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TUBE SHIELD AND GROUND STRAP STRUCTURE

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Fig. 1

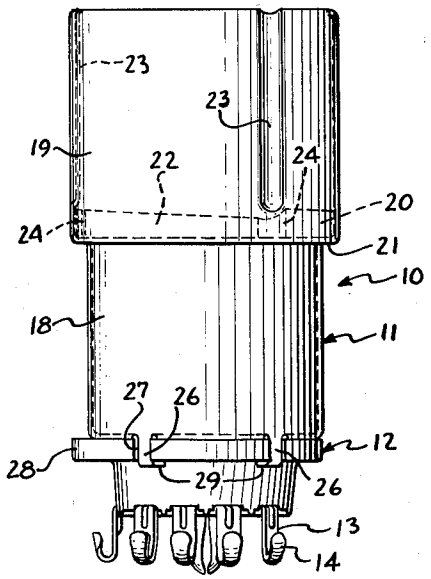
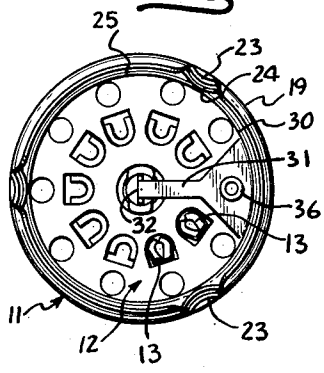


Fig. 2



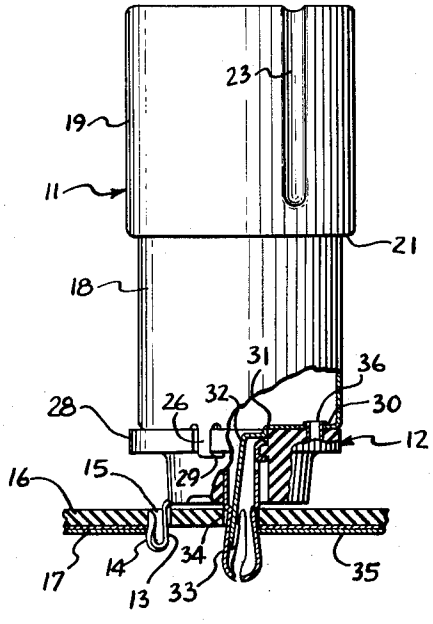


Fig. 3

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TUBE SHIELD AND GROUND STRAP STRUCTURE

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This invention relates to a tube socket assembly, and more particularly to an assembly comprising a socket casting having a tube shield affixed thereto which is equipped with an integral ground strap attached to the ground pin of the socket.

It is well known that tube shields are employed for the purpose of dissipating electromagnetic and electrostatic fields developed in the vicinity of a tube by conducting such fields to ground. Thus, the effectiveness of a shield is directly related to the type and quality of the ground connection therefor. One of the difficulties encountered in this respect is that ordinarily tube shields must be releasably secured to the socket casting because the shield necessarily extends to the upper end of the tube, and must then be removed to provide access to the tube for the removal and replacement thereof. Consequently, various grounding devices have been employed for the shields which rely on a mechanical engagement in the nature of a frictional contact with a limited area thereof. Such frictional interconnections have apparent disadvantages since there is a resistance loss across the limited area thereof, which impedes the grounding function.

An object of the present invention is to provide a tube shield structure which may be permanently affixed to a socket casting, and which is equipped with an integral ground strap permanently connected with the ground terminal of the socket casting to establish a good electrical connection therewith. Still another object is that of providing a telescopically adjustable tube shield having a lower end portion permanently secured to a socket casting and providing an integral ground strap mechanically anchored to such casting and soldered or otherwise permanently connected with the center or ground pin of the casting.

Still another object is in the provision of an assembly of the character described, in which the ground strap extends inwardly from the lower end of the shield in juxtaposition with the upper surface of the socket casting so as to be disposed beneath a tube mounted in the casting. Yet a further object is in the provision of a structure of the character described, in which the socket casting is adapted for use in conjunction with printed wire boards and has terminals to be pressed therethrough for connection with the printed wires thereof, and in which the socket casting is equipped with a hollow ground pin, into which an end portion of the ground strap depends, for connection thereto in a dip soldering operation. Additional objects and advantages of the invention will become apparent as the specification develops.

An embodiment of the invention is illustrated in the accompanying drawing, in which—

FIGURE 1 is a side view in elevation of a socket assembly embodying the invention; FIGURE 2 is a top plan view thereof; and FIGURE 3 is a side view in elevation of the assembly shown in position on a printed wire panel, and in which portions of the structure are shown in section.

The assembly in its entirety is designated with the numeral **10**, and comprises a tube shield **11** and a socket casting **12** equipped with a plurality of pin-receiving terminals **13**. In the specific illustration, there are nine such terminals **13**, each of which has an upwardly turned

tail or end portion **14** adapted to be inserted through an opening **15** therefor in a printed wire panel **16** equipped along the underside thereof with printed conductors **17**. With respect to the casting **12**, the terminals **13** thereof and the panel **16**, all of these components are substantially conventional and for such reason need not be further described in detail.

The tube shield **11** comprises two telescopically engaged sections **18** and **19**, the first of which extends into the latter for free coaxial movement therealong. The upper end of the lower section **18** is turned outwardly as shown at **20** to provide an annular shoulder adapted to abut the inwardly turned lower end portion **21** of the upper section **19**. It will be apparent in FIGURE 1 that the upper edges of the outwardly turned end portion **20** have a plurality of inclined surfaces **22** defining cams adapted to be engaged by the lower ends of the cam followers **23** which are defined by inwardly projecting ribs extending axially along the section **19**. When the upper section is rotated toward the left as shown in FIGURE 1, the cooperative engagement of the cams **22** and cam followers **23** forces the upper section **19** upwardly with respect to the section **18** to effect a good frictional engagement of the surfaces defined, respectively, by the outwardly extending portion **20** of the lower section and the inwardly turned portion **21** of the upper section. In the relative position of the sections **18** and **19** shown in FIGURE 1, the upper section **19** is free to move downwardly with respect to the section **18** because the cam followers or ribs **23** are in alignment with the respective channels **24** formed in the upper end portion **20**.

The lower shield section **18** at the bottom end thereof has an inwardly turned annular lip **25**, that is segmented as shown in FIGURE 2 and is contiguous with the upper surface of the casting **12**. Intermediate the segments **25**, the shield section **18** is equipped with depending cleats or fingers **26** that extend through slots or recesses **27** provided therefor along the circumferential surface of the flanged upper end **28** of the casting **12**. The cleats are turned inwardly as shown at **29** to clamp the lower shield section **18** in position on the casting **12**.

One of the lips, which is denoted with the numeral **30** for identification, merges into a ground strap **31** that extends inwardly from the lip along the upper surface of the casting and terminates in an elongated depending tail **32** that extends into the interior of a ground pin or terminal **33** centrally disposed with respect to the casting **12**. The pin **33** is adapted to extend through an opening **34** provided therefor in the panel **16** for connection with the ground lead **35** of the panel. It will be apparent from FIGURE 2 that the tail **32** has a greater dimension than the upper portion **31** thereof, and is in substantial abutment with the sides of the ground pin **33** throughout its entire length.

Further, the tail **32** is inclined toward one side of the pin **33** so as to abut the same along a portion thereof disposed beneath the panel **16**. Thus, in a dip soldering operation wherein the terminals **13** are secured to the conductors **17** therefor, the ground strap is soldered to the ground pin **33** and consequently is electrically connected with the ground conductor **35**. Since the ground pin is substantially cylindrical, and the tail **32** of the ground strap generally rectangular and has a width substantially equal to the inner diameter of the pin, the tail of the ground strap may be pressed into the terminal and will maintain the initially established position thereof, whereby a good solder connection between the strap and ground pin is assured.

With the construction described, the tube shield **11** is permanently secured to the casting **12**, both by the cleats

or fingers **26** and by a rivet **36** which extends through the enlarged portion of the strap in juxtaposition with the socket and which merges into the lip **30**. This rivet also enforces a contiguous relation between the strap and upper surface of the socket. Therefore, the ground strap may be soldered to the ground pin **33** to form a permanent connection therewith having excellent electrical characteristics. As a result, the shield is properly grounded and performs an effective shielding function.

While in the foregoing specification an embodiment of the invention has been described in considerable detail for purposes of making a full disclosure thereof, it will be apparent to those skilled in the art that changes may be made in such details without departing from the principles and spirit of the invention.

I claim:

1. In combination with a casting equipped with a hollow ground terminal and adapted for use with a printed wire panel, a tube shield member secured to said casting, a ground strap formed integrally with said shield, said ground strap extending inwardly from said shield along the upper surface of said casting and having a depending tail extending into the interior of said ground terminal, said tail being substantially of the same width as the inner diameter of said ground terminal and angularly disposed relative to the longitudinal axis thereof to provide a portion adjacent its lower end in contiguous relation to said ground terminal.

2. In combination, a socket casting equipped adjacent the upper end thereof with an outwardly extending flange provided with spaced notches, and a telescoping tube shield provided at the lower end thereof with a plurality of cleats respectively seated in said notches and

turned under said flange to anchor said shield to said casting, said casting having a centrally disposed ground terminal extending downwardly therethrough and provided with a hollow interior, said shield at the lower end thereof being equipped with an inwardly turned lip terminating in a ground strap lying along the upper surface of said casting, said ground strap being provided with a depending tail extending into the interior of said hollow ground terminal and into substantial abutment with a wall portion thereof to provide a solder connection therewith in a dip soldering operation subsequent to the mounting of the casting on a printed wire panel.

3. The combination of claim 2 in which said tail has a transverse dimension such that it is in substantial engagement throughout the length thereof with said ground terminal, and in which rivet means are provided to permanently anchor said ground strap to said casting along the upper surface thereof.

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