

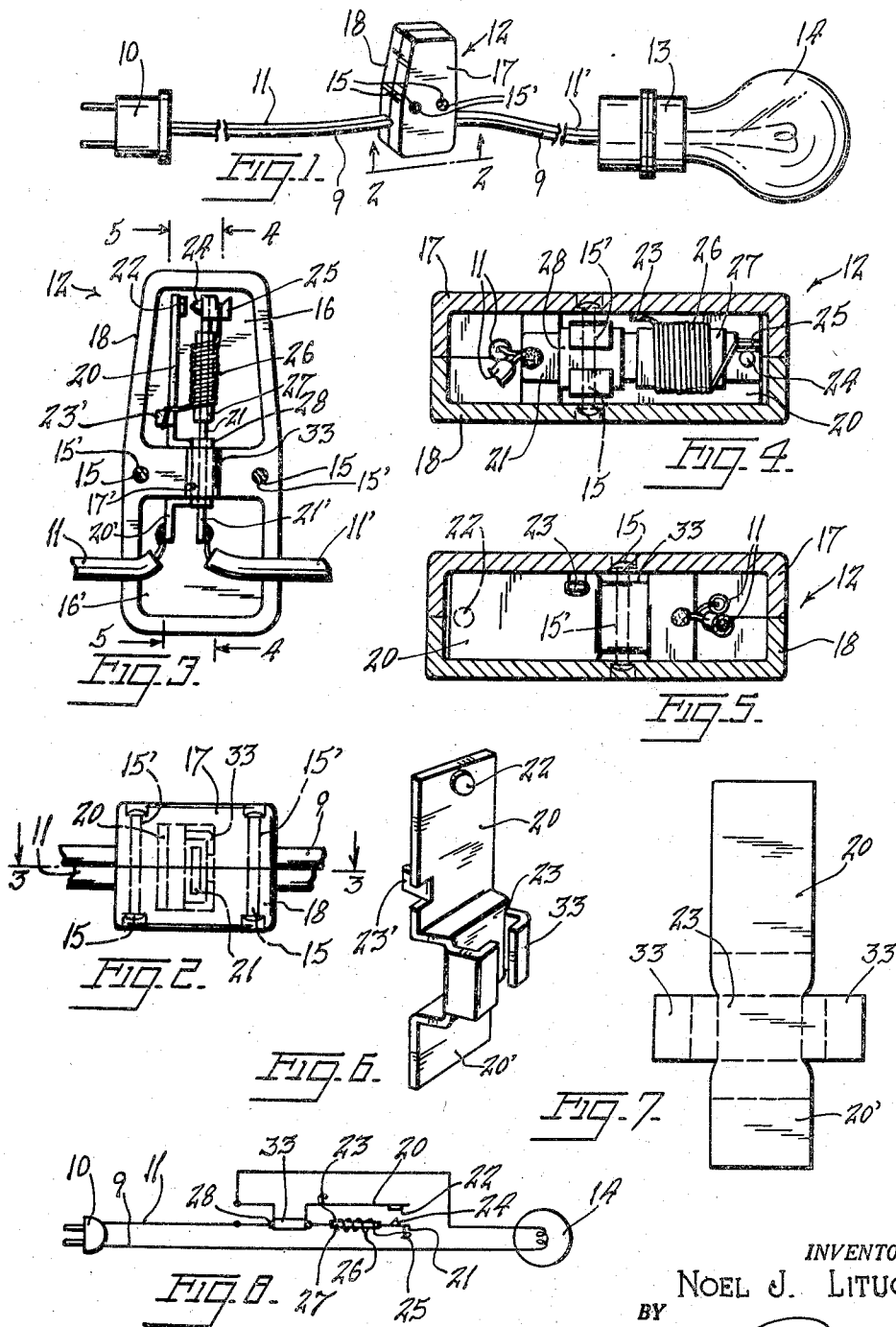
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N. J. LITUCHY
ELECTRIC LIGHT FLASHER

2,774,845

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2 Sheets-Sheet 1



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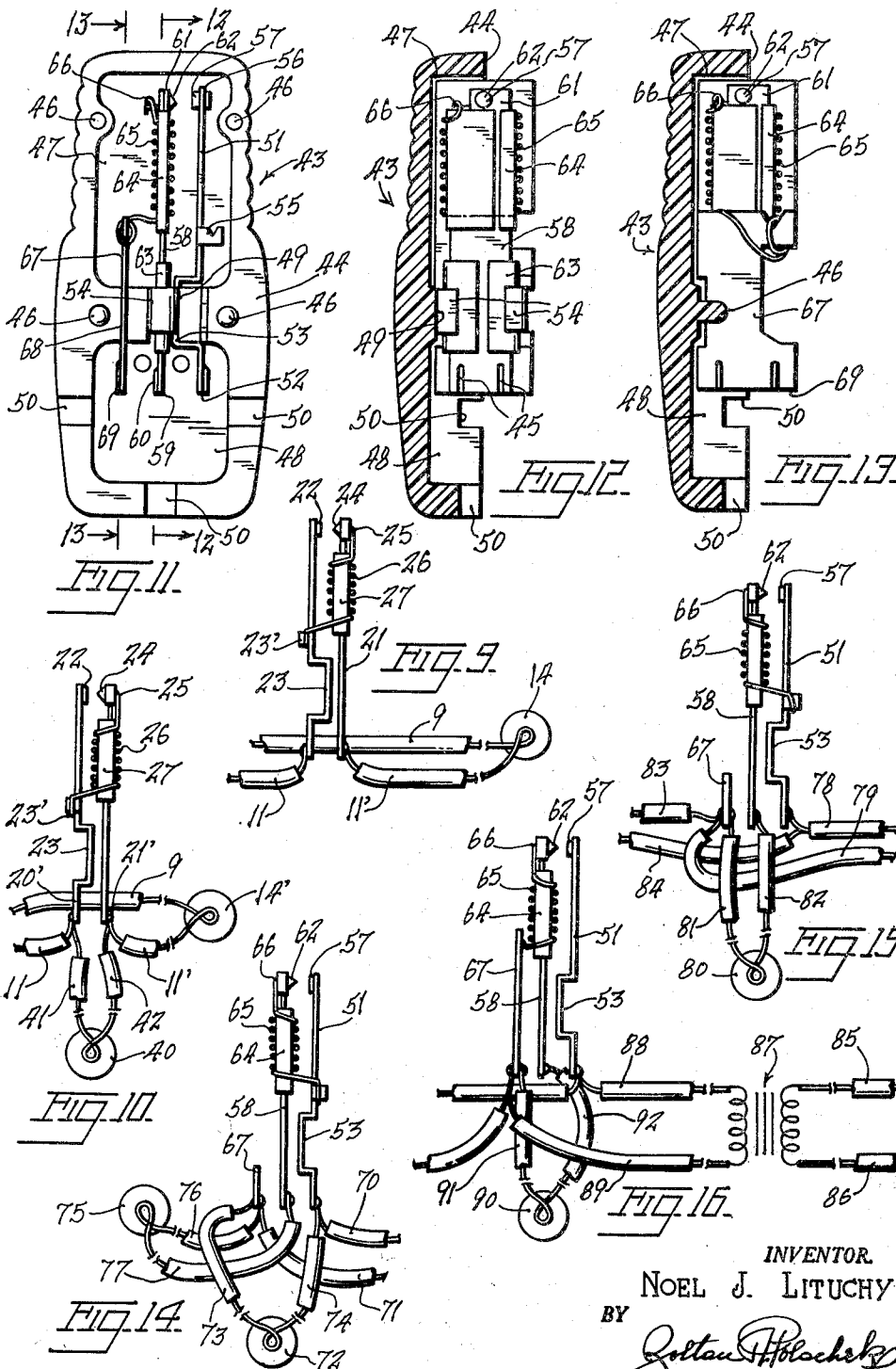
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ELECTRIC LIGHT FLASHER

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2 Sheets-Sheet 2



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ELECTRIC LIGHT FLASHER

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9 Claims. (Cl. 200—122)

This invention relates to new and useful improvements in electric circuit breakers which are adapted to be connected directly to a direct or alternating current source to provide for and control the periodic flashes of one or more electric lamps.

More particularly, the present invention proposes the construction of an improved electric light bulb flasher device which can be inserted in a light cord between a plug and the lamp or lamps for a blinking display of Christmas tree lights, twinkling star, or household or advertising lights.

As a further object, the present invention proposes forming the flasher device with a separable casing having a stationary conductor strip and a movable conductor strip, the movable conductor strip being bimetallic with a heating coil mounted around, spaced from and connected with it to move the movable strip toward and away from the stationary strip by the heating and cooling of the coil.

Still further, the present invention proposes constructing the flasher device so that it can be used to provide a blinking light and a constant light on the same string or cord of lights.

Another object of the invention proposes constructing the flasher device so that it can be arranged and formed for an open circuit arrangement, a closed circuit arrangement, an alternate arrangement and a combination open circuit flashing and constant light arrangement.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a perspective view of a lighting string with a flasher device constructed and arranged in accordance with the present invention.

Fig. 2 is an enlarged end view of the flasher device taken along line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 3.

Fig. 6 is an enlarged perspective view of the stationary conductor strip shown in Figs. 3, 4 and 5.

Fig. 7 is an enlarged plan view of the flat blank or piece of metal from which the strip shown in Fig. 6 is bent and formed.

Fig. 8 is a schematic wiring diagram of the structure shown in Fig. 1.

Fig. 9 is a diagrammatic view of the flasher mechanism and lamp shown in Fig. 1 without the casing, the circuit being an open series hookup normally open.

Fig. 10 is a view similar to Fig. 9 but showing an alternating hookup normally open with a low wattage lamp and a high wattage lamp.

Fig. 11 is a view similar to Fig. 3 but illustrating a modification of the invention.

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Fig. 12 is a sectional view taken on line 12—12 of Fig. 11.

Fig. 13 is a sectional view taken on line 13—13 of Fig. 11.

Fig. 14 is a view similar to Figs. 9 and 10 but showing the structure of Figs. 11, 12 and 13 in an open circuit series combination for a constant burning lamp and a flashing lamp.

Fig. 15 is a view similar to Fig. 14 showing an open circuit multiple hookup with one flashing light shown.

Fig. 16 is a view similar to Figs. 14 and 15 but showing a closed circuit low and high voltage hookup normally closed for random flashing of Christmas tree lamps or other size and type of lamps independently of each other.

The electric light bulb flasher device, in accordance with the first form of the invention illustrated in Figs. 1 to 9, inclusive, has a casing which is generally designated by the reference numeral 12.

Flasher device casing 12 is adapted to be mounted between electric wires 11 and 11' and over wire 9, these wires being connected at one end with a conventional plug 10 for insertion into an electric wall outlet receptacle or the like (not shown) to supply the required electric current. The other end of wire 9 and wire 11' is connected to a socket 13 in which a conventional lamp 14 is screwed. Lamp 14 may be a Christmas tree bulb or a conventional household or advertising display bulb.

The casing 12 is made of insulator material and has an upper half 17 and a lower half 18 which are detachable and which have two rivet or eyelet openings 15' for rivets 15, the rivets or eyelets 15 tightly clamping the casing halves together.

The casing halves each have two spaced chambers 16 and 16', one chamber being at one end and the other at the other end. Chambers 16 and 16' of the casing are connected by a chamber connecting opening 17'.

A stationary conductor strip 20 is mounted in the casing in the chambers 16 and 16' and between the casing halves 17 and 18, a part of the strip extending through the chamber connecting opening 17'. One end of the strip 20 is provided with a contact 22 located on one side. The other end of the strip 20 is a terminal end 20' adapted to secure the wire 11 thereto as by soldering. Conductor strip 20 also contains an offset portion 23 adjacent the terminal end 20' and an outwardly bent terminal ear 23' is provided on the strip between the contact 22 and offset portion 23.

A movable conductor strip 21 is also mounted in the casing alongside stationary strip 20 and spaced from it in chambers 16 and 16' and in the chamber connecting opening 17'. The movable conductor strip 21 is a bimetallic construction having a high expansion side and a low expansion side. That is, of the two thin strips of metal having different coefficients of expansion welded or riveted together to form strip 21, the more expansive metal is on the high expansion side and the less expansive metal is on the low expansion side so that when strip 21 bends as it expands, the more expansive metal is on the convex side away from the stationary conductor strip 20.

An insulated wrapper 28 encircles a portion of movable strip 21 electrically to isolate the strips 20 and 21. Wrapper 28 is preferably a piece of heavy paper or asbestos sheeting but may be made from any high dielectric material. The stationary conductor strip 20 has a pair of bent brackets 33 on each side of its offset portion 23 which clamp the wrapper 28 and hold the two strips 20 and 21 together, the brackets 33 and offset portion 23 of strip 20 fitting tightly but removably into the chamber connecting opening 17' to hold the strip 20 stationary in the casing and to hold the terminal end 21' of the movable strip 21 fixed in the casing so that only its free upper end containing a contact 24 can bend.

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The contact 24 on movable conductor strip 21 is adapted and disposed to be brought into registration with opposed contact 22 on stationary strip 20. A terminal 25 is also provided on the free end of the movable conductor strip 21 on the opposite side of the strip from the contact 24. The terminal end 21' of movable conductor strip 21 is adapted for fastening as by soldering one end of wire 11' thereto. Casing halves 17 and 18 are provided with inlet and exit wire openings for wires 11 and 11', respectively, and for wire 9 to extend through.

Another section of bimetallic strip 21 is covered with insulating material 27 and a heating coil 26 of the high resistance type is wound on top of insulating material 27 around the strip 21 in the chamber 16. One end of coil 26 is wrapped around the terminal 25 on movable bimetallic conductor strip 21 and the other end of coil 26 is secured to terminal 23' on the stationary conductor strip 20.

The stationary strip 20 preferably is made by a stamping from a single piece or blank, as shown in Fig. 7.

The operation of the flasher device can best be seen from the diagrams of Figs. 8 and 9 which show an open circuit series hookup which is normally open, the low expansive side of bimetallic strip 21 being disposed facing the stationary conductor strip 20. The high resistance heating coil 26 is wired in series with the low resistance lamp or bulb 14. The contacts 22 and 24 are normally out of registration. When the plug 10 is inserted in a wall receptacle, however, current flows in a circuit through wire 11, strip 20, terminal 23, coil 26, terminal 25, strip 21, wire 11', lamp 14 and wire 9 back to the plug 10. Coil 26 is thus energized, bimetallic strip 21 is heated and bends toward strip 20 thus bringing contacts 22 and 24 into registration. This short-circuits coil 26 permitting strip 21 to cool and bend away from strip 20 thus breaking the connection between contacts 22 and 24. The cycle is repeated indefinitely.

When contacts 22 and 24 are separated, due to the nature of high resistance coil 26, only a very small current flows through lamp 14 and the lamp will not light. However, when the contacts 22 and 24 are together coil 26 is short-circuited and sufficient current passes through the lamp 14 to light it. Thus as contacts 22 and 24 are alternately together and apart, lamp 14 is turned on and off.

The modification of the invention illustrated in Fig. 10 is characterized by the provision of a low wattage lamp 40 connected by wire 41 to the terminal 20' of stationary strip 20 and by wire 42 to the terminal 21' of movable bimetallic strip 21 for an alternating hookup which is normally open. Lamp 14' in Fig. 10 is a high wattage lamp.

The modification of the invention illustrated in Figs. 11, 12 and 13 is characterized by the provision of a casing 43 having two identical halves 44 (only one shown) with rivet openings 46 removably to hold them together and end chambers 47 and 48 connected by a central chamber connecting opening 49. The casing halves also have inlet and exit wire openings 50.

A stationary conductor strip 51 is mounted in the casing. Strip 51 has one end 52 disposed in chamber 48, an offset portion 53 with brackets 54 extending from the sides thereof, a terminal hook or ear 55, and an upper end 56 with a contact 57 fixed on one side thereof. Spaced raised spacers 45 are provided on the end 52 of strip 51 centrally to locate a connecting wire for soldering thereto.

A movable conductor strip 58 of bimetallic material having a high expansion side and a low expansion side is also mounted in the casing. The strip 58 has a fixed end 59 having a terminal 60 thereon disposed in chamber 48 and a free end 61 with a contact 62 on one side thereof opposed to contact 57 on the end 56 of strip 51. A portion of strip 58 is wrapped with an insulator wrapper 63 and the wrapper is secured by brackets 54 to the off-

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set portion 53 of strip 51. The brackets and offset portion 53 fit securely into the chamber connecting opening 49 to secure the strips in the casing.

Another portion of bimetallic strip 58 is also wrapped with insulating material 64 and a heating coil 65 is wound on top of insulator material 64 around the strip 58. One end of heating coil 65 is connected to a terminal 66 on strip 58 behind contact 62. The other end of the heating coil is connected to a third conductor strip 67 mounted in the casing and extending tightly through another chamber connecting opening 68. A wire terminal 69 is provided at one end of the third conductor strip 67 in chamber 48.

The provision of the two cavities 47 and 48 in Fig. 11, and cavities 16 and 16' in Fig. 3, permit the wires and terminals to be mechanically separated from the moving bimetallic strip 21 or 58, Figs. 3 and 11 respectively as well as strip 20, Fig. 3 and strip 51 in Fig. 11. This prevents the wires from interfering or disturbing the timing adjustment as well as any movement of the flashers. The bent ears 54 in Fig. 12 tightly hold the insulated metal strip 58 in place so that it cannot loosen, rotate slightly or slide back and forth, which insures consistent timing and better flasher operation.

Fig. 14 shows how the structure of Figs. 11, 12 and 13 may be arranged so that one end of heating coil 65 is connected to terminal 55 on stationary conductor strip 51 instead of to the third conductor strip 67. Wires 70 and 71 coming from a plug (not shown) are secured by solder to strips 52 and 67, respectively. A lamp 72 is connected by wires 73 and 74 to strips 67 and 52 respectively, to make lamp 72 a constantly lighted one. Another lamp 75 is connected by wires 76 and 77 to strips 67 and 59 to make this lamp a flashing or blinking one.

Fig. 15 shows how the same structure of Fig. 14 can be arranged and wired so as to provide an open circuit with a multiple hookup of flashing lights. Wires 78 and 79 lead from the power source and are connected with strips 52 and 67. A flashing lamp 80 is connected by lines 81 and 82 with strips 67 and 59 respectively. In addition, wires 83 and 84 lead from strips 67 and 52 for further lamps.

Fig. 16 illustrates how the structure of Figs. 14 and 15 may be altered and arranged to provide a closed circuit for low and high voltage, normally closed, which will produce random flashing of Christmas tree lamps independently of each other. Wires 85 and 86 lead from a 110 volt power source to a transformer 87 which transform the voltage to 6 volts. Wires 88 and 89 extend from the transformer 87. Wire 88 is connected with stationary conductor strip 52 and extends on from it. Wire 89 likewise is connected to strip terminal 69 and extends on from it. A lamp 90 is connected by wire 91 to the third conductor strip at 69 and by wire 92 to bimetallic strip 59. One end of coil 65 is connected to the third conductor strip 67 and the other end of the coil is connected with the movable conductor strip 58. The high expansion side of the bimetallic strip 58 is opposite the fixed conductor strip 51 and contacts 57 and 62 are normally closed.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. An electric light bulb flasher device for insertion in a light cord comprising a casing having cord inlet and exit openings, two spaced chambers and a chamber connecting opening, a stationary conductor strip mounted in the casing in the chambers and extending through the chamber connecting opening, a movable conductor strip mounted

said stationary conductor strip, said strips having opposed contacts at one end disposed for contacting one another and terminals at the other end, said movable conductor strip being of bimetallic material, a heating coil mounted adjacent the bimetallic movable conductor strip to heat said strip for movement thereof relative to said stationary strip, said heating coil having one end connected with the movable conductor strip, a third conductor strip mounted in the casing in the chambers and extending through another of the chamber connecting openings, said heating coil having another end connected with said third conductor strip, said bimetallic movable conductor strip having a high expansion side facing said stationary conductor strip, said stationary conductor strip having an offset portion with two brackets thereon, and an insulated wrapper around a portion of said movable conductor strip, said wrapper being held by said brackets, said stationary and movable conductor strips extending through the same chamber connecting opening in the casing.

8. An electric light bulb flasher device for insertion in a light cord comprising a casing having cord inlet and exit openings, two spaced chambers and a chamber connecting opening, a stationary conductor strip mounted in the casing in the chambers and extending through the chamber connecting opening, a movable conductor strip mounted in the casing in the chambers and extending through the chamber connecting opening and spaced from said stationary conductor strip, said strips having opposed contacts at one end disposed for contacting one another and terminals at the other end, said movable conductor strip being of bimetallic material, a heating coil mounted adjacent the bimetallic movable conductor strip to heat said strip for movement thereof relative to said stationary strip, said heating coil having one end connected with the movable conductor strip, a third conductor strip mounted in the casing in the chambers and extending through another of the chamber connecting openings, said heating coil having another end connected with said third conductor strip, said third conductor strip having a terminal at one end disposed in one of the chambers adjacent the terminals of the other strips, said strips each having a pair of raised spacers on the terminal ends thereof adapted to locate and hold thereon wires extending through said inlet and exit openings of the casing, said stationary conductor strip having an offset portion with two brackets thereon, and an insulated wrapper around a portion of said movable conductor strip, said wrapper being held by said brackets, said stationary and movable conductor

strips extending through the same chamber connecting opening in the casing.

9. An electric light bulb flasher device for insertion in a light cord comprising a casing having cord inlet and exit openings, two spaced chambers and a chamber connecting opening, a stationary conductor strip mounted in the casing in the chambers and extending through the chamber connecting opening, a movable conductor strip mounted in the casing in the chambers and extending through the chamber connecting opening and spaced from said stationary conductor strip, said strips having opposed contacts at one end disposed for contacting one another and terminals at the other end, said movable conductor strip being of bimetallic material, a heating coil mounted adjacent the bimetallic movable conductor strip to heat said strip for movement thereof relative to said stationary strip, said heating coil having one end connected with the movable conductor strip, and another end connected with the stationary strip, said bimetallic movable conductor strip having a low expansion side facing said stationary conductor strip, said stationary conductor strip having an offset portion with two brackets thereon, an insulated wrapper around a portion of said movable conductor strip, said wrapper being held by said brackets, said strips extending through the same chamber connecting opening in the casing, said stationary conductor strip having an outwardly bent ear adapted to secure one end of the heating coil thereto, said strips each having a pair of raised spacers on the terminal ends thereof adapted to locate and hold thereon wires extending through said inlet and exit openings of the casing, said casing being of insulated material and having two separable halves with rivet openings therein, and rivets for firmly connecting said halves.

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