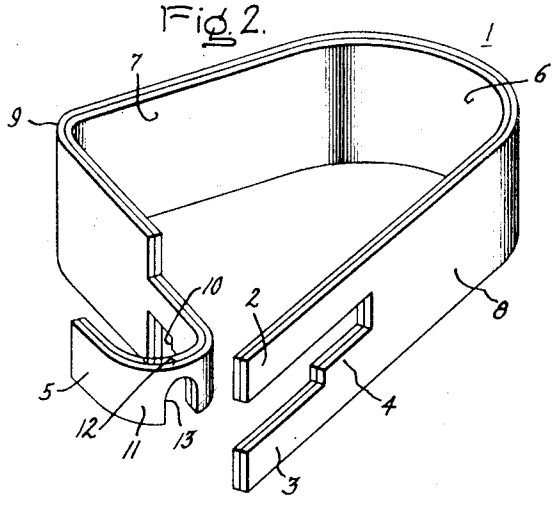


Fig. 2.



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TEMPERATURE SENSITIVE CIRCUIT BREAKER

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3 Claims. (Cl. 200—138)

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My invention relates to circuit protectors and more particularly to a circuit breaker responsive to increase of temperature to disconnect a circuit when temperature reaches a predetermined value.

An object of my invention is to provide a simple, inexpensive and dependable device for disconnecting an overheating circuit.

Another object of my invention is to provide a circuit breaker sensitive to temperature increase to disconnect a circuit when temperature reaches a predetermined value.

The coils of fluorescent lamp ballasts are provided with a large number of turns and are designed to operate within a safe temperature range. Frequently, a number of the turns of the coil become short-circuited, and when this occurs the current induced in the shorted turns causes the ballast to overheat dangerously. The softening of the insulation resulting from the high heat generated creates an additional fire and explosion hazard.

This condition is not readily recognizable since the lamps often continue to shed a satisfactory light despite short-circuited turns. Also the lamps are generally located too high for the excess heat to be felt by persons in the room so that a safety device is necessary to disconnect the ballast coils when the temperature of the coils reaches a predetermined value.

According to my invention, a flat bimetallic strip is provided with a bifurcated end and an axial tongue end. The strip is bent intermediately in a U having diverging straight members and is also bent adjacent the tongue end in a sharp 90 degree bend. The space between the tines of the bifurcated end is made equal to the width of the tongue so that when the spring is compressed the tongue projects between the tines. One side of the tongue is provided with a shoulder which engages a rectangular projection extending part way along the side of the corresponding tine to retain the tongue between the tines. The tongue is bent into a reverse U-bend to provide with the tines an external loop to enclose a wire.

For a better understanding of my invention, reference is made to the accompanying drawing of one embodiment of my invention in which Fig. 1 portrays the device in cocked position around a wire; Fig. 2 shows the device in the sprung position.

According to the drawing, a bimetallic strip 1 is provided at one end with tines 2 and 3 and a rectangular detent 4 projecting from the side

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of tine 3. A tongue 5 is provided at the opposite end of strip 1 equal in width to the spacing between tines 2 and 3. Strip 1 is formed into a spring device having an intermediate U-bend 6 with straight sides 7 and 8 and a 90 degree bend 9 adjacent tongue 5. The side of tongue 5 adjacent detent 4 is provided with a rectangular indentation forming a shoulder 10. Tongue 5 is oppositely bent to form a U-bend 11 having an upper edge 12. The lower edge of U-bend 11 is provided with a notch 13.

To cock the device, tongue 5 is positioned around a wire 14 which may be the lead wire to the ballast coil (not shown) of a lighting fixture. Tines 2 and 3 are forced around tongue 5 with shoulder 10 caught on detent 4 stowing energy in the spring device. Wire 14 is enclosed in an external loop formed by U-bend 11 and tines 2 and 3.

The device is positioned within an enclosure adjacent the ballast so that when the ballast overheats and the temperature of strip 1 increases due to the increase of ambient temperature within the enclosure, strip 1 tends to deflect due to action of the bimetal. Shoulder 10 gradually moves along detent 4 until at a predetermined temperature shoulder 10 clears detent 4 and strip 1 snaps to the spring position of Fig. 2 due to the energy stored into the spring device.

As tongue 5 passes between tines 2 and 3, wire 14 is sheared between edge 12 and the adjacent edge of tine 2, breaking the connection to the ballast coil. At the same time wire 14 is bent by the adjacent edge of tine 3 into relief notch 13 spacing the cut ends of wire 14 so that they will not be rejoined by subsequent vibration and so that the force of the spring is concentrated at but one pair of shearing edges.

While certain specific embodiments have been shown and described, it will, of course, be understood that various modifications may be made without departing from the invention. The appended claims are, therefore, intended to cover any such modifications within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A temperature sensitive circuit breaker for shearing a wire in response to increase in temperature above a predetermined value comprising a bimetallic strip having a bifurcated end and a tongue end, the width of said tongue end being substantially equal to the spacing of the tines of said bifurcated end, said tongue end being provided with a shoulder and said bifurcated end be-

ing provided with a detent, said tongue being bent into a U-bend and said strip being oppositely bent to form a loop with said shoulder engaging said detent and with said tongue projecting between said tines to form an external loop therewith so that said strip distorts in response to increase in temperature above said predetermined value to snap said tongue from between said tines and where said outside loop encloses said wire said wire is severed between adjacent edges of said tongue and one of said tines.

2. A temperature sensitive circuit breaker for shearing the supply wire of a circuit in response to increase in ambient temperature to a predetermined value comprising a bimetallic strip having a bifurcated end and a tongue end, the width of said tongue end being substantially equal to the spacing of the tines of said bifurcated end, a shoulder formed upon said tongue end and a detent formed upon said bifurcated end, said strip being curved and having the ends thereof spaced apart, said tongue end being oppositely bent into a U-curve and provided with a slot, so that when said tongue is forced between said tines with said shoulder engaging said detent to form an outside loop between said U-curve and said tines, said bimetal strip responds to increase in ambient temperature to disengage said shoulder from said detent and to snap said tongue from between said tines and when said wire is enclosed in said outside loop the passage of said tongue between said tines severs said wire between adjacent edges of said tongue and one of said tines and the other tine bends said wire into said notch to space the cut ends of said wire.

3. A temperature sensitive circuit breaker for shearing the supply wire of a circuit in response to increase in temperature above a predetermined value comprising a bimetallic strip having a bifurcated end and a tongue end, the width of said tongue end being substantially equal to the spacing of the tines of said bifurcated end, said strip being bent into a curve and having the ends thereof spaced apart, said tongue being provided with a reverse U-bend having substantially equal straight members, a rectangular detent projecting from the base end along the inside of one of said tines, the edge of said tongue end adjacent said detent being provided with a shoulder and being provided with a notch at said U-bend, so that when said tongue is forced into position between said tines with said shoulder engaging said detent to form an outside loop between said reverse U-bend and said tines said bimetal responds to increase in ambient temperature beyond said predetermined value to snap said tongue from between said tines, and when said wire is enclosed by said loop said wire is thereby severed between adjacent edges of said tongue and one of said tines and said wire is bent into said notch by the other of said tines to space the cut ends of said wire.

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No references cited.