

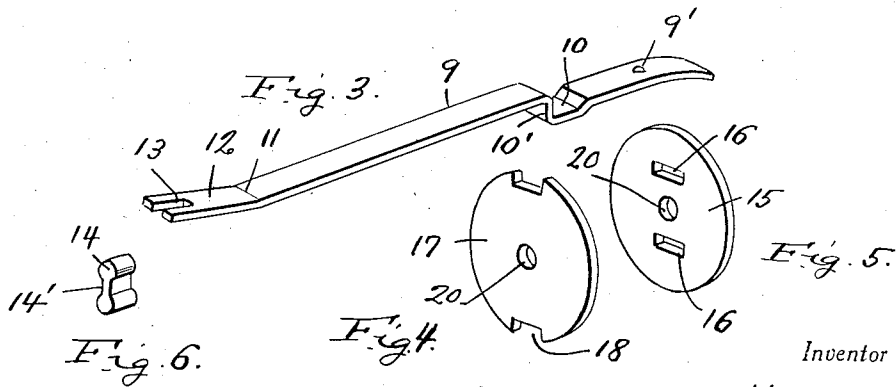
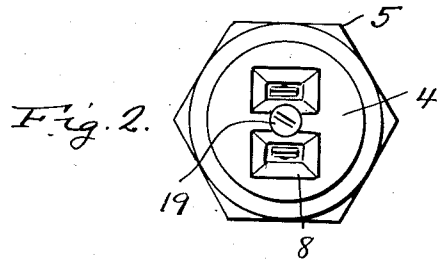
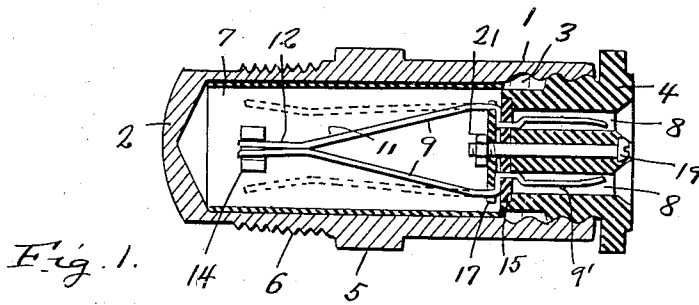
March 7, 1939.

G. W. HUNTLEY

2,149,773

SAFETY PLUG

Filed Oct. 25, 1937



Inventor

George W. Huntley

By *Clarence A. O'Brien*
Hyman Berman

Attorneys

UNITED STATES PATENT OFFICE

2,149,773

SAFETY PLUG

George W. Huntley, Washington, D. C.

Application October 25, 1937, Serial No. 170,921

6 Claims. (Cl. 200—142)

This invention relates to a safety plug for use in connection with boilers and where it is desired to break an electric circuit when a high temperature occurs, such as when the water level in a boiler becomes low and it is desired to break the circuit for an oil burner or to operate a signal or alarm to notify an attendant that the water level is low.

The general object of the invention is to provide a pair of contact members located in the circuit and tending to separate, with a fusible element for holding the members in contact so that when a high temperature occurs the fusible element will melt and thus permit the contact members to spring apart to break the circuit.

Another object of the invention is to so arrange the parts that any tendency of the flow of current through the two members to heat the parts and thus melt the fusible element, is overcome by having the point of contact of the members spaced from the points where they are engaged by the fusible element.

This invention is an improvement over that forming the subject matter of an application filed by me on August 3, 1932, Serial No. 627,355.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts to be hereinafter fully described, illustrated in the accompanying drawing and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawing wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a longitudinal sectional view through the invention.

Figure 2 is a view looking toward the inner end of the device.

Figure 3 is a view of one of the spring members.

Figure 4 is a view of the retaining washer.

Figure 5 is a view of the separator washer.

Figure 6 is a view of the fusible element.

In this drawing the numeral 1 indicates the tubular body of the device which is preferably formed of suitable metal and has one end closed as shown at 2 and the other end is open and formed with the internal threads 3 for receiving the threads of the plug 4 which is formed of non-conducting material such as "Bakelite". Intermediate the ends of the body 1 it is formed with a non-circular enlargement 5 which is adapted to be engaged by a wrench when the body is screwed into a threaded opening in the wall of a boiler or other member, the circuit of which is to be controlled by the device. The body is formed with the threaded portion 6 to engage the threads of such opening. A shell or lining 7 of fibre or other non-conductive material is placed in the body as shown.

The plug is provided with the usual slots 8 for receiving the prongs of a supply plug which is connected with the circuit wires and the ends of a pair of spring metal strips 9 extend into these slots 8 to be engaged by said prongs so that the strips 9 form part of the circuit. As shown in detail in Figure 3 each strip 9 is formed with an offset part 10 intermediate its ends which includes a substantially right angular part 10'. The outer portion of each strip curves slightly toward the center of the plug and a small indentation 9' is formed in this part, this form of the outer ends of the two members 9 with the indent 9' insures good electrical connection between the outer ends of the members 9 and the prongs of the plug when such prongs of the supply plug are placed in the openings 8 of the plug 4. The inner end of each member 9 is bent slightly outwardly on the line 11 so that the inner end parts 12 of the two members 9 slightly diverge from each other, when the members are in contacting relation, as shown in full lines in Figure 1 and attention is called to the fact that the point of contact between the members is at the parts 11 and that the ends 12 are slightly separated as also shown in Figure 1. These inner ends of the members 9 are notched as shown at 13 and the fusible element 14 shown in Figure 6 has rounded enlarged ends with the reduced part 14' connecting said ends together and this reduced part passes through the two notches 13 with the enlarged ends engaging the outer faces of the notched parts so as to hold the two members in the position shown in full lines in Figure 1. The spring nature of these members cause them to assume the dotted line positions shown in Figure 1 when not connected together by the fusible element 14.

A separator washer 15 is seated in a recess in the inner end of the plug 4 and has the slots 16 therein for the passage of the offset portions 10 of the two members 9 and the parts are so arranged that the right angle parts 10' will rest on this washer 15 and these parts 10' extend in opposite direction as shown in Figure 1. A retaining washer 17 has oppositely arranged notches 18 therein for receiving portions of the members 9 adjacent the parts 10' and this washer 17 rests on said parts 10'. A bolt 19 passes through the plug 4 and through a hole 20 in each washer and has a nut 21 at its inner end for holding the parts in position. Thus the parts 10' of the members 9 are clamped between the two washers as said washers retain the members 9 in position with their outer ends adapted to engage the prongs of a supply plug when the same is placed in the openings 8 of the plug 4 and with the inner portions of the members 9 separated, as shown in dotted lines in Figure 1, when the fusible element 14 is not in place. However, when the device is operated the fusible ele-

ment is put in place so as to hold the members 9 in the position shown in full lines in Figure 1. Then the current will enter through one of the members 9 and pass through the contacting parts 11 of the two members and pass out through the other member 9. However, if a high enough temperature should occur adjacent the device the fusible element 14 would melt so that the members 9 would spring apart to the dotted line position shown in Figure 1 and thus the circuit would be broken.

As before stated this circuit may control an oil burner or other heating means for a boiler or the like so that if the water level in the boiler should become dangerously low the device should break the circuit of the heating means of the boiler and thus prevent damage to the parts. This device could be also used to give an alarm and said device can be used wherever it is necessary or desirable to break a circuit when a high temperature occurs at a certain point.

As before stated by having those ends of the members 9 engaged by the fusible element separated and the parts spaced from such ends in contact, there is no danger of the passage of current from one member to the other injuring the fusible element.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts provided that such changes fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. In a device of the class described, a plug, a pair of spring contact strips supported by the plug in spaced relation and including integral offset portions adjacent the free ends thereof, and a fusible element connecting the free ends of said strips to bring the offset portions into engagement with each other to establish a direct electrical connection between said strips.

2. In a device of the class described, a plug, a pair of spring contact strips supported by the plug in spaced relation and including integral offset portions adjacent the free ends thereof, the free ends of said strips having notches therein, and a grooved fusible element received in the notches to bring the offset portions in direct contact with each other to form an electrical connection between said strips and permitting said free ends to remain in spaced relation.

3. In a device of the class described, a plug of non-conductive material, a pair of spring contact strips carried by the plug in spaced relation and having their major portions extending from one end of the plug, the free ends of said major portions being slightly bent away from each other by transverse bends which are located adjacent but spaced from said ends and a fusible member connected with the free ends and holding said ends slightly spaced apart with the two strips directly contacting each other at the points where the bends occur to establish a direct electrical connection between said strips, said fusible member holding the two strips under tension whereby said strips will spring apart when the member melts.

4. A device of the class described comprising a casing having one end closed and its other end open, a plug of non-conductive material removably fitting in the open end and having spaced slots therein, a pair of elongated spring strips having their outer ends located in the slots, a cover part at the inner end of the plug having slots therein through which portions of the strips pass, said strips having substantially right angular portions seated on the cover part and extending in opposite directions, a washer member of non-conductive material connected with the plug and holding the right angle portions against the cover part, the strips adjacent their inner ends being slightly bent outwardly to space their inner extremities apart when the bent portions are in contact with each other and a fusible element engaging the said extremities for holding the bent portions in contact.

5. A device of the class described comprising a casing having one end closed and its other end open, a plug of non-conductive material removably fitting in the open end and having spaced slots therein, a pair of elongated spring strips having their outer ends located in the slots, a cover part at the inner end of the plug having slots therein through which portions of the strips pass, said strips having substantially right angular portions seated on the cover part and extending in opposite directions, a washer member of non-conductive material connected with the plug and holding the right angle portions against the cover part, the strips adjacent their inner ends being slightly bent outwardly to space their inner extremities apart when the bent portions are in contact with each other and a fusible element engaging the said extremities for holding the bent portions in contact, said inner extremities of the strips having notches therein for receiving portions of the fusible element, the ends of said element being enlarged to engage outer face parts of the strips.

6. A protective device for boilers, said protective device comprising a cup adapted to be disposed through an opening in a wall of the boiler with the closed inner end portion thereof within the boiler and the open outer end portion thereof extending on the exterior of the boiler, a dielectric core mounted within said outer end portion, the major portion of said core being spaced from the interior of said cup and connected to said cup only at a point adjacent to the outer end of said outer end portion, said core being formed with two longitudinal bores extending there-through, a contact tongue disposed in each of said bores, a spring extension on the axially inward end of each tongue and projecting into the interior of the inner end portion of said cup, said spring extensions tending to move away from each other, and fusible means connecting said spring extensions in electrical engagement against the tension thereof, a bolt extending axially from the inward end of said core, dielectric plate means extending between and engaging portions of said spring extensions and said axially inward end of the core and traversed by said bolt, and a nut on said bolt clamping said dielectric plate means and holding said spring extensions in place.

GEORGE W. HUNTLEY.