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ELECTRICAL PANEL ASSEMBLY FOR DIP SOLDERING

Filed Aug. 6, 1953

2 Sheets-Sheet 1

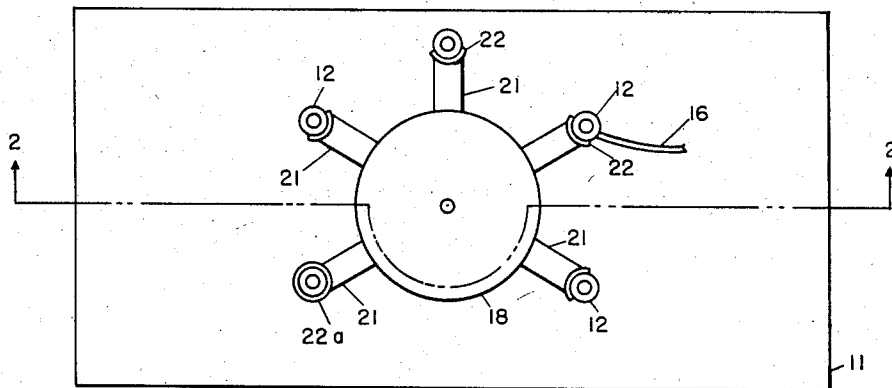


Fig. 1

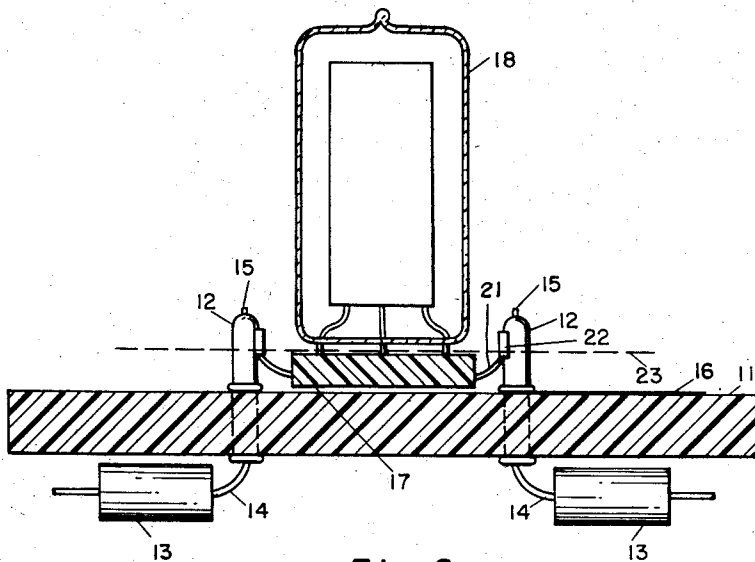


Fig. 2

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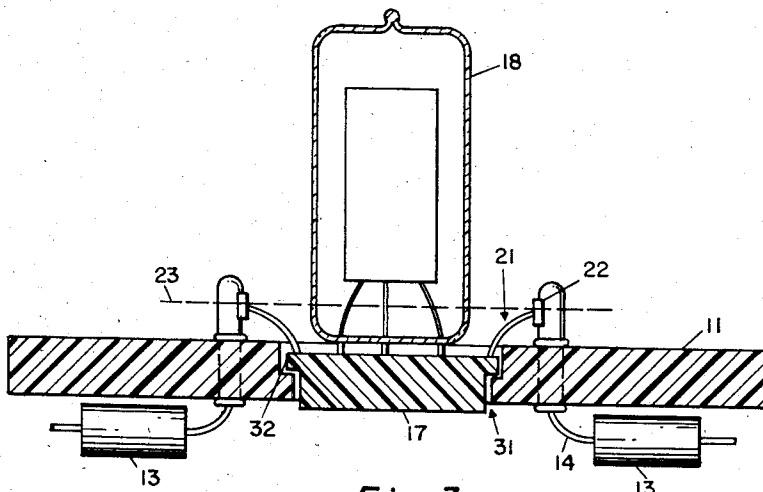


Fig. 3

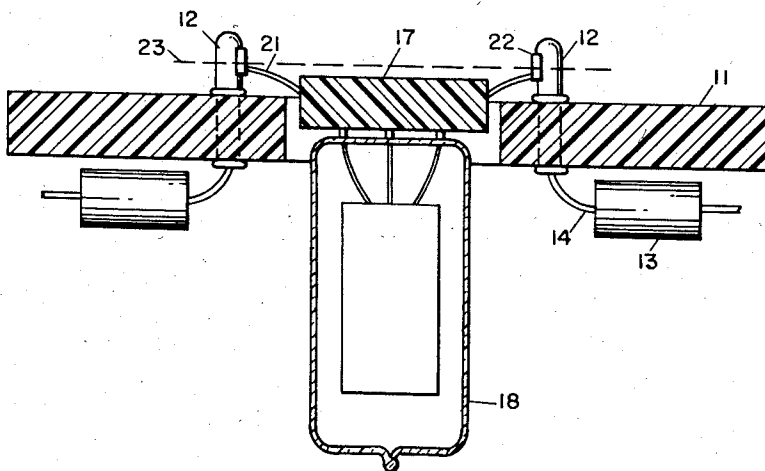


Fig. 4

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1

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ELECTRICAL PANEL ASSEMBLY FOR DIP SOLDERING

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4 Claims. (Cl. 339—150)

This invention relates to electrical circuit assemblies and particularly to an apparatus for fastening sockets and the like to electrical circuits.

The present invention is particularly useful in combination with electrical circuits of the "printed circuit" type which employ dip-soldering techniques as disclosed in co-pending patent application Serial No. 360,484, now abandoned, by Robert E. Ricketts and assigned to the present assignee.

An object of the present invention is to fasten sockets and the like to electrical circuits with a single soldering operation. Other objects will be apparent.

In the drawing, Fig. 1 is a plan view of a preferred embodiment of the invention,

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 1,

Fig. 3 is a cross-sectional view, taken on the line 2—2 of Fig. 1, but illustrating an alternative embodiment of the invention, and

Fig. 4 is a cross-sectional view, taken on the line 2—2 of Fig. 1, but illustrating a further embodiment of the invention.

Referring particularly to Figs. 1 and 2, a support or baseboard 11 of insulative material, such as a plastic, is provided with hollow terminal pins 12 attached therethrough and extending therefrom in the manner disclosed in the above mentioned co-pending patent application. Condensers 13, or resistors or the like, having electrical connection leads 14, are embodied in electrical circuits attached to the baseboard 11. The leads 14 may be inserted through the hollow terminal pins 12, terminating near the upper ends of the terminal pins 12, as indicated by the reference numerals 15. Also, if desired, printed wiring 16 may be attached to the baseboard 11 in order to make electrical connections to the terminal pins 12, as is disclosed in the above mentioned co-pending patent application. After the leads 14 are inserted into the hollow terminal pins 12, the ends of the pins 12 may be dipped into molten solder, thereby simultaneously soldering all of these connections.

Heretofore, it has been difficult to attach satisfactorily electrical sockets and the like to printed wiring circuits employing the terminal pins 12. The present invention solves the problem in the following manner.

A socket 17 of well known type having an insulating body and terminals, adapted to receive connector pins of an electronic tube 18 in the well-known manner, is provided with a plurality of connector clips 21 extending radially therefrom and terminating in curved or arcuate portions 22 adapted to engage portions of the surfaces of the respective terminal pins 12 adjacent the ends thereof, i.e. between the ends and the socket member as shown. The terminal pins 12 are preferably arranged in a circular manner, as shown, so as to be engaged by the curved portions 22 of the respective connector clips 21 when the socket 17 is positioned in place against the baseboard 11. The connector clips 21 are preferably somewhat resilient so that each curved portion 22 (Fig. 1) will resili-

2

ently engage a respective terminal pin 12. If desired, the curved portions 22 may be replaced by hollow circular portions 22a, which are adapted to surround the terminal pins 12, in which case it is not so necessary to provide resiliency in the connector clips 21.

After the socket 17 has been positioned as disclosed, and with the tube 18 removed therefrom, the entire assembly is held with the terminal pins 12 extending downwardly, whereupon the end portions of the terminal pins 12 and the contact portions 22 of the clips 21 are temporarily dipped into molten solder to the level indicated by the dotted line 23 in the drawing. This one-dip soldering operation simultaneously solders all of the connector clips 21, at the curved ends 22 thereof, to the respective terminal pins 12, and, at the same time, solders the leads 14 of the electrical components 13 to the terminal pins 12. The soldering level 23 is such that the socket 17 and all other electrical components will not touch the molten solder during the soldering operation. To achieve this, the connector clips 21 extend beyond and above the level of the top surface of the socket 17, as shown. It will be appreciated that, by thus simultaneously connecting the printed wiring 16, the components 13 and the tube socket 17, appreciable time and expense will be saved in mass production of electrical assemblies.

It has been found unnecessary to dip the entire lengths of the curved contact portions 22 into the molten solder, since even the slightest touching of the curved portions 22 to the molten solder will cause solder to be drawn, due to capillary action, into the space between the curved portions 22 and the pins 12, thereby insuring adequate and secure soldering. After the soldering step, the assembly is ready to have the tube 18 or other components plugged into the socket 17.

In the embodiment shown in Fig. 2, the socket 17 may be mechanically supported by means of the connector clips 21, or may rest against the baseboard 11. In either case, printed wiring may be positioned on the board 11 under the socket 17.

In the embodiment of Fig. 3, an opening 31 is provided through the baseboard 11, into which opening the socket 17 extends. This allows the socket to be mechanically positioned in line with or below the surface of the baseboard 11. If desired, shoulders 32 may be provided in the baseboard 11 and in the socket 17 to aid in accurately positioning and supporting the socket 17 in the opening 31.

In the embodiment of Fig. 4, the socket 17 is shown to be in an inverted position, so that the tube 18 will extend from the lower or reverse side of the mounting board 11 than was the case in the embodiments described above. In the embodiment of Fig. 4, the connector clips 21 may be soldered to the terminal pins 12 while the tube 18 is in position and plugged into the socket 17. If desired, the combination of the socket 17 and tube 18 may be replaced with a unitary electrical component, such as a transformer or a hermetically sealed electrical circuit, which entire unit can be positioned as shown in Fig. 4, with the connector clips 21 extending therefrom as shown, so that the unit may be dip-soldered into place as has been described.

While preferred embodiments of the invention have been shown and described, various modifications thereof will occur to those skilled in the art but will fall within the scope of invention as defined in the following claims.

What is claimed is:

1. An assembly for dip soldering which comprises, a support base having a plurality of hollow pins extending therethrough and arranged in a geometric outline, an insulating member located within said outline and spaced from said base, said member having a plurality of resilient leaf spring conductive members extending outwardly

3

therefrom, said spring members having ends partially encircling said pins at points more remote from said base than said insulating member, said spring members bearing against said pins and exerting sufficient pressure thereon to hold said insulating member in position whereby said assembly may be inverted and dipped in solder to a level such that said spring members are soldered to said pins and said insulating member does not contact the solder.

2. An assembly for dip soldering which comprises a support base having a plurality of hollow pins extending therethrough and arranged in a generally circular outline, an insulating member located within said outline and spaced from said base, said member having a plurality of resilient leaf spring conductive members extending radially therefrom, said spring members having ends partially encircling said pins at points more remote from said base than said insulating member, said spring members bearing against said pins and exerting sufficient pressure thereon to hold said insulating member in position whereby said assembly may be inverted and dipped in a solder to a level such that said spring members are soldered to said pins and said insulating member does not contact the solder.

3. An assembly for dip soldering which comprises a support base having a plurality of hollow pins of circular cross section extending therethrough, and arranged in a geometric outline, an insulating member located within said outline and spaced from said base, said member having a plurality of resilient leaf spring conductive members extending outwardly therefrom, said spring members having arcuate ends partially encircling said pins, said spring members bearing against said pins at points more remote from said base than said insulating member and exerting sufficient pressure thereon to hold said insulating member in position whereby said assembly may be inverted and dipped in a solder to a level such that said spring mem-

4

bers are soldered to said pins and said insulating member does not contact the solder.

4. An assembly for dip soldering which comprises a support base having a plurality of hollow pins of circular cross section extending therethrough, and arranged in a generally circular outline, insulating member located within said outline and spaced from said base, said insulating member having a plurality of resilient spring members extending radially therefrom, said spring members having arcuate ends partially encircling said pins, said spring members bearing against said pins at points more remote from said base than said insulating member and exerting sufficient pressure thereon to hold said insulating member in position whereby said assembly may be inverted and dipped in a solder to a level such that said spring members are soldered to said pins and said insulating member does not contact the solder.

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