

Description

This invention relates to electrical receptacles. More particularly, it relates to improved electrical receptacles having spring means contained therein.

Electrical receptacles, or sockets as they are sometimes referred to, are essential elements of electrical connectors. Normally, one end of the socket terminates a cable conductor by using solder or some other technique. The other end is open and is adapted to receive a corresponding electrical pin contact. A spring fixed in the box provides spring force on the pin to make contact therewith. A solder tab may be part of the spring.

The object of this invention is to provide a plug-in receptacle of the type described above that prevents overstressing of the contact spring which is in the general form of a leaf spring having a central arc portion when an associated contact pin is inserted skewed and as a result permanently deforms the spring.

A solution to such overstressing problems in similar plug-in receptacles is proposed in e.g. FR-A- 2236291.

According to one aspect of the invention there is provided an electrical receptacle comprising: a formed resilient metal leaf spring to be received in a through passage in a plastic supporting housing, said through passage having an inclined portion for contacting said spring, said spring being formed with an arc, and means for securing said spring in said through passage with its arc portion contacting said inclined portion of the through passage in the receptacle, characterised in that said arc is formed in the central portion of the spring and that said arc has a nonflexing portion. Thus according to this aspect of the invention the spring itself incorporates an overstress stop by, in preferred embodiments, being formed with a double bend nonflexing portion; i.e., a hump, in the arc portion of the leaf spring, preferably near the apex of the arc, or forming a concave non-flexing depression near the apex of the arc.

A number of embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Fig. 1 is a cross-sectioned side elevation of the receptacle of this invention.

Figs. 1A and 1B are cross-section views of Fig. 1 taken along lines 1A-1A and 1B-1B respectively.

Fig. 2 is a cross-sectioned view of Fig. 1 taken along line 2-2.

Fig. 3 is an end view of Fig. 1.

Fig. 4 is a perspective view of another preferred embodiment, partially in section.

Fig. 5 is a perspective view of the leaf contact spring of Fig. 4.

Fig. 6 is a cross-sectioned view of Fig. 4 taken along line 11-11.

Referring now to Figs. 1-3, the receptacle chosen for purposes of illustration for this embodiment of the invention includes as its basic elements a housing 10 made of insulating plastic material. Received in the through passage 11 of the housing is a resilient metal leaf spring 12. Tabs 14 and 16 are formed at one end of spring 12 and bent at a 90° angle so that in connection with the interior of the housing in the form of inclined plane sections 17,19, against which the edges of spring 12 rest, a secure fastening for the spring in the housing is obtained. The inclined plane sections 17,19 engage the edges of spring 12 and serve to preload spring 12 to reduce the insertion force of pin 22 and also serve as a guide for centering pin 22. The spring 12 also has legs 12a, 12b formed at either end to provide for a solder connection at each end of the connector. A double-bend nonflexing portion or hump 18 is formed in the arc portion 20 of the spring to provide a section that acts as a positive stop should the spring be overstressed by skewed insertion of pin 22 and assures that spring 12 can only be elastically deformed and not permanently deformed.

In another preferred embodiment, shown in Figs 4-6, the housing 50 is made of insulating material and has a passage 51 there through which has sidewalls 52,54 defining inclined planes 52a, 54a. A metal leaf spring 53, has a central arc portion 55 which is formed with concave depressions 56,58 at each edge of the spring near the apex of the arc portion 55. The spring also has a leg 53a formed at one end to provide for a connection. The spring 53 is retained in the housing 50 by tab 53b engaged with lip 57 of the housing and shoulders 61,62 of the spring engaging angled stops 63,64 formed in the passage 51 of the housing. The inclined plane 52a, 54a engage the edges of spring 53 and serve to preload the spring to reduce the insertion force of the pin 60 which is rectangular in cross-section. The side walls (52,54) also serve as a guide for centering the pin 60 over the spring 53. The concave depressions 56,58 are rigid non-flexing portions that act as positive stops should the spring be overstressed by skewed insertion of pin 60 and assure that spring 53 can only be elastically deformed and not permanently deformed.

Claims

1. An electrical receptacle comprising: a formed resilient metal leaf spring (12;53) to be received in a through passage (11;51) in a plastic supporting housing (10;50), said through passage having an inclined portion



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(17,19;52a,54a) for contacting said spring (12;53), said spring being formed with an arc (20;55), and means for securing said spring in said through passage (11;51) with its arc portion contacting said inclined portion (17,19;52a,54a) of the through passage in the receptacle, characterised in that said arc is formed in the central portion of the spring and that said arc has a nonflexing portion (19;56,58).

2. The receptacle of claim 1, wherein said non-flexing portion is a double bend portion (18).
3. The receptacle of claim 1, wherein said non-flexing portion is a concave depression (56,58).
4. The receptacle as defined in claims 1 or 3 wherein said means for securing said spring (53) in said through passage is a tab (53b) on the end of the spring 53 and shoulders (61,62) near the same end of the spring engaging a lip (57) and angled stops (63,64) respectively, in said passage (51).

Patentansprüche

1. Elektrische Steckaufnahme, welche folgendes aufweist: eine geformte, federnd nachgiebige, metallische Flachfeder (12; 53), welche in einem Durchgang (11; 51) in einem Kunststoffhaltegehäuse (10; 50) aufnehmbar ist, wobei der Durchgang einen geneigten Abschnitt (17, 19; 52a, 54a) zur Kontaktierung der Feder (12; 53) hat, die Feder mit einem Bogen (20; 55) ausgebildet ist, und eine Einrichtung zum Festlegen der Feder in dem Durchgang (11; 51), wobei der Bogenabschnitt den geneigten Abschnitt (17, 19; 52a, 54a) des Durchganges in der Aufnahme berührt, dadurch gekennzeichnet, daß der Bogen im Mittelabschnitt der Feder ausgebildet ist, und daß der Bogen einen nicht biegbaren Abschnitt (19; 56, 58) hat.
2. Steckaufnahme nach Anspruch 1, bei der der nicht biegbare Abschnitt ein doppelt gebogener Abschnitt (18) ist.
3. Steckaufnahme nach Anspruch 1, bei der der nicht biegbare Abschnitt eine konkave Vertiefung (56, 58) ist.
4. Steckaufnahme nach den Ansprüchen 1 oder 3, bei der die Einrichtung zum Festlegen der Feder (53) in dem Durchgang von einem Ansatz (53b) an dem Ende der Feder (53) und

Schultern (61, 62) in der Nähe des gleichen Endes der Feder gebildet wird, welche mit einer Lippe (57) und abgewinkelten Anschlüssen (63, 64) jeweils im Durchgang (51) zusammenarbeitet.

Revendications

1. Une douille électrique comprenant:
 - un ressort à lame en métal élastique (12; 53) destiné à être disposé dans un passage traversant (11; 51) d'un boîtier de support en plastique (10; 50), ledit passage traversant ayant une partie inclinée (17, 19; 52a, 54a) rentrant en contact avec ledit ressort (12; 53), ledit ressort ayant une forme présentant un arc (20; 55), et des moyens pour fixer ledit ressort dans ledit passage traversant (11; 51), avec sa partie arquée en contact avec ladite partie inclinée (17, 19; 52a, 54a) du passage traversant de la douille, caractérisée en ce que ledit arc est formé sur la partie centrale du ressort, et en ce que ledit arc présente une patte non-flexible (19; 56, 58).
2. La douille selon la revendication 1, dans laquelle ladite partie non-flexible est une partie à double courbure (18).
3. La douille selon la revendication 1, dans laquelle ladite partie non-flexible est une cavité concave (56, 58).
4. La douille selon l'une quelconque des revendications 1 ou 3, dans laquelle lesdits moyens pour fixer ledit ressort (53) dans ledit passage sont constitués d'une patte (53b) à l'extrémité du ressort (53) et d'épaulements (61, 62) à proximité de la même extrémité du ressort, en contact respectivement avec une lèvre (57) et des butées d'arrêt angulaires (63, 64), dans ledit passage (51).