June 28, 1966 J. A. MARTIN 3,258,732

ANODE CONNECTOR

Filed March 5, 1965

Fig. 1.

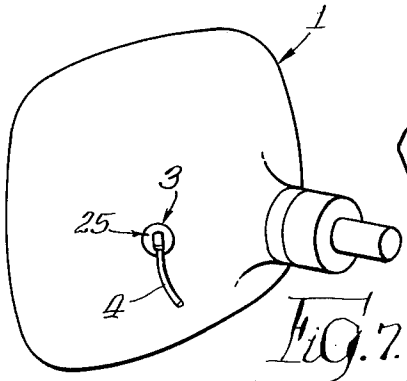


Fig. 2.

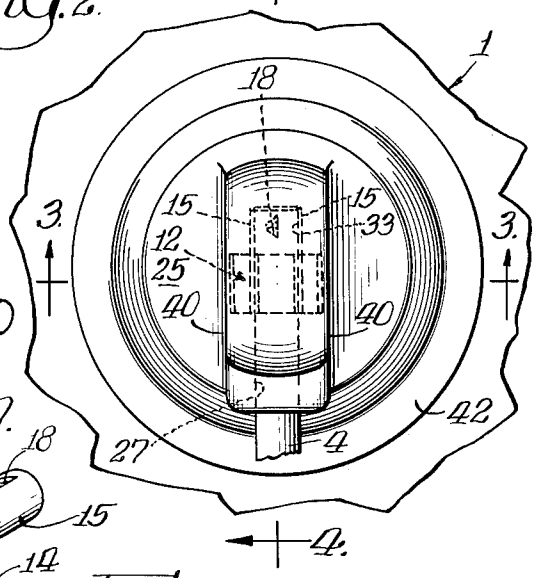


Fig. 7.

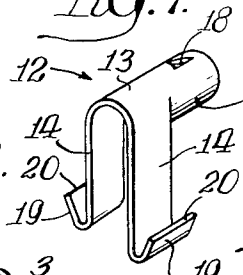
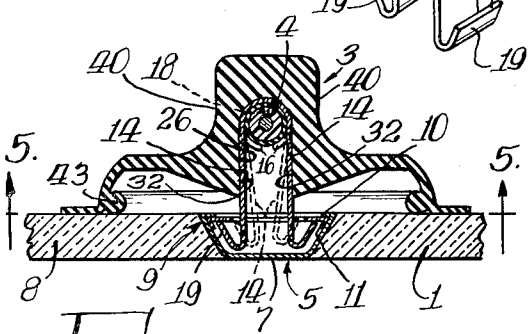


Fig. 3.

Fig. 4.



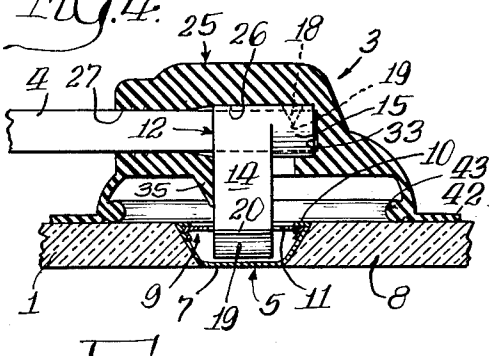


Fig. 5.

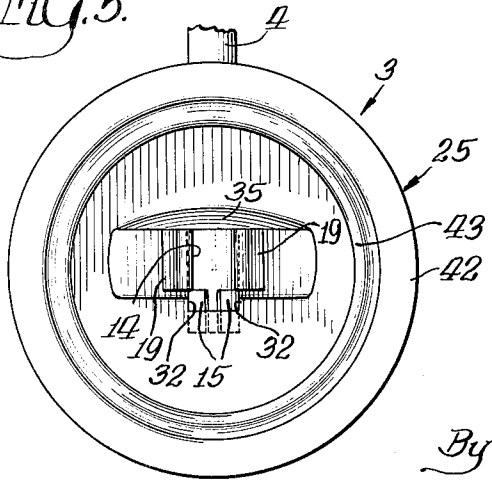
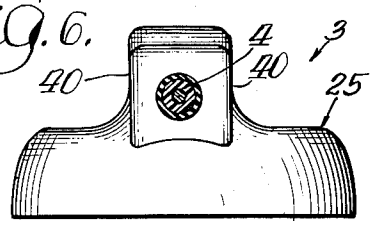


Fig. 6.



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United States Patent Office 3,258,732 Patented June 28, 1966

3,258,732
ANODE CONNECTOR

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Filed Mar. 5, 1965, Ser. No. 437,471
8 Claims. (Cl. 339—59)

The present invention relates to an anode connector for connecting an insulated flexible conductor with the anode electrode socket of the cathode ray tube.

Cathode ray tubes are today in wide spread use in television receivers and, is well known, the anode of the tube is connected with a high electrical potential source through an insulated flexible conductor which extends from the potential source to the anode electrode socket secured to and forming part of the cathode ray tube.

The purpose of the present invention is to provide an improved anode connector.

In known anode connectors, it is common practice to provide a clip electrically connected with and secured to an insulated flexible conductor, and in which the clip is formed of wire suitably bent to provide end portions for electrically contacting and connecting the insulated flexible conductor with an anode electrode socket of a cathode ray tube. In such constructions, the ends of the clips, since they are fabricated of wire, form only small areas of electrical contact which are undesirable in view of the large electrical potential sources involved in cathode ray tubes, and, in addition, are of limited mechanical strength.

Accordingly, it is an object of the present invention to provide a clip for an anode connector for engaging with an anode electrode socket of a cathode ray tube in which the clip is formed of a spring metal sheet having legs of substantial width and with end edges of a length corresponding to such widths to afford large area of contact with an anode socket electrode.

Also, in certain of the known anode connectors, the aforementioned wire clips are secured to the flexible insulated conductors by separate ferrule-like members so that in such constructions two separate components namely, the clip and ferrule are required.

It is a further object of the present invention to form a clip of a one piece spring sheet material formed to provide the aforementioned legs for mounting the clip in an anode socket and, in addition, a pair of arms for encircling the insulated conductor to mount the clip on the latter.

It is also known in the art to enclose the clip of an anode connector in a cup of resilient insulating material, and, in which, the cup is deformable to engage and disengage the clip ends with respect to the anode electrode socket, and for mounting the insulated flexible conductor in sealed relation at the anode electrode socket.

A further object of the present invention is to provide an anode connector embodying a one piece sheet metal clip as aforenoted, and a cup of resilient insulating material embodying a resilient annular sealing ring inwardly of the open end of the cup, and which sealing ring is firmly compressed against the surface of the cathode ray tube surrounding the anode electrode socket in the engaged position of the end edges of the legs of the clip with the anode electrode socket.

A further object of the invention is to provide a cup of resilient insulating material as last noted embodying external or outer flat surfaces extending in the same direction as the sides of the legs of the clip, and which outer surfaces may be displaced toward and away from each other to engage and disengage the end edges of the legs of the clip with the anode electrode socket.

In connection with the above last noted object it will be further observed that such other flat surfaces of the cup serve to indicate the positions of the legs of the clip to assist in engaging and disengaging the anode connector with respect to the anode electrode socket of the cathode ray tube.

The above and other objects and advantages of my invention will appear from the following detail description of a preferred embodiment of the invention.

Now in order to acquaint those skilled in the art with the manner of constructing and using anode connectors in accordance with the principles of the present invention, there shall be described in connection with the accompanying drawings a preferred embodiment of the invention.

In the drawings:

FIGURE 1 is a rear elevational view of a cathode ray tube with the anode connector of the present invention connected to the anode electrode socket of the tube;

FIGURE 2 is a plan view of the anode connector of the present invention and a portion of the cathode ray tube to which the anode connector is attached;

FIGURE 3 is a detail transverse cross sectional view taken along the line 3—3 of FIGURE 1 looking in the direction indicated by the arrows;

FIGURE 4 is a detail transverse cross sectional view taken at right angles to the cross sectional view of FIGURE 3 and along the line 4—4 of FIGURE 2 looking in the direction indicated by the arrows;

FIGURE 5 is a bottom elevational view of the connector of FIGURE 2 looking into the open end of the cup of resilient insulating material of the connector;

FIGURE 6 is an end elevational view of the anode connector of FIGURE 1; and

FIGURE 7 is a perspective view of a clip embodied in the anode connector of FIGURE 2.

Referring now to the drawing there is shown in FIGURE 1 a cathode ray tube of known construction to which the anode connector 3 of the present invention is attached for connecting an insulated flexible conductor 4 leading from a source of electrical potential (not shown) to an anode electrode socket such as shown at 5 in FIGURES 3 and 4. The anode electrode socket 5 is of conventional construction and as shown comprises a metal cup 7 embedded in the tube 1 with its open end at the outer surface of the wall 8 of the tube. The cup 7 is provided at the periphery of its open end with radially inwardly extending annular flange means 9 which, in the form of the cup shown, is defined by a radially inwardly extending annular flange 10 integral with the cup at its open end, and an annular member 11 formed with an outer annular flange disposed in nested relation with the annular side wall of the cup 7 and its annular flange 10.

The clip 12 of the anode connector of the present invention, as best seen in FIGURE 7, is formed from a one piece spring metal sheet member. The clip 12 is formed with a lengthwise extending return bend portion 13 from which a pair of legs 14—14 extend at one end of the clip, and a pair of arms 15 extend from the other end of the clip. The arms 15 are shaped to encircle the insulated flexible conductor and the opposed free edges of the arms are preferably embedded in the insulating material of the insulated flexible conductor 4 to secure the clip 12 thereto. It will be observed that the sides of the legs 14 and the arms 15 are of substantial width with respect to the length of return bend and together equal the length of the return bend 13 of the clip. The return bend 13 adjacent the outer end of the arms 15 may be provided with a stake or piercing tongue 18 which may be folded over or upon the conductor of the insulated flexible conductor 4 to electrically connect the same as at 19 with the clip. Other means of securing the conducting element

of the flexible electrical conductor may be used if desired. Referring again to FIGURE 7, it will be seen that the outer ends of the legs **14** are formed with bent ends **19** extending outwardly away from each other and generally toward the return bend **13** having end edges **20**, which as best seen in FIGURE 3, may be engaged with the inner surface of the flange means **9** at the open end of the anode electrode socket **5** to connect the clip thereto and provide for electrical connection of the clip with the cup **7**. The legs **14** in FIGURE 3 are shown in full lines in their normal engaged position with the anode electrode socket **5**, and it will be seen that upon biasing of the legs toward each other that the end edges **20** may be disengaged from the flange means **9** to release the clip from the anode electrode socket **5**.

The aforedescribed clip **12** connected to insulated flexible conductor **4** as above described in accordance with the present invention may be embedded in an open ended cup of resilient insulating material, such as rubber, as shown at **25**. The cup **25** is formed with a suitable internal recess **26** for receiving and supporting the clip **12** and is further provided with an opening **27** through which the insulated flexible conductor **4** extends from the clip outwardly of the cup **25**. As best seen in FIGURES 3 and 5, the recess **26** also comprises side walls **32** extending lengthwise of the return bend **13** of the clip and along the sides of the legs **14—14**. A bore **33** in alignment with the opening **27** receives the end portions of arms **15** of the clip and the adjacent end of the flexible conductor **4**. A reinforcing ridge **35** extends transversely between side walls **32** of the recess engaging the outer end edges of the legs **14**.

It will be noted that the resilient cup member **3** is further provided with flat outer surfaces **40** which extend parallel with the walls **32** of the recess **26** and the sides of the legs **14**. The walls **40** when displaced by pressure applied inwardly and angularly downwardly toward each other bias the legs **14** toward each other to enable positioning of the end edges **20** of the legs toward each for positioning into the anode electrode socket **7** to connect the clip and insulated flexible connector to the cathode ray tube upon release of the sides **40**. Conversely to remove the anode connector from the tube pressure may be applied to the sides **40** inwardly and angularly downwardly toward each other to position the end edges **20** to positions from which they may be withdrawn from the anode electrode socket. The walls **40** also advantageously serve to indicate the direction of the sides of the legs **14** and **14** externally of the resilient cup from its closed end, and the direction in which the legs may be biased to connect or disconnect the clip **12**.

The cup **25** is formed at the periphery of its opening with relatively flexible sealing flange **42** together with an annular ring portion **43** inwardly of the flange **42**. As best seen in FIGURES 3 and 4 in the assembled position of the anode connector on the wall **8** of the tube **1** the flexible flange **42** sealingly engages the outer surface of the wall **8** and the engagement of the end edges **20** of the legs **14** compress the annular ring portion **42** into tight engagement with the surface of the cathode ray tube surrounding the anode socket **7** and thus provide effective sealing of the mounted anode connector on the TV tube.

While I have shown and described what I consider to be preferred forms of my invention, it will be understood that various modifications and rearrangements may be made therein without departing from the spirit and scope of the invention.

I claim:

1. A clip for electrically connecting an insulated flexible conductor with an electrode socket of a cathode ray tube comprising a one piece spring metal sheet member formed with a return bend portion adapted to extend lengthwise of and in co-extensive overlying relation with one end of said conductor, a pair of legs extending away from said return bend at one end portion thereof, said legs having end edges spaced away from said conductor and extending in the lengthwise direction of said return bend for electrically connecting said clip with said electrode socket, a pair of arms extending from said return bend at the other end portion thereof formed to encircle said conductor, and said arms having opposed end edges extending lengthwise of said return bend adapted to be embedded in the insulation of said conductor for mounting the clip on the latter.

2. A clip for electrically connecting an insulated flexible conductor with an electrode socket of a cathode ray tube comprising a one piece spring metal sheet member formed with a return bend portion adapted to extend lengthwise of and in co-extensive overlying relation with one end of said conductor, a pair of legs extending away from said return bend at one end portion thereof, said legs each having sides of substantial width with respect to the length of said return bend, said legs at their outer ends each having an end edge extending in the lengthwise direction of said return bend for electrically connecting said clip with said electrode socket, a pair of arms extending from said return bend at the other end portion thereof formed to encircle said conductor, each of said arms being of substantial width and together with said widths of said legs equaling the length of said return bend, and said arms having opposed end edges extending lengthwise of said return bend adapted to be embedded in the insulation of said conductor for mounting the clip on the latter.

3. A clip for electrically connecting an insulated flexible conductor with an electrode socket of a cathode ray tube comprising a one piece spring metal sheet member formed with a return bend portion adapted to extend lengthwise of and in co-extensive overlying relation with one end of said conductor, a pair of legs extending in spaced relation with respect to each other and away from said return bend at one end portion thereof, said legs at their outer ends each having end edges extending toward and in a lengthwise direction of said return bend for electrically connecting said clip with said electrode socket, a pair of arms extending from said return bend at the other end portion thereof formed to encircle said conductor, and said arms having opposed end edges extending lengthwise of said return bend adapted to be embedded in the insulation of said conductor for mounting the clip on the latter.

4. In a connector for electrically connecting an insulated flexible conductor with a cathode ray tube having an anode socket provided with radially inwardly extending flange means at the periphery of its open end, the combination of an open ended cup of resilient insulating material, a clip, means for electrically connecting and mounting said clip at one end on said conductor, said cup having a recess for receiving and supporting said clip and an opening through which said conductor extends from said clip, said clip having a pair of legs extending away from said one end of said conductor and towards the open end of said cup, said legs at their outer ends having end edges for engaging the inner surface of said flange of said anode socket, said cup having a resilient annular ring portion inwardly of its open end, and said end edges of said legs when engaged with said annular flange of said anode socket compressing said annular ring portion into engagement with the surface of said cathode ray tube surrounding said anode socket.

5. In a connector for electrically connecting an insulated flexible conductor with a cathode ray tube having an anode socket provided with radially inwardly extending flange means at the periphery of its open end, the combination of an open ended cup of resilient insulating material, a clip of spring sheet metal, means for electrically connecting and mounting said clip at one end of and on said conductor, said clip having a return bend extending lengthwise of and at said one end of said conductor, said cup having a recess for receiving and supporting said clip

and an opening through which said conductor extends from said clip, said clip having a pair of legs each of substantial width with respect to the length of said return bend and extending away from said return bend at said one end of said conductor and toward the open end of said cup, said legs at their outer ends having end edges for engaging the inner surface of the flange of said anode socket, said cup having outer flat surfaces opposite the widths of said legs movable toward each other for biasing said legs toward each other to engage and disengage said end edges with the inner surface of said flange of said anode socket, said cup having a resilient annular ring portion inwardly of its open end, and said end edges of said legs when engaged with said annular flange of said anode socket compressing said annular ring portion into engagement with the surface of said cathode ray tube surrounding said anode socket.

6. In a connector for electrically connecting an insulated flexible conductor with a cathode ray tube having an anode socket provided with radially inwardly extending flange means at the periphery of its open end, the combination of an open ended cup of resilient insulating material, a clip of spring sheet metal, means for electrically connecting and mounting said clip at one end of and on said conductor, said clip having a return bend extending lengthwise of and at said one end of said conductor, said cup having a recess for receiving and supporting said clip and an opening through which said conductor extends from said clip, said clip having a pair of legs each having sides of substantial width with respect to the length of said return bend and extending away from said one end of said conductor and toward the open end of said cup, said recess of said cup having side walls opposite said sides of said legs, said legs at their outer ends having end edges for engaging the inner surface of the flange of said anode socket, said cup having outer flat surfaces extending in the same lengthwise direction as said side walls of said recess and said sides of said legs, and said outer flat surfaces of said cup being movable toward each other to bias said legs toward each other for engaging and disengaging said end edges with the inner surface of said flange of said anode socket.

7. In a connector for electrically connecting an insulated flexible conductor with a cathode ray tube having an anode socket provided with radially inwardly extending flange means at the periphery of its open end, the combination of an open ended cup of resilient insulating material, a clip of spring sheet metal, means for electrically connecting and mounting said clip at one end of and on said conductor, said clip having a return bend extending lengthwise of and at said one end of said conductor, said cup having a recess for receiving and supporting said clip and an opening through which said conductor extends from said clip, said clip having a pair of legs each having sides of substantial width with respect to the length of said return bend and extending away from said one end of said conductor and toward the open end of said cup, said recess of said cup having side walls opposite said sides of said legs, said legs at their outer ends having end edges for

engaging the inner surface of the flange of said anode socket, said cup having outer flat surfaces extending in the same lengthwise direction as said side walls of said recess and said sides of said legs, said outer flat surfaces of said cup being movable toward each other to bias said legs toward each other for engaging and disengaging said end edges with the inner surface of said flange of said anode socket, said cup having a resilient annular ring portion inwardly of its open end, and said end edges of said legs when engaged with said annular flange of said anode socket compressing said annular ring portion into engagement with the surface of said cathode ray tube surrounding said anode socket.

8. In a connector for electrically connecting an insulated flexible conductor with a cathode ray tube having an anode socket provided with radially inwardly extending flange means at the periphery of its open end, the combination of an open ended cup of resilient insulating material, a clip of spring sheet metal, said clip having a return bend extending lengthwise of and at said one end of said conductor, said clip having arms having sides of substantial width with respect to the length of said return bend and extending therefrom for encircling said conductor for mounting said clip at one end of said conductor, said cup having a recess for receiving and supporting said clip and an opening through which said conductor extends from said clip, said clip having a pair of legs each having sides of substantial width with respect to the length of said return bend and together with the widths of said arms equal the length of said return bend, said legs extending away from said one end of said conductor and toward the open end of said cup, said recess of said cup having side walls opposite said sides of said legs, said legs at their outer ends having end edges for engaging the inner surface of the flange of said anode socket, said cup having outer flat surfaces extending in the same lengthwise direction as said side walls of said recess and said sides of said legs, said outer flat surfaces of said cup being movable toward each other to bias said legs toward each other for engaging and disengaging said end edges with the inner surface of said flange of said anode socket, said cup having a resilient annular ring portion inwardly of its open end, and said end edges of said legs when engaged with said annular flange of said anode socket compressing said annular ring portion into engagement with the surface of said cathode ray tube surrounding said anode socket.

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