

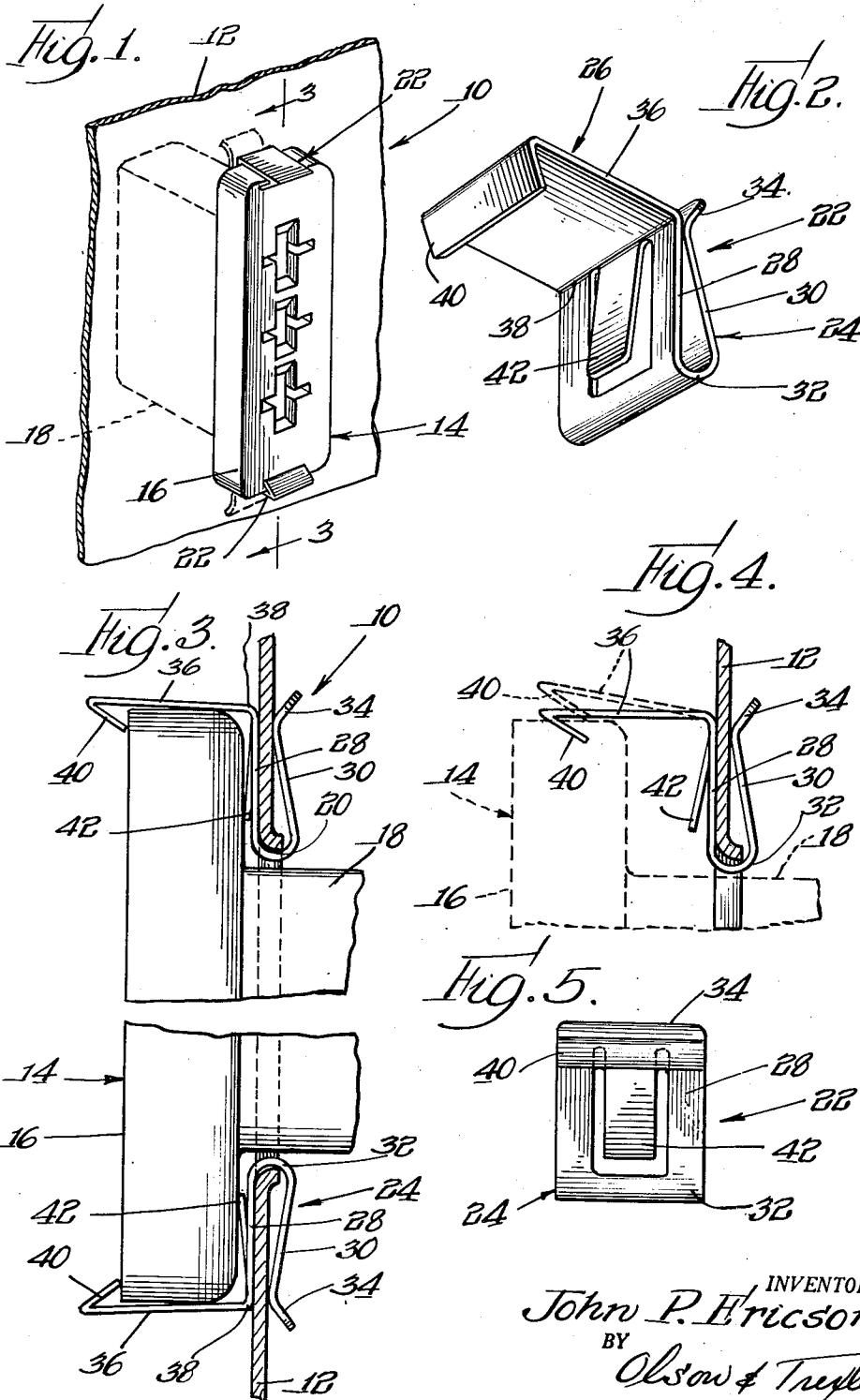
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ELECTRICAL CONNECTOR MOUNTING ASSEMBLY

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1

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ELECTRICAL CONNECTOR MOUNTING ASSEMBLY

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The present invention relates to a novel assembly including an electrical connector and to novel fastening means for retaining the connector in the assembly.

Electrical appliances such as stoves and the like are usually provided with an electrical connector having a ceramic body, which connector is secured to a metal frame or panel of the appliance to permit the appliance to be connected with the power source. The ceramic bodies for such electrical connectors are usually made without holding them to close tolerances in order to facilitate economical production, but this has sometimes made the mounting of such connectors on an appliance or other workpiece relatively difficult. Various fastening devices have been devised for mounting such connectors on a workpiece and these heretofore known fastening devices have not been entirely satisfactory since they have often been relatively complicated and expensive to manufacture and install and they have often required some auxiliary fastening device such as screws or rivets for connecting them to the work.

An important object of the present invention is to provide a novel assembly including an electrical connector, a workpiece or panel, and fastening means which are constructed so that the connector may be easily and economically mounted to the panel or workpiece despite relatively great tolerance differences or inaccuracies in the connector.

Another important object of the present invention is to provide a novel fastening device especially useful in an assembly of the above described type, which fastening device is of simple construction and may be easily applied to a workpiece or panel without the aid of auxiliary fastening means such as screws, rivets or the like.

A further object of the present invention is to provide a novel fastening device of the above described type, which fastening device may be simply made from a single piece of sheet material such as sheet metal and is adapted to retain articles such as an electrical connector regardless of substantial variations in the dimensions of the article.

Other objects and advantages of the present invention will become apparent from the following description and the accompanying drawings wherein:

Fig. 1 is a perspective view of an assembly embodying the principles of the present invention;

Fig. 2 is a perspective view of the novel fastening device of this invention;

Fig. 3 is an enlarged fragmentary cross sectional view taken along line 3—3 in Fig. 1;

Fig. 4 is a sectional view showing a fastening device of this invention applied to an apertured panel and further showing in broken lines the manner in which an article such as an electrical connector may be assembled with the fastening device; and

Fig. 5 is an end view of the fastening device of this invention.

Referring now more specifically to the drawings, where-

2

in like parts are designated by the same numerals throughout the various figures, an assembly 10 embodying the principles of this invention is shown in Figs. 1 and 3. The assembly 10 includes a sheet metal panel 12 which, for example, may be a part of an electrical appliance such as a stove. However, it will be apparent that certain features of this invention will be useful for many purposes and that the panel 12 may be a part of various structures other than electrical stoves. The assembly 10 also includes an electrical connector 14 having a body made from ceramic material or any other suitable electrical insulating material. The ceramic body of the electrical connector includes an enlarged head portion 16 adapted to overlie an outer face of the panel 12 and an axially extending shank portion 18 adapted to extend through an opening 20 provided in the panel 12. In order to retain the electrical connector and the panel 12 in assembled relationship a pair of fastening members 22 constructed in accordance with the present invention are disposed at opposite sides of the panel opening 20 and engage opposite ends of the electrical connector in the manner shown.

Each of the fastening members 22 is made from a single piece of sheet material, preferably sheet spring steel, and includes a portion 24 adapted to secure the fastener to the workpiece or panel and a portion 26 adapted to retain the electrical connector or any other desired article. As shown in the drawings the fastener portion 24 is generally U-shaped and includes legs 28 and 30 joined together by a curved section 32 at the closed end of the U and converging toward each other and substantially together at the open end of the U. It will be appreciated that the fastening devices 22 may be easily applied to the panel 12 merely by slipping the legs 28 and 30 over the edge of the opening 20 in the manner shown whereupon the resilient legs grip the panel to retain the fastening device in assembled relationship therewith. In order to facilitate application of the fastening devices to the panel the free ends of the legs 30 are each provided with an outwardly flared cam portion 34 which extends beyond the outer end of the leg 28.

The article retaining portion of each of the fastening members 22 includes a resilient leg 36 integrally joined to the outer end of the leg 28 along a bend line 38. Preferably the leg 36 is disposed at an angle to the leg 28 such that when the fastening device is applied to the panel with the leg 28 flush against the panel as shown best in Figs. 3 and 4, the leg 36 is substantially perpendicular to the panel. This angle may, of course, be varied in accordance with the article to be retained by the fastening device and should be such that the leg 36 closely confines the end of the head section of the electrical connector or other article to be retained in the manner shown best in Figs. 1 and 3. The outer end of the leg 36 of each of the fastening members merges with a reversely bent and inwardly extending section 40 adapted to overlie and engage the outer surface of the article or electrical connector and thus retain the electrical connector in assembled relationship.

The article retaining portion 26 of each of the fastening members also includes a resilient tongue 42 joined with the leg 36 along the bend line 38 and struck from the leg 28. Furthermore, the tongue 32 is formed so that it normally projects out of the plane of the leg 28 for engagement with the bottom or inner surface of the article or electrical connector head in the manner shown best in Fig. 3. The tongues 42 serve to resiliently clamp the head of the electrical connector in cooperation with the sections 40 so that the electrical connector may be snugly and securely retained regardless of variations in the dimensions thereof. It should be noted that the legs 36 and the tongues 42 combine together to provide the

fastening members with generally L-shaped portions engageable with the article or electrical connector in a manner so that after assembly of the electrical connector with the fasteners, any attempt to spread the legs 36 is resisted by engagement of the tongues 42 with the under surfaces of the connector head. While this resistance is sufficient to insure against any inadvertent disassembly of the electrical connector, it is understood that the legs 36 are sufficiently resilient to permit them to be spread apart and to permit removal of the electrical connector whenever desired.

After the fastening members 22 have been assembled over opposite margins of the panel opening 20, the electrical connector may be easily applied to the assembly. More specifically, as shown in Fig. 4 by the broken lines, the shank of the electrical connector is first inserted into the panel opening whereupon the connector is merely advanced toward the panel. As the head of the electrical connector advances toward the panel its opposite ends engage the sections 40 of the fastener members, which sections are flared away from the legs 36 and act as cams to spread the legs 36 and permit passage of the connector head to its finally assembled position and beneath the ends of the sections 40.

From the above description it is seen that the present invention has provided a structure including an apertured panel, an article such as an electrical connector and fastening members, which structure is formed so that the elements thereof may be rapidly and economically assembled together regardless of substantial variations in the dimensions of the elements. More specifically, it will be appreciated that the resilient legs 36 of the fastening members will enable the assembly of electrical connectors or other articles having various lengths and the resilient tongues 42 of the fastening members insure that the electrical connector or other article will be tightly and securely clamped in position regardless of substantial variations in thickness. It is also seen that the present invention has provided a novel one-piece sheet material fastening member which is of simple and economical construction, which may be easily applied to an apertured panel without the aid of complementary fastening devices such as screws and the like and with which an article such as an electrical connector may be easily and securely assembled.

While the preferred embodiment of the present invention has been shown and described herein it is obvious that many structural details may be changed without departing from the spirit and scope of the appended claims.

The invention is claimed as follows:

1. In combination a panel having opening means therein, a pair of generally oppositely disposed one-piece sheet material fastening members each including a pair of opposed resilient panel gripping legs interconnected at adjacent ends, the legs of one of said fasteners being assembled over an inner marginal portion of the panel at one side of said opening means and the legs of the other of said fastening members being assembled over a generally oppositely disposed inner marginal portion of said panel, and an article having a body portion overlying one side of said panel and disposed between said fastening

members, each of said fastening members including a resilient portion interconnected with one of said legs overlying said one side of the panel and extending laterally of the panel and across an edge of said body portion, a section interconnected with said resilient portion and overlying and engaging a part of said body portion for retaining the body portion in assembled relationship, and an integral resilient tongue portion engaging said body portion and cooperating with said section for clamping said body portion in assembled relationship.

2. In combination a panel having an aperture therein and a pair of clips positioned at substantially opposite ends of said aperture, a dielectric body having a head portion greater in size than said aperture overlying the panel on one side thereof and positioned between said pair of clips, said clips each comprising two opposed leg sections interconnected by a curved bight portion, said two legs being accepted on opposite sides of the panel and with the bight portion positioned adjacent to one margin of said aperture, a resilient third leg extending from the free end of the leg positioned on the same side of the panel as said head portion, said third leg having a reversely bent free end integral therewith which provides a cam surface, a spring finger struck from within the margins of the leg adjacent the head section and extending towards the reversely bent portion of the third leg, whereby said head portion is removably resiliently retained between said spring fingers and said reversely bent portions.

3. In combination an assembly comprising a sheet material panel having an elongated aperture therein, a pair of clips positioned at opposite ends of said elongated aperture, each of said clips having two resilient opposed legs interconnected by a rounded bight portion, the first of said legs being positioned on the back-side of said panel while the second leg in juxtaposition to the front side of said panel, the bight portion being adjacent to the margin of the aperture, a resilient third leg integrally connected adjacent the free end of the second leg and extending outwardly from the front of the panel, the third leg having at least a portion of its length extending at an angle to the leg and in a direction towards the bight portion, a spring finger struck entirely from within the margins of the second leg extending outwardly having its free end adjacent the bight portion, and a dielectric block having a head section and a shank section, said shank section being adapted to extend from the front side through the aperture beyond the back-side of the panel, the head section of the block being adapted to overlie the front of the panel between the pair of clips and to be removably retained between the spring finger and reversely bent portion of each of the clips at opposite ends of said head section.

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