

April 30, 1968

S. MANOS

3,381,259

TWIN PLUG CONNECTOR HAVING A COUPLING PIN

Filed Sept. 1, 1965

FIG. 1

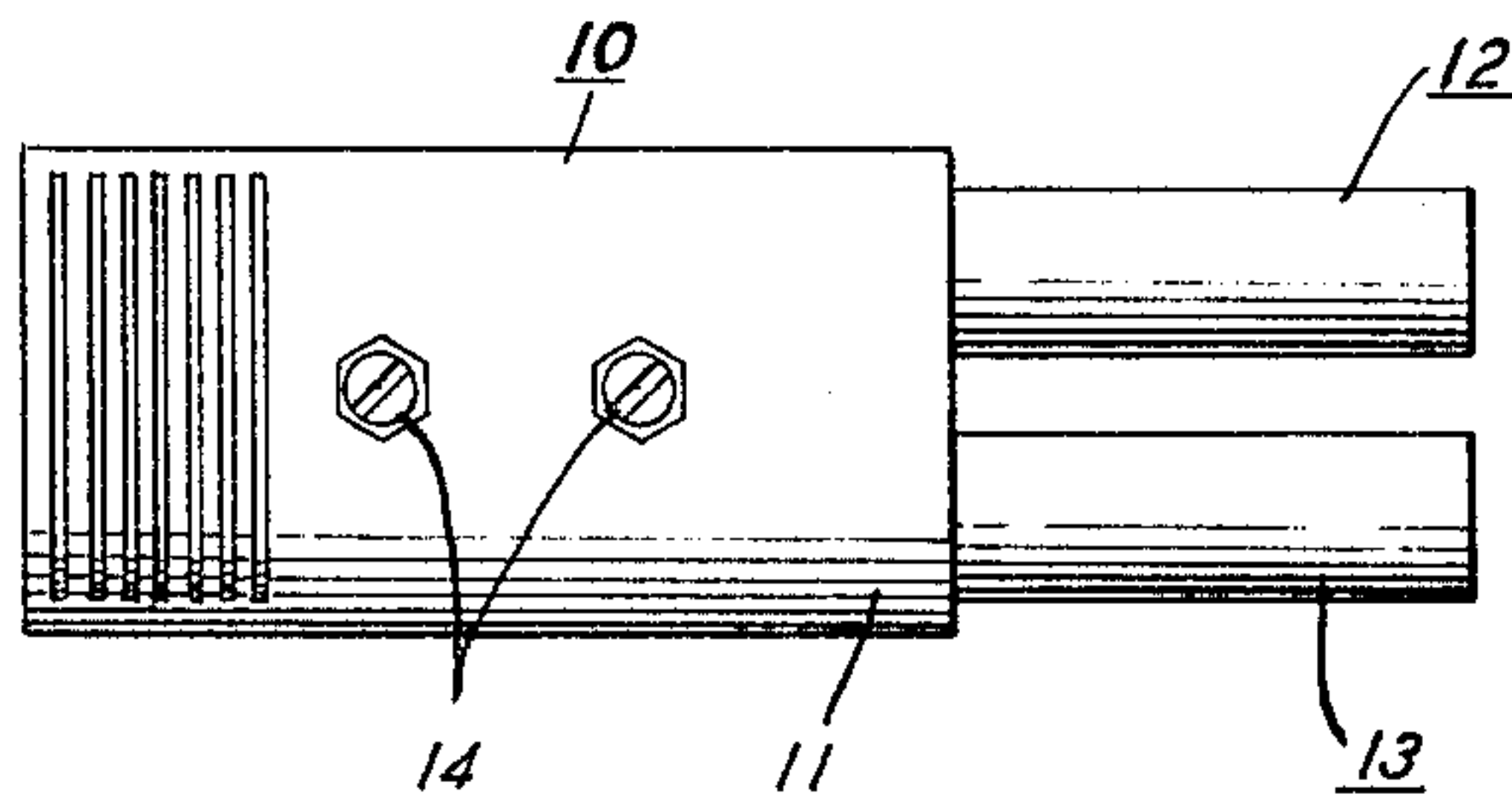


FIG. 2

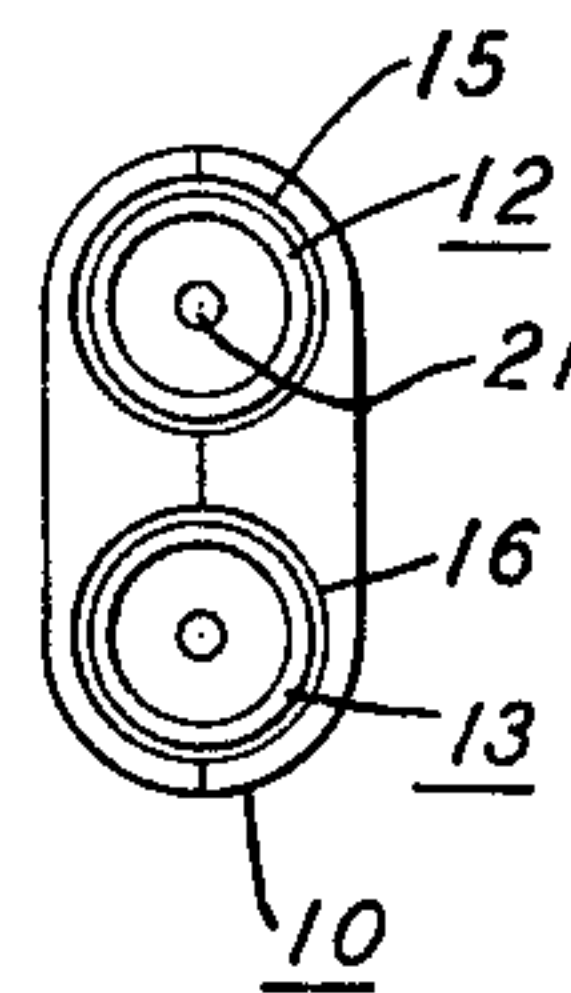


FIG. 3

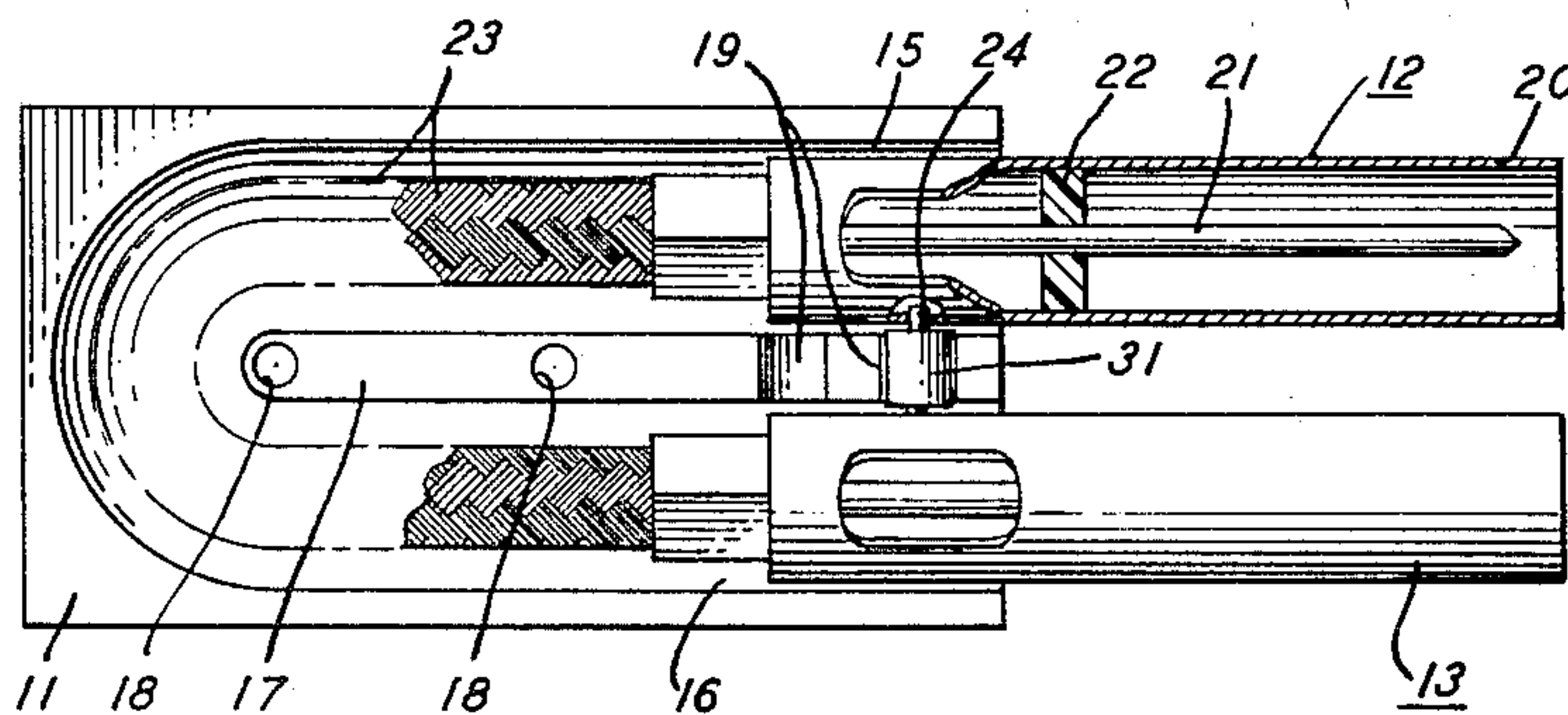
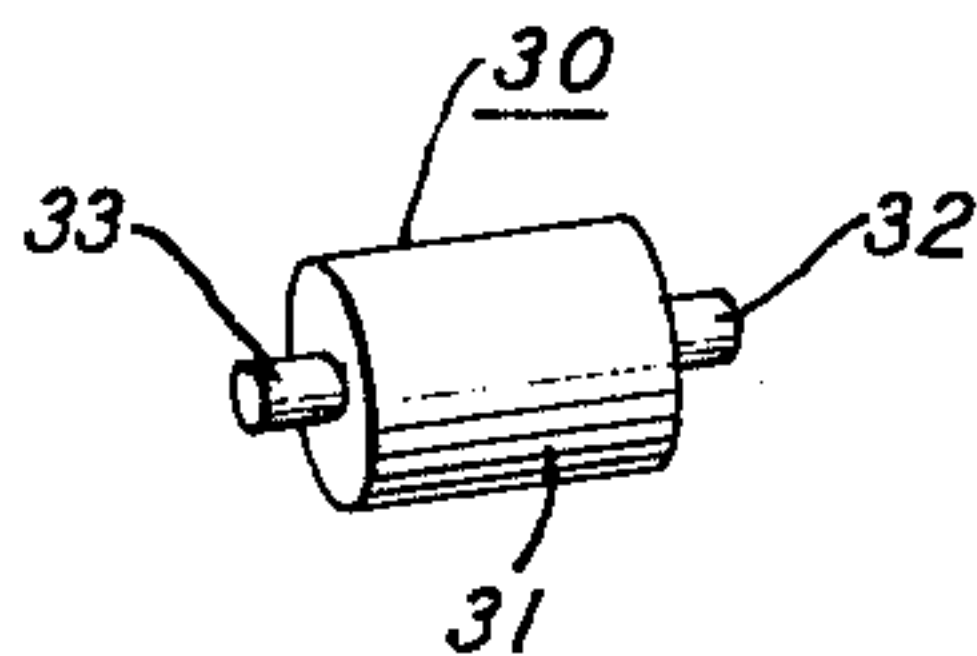


FIG. 4



INVENTOR
S. MANOS
BY

[Signature]
ATTORNEY

1

3,381,259

TWIN PLUG CONNECTOR HAVING A COUPLING PIN

Steven Manos, Bayonne, N.J., assignor to Bell Telephone Laboratories, Incorporated, New York, N.Y., a corporation of New York

Filed Sept. 1, 1965, Ser. No. 484,341

4 Claims. (Cl. 339-64)

ABSTRACT OF THE DISCLOSURE

A twin plug connector is disclosed in which two plugs are positioned in a case by a coupling pin.

This invention pertains to electrical connectors and relates particularly to connectors containing self-aligning or floating plugs.

Devices of the type to which this invention applies are typically used for making manual connections between circuits. For example, in the telephone industry many circuits are terminated in jacks. Connections into and between such circuits are made by inserting connector plugs into the jacks.

One commonly used connector plug is the two-prong or twin plug type. A twin plug connector typically comprises two plug bodies mounted parallel to each other in a plug case. In order for the twin plug connector to function properly, the plug body must not be able to move in and out of the plug case but must be capable of some lateral movement. If the plug bodies are able to move in and out of the plug case, then they will be unable to engage properly when inserted into jacks. On the other hand, if the plug bodies are unable to move laterally within the plug case, small variations in the center-to-center spacing between jacks will make insertion of the twin plug connector difficult if not impossible.

Accordingly, it is an object of this invention to provide a twin plug connector wherein the plug bodies are unable to move in and out but are able to move laterally within the housing in which they are mounted.

It is still another object of this invention to improve the reliability of twin plug connectors.

It is another object of this invention to reduce the cost of making twin plug connectors.

A feature of this invention is a double-ended coupling pin wherein the center of the pin is held by a housing containing a pair of plugs and the ends of the pin hold the plugs in place within the housing.

According to one embodiment of this invention, twin plug bodies are mounted in a plug case and held in place by a coupling pin. The plug case contains two chambers for receiving plug bodies and a passage connecting the two chambers for receiving the coupling pin. The plug bodies fit loosely in the chambers in the plug case and each plug body has a hole in its side for receiving one end of the coupling pin. The coupling pin is mounted in the passage in the plug case and its ends hold the plug bodies against in and out movement while permitting side-wise movement within the plug case.

Other objects and features of this invention will become readily apparent from the following detailed description when taken in conjunction with the drawing, in which:

FIG. 1 is an elevation view of a twin plug connector made in accordance with this invention;

FIG. 2 is an end elevation view of the twin plug connector shown in FIG. 1;

FIG. 3 is an elevation view of the twin plug connector shown in FIG. 1 with the outer cover removed and illustrating therein a coupling pin and two plugs in which one of the plugs has portions broken away; and

2

FIG. 4 is a perspective view of a coupling pin.

Referring now to FIG. 1, a twin plug connector 10 is shown therein which comprises a plug case 11, two plugs 12 and 13, and mounting screws 14. The plug case 11 can be made from any suitable material such as, for example, aluminum. As can be seen from FIG. 2, the plug case 11 is conveniently divided into two parts. Moreover, the plug case 11 contains two chambers 15 and 16 into which the plugs 12 and 13 fit, respectively.

In the embodiment being described the plugs 12 and 13 are cylindrical as are the chambers 15 and 16. Neither, however, need be confined to this configuration. In any event, the perimeter of the chambers 15 and 16 must be somewhat larger than the perimeter of the plugs 12 and 13 in order to allow the plugs to move laterally or sidewise when the two parts of the plug case 11 are joined together.

As shown in FIG. 3, the chambers 15 and 16 do not extend entirely through the plug case 11 but, instead, join each other to form a U-shaped channel which defines a boss 17. The boss 17 contains mounting holes 18 and two passages 19. The mounting holes 18 are arranged to cooperate with the screws 14 to hold the two parts of the plug case 11 together. In the embodiment illustrated, the screws 14 extend through the holes 18 and are held in place by threaded nuts (not shown). The passages 19 connect the chambers 15 and 16.

The plugs 12 and 13 can be made of any electrically conducting material such as copper. In the embodiment being described, both plugs are identical so a description of one serves as a description of the other.

As illustrated in FIG. 3, the plug 12 is designed for connection into a coaxial circuit. It is of typical coaxial construction and comprises an outer sleeve 20, an inner conductor 21, and separators similar to separator 22. The outer sleeve 20 and the inner conductor 21 can be made of any electrically conducting material such as copper or brass. The separator 22 can be made of any insulating material such as plastic, and as many as desired can be used.

The outer sleeve 20 is designed to be plugged into a jack at one end and to be connected to an electrical circuit at the other end, as, for example, to the short-circuit conductor 23 illustrated in FIG. 3. In addition, the outer sleeve 20 includes a hole 24 in one side for accepting a projection from a coupling pin 30.

The coupling pin 30, as illustrated in FIG. 4, comprises a stud made up of a body 31 having projections 32 and 33 protruding from each end. The coupling pin 30 can be made of any material such as metal or plastic. It is desirable, however, that the material be one which has a high shear strength. Furthermore, it can be regular in shape such as cylindrical or rectangular, or it can be irregular depending on the application desired.

As illustrated in FIG. 3, when the twin plug connector 10 is assembled, the coupling pin 30 is located in one of the passages 19. The particular passage 19 in which the coupling pin 30 is located will be determined by the type of plugs being used. The walls of the passage 19 hold the body 31 in place while the projection 32 extends into the hole 24 in the plug 12 and the projection 33 extends into a similar hole in the plug 13. Thus, when the two parts of the plug case 11 are joined together, the projections 32 and 33 on the connecting pin 30 prevent the plugs 12 and 13 from moving in and out while allowing lateral or floating movement of the plugs in the space between the walls of the chambers 15 and 16.

Accordingly, there has been herein disclosed an electrical connector containing self-aligning twin plugs which are unable to move in and out of the plug case in which they are mounted but are capable of lateral or sidewise movement to accumulate misaligned jacks. Although a

specific embodiment of this invention has been shown and described, it will be understood that various modifications can be made without departing from the spirit of this invention and within the scope of the appended claims.

What is claimed is:

1. In a twin plug connector adaptable for use with misaligned jacks, the combination comprising:

a plug case having two chambers connected by a plurality of passages;

a pair of plugs mounted loosely in said chambers, each of said plugs having a hole in one side; and

a unitary coupling pin having a body and two end projections, said body being positioned in one of said passages and each of said projections extending into a hole in a plug whereby said plugs are firmly mounted in said plug case but can readily adapt to misaligned jacks.

2. A combination in accordance with claim 1 wherein the body and end projections of said coupling pin are cylindrical.

3. A twin plug coaxial connector adaptable for use with misaligned jacks comprising:

a plug case having two parallel chambers connected by a cylindrical passage;

a pair of plugs mounted loosely in said chambers, each of said plugs having an inner conductor and an outer conductor spaced from each other by an insulating separator, said outer conductor having a hole therein;

a coupling pin having a cylindrical body and two cylindrical end projections extending out of and having a smaller diameter than said body, said body being positioned in said passage and each of said projec-

tions extending into a hole in a plug whereby said plugs are firmly mounted in said plug case but can readily adapt to misaligned jacks;

means for connecting said plugs to an electrical circuit.

4. In a twin plug connector adaptable for use with misaligned jacks, the combination comprising:

a plug case having two chambers connected by a passage;

a pair of plugs mounted loosely in said chambers, each said plugs having an inner conductor and an outer conductor spaced from each other by an insulating separator, said outer conductor having a hole therein;

a unitary coupling pin having a body and two end projections, said body being positioned in said passage and each of said projections extending into one of said holes whereby said plugs are firmly mounted in said plug case but can readily be adapted to misaligned jacks; and

means for adjusting the position of said coupling pin within said plug case.

References Cited

UNITED STATES PATENTS

2,195,546 4/1940 Townsend ----- 339—64

FOREIGN PATENTS

345,879 12/1921 Germany.

MARVIN A. CHAMPION, *Primary Examiner*.

J. H. McGLYNN, *Assistant Examiner*.