Oct. 13, 1942. E. C. CONRAD 2,298,822

ELECTRICAL CONNECTOR

Filed Aug. 30, 1941

Fig. 1

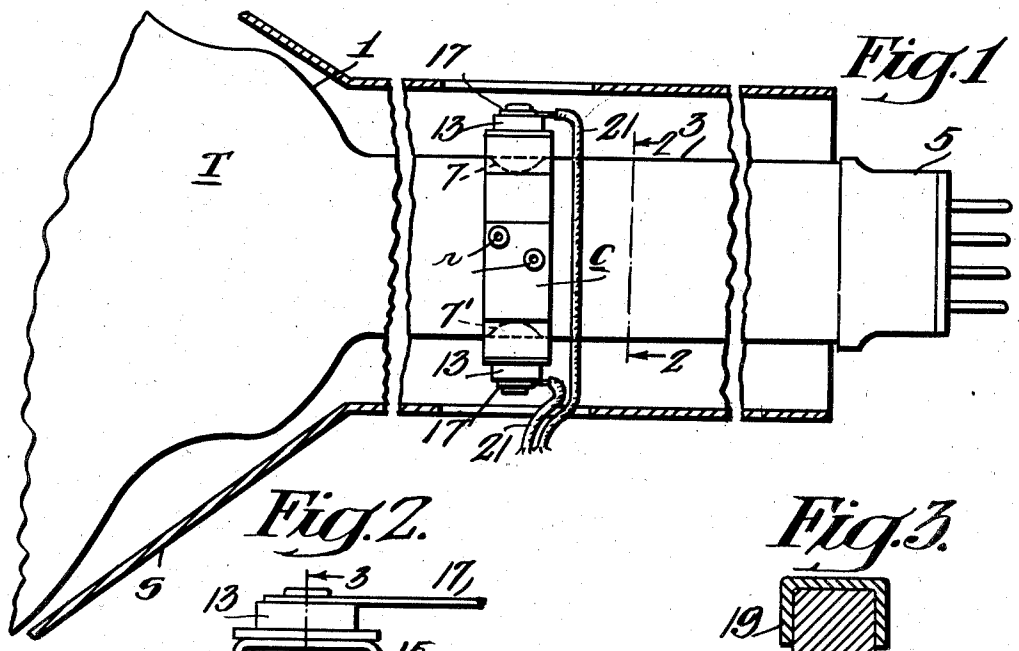


Fig. 2.

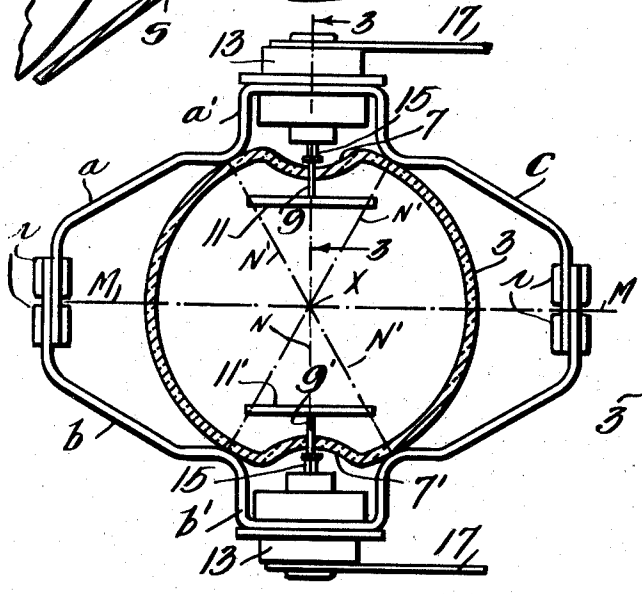
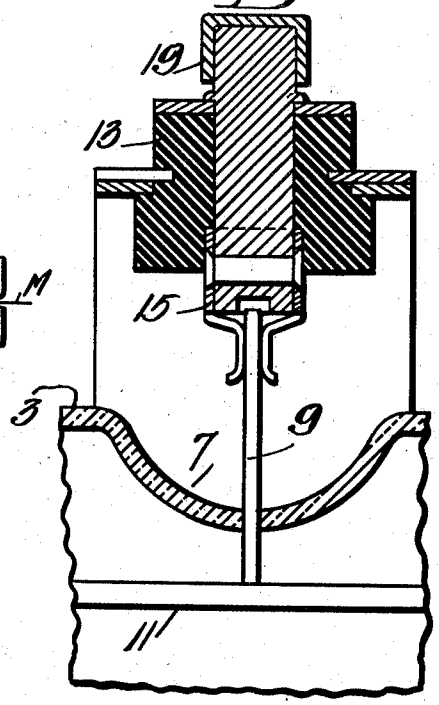


Fig. 3.



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ELECTRICAL CONNECTOR

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4 Claims. (Cl. 250—27.5)

This invention relates to connectors for electrical apparatus and has for its principal object to provide an improved detachable connector for cathode ray tubes and the like.

In certain cathode ray tubes, e. g., picture transmitting tubes of the type employing electrostatic focusing, the leads for certain of the electrodes, for example, the deflecting plates, terminate within small depressions or "wells," arranged at diametrically opposite points on the cylindrical neck of the tube. The leads are thus less likely to be broken off in shipment or in handling. It is difficult to make satisfactory electrical connections to these leads, not only because they are so short but because, when the tube is mounted in its operating position, it is surrounded by a shield of similar, generally bulbous, contour and, as a result, the said connections have heretofore been made after the tube has entered its socket through the bore of the shield. Thus, it has heretofore been thought necessary to provide relatively large openings in the neck of the shield to permit of access to the said electrode terminals when soldering or otherwise fixing the circuit connectors thereto. One very real objection to connections made in this manner is that any mechanical force applied to the connecting wires, either accidentally or in making the necessary circuit connections, is exerted upon the glass-to-metal seal through which the said electrode terminals extend.

Accordingly, another and important object of the present invention is to obviate the foregoing and other less apparent objections to prior art connectors for tubes of the general character described.

The said objects are achieved in accordance with the present invention by the provision of an expansible elliptical member which is adapted, when expanded by compression along its major axis, to be fitted about the cylindrical neck of the discharge tube envelope prior to mounting the tube within its shield. This elliptical member is provided with a pair of oppositely located connectors in which the projecting electrode terminals of the tube are adapted to be received, and is so shaped that when contracted it contacts the cylindrical surface of the tube at a plurality of circumferentially spaced points intermediate said electrode terminals. Thus, should any force be applied to the assembly accidentally, as during subsequent wiring operations, the effect of said force will not be felt adjacent the glass seals through which the electrode terminals extend but will be taken up either entirely in the resilient metal of which the ellipse is comprised or will be dissipated adjacent the spaced areas on the surface of the envelope, remote from the seals, against which the said ring bears.

The free ends of the terminal receiving connectors are preferably provided with metal caps or strips for making connections to points beyond the tube shield. Alternatively, these external connectors may be in the form of wires which may conveniently be wrapped about the envelope prior to inserting the tube within its shield, and which may subsequently be drawn through a single relatively small opening in the shield.

In the drawing which accompanies and forms a part of this specification and in which like reference characters designate the same or corresponding parts in all figures:

Fig. 1 is a side elevational view of a cathode ray tube which is provided with an electric connector constructed in accordance with the invention,

Fig. 2 is a sectional view taken on the line II—II of Fig. 1, and

Fig. 3 is an enlarged fragmentary view of a modified form of the connector of the invention.

In the drawing, T designates generally a cathode ray tube shown mounted within a shield S and having a bulbous portion 1, a cylindrical neck portion 3 of reduced diameter, and a socket base 5 affixed to the free end of said neck. The neck portion of the tube is provided with two oppositely located depressions or "wells" 7, 7' through which separate terminals 9, 9' for electrodes 11, 11', respectively extend. Surrounding the tube is a ring-like device, indicated generally at C, and which is constructed in accordance with the invention, for making electric connections to the electrode terminals 9, 9'.

As shown more clearly in Fig. 2, the member C is of a generally elliptical contour and has major and minor axes M and N, respectively, which intersect the long axes X of the neck portion 3 of the tube. The member C is constituted of spring metal and may conveniently be formed of two suitably bent strips *a* and *b* united at their free ends as by rivets *r* at the opposite extremities of the major axis M.

The opposite half sections *a* and *b* of the ellipse C are provided adjacent their narrowest dimension, i. e., adjacent the terminals of the shortest minor axes N' with bent U-shaped sections *a'*, *b'*, respectively, which are bowed outwardly from the surface of the tube beyond the free ends of the electrode terminals 9, 9'. A Bakelite or

other suitable insert 13 (see Fig. 3) in each of these extensions provides an insulating support for a conductive element 15 which terminates in a split prong-receiving contact 17 for one of the electrode terminals 9, 9'. The conductive elements 15 may be provided adjacent their respective outer ends with a flat metal strip 17 (see Fig. 2) or with caps 19 (see Fig. 3) for the purpose of connecting the said elements, and hence the electrode terminals 9, 9' to remote points in the circuit. Alternatively, as shown in Fig. 1, insulated wires 21 may be soldered or otherwise connected directly to the free ends of the conductive inserts 13.

In mounting the connector C of the invention upon the neck 3 of the tube T, a compression force is applied to the connector along its major axis M, whereupon it may be drawn over the socket ends of the tube to a position adjacent the electrode terminals 9, 9'. When the prong-receiving elements 15, 15' are in register with the electrode terminals 9, 9', respectively, the compression force is removed, whereupon the said terminals are received within the parts 15, 15 and form electrical connections thereto which, as previously described, may be extended by the wires 21 or other means 17, Fig. 2; 19, Fig. 3.

Various modifications of the invention will suggest themselves to those skilled in the art. It is to be understood, therefore, that the foregoing is to be interpreted as illustrative and not in a limiting sense except as required by the spirit of the appended claims.

What is claimed is:

1. The combination with an electron discharge tube having a cylindrical section through which a pair of oppositely located electrode terminals extend, of an expansible ring-like member adapted to be fitted about said cylindrical section and having a pair of oppositely located terminal receiving connectors, said expansible ring having a contour such that when contracted it contacts said tube at a plurality of circumferentially spaced points intermediate said electrode terminals.

2. A device of the character described comprising an elliptical spring metal member having major and minor axes and adapted when compressed along its major axis to be fitted about the neck of a cathode ray tube through which oppositely located electrode terminals extend, said spring metal member being provided adjacent a minor axis with a pair of connectors adapted to contact said electrode terminals when said compression force is released.

3. The invention as set forth in claim 2 and wherein the dimensions of said elliptical spring metal member when relaxed and as measured along the shortest of its minor axes corresponds substantially to the diameter of the neck portion of said cathode ray tube.

4. A device of the character described comprising a substantially elliptical member provided adjacent its shorter dimension with a pair of oppositely located outwardly extending U-shape sections, and an inwardly extending electrical connector mounted within each of said U-shape sections, said elliptical member being constituted of spring metal whereby said U-shape sections, and hence the electrical connectors supported therein, are bowed apart upon the application of a compression force applied along the major axis of said ellipse.

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