Sept. 22, 1953 H. M. WADSWORTH 2,653,304

DETACHABLE ELECTRICAL CONNECTOR

Filed June 6, 1950

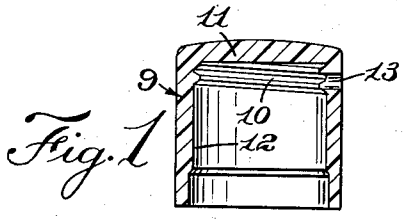


Fig. 1

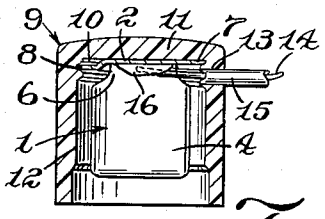


Fig. 4

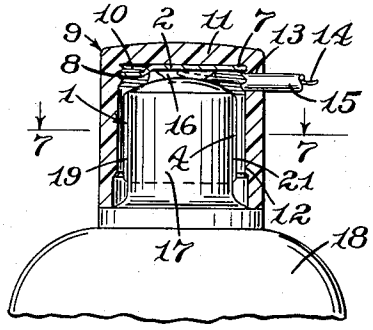


Fig. 6

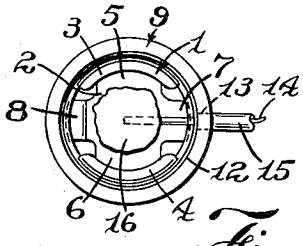


Fig. 5

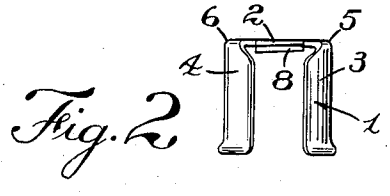


Fig. 2

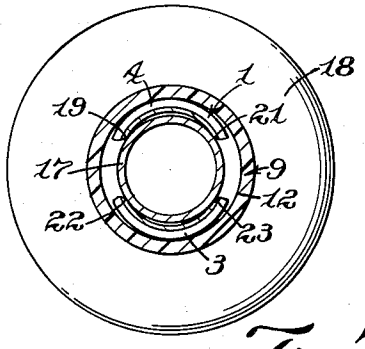


Fig. 7

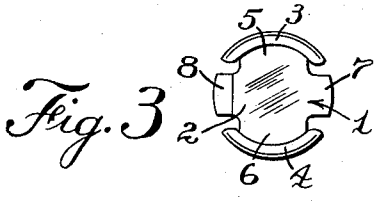


Fig. 3

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Patented Sept. 22, 1953 2,653,304

UNITED STATES PATENT OFFICE

2,653,304

DETACHABLE ELECTRICAL CONNECTOR

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Application June 6, 1950, Serial No. 166,318

3 Claims. (Cl. 339—217)

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The present invention relates to a detachable electrical connector and more particularly to a grid cap for vacuum tubes.

It is an object of the present invention to provide an electrical connector which is simple and economical in construction and provides a firm, intimate contact between the engaging surfaces.

It is another object to provide such a device in which the electrically charged surfaces are entirely enclosed when the cap is applied to the grid terminal so as to reduce the liability of corona discharges.

Another object is to provide such a device including a stamped electrode and a molded dielectric cup having interengaging parts providing a rigid connection while permitting the electrode to expand and contract to closely grip the cooperating terminal.

Further objects and advantages will be apparent from the following description taken in connection with the accompanying drawing, in which:

Fig. 1 is a vertical substantially mid-sectional view of the dielectric cap enclosing the terminal;

Fig. 2 is a side elevation of a preferred form of terminal;

Fig. 3 is an end view of the terminal;

Fig. 4 is a vertical substantially mid-sectional view of the assembled connector;

Fig. 5 is a view looking into the open end of the assembled connector;

Fig. 6 is a vertical substantially mid-sectional view of the connector as assembled on the cylindrical terminal of a vacuum tube; and

Fig. 7 is a section taken substantially on the line 7—7 of Fig. 6.

Referring first to Fig. 2 of the drawing there is illustrated an electrode 1 of suitable conductive material comprising a base 2, and a pair of arms 3 and 4 extending substantially perpendicular to the base and connected thereto by hinge portions 5 and 6 which render the arms elastically expansible. The arms 3 and 4 are cylindrical in contour as best shown in Fig. 3, and in the spaces between the arms, the base 2 is provided with radially extending lugs or projections 7 and 8 the outer contours of which are circular. The lug 7 extends substantially in the plane of the base 2 but is slightly twisted so that the outer edge forms a portion of a screw thread. The projection 8 is similarly twisted and is offset slightly as shown in Fig. 2 so that the lugs 7 and 8 provide portions of a single screw thread.

A cup 9 of suitable dielectric material (Fig. 1) is arranged to receive the electrode 1 therein and

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is provided with an internal thread 10 adapted to cooperate with the thread lugs 7 and 8 of the electrode so as to permit the electrode to be screwed tightly against the bottom 11 of the cup. The side wall 12 of the cup is cylindrical in shape and slightly larger than the arms of the terminal so as to permit elastic expansion of the arms.

The cup 9 is provided with a cylindrical opening 13 in its side which is located adjacent one of the thread lugs of the electrode when the latter is screwed in place in the cup as shown in Fig. 4. A cable 14 having an insulating sheath 15 traverses the opening 13 and is rigidly attached to the base of the electrode as by soldering as indicated at 16, so as to form a permanent electrical connection and at the same time prevent the electrode from unscrewing. The sheath 15 of cable 14 has a press fit in the opening 13 so as to tightly close said opening. It will be understood that the opening 13 in the side of the cup is preferably drilled after the electrode has been screwed in place in the insulating cup, the electrode being arranged to cooperate with a suitable drilling fixture so as to properly locate said opening with respect to the electrode.

The radius of curvature of the spring arms 3, 4 of the electrode is slightly less than the radius of the cylindrical terminal for which the connector is designed. Thus, as shown in Figs. 6 and 7 when the connector is pressed on to the terminal 17 of a vacuum tube 18, the arms each have two line contacts with the cylindrical surface of the terminal as shown at points 19, 21, 22, 23 in the section illustrated in Fig. 7. This arrangement secures high unit pressure between the connector and the terminal thus providing a clean metal-to-metal contact therebetween.

Although but one embodiment of the invention has been shown and described in detail it will be understood that changes may be made in the precise design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

1. A grid cap for vacuum tubes including an electrode having a flat base with a pair of spring arms extending perpendicular thereto, said base being provided with a pair of thread lugs extending radially from the base intermediate the junctions of the arms with the base; a cylindrical cup of dielectric material loosely surrounding the arms of the electrode and having an internal thread into which the thread lugs of the base are screwed to anchor the electrode to the bottom of the cup, said cup having a cylindrical radial opening in its side located adjacent one of the lugs

of the electrode; and means for rigidly anchoring the electrode in the cup comprising an insulated cable having a press fit in said opening extending radially across one of said lugs and rigidly attached to the base of the electrode.

2. A high tension electrical connector for attachment to a cylindrical terminal comprising an electrode having a flat base and a pair of elastic arms extending substantially normal to the base, a cup of dielectric material surrounding the electrode with the rim of the cup extending substantially beyond the ends of said arms, said base having a pair of radially extending projections located intermediate said arms, the outer contours of which are twisted and offset to form portions of a screw thread, said dielectric cup having an internal screw thread near its bottom formed to receive said projections when the electrode is screwed into the cup, said cup also having a cylindrical radial opening adjacent one of the base projections, and means for preventing the electrode from unscrewing from the cup comprising a cable traversing the opening extending radially across one of said lugs and rigidly attached to the base of the electrode, said cable being provided with a sheath of dielectric material having a force fit in said opening.

3. A high tension electrical connector as set forth in claim 2 in which the side wall of the cup is spaced from the arms of the electrode to permit flexure thereof, said arms being cylindrical in shape with radii slightly less than the radius of the cylindrical terminal which the connector is designed to fit.

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