

May 29, 1934.

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1,960,408

MEANS FOR PREVENTING RADIO INTERFERENCE FROM NEON SIGNS

Filed Oct. 4, 1933

Fig. 1

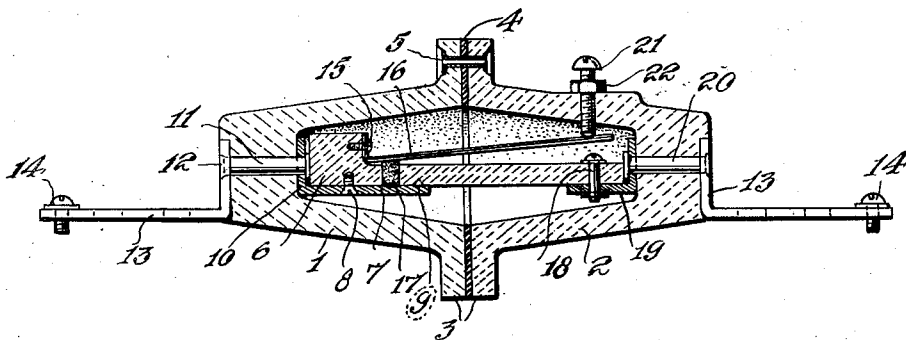


Fig. 2

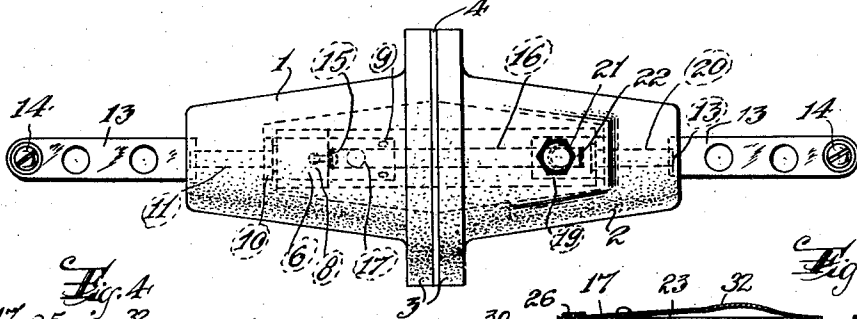
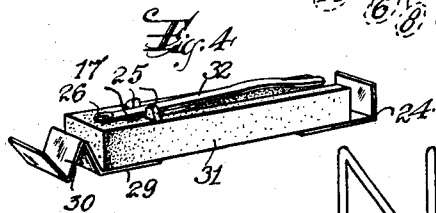
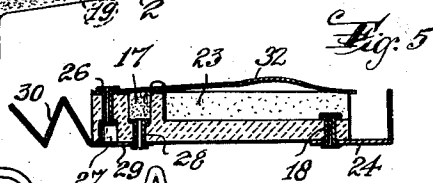


Fig. 3

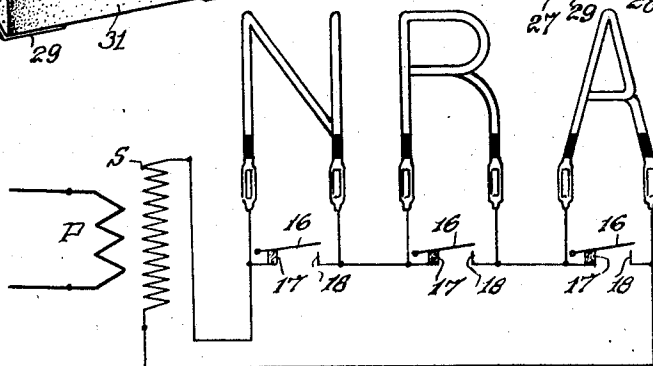


Fig. 6

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1,960,408

MEANS FOR PREVENTING RADIO INTER-
FERENCE FROM NEON SIGNS

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Application October 4, 1933, Serial No. 692,217

13 Claims. (Cl. 200—118)

In the operation of the present type of neon signs, high tension current from a transformer is passed through the glass tubes making up the parts of the sign, and which tubes contain inert
5 gases. Should one of these tubes become broken or disconnected from the circuit, the other tubes in the same circuit have a tendency to flicker due to the variations in the current in that circuit. This variation in the current results in noises being set up in nearby radio receiving sets.

Certain devices have been put out and are now on the market which are connected across the various parts or sections of the neon sign. These devices have a fixed air gap higher in resistance
15 than the section of glass tubing or portion of the neon sign across which the device is connected, and these gaps act as a bypass for the current should the tube break or become disconnected from the circuit. By providing such a jump gap
20 bypass, the balance of the sign may be maintained in operation. Furthermore, this shunt gap acts to prevent the voltage of the transformer from rising to an open circuit potential which is materially greater than the closed circuit voltage of
25 the transformer. Thus the bypass device serves two functions, but the arc produced across the open gap, when the arc is set up, will create a noise in the radio sets even greater than the broken or disabled sign without the so-called
30 safety device.

It is therefore the object of my present invention to provide a bypass for such signs of a type which will perform the necessary functions of cutting out the disabled part of the sign and protecting the transformer, without the objectionable feature mentioned with respect to the open gap type of device.

My improved device will be readily understood by reference to the annexed drawing, wherein:

40 Figure 1 is a sectional view through the device.

Figure 2 is a plan view looking down from the top of Figure 1, showing the working parts within the casing in dotted lines.

45 Figure 3 is a diagrammatic illustration of the application of my invention.

Figure 4 is a perspective view of a modified form of the bypass device.

Figure 5 is a longitudinal section through Figure 4.

50 Figure 6 is an enlarged fragmentary view of the bi-metallic member of Figure 4.

In the drawing, 1 and 2 illustrate two conically shaped insulators of any suitable material such as porcelain. The parts 1 and 2 have similar
55 flanges 3 between which preferably a gasket 4 of

any suitable material is positioned and the two flanges are held together in any satisfactory manner as by rivets or eyelets 5. Mounted within the housing members 1 and 2, are the working parts of my device. These parts include an insulator 6 of any suitable insulating material which will preferably stand considerable heat, and I have found slate to be very successful for this purpose.

To one end of the insulator 6 is fastened a
65 metallic bracket 7 as by means of a screw 8 and positioning dowels 9. The end 10 of the bracket 7 is turned over the end of the insulator 6 and to the end 10 is rigidly fastened a stud 11 which extends through the end of the insulator 1 and is rigidly fastened at 12 as by riveting to a terminal arm 13 to which connection may be made in any satisfactory manner as by the screw and washer connection 14. The insulator 6 has a shoulder
70 and to this shoulder is fastened in any satisfactory manner, as by screw 15, a bi-metallic thermoelectric member 16.

Resting on and contacting with the bracket 7, is a high-resistance element such as a block 17 of silicon carbide or the equivalent. The bi-metallic member 16 continually rests against the upper
80 end of the block 17.

At the opposite end of the insulator 6, there is provided a contact 18 which also acts to fasten a contact bracket 19 to the end of the insulator.
85 To the bracket 19 is fastened a stud 20 similar to the stud 11, and to the stud 20 is rigidly fastened another terminal arm similar to the arm 13. Preferably the upturned ends of the arms 13, to which the studs 11 and 20 are respectively fastened, lie in grooves moulded in the insulators 1 and 2 so as to prevent them from turning. If desired, an adjusting screw 21 with a lock-nut
90 22 may be provided on the insulator 2 so as to position the outward end of the spring 16 whereby the air gap between the end of the spring 16 and the contact 18 may be adjusted. This is not absolutely necessary as the housing 2 may be designed so that the ends of the spring will rest against the inner surface thereof to give the right air gap, but as stated, the adjustment may be used if desired.

In Figure 3, I have shown, diagrammatically, the primary of a transformer T and secondary S, the secondary being connected into the circuit of a neon sign of any desired character, the letters
105 NRA being illustrated. Across each letter and in the circuit of the secondary of the transformer, is connected one of my devices above described. 110

In operation, my device works substantially as follows:

When one of the parts of the sign, across which the device is connected, becomes broken or disconnected, the current will then flow from one of the terminal strips 13 through the bracket 7 and high-resistance element 17 to the bi-metallic member 16 and then jump the gap to the contact 18, and through the other terminal strip 13 to the next part of the sign, thereby keeping the rest of the sign in operation. The flow of the current through the high-resistance element 17 and that caused by the arc between the spring 16 and the contact 18, will generate sufficient heat so as to cause the bi-metallic strip to bend and close the gap, thereby quenching the arc, and the heat then continuously generated in the high-resistance member 17 will hold the contact 18 closed, whereby no further arcing will occur. There will then be just a short interval when the arc is first established that a noise is produced, by reason of the device, but thereafter no disturbance will take place from the defective neon sign. If it were not for the continuously acting heating element 17, the bi-metallic strip would keep opening and closing with intermittent action of the arc and with the consequent objections to the device, but with the construction herein described, I have produced a device which overcomes all the objectionable features existing in previous devices of this character.

In Figure 4, I have shown a modified form of a bypass device. In this form, the insulator 31, which may be of porcelain, has a channel 23 for the greater portion of its length. The contact 18, which may be in the form of an eyelet, serves to hold a flexible contact member 24 in position. The end of the insulator, adjacent the closed portion of the channel, is provided with a bridge 25 having a notch therein within which a bi-metallic member 32 is positioned, the member 32 being held to the insulator in any satisfactory manner as by an eyelet 26 positioned in the recess 27. The insulator 31 is also provided with another recess adjacent the bridge 25 and within which the resistance block 17 is located, one end of the block resting against an eyelet 28 and the other end against the bi-metallic member 16 as in Figure 1.

The eyelet 28 serves to clamp a flexible terminal 29 to the insulator 31. The free end of the terminal 29 is preferably provided with flexible convolutions 30 which, in cooperation with the flexible terminal 24, are adapted to take up inaccuracies in the moulding of a casing member such as 1 and 2, or some other similar type of casing, and to make contact with suitable contact members extending through the ends of said casing. The operation of the device shown in Figures 4 and 5 is just the same as in the form of device shown in Figures 1 and 2.

From what has been said, it will be obvious that the detail construction of the bypass device itself can be varied considerably. Likewise, the type of housing within which the bypass device is mounted; for example, the bypass may be incorporated or made integral with the support used for carrying the glass tube portions of the sign itself, thereby eliminating any special housing such as shown in Figures 1 and 2. I therefore do not wish to be unnecessarily limited in the interpretation of the appended claims.

Having thus described my invention, what I claim is:

1. In a device for the purpose described, an

insulator, metallic members fastened to opposite ends of the insulator at least one of which has a circuit contact, a bi-metallic strip fastened to one end of the insulator and extending toward the other with its free end over said contact but normally out of engagement therewith, and a heating element positioned between and contacting with one of said metallic members and said strip intermediate its ends.

2. In a device for the purpose described, a housing, circuit terminals fastened to opposite ends of the housing, an insulator mounted within the housing, a circuit contact carried on the insulator at one end thereof and electrically connected to one of said terminals, a bi-metallic strip mounted on the other end of said insulator and having its free end extending into operative relationship but normally out of engagement with said contact, and means for electrically connecting said strip to another of said circuit terminals, said means including a heating element which is continuously in engagement with said strip.

3. In a device for the purpose described, a two-part housing of insulating material, means for fastening the parts of the housing together, a terminal fastened to the end of each housing part, an insulator positioned within the housing, a thermal element carried by said insulator, a contact positioned so as to be engaged by said element and electrically connected to one of said terminals, and means for electrically connecting said element to the other terminal, said means including a heating element continuously in contact with said thermal element.

4. A device for the purpose described including current conducting parts electrically arranged in series with a gap between two of said parts, one part being a thermal element, and a high-resistance member between the thermal element forming said gap and another part, said gap being initially closed by the thermal element through heat generated in said high-resistance member, assisted by heat set up by an arc which may be established across said gap.

5. A device for the purpose described including current conducting parts electrically arranged in series with a gap between two of said parts, one part being a thermal element, and a member of silicon carbide inserted between and in continuous contact with said thermal element.

6. A device for the purpose described including current conducting parts electrically arranged in series with a gap between two of said parts, one part being a thermal element, and a member of silicon carbide inserted between and in continuous contact with said thermal element, and means for adjusting the normal length of said gap.

7. For use in connection with a neon gas or the like sign, a device connected across at least some part of said sign for eliminating, as described, interference from such signs with radio receiving sets; said device including a high-resistance element and a bi-metallic strip continuously in contact and in series with a normally open gap formed by said strip and a cooperating contact, said strip adapted to close said gap due to heat generated from said high-resistance device and in the gap, on the continued passage of a high-voltage current used in such signs.

8. For use in connection with a neon gas or the like sign, a device connected across at least some part of said sign for eliminating, as described, interference from such signs with radio receiving sets; said device including a high-resistance element and a bi-metallic strip continuously in

- contact and in series with a normally open gap formed by said strip and a cooperating contact, said strip adapted to close said gap due to heat generated from said high-resistance device and in the gap, on the continued passage of a high-voltage current used in such signs, and said high-resistance element also acting to hold said gap closed during the period of the interfering condition of the sign.
9. Means for eliminating radio interference from an inoperative portion of a neon gas or the like sign, comprising an open air gap circuit connected in parallel with at least said portion of the sign, said gap circuit including a thermal element for closing the gap and a high-resistance element in contact with said thermal element to heat the same on passage of a high voltage current across said gap.
10. Means for eliminating radio interference from an inoperative portion of a neon gas or the like sign, comprising an open air gap circuit connected in parallel with at least said portion of the sign, said gap circuit including a bi-metallic strip for closing the gap and a piece of silicon carbide in continuous contact with said strip to assist in initially heating the strip to cause it to close the gap and to keep the strip heated, whereby the strip holds the gap closed when the sign current passes therethrough.
11. In a device for the purpose described, an insulator having a channel therein, a contact positioned at one end of the channel, a terminal connected to said contact, said insulator having a pair of recesses adjacent the opposite end of the channel, fastening means positioned in one of said recesses, a bi-metallic member held in operative position by said fastening means and extending over the contact in said channel, fastening means in the other recess, a terminal held to the insulator by said last-mentioned fastening means, and a high-resistance element positioned in the second-mentioned recess and in continuous contact with the bi-metallic member and the fastening means in said second recess.
12. In a device as set forth in claim 11, further characterized in that said terminals are resilient and the insulator is provided with a bridge having a notch therein to receive and guide the bi-metallic member.
13. A device for the purpose described having a single circuit therethrough including current-conducting parts electrically arranged in series with a gap between two of said parts, one part being a thermal element, and a heating member inserted in said circuit between a current-conducting part thereof and said thermal element and in continuous electrical contact with said thermal element.
- LEON S. BRACH.