

Jan. 16, 1945.

W. C. MacFADDEN

2,367,512

INSULATED CONTACT SOCKET

Filed June 18, 1943

2 Sheets-Sheet 1

Fig. 1.

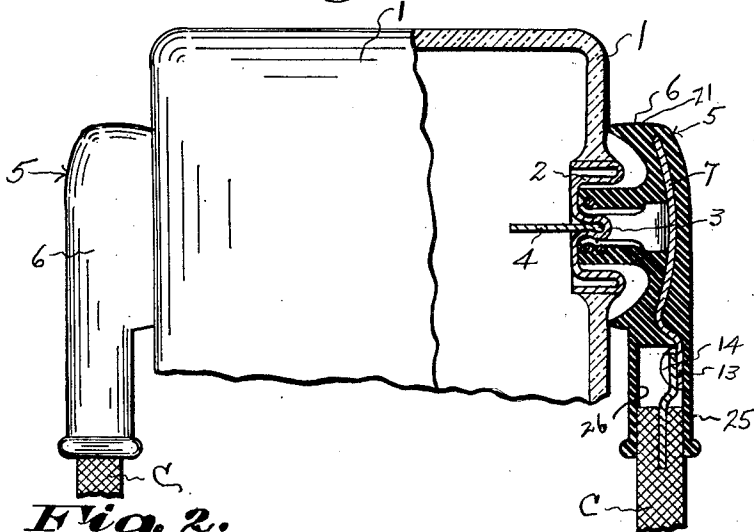


Fig. 2.

Fig. 3.

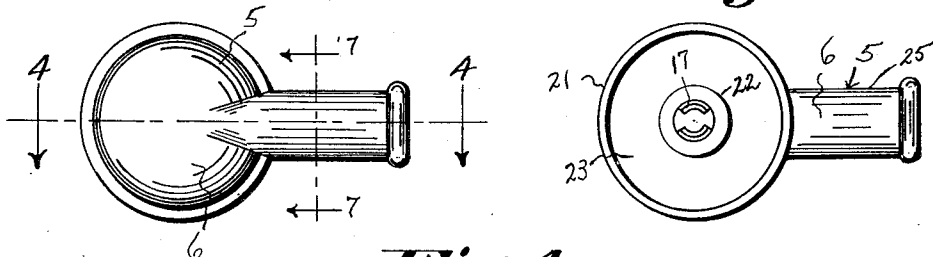
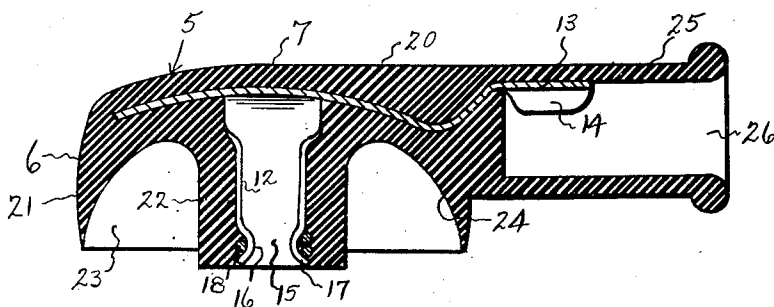


Fig. 4.



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Fig. 5.

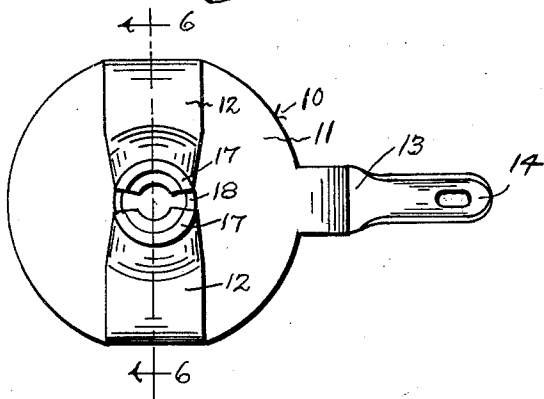


Fig. 6.

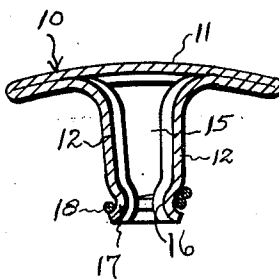


Fig. 8.

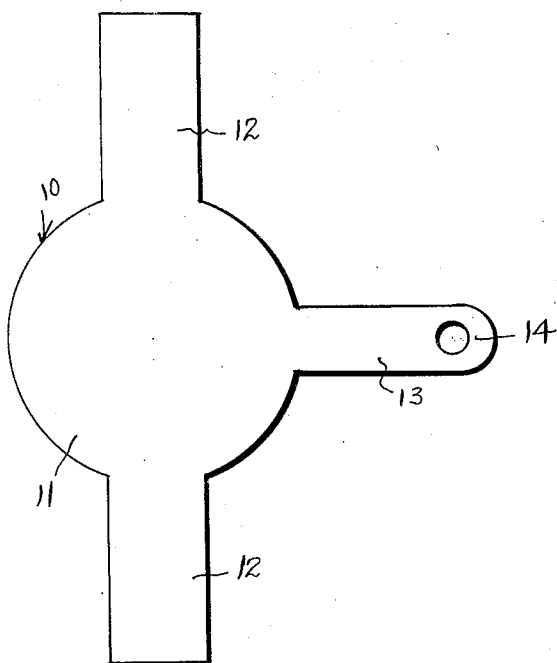
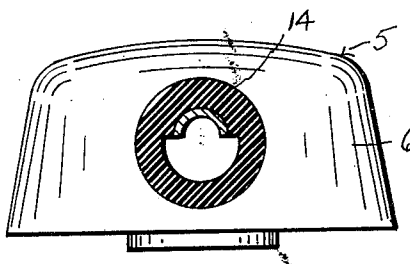


Fig. 7.



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UNITED STATES PATENT OFFICE

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INSULATED CONTACT SOCKET

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Application June 18, 1943, Serial No. 491,414

7 Claims. (Cl. 173—363)

The present invention relates to electrical socket contacts, such as are used for connection with a side wall terminal connector of electrical discharge tubes, particularly high voltage tubes such as cathode ray tubes, and more particularly to insulated contact sockets therefor.

Many electrical discharge tubes such as cathode ray tubes are provided with one or more wall contact terminals embedded in and sealed to the glass wall of the tube. These terminals are connected interiorly to a lead wire of the internal tube circuit and have a part exposed to the outside of the tube, for example a snap-fastener stud-like member for snap fastener connection with a socket member attached to a suitable conductor. The present invention aims generally to improve such socket members for snap fastener connection with the stud of tube wall contacts.

Illustrative of the invention, reference is made to the accompanying drawings showing a preferred embodiment of the invention and in which:

Fig. 1 is a fragmentary view of a portion of an electric discharge tube, for example, a cathode ray tube showing one form of any attaching socket applied thereto, parts thereof being shown in section to better illustrate the construction;

Fig. 2 is a top plan view of one of the improved socket contacts;

Fig. 3 is a bottom plan thereof;

Fig. 4 is an enlarged sectional view as taken on the line 4—4 of Fig. 2; illustrating the improved socket contact applied to a cooperating terminal;

Fig. 5 is a bottom plan view of the metal contact part of my improved socket;

Fig. 6 is a sectional view as taken on the line 6—6 of Fig. 5;

Fig. 7 is a transverse sectional view taken on the line 7—7 of Fig. 2; and

Fig. 8 is a plan view of the metal blank from which the metal socket part is made.

Referring to the drawings, the tube T, which in the illustrated form may be a cathode ray tube, is formed with the usual glass walls 1 having a terminal connector 2 sealed therein. The connector 2 is advantageously formed with an axial hollow stud member 3 to the interior of which is connected a lead 4 of the internal circuit of the tube. The lead is thus in electrical conducting contact with the stud.

The lead 4 and stud 3 are to be electrically connected to a circuit of the apparatus with which the tube is used, and to accomplish this purpose the contact socket 5 of the present invention is employed.

In the illustrated form of the invention, the

socket member 5 comprises a flexible insulating sheath 6 preferably of pure gum and a metal contact insert 7 embedded therein and completely covered thereby.

The contact insert is advantageously formed from a single blank 10 of sheet metal (see Fig. 8) of relatively high current carrying capacity, and is formed with a central convexed or crowned portion 11 with diametrically opposed extensions 12 extending outwardly from the peripheral edges of said convexed portion 11. A wiring terminal 13 also extends outwardly from a peripheral edge of the portion 11, intermediate and at right angles to the extensions 12 and the end portion thereof may be bent to U or V-shaped form as at 14 to be clamped to a conductor connected to the socket.

In forming the socket member from the blank shown in Fig. 8, the portion 11 is convexed as shown in Fig. 6 and the extensions 12 are folded inwardly against the under side of the portion 11 and then outwardly in opposed relation, presenting opposed resilient fingers forming a stud-receiving socket 15 and a constricted neck 16 adapted for snap fastener engagement with the socket 3 of the connector 2. The lower terminal portion 17 of the extensions 12, forming the restricted neck 15 of the socket, may be surrounded by a coil spring 18 to increase the holding engagement of the socket 10 with the stud 3 when the former is in snap fastener engagement therewith.

The socket member 10 is advantageously embedded and encased in a flexible insulating shield 6 formed of suitable flexible insulating material, such as pure gum, comprising a body portion 20 overlying the entire upper surface of the convexed member 11, as at 20, and formed with a peripheral flange 21, extending to a plane substantially in alignment with the lower terminal end of the socket member. A portion of the shield 6 surrounding the opposed socket-forming extensions, forms a tubular flexible insulating casing 22 therefor, the inner ends of which are connected by curved walls to the outer edge of the peripheral flange 21, thus forming a terminal-receiving recess 23 and a surrounding flexible tapered peripheral wall 24. A lateral tubular extension 25 on the shield 6 surrounds the wiring terminal 13 and is formed with a bore 26 surrounding the U-shaped end portion 14 thereof, so that a bare end of a conductor C may be inserted in the bore 26 and the wings of the U-shaped portion 14 clenched thereto. This is possible because of the highly flexible nature of the insulating shield 6.

Certain of the electron discharge tubes, such

for example as cathode ray tubes, operate under high voltages such as 3000 to 5000 volts with the result that there is a considerable corona loss at any point of outside electrical connection. My improved contact socket provides a convexed plate overlying and surrounding the contact socket which is in engagement and electrical contact with the stud and provides a shield for the corona which is created at the connecting point due to the high voltage.

The resilient socket portion 15 of the terminal is completely enclosed by the flexible tubular insulating member, thus providing a completely insulated contact socket which may be safely used by the operator notwithstanding the high voltages employed in such tubes.

It will be apparent from the above specification that I have provided an extremely simple, efficient and safe contact socket for the purposes described.

Although I have illustrated and described a preferred form of my invention, I do not wish to be limited thereby because the scope of my invention is best defined by the following claims.

I claim:

1. A contact socket of the character described comprising a convexed relatively thin metal body portion, resilient finger portions integral with said body portion and folded thereunder, portions of said fingers extending away from said body portion at substantially right angles thereto and cooperating to form a tubular resilient socket adapted for snap fastener engagement with a stud member and disposed with its axis normal to said body portion, and a protective flexible insulating sheath completely encasing said body portion and formed with a tubular extension surrounding said resilient socket.

2. A contact socket of the character described comprising a convexed relatively thin metal body portion, resilient finger portions integral with said body portion and folded thereunder, portions of said fingers extending away from said body portion at substantially right angles thereto and cooperating to form a tubular resilient socket adapted for snap fastener engagement with a stud member and disposed with its axis normal to said body portion, and a wiring terminal extending from said body portion, and a protective flexible insulating sheath completely encasing said body portion and formed with tubular extensions surrounding said resilient socket and wiring terminal.

3. A contact socket of the character described comprising a convexed relatively thin metal body portion, resilient finger portions integral with said body portion and folded thereunder, portions of said fingers extending away from said body portion at substantially right angles thereto and cooperating to form a tubular resilient socket adapted for snap fastener engagement with a stud member and disposed with its axis normal to said body portion, and a protective flexible insulating sheath completely encasing said body portion and formed with a tubular extension surrounding said resilient socket member, said cas-

ing being provided with an outer peripheral wall spaced radially from said tubular extension.

4. A contact socket of the character described comprising a convexed relatively thin metal body portion, resilient finger portions integral with said body portion and folded thereunder, portions of said fingers extending away from said body portion at substantially right angles thereto and cooperating to form a tubular resilient socket adapted for snap fastener engagement with a stud member and disposed with its axis normal to said body portion, and a protective flexible insulating sheath completely encasing said body portion and formed with a tubular extension surrounding said resilient socket member, said casing being provided with an outer peripheral tapered wall spaced radially from said tubular extension.

5. A contact socket of the character described comprising a convex and relatively thin body portion, a plurality of finger members integral with the peripheral edge of said body portion, said finger portions being bent inwardly under said body portion and then outwardly therefrom at substantially right angles thereto and together forming a hollow stud-receiving socket contact with a restricted neck portion, an integral wiring terminal extending laterally from said body and adapted to be connected to an electrical conductor, and a flexible insulating sheath completely encasing said body, said sheath having tubular extensions surrounding said stud-receiving socket member and said wiring terminal.

6. A contact socket of the character described comprising a convex and relatively thin body portion, a plurality of finger members integral with the peripheral edge of said body portion, said finger portions being bent inwardly therefrom at substantially right angles thereto and together forming a hollow stud-receiving socket contact with a restricted neck portion, a spring member surrounding said neck portion, an integral wiring terminal extending laterally from said body and adapted to be connected to an electrical conductor, and a flexible insulating sheath completely encasing said body, said sheath having tubular extensions surrounding said stud-receiving socket member and wiring terminal.

7. A contact socket of the character described comprising a convex and relatively thin body portion, a plurality of finger members integral with the peripheral edge of said body portion, said finger portions being bent inwardly under said body portion and then outwardly therefrom at substantially right angles thereto and together forming a hollow stud-receiving socket contact with a restricted neck portion, an integral wiring terminal extending laterally from said body and adapted to be connected to an electrical conductor, and a flexible insulating sheath completely encasing said body, said sheath having tubular extensions surrounding said stud-receiving socket member and wiring terminal, said sheath being provided with an outer peripheral flexible wall spaced radially from said tubular socket member protecting portion.

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