

L. E. HODGES.
CIRCUIT BREAKER.

APPLICATION FILED SEPT. 19, 1911.

1,054,845.

Patented Mar. 4, 1913.

Fig. 1.

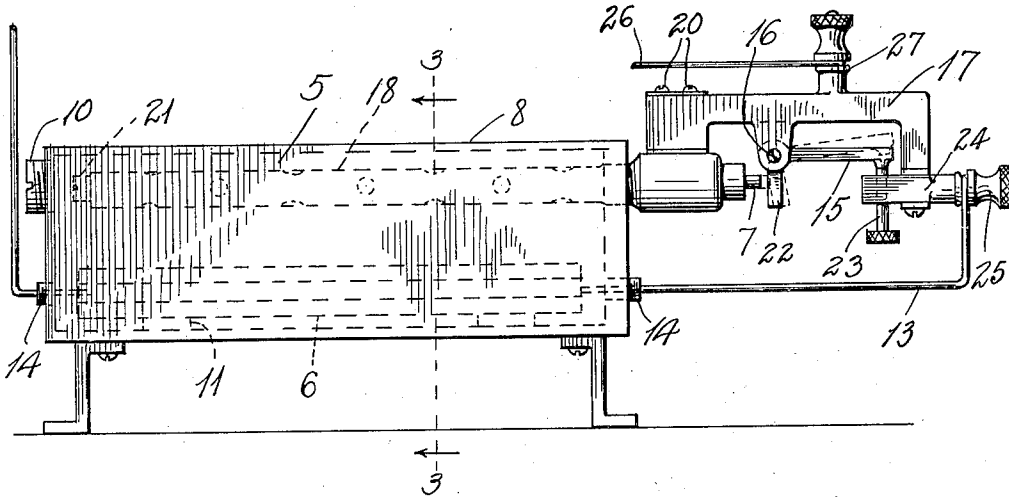


Fig. 2.

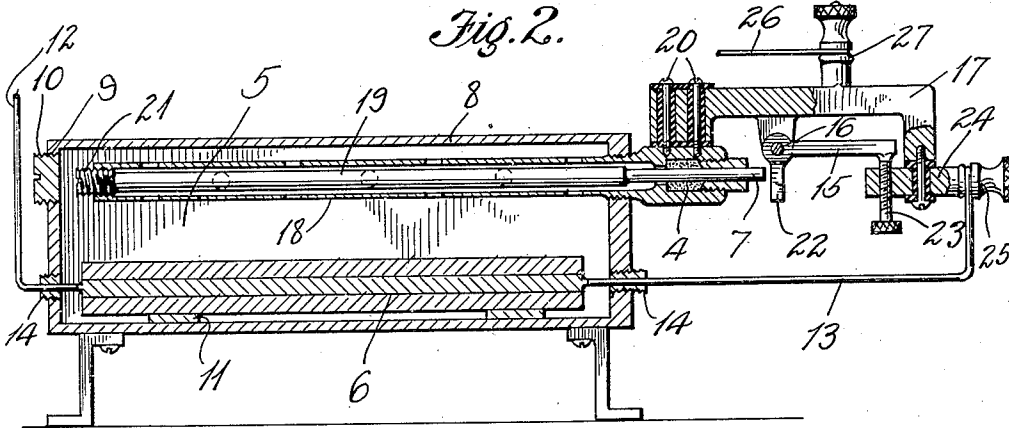
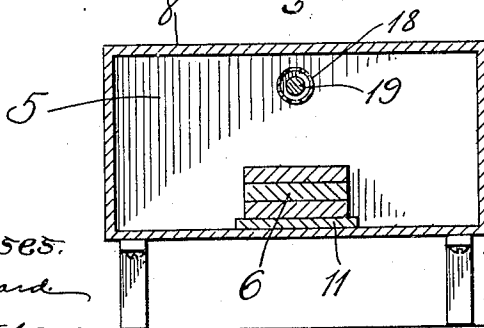


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

LLOYD E. HODGES, OF COVINA, CALIFORNIA.

CIRCUIT-BREAKER.

1,054,845.

Specification of Letters Patent.

Patented Mar. 4, 1913.

Application filed September 19, 1911. Serial No. 650,150.

To all whom it may concern:

Be it known that I, LLOYD E. HODGES, a citizen of Canada, residing at Covina, in the county of Los Angeles and State of California, have invented new and useful Improvements in Circuit-Breakers, of which the following is a specification.

This invention relates to improvements in thermostatically operated circuit breakers used in connection with vulcanizing devices, and it is an object of the invention to provide a means for vulcanizing certain articles in which water may be raised to a proper temperature to accomplish the vulcanizing operation and yet not be permitted to become too hot for obtaining the desired results.

It is also an object of the invention to provide a vulcanizing device which is electrically heated, the said device being also provided with a mechanism for automatically breaking the circuit when the temperature of the heating medium becomes greater than is desired.

It is also an object of the invention to provide a vulcanizing device which is electrically heated, the device being also provided with thermostatic means whereby the electrical current operating the heater will be broken when the temperature of the heating device reaches a certain degree.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation of the improved vulcanizing mechanism forming the subject matter of the present invention. Fig. 2 is a vertical central sectional view taken longitudinally through the mechanism, some parts being shown in elevation. Fig. 3 is a transverse vertical sectional view taken upon the line 3—3 of Fig. 1.

The details and features of the invention will now be more particularly described with reference to the drawing, in which—

5 indicates a receptacle to contain the heating medium employed.

6 indicates a resistance or other electrical heating device mounted within the receptacle 5, and 7 indicates a plunger or thrust rod which is automatically operated for controlling the current of electricity used, in raising the heating agent to the proper temperature.

The receptacle 5 is usually made in the form of a rectangular inclosure having a broad flat upper surface as 8 upon which the materials to be vulcanized may be placed.

The heating medium usually and preferably consists in water which is placed within the receptacle 5 being introduced through an opening 9 which is normally closed by a plug 10. The resistance device 6 is mounted within the receptacle 5 and is rested upon insulating blocks or supports 11 placed upon the bottom or floor of the receptacle. Conductors 12 and 13 connected with the resistance device project through the end walls of the receptacle 5 and are provided at these points with insulating bushings as 14. The electric current employed is adapted to be made or broken through an armature 15 pivoted at 16 upon the bracket 17 which is mounted upon the outer end of one member of the thermostat device. The said thermostat device comprises an outer perforated tube 18 and an inner rod 19, the said rod 19 carrying at one end the thrust rod or plunger 7. The tube 18 is enlarged at its outer end and a packing gland 4 is formed therein so as to make a tight joint along the movable plunger or thrust rod 7 and prevent the escape of water or steam. The bracket 17 is insulated from the said tube 18 and is secured thereto by means of screws 20 which are insulated from the said bracket as clearly shown in Fig. 2. The tube 18 is perforated at frequent intervals along its length within the receptacle 5 and is made of one kind of material as steel and preferably such as is not rapidly expanded by the action of heat. The inner member of the thermostat, namely the rod 19 is placed within the walls of the tube 18 so as not to touch the same and be free to expand under the action of heat, the said rod being formed of material which is acted upon quickly and to a considerable degree by heat so as to expand and elongate to force the plunger 7 outwardly and move the armature 15. The inner end of the said rod 19 is secured to a screw block 21 which is screwed into the end of the tube 18. The said rod 19 thus has a fixed support and bearing at its inner end. The said rod 19 may be made of aluminum or other material which expands under the action of heat much more rapidly than the steel of the tubing 18. The plunger 7 is arranged to strike a depending arm 22 formed upon the armature 15, so that when the said plunger is forced outwardly through the expansion of the rod 19, the armature will be rocked upon its pivot point for breaking the circuit.

The armature engages, for the purpose of

completing a circuit, a screw contact 23 which is carried by a block or bar 24 fastened to the outer end of the said bracket 17. The connection between the said block 5 or bar 24 and the bracket is thoroughly insulated to prevent short circuiting. The upper end of the said screw contact 23 is adapted to be engaged by the outer free end of the armature 15 when the temperature of 10 the vulcanizer has not been raised to too great an extent. The conductor 12 includes any suitable source of electrical energy as a battery or other means, and the said source is further connected with the vulcanizer by 15 means of a conductor 26 which is attached to a binding post 27 upon the bracket 17. When the parts are in their normal condition and the heat has not arisen to too great a degree within the receptacle 5, the 20 circuit is completed through the resistance materials of the heater 6, conductor 13 and binding post, block 24, carrying said binding post, contact screw 23, armature 15, bracket 17, conductors 26 and thence to the 25 source of energy employed from which the circuit is made through the conductor 12 back to the resistance material of the heater. When the temperature within the receptacle 5 attains a certain degree, the expansion of 30 the rod 19 will force the plunger 7 against the arm 22 of the armature 15 breaking the contact between the same and the securing contact 23. In this manner the heater is allowed to cool again until the normal tem- 35 perature for vulcanizing has been regained in the receptacle 5 when the said armature 15 will again complete the circuit through the heater.

In vulcanizing it is desirable to have a 40 steady, even temperature usually not of a very high degree for too high a temperature will produce a poor result. The mechanism above described will automatically maintain the temperature of the vulcanizing device at 45 an even heat which it is found accomplishes the vulcanizing operation to the best advantage. If it is desired to use a higher temperature at any time the rod 19 may be adjusted inwardly so that it will require a 50 greater quantity of heat than before, to elongate it sufficient to break an electric circuit. The adjustment of the rod is easily accomplished by removing the plug 10 from the receptacle and turning the plug 21 so 55 that its threads will move it inwardly or outwardly as desired for properly position-

ing the rod 19. It will also be understood that the same result may be attained by the adjustment of the screw contact 23 so that it requires a greater or less movement of the 60 plunger or thrust bar 7 to engage and lift the armature 15.

What I claim is:—

1. A thermostatically operated circuit breaker comprising a casing, a tube mounted 65 within the casing, one end projecting therefrom, a bracket mounted upon the projecting end of said tube and insulated therefrom, a contact carried by said bracket and insulated therefrom, electrical circuit con- 70 nections extending from said bracket and said contact in series with current supply means, a pivoted bell crank lever for making and breaking the circuit mounted on said bracket, and an expansible member extend- 75 ing into the casing having its outer end adapted to engage one end of the bell crank for operating the same in accordance with the heat conditions within the casing.

2. A thermostatically operated circuit 80 breaker, comprising a vulcanizer casing, of a perforated tube projecting into said casing for the greater portion of its length, one end thereof extending a short distance outside 85 the said casing, a bracket mounted on said tube but insulated therefrom a contact mounted on said bracket and insulated therefrom, conductors extending from the bracket and contact in series with and a 90 source of electrical energy, a bell crank lever pivoted on said bracket, and in electrical contact therewith, an expansible rod extending into said tube and having one end projecting beyond the outer end thereof and 95 adapted to engage said one arm of said bell crank, adjusting means carried by the inner end of the tube and adapted to form an adjustable abutment for said expansible rod, a packing surrounding the outer end of said 100 expansible rod for preventing leakage from the casing, the structure being such that the expansion and contraction of the rod will operate the pivoted bell crank to make or break the circuit.

In witness that I claim the foregoing I 105 have hereunto subscribed my name this 12th day of Sept., 1911.

LLOYD E. HODGES.

Witnesses:

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