May 6, 1924. 1,493,148

M. B. COHEN

FUSE FOR VACUUM BULBS

Filed July 23, 1920

Fig.1.

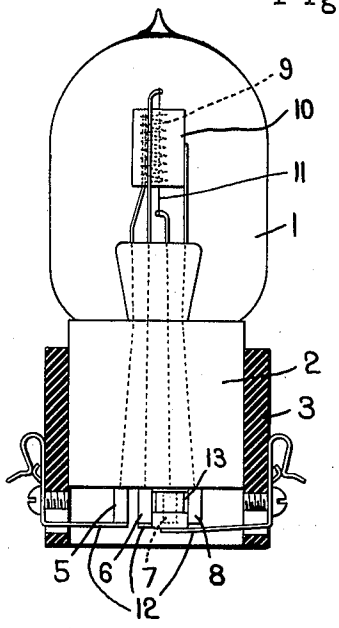


Fig.2.

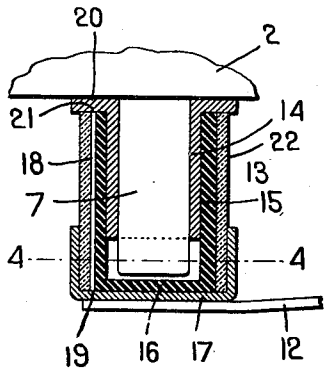


Fig.3.

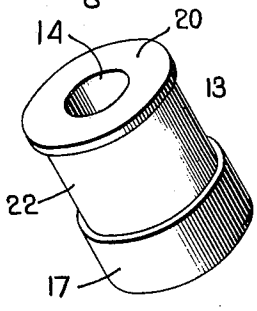
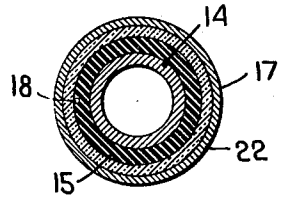


Fig.4.



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Patented May 6, 1924. 1,493,148

UNITED STATES PATENT OFFICE.

MONTGOMERY B. COHEN, OF BOSTON, MASSACHUSETTS.

FUSE FOR VACUUM BULBS.

Application filed July 23, 1920. Serial No. 398,446.

To all whom it may concern:

Be it known that I, MONTGOMERY B. COHEN, a citizen of the United States, and resident of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Fuses for Vacuum Bulbs, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to vacuum bulbs and especially to those which are used in wireless work, and the object of the invention is to provide a novel means for protecting the bulb from the destructive effects of excessive current.

In accordance with my invention I provide a protecting device which is constructed to be interposed between the terminals of the bulb and the terminals of the socket in which the bulb is placed, the device being preferably of a nature to be detachably applied to the terminals of the bulb.

In the preferred embodiment of my invention this protective device assumes the form of a fuse which will "blow" when the current becomes excessive thus breaking the circuit and protecting the bulb.

The fuse element embodying the invention is constructed so that it can be applied to the filament terminals of the vacuum bulb without interfering in any way with the placing the bulb into its socket or removing it therefrom. When the fuse is in place the electrical connections between the bulb terminal, to which it is applied, and the corresponding socket terminal is completed through the fuse and, therefore, if at any time the current should become excessive the fuse will burn out before the filament is destroyed thus protecting the latter.

In order to give an understanding of my invention I have illustrated in the drawings a selected embodiment thereof which will now be described, after which the novel features will be pointed out in the appended claims.

In the drawings:

Fig. 1 is a view of a vacuum bulb showing my improved fuse element applied to one of the filament terminals, the socket for the bulb being shown in section,

Fig. 2 is an enlarged sectional view through the fuse element applied to a bulb terminal,

Fig. 3 is a perspective view of the fuse element separated from the bulb terminal.

Fig. 4 is a section on the line 4—4 Fig. 2.

In the drawings 1 indicates a vacuum bulb of unusual construction, it having the neck portion 2 adapted to be inserted into a socket or holder 3 and also having the four terminals 5, 6, 7 and 8 at the end of the neck 2, these terminals being in the form of projecting pins. The terminal 5 connects to the grid element 9 within the bulb; the terminal 8 connects to the plate element 10; and, the two terminals 6 and 7 are the terminals for the filament.

The bulb with its filament, grid and plate may have any suitable or usual construction and does not form any part of my present invention.

The socket or holder 3 is provided with four contacts or terminals 12 which are situated to engage the ends of the bulb terminals 5, 6, 7 and 8 when the latter is inserted into the socket, all as usual in devices of this nature. The parts thus far described are, or may be, all as usual in vacuum bulbs of this type and form no part of my present invention.

In using vacuum bulbs of this type it some times happens that an excessive current will arise which is sufficient to burn out or destroy the filament 11 and when this happens the bulb is rendered unfit for further use and must be discarded. These bulbs are more or less expensive to manufacture and it is of some importance, therefore, to protect the filament from being burned out by an excessive current. As stated above the present invention has this for its object and the said object is accomplished by the use of a fuse element, indicated generally at 13, and of a shape to fit over one of the filament terminals and to form the contact between said filament terminal and the corresponding socket contact 12.

A fuse element embodying my invention can be readily slipped on to either of the filament terminals and when in place does not interfere in any way with the placing of the bulb into the socket or its removal therefrom. The fuse element is preferably cup-shaped and is provided with a sleeve-like contact member which fits the filament terminal, another contact member at its end which is insulated from the first contact member and which engages the contact 12 of the

socket, and a fusible connection between these two contact members.

In the embodiment of the invention herein illustrated 14 indicates a sleeve-like contact which is of a size to fit over the filament terminal 7 and which is enclosed within a cylindrical body member 15 of insulating material. The outer end of this body member 15 is preferably closed as shown at 16. On the end of the fuse element is a plate 17 which forms the other contact thereof that is adapted to engage the socket contact 12. This plate 17 is preferably formed as part of a cup-shaped member which can be forced over the end of the fuse and is retained in position thereon in any suitable way. The contacts 17 and 14 are thus insulated from each other by the insulating body member 15, 16. 18 indicates a fuse wire which connects the contacts 14 and 17. This fuse wire 18 may have any suitable location in the fuse, but I find it convenient to place it on the exterior of the body 15 and extending longitudinally thereof, one end of the wire being connected to the contact 17 at 19 and the other end being connected to a flanged portion 20 of the contact 14 as shown at 21. If desired a protecting sheath 22 of glass, or any other insulating material, may be placed around the body 15 thereby enclosing and protecting the fuse wire 18 and where this protecting sheath 22 is employed the cap shaped contact 17 may be constructed to embrace the lower end of said protecting sheath.

The fuse thus made up constitutes a cup-like element which can be slipped over either of the filament terminals and will be held thereon by frictional engagement therewith. When the fuse is placed on the terminal 7 the bulb 1 may be inserted into the socket 3 and when this is done the contact element 17 of the fuse will be brought into engagement with the appropriate contact 12 of the socket and a proper electrical connection between the filament terminal and the contact 12 will be afforded through the fuse. The presence of the fuse does not in any way interfere with the ordinary use of the bulb, but if during its use an excessive current should arise which would be likely to injure the filament 11 the fuse wire 18 will melt thus breaking the circuit to the filament and preventing the latter from injury. When this happens it will simply be necessary to remove the bulb and replace the burned-out fuse by a fresh fuse, when the bulb will be ready for use again.

From the above it will be seen that the fuse herein described can be applied to any of the standard vacuum bulbs now in common use without necessitating any change in the bulb or in the sockets that are used.

In its broad aspect the fuse constitutes means for protecting the bulb in that it will open the circuit when the current becomes excessive.

My invention therefore in its broad sense is a protecting device which is adapted to be applied to one or more of the terminals of the bulb and which operates to protect the filament, plate, grid and other parts of the bulb from the destructive effects of excessive current.

While I have illustrated a selected embodiment of my invention, I do not wish to be limited to the constructional features shown.

I claim:

1. A fuse element for use with a vacuum bulb having a terminal in the form of a projection, said fuse element having a shape to fit over the bulb terminal and provided with two contacts, one engaging the bulb terminal and the other adapted to engage the terminal of the socket into which the bulb is placed and a fuse wire connecting said contacts.

2. The combination with a vacuum bulb having terminals, of a socket to receive said bulb and provided with contacts for the terminals, of a fuse element detachably applied to one of the bulb terminals and constructed to engage the corresponding socket contact.

3. The combination with a vacuum bulb having terminals, in the form of projections extending therefrom, of a socket to receive said bulb and provided with contacts to engage said terminals and a fuse element detachably applied to one of the bulb terminals and constructed to engage the corresponding socket contact.

4. The combination with a vacuum bulb having terminals in the form of projections extending therefrom, of a socket to receive said bulb and provided with contacts to engage said terminals and a fuse element fitted over one of the bulb terminals and having a contact adapted to engage the corresponding socket contact.

5. The combination with a vacuum bulb having terminals in the form of projections extending therefrom, of a socket to receive said bulb and provided with contacts to engage said terminals and a cup-shaped fuse element fitted over one of the bulb terminals and having at its end a contact to engage the corresponding socket contact.

6. A fuse for use with terminals of electric bulbs, said fuse comprising a sleeve-like contact to fit over the bulb terminal, a body of insulating material enclosing said sleeve-like contact, a second contact element at the end of the fuse exterior to said insulating body and a fuse wire connecting said contacts.

7. A fuse element for use with terminals of electric bulbs, said fuse element being formed with a recess into which the termi-

nal may be inserted and having a contact to engage said terminal, a second contact situated to engage the socket terminal when a bulb having the fuse applied to its terminal is placed in the socket, and a fuse wire connecting the contacts of the fuse element.

8. A hollow fuse element constructed to slip over a projecting terminal of an electric bulb, said element having two contacts, one of which is adapted to engage the projecting terminal when the element is placed thereover, and the other of which is situated at the end of the element and is adapted to engage the socket terminal when the bulb with the fuse element thereon is placed in the socket, and a fusible member connecting said contacts.

9. A protecting device for use with terminals of electric bulbs, said device having a shape to fit over the bulb terminal and provided with two contacts, one engaging the bulb terminal and the other adapted to engage the terminal of the socket into which the bulb is placed, and a protecting element connecting said contacts.

10. The combination with a vacuum bulb having terminals, of a socket to receive said bulb and provided with contacts to engage the terminals of the bulb, said bulb being removably carried by the socket, and a fuse element separable from both the socket and bulb and interposed between one terminal and the bulb of the corresponding contact of the socket.

11. The combination with a vacuum bulb having terminals, of a holder to receive said bulb and provided with contacts to engage said terminals, said bulb being separable from the holder, and a protective device separable from both the bulb and holder and interposed between a bulb terminal and the corresponding holder contact.

In testimony whereof, I have signed my name to this specification.

MONTGOMERY B. COHEN.