A spring receptacle contact and a housing therefor, the contact including a pair of resilient cantilever spring fingers which cooperate to provide a receptacle. The fingers are each provided with a button compressibly engaged on opposed sides of a housing recess into which the spring contact is inserted. The contact is further provided with a tab in spaced relationship from a pair of flaps. Together, the tab and flaps are crimped over an electrical post which projects from the housing recess. The receptacle contact is further provided with an elongated embossed base which terminates in a generally T-shaped end portion which seats laterally within the housing recess. Such end portion additionally carries a tine which abuts against a shoulder in the housing to prevent withdrawal of the contact receptacle. A pair of diagonally projecting levers compressibly engage against a side of the housing recess for seating the longitudinal base of the receptacle contact laterally against an opposed side of the housing recess. Additionally, the levers abut against a shoulder provided in the housing recess to lock the recess to lock the receptacle contact therein. To remove the receptacle contact, a suitable tool is inserted into the housing recess for resiliently deforming the tine and disengaging it from the cooperating shoulder.

7 Claims, 8 Drawing Figures
FIELD OF THE INVENTION

The present invention relates to an electrical spring receptacle contact which is precision aligned and rigidly supported against movement within a recess of a housing, which contact is positively locked in place to prevent removal thereof from the housing.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

According to the preferred embodiments, the present invention comprises a spring receptacle contact and a housing therefor. The contact is characterized by a pair of cooperating cantilever spring fingers each of which are provided with a projecting button or knob. The knobs engage against opposed sidewalls of a housing recess, laterally supporting the contact therewithin. An elongated embossed base extends longitudinally of the contacts and is provided with a T-shaped end portion bridging laterally across the housing recess to additionally provide lateral support for the contact. A line projects from the end portion and engages against a cooperating shoulder provided in the housing, thereby preventing removal of the contact from the housing recess. A pair of diagonally projecting resilient levers compressibly engage against a sidewall of the housing recess for maintaining the elongated base seated in abutment against an opposed sidewall of the housing. Thus the contact is precision aligned within the housing recess and is laterally supported on all sides. Additionally, the levers abut against a cooperating shoulder provided in the housing to lockably retain the contact in place. To remove the contact, a suitable tool is inserted into the housing recess, resiliently deforming the time and disengaging it from its cooperating shoulder.

OBJECTS OF THE INVENTION

It is therefore an object of the present invention to provide a spring receptacle contact in laterally supported, precision alignment within a recess of a housing.

Another object of the present invention is to provide a spring receptacle contact which is laterally supported within a recess of a housing and resiliently locked in place by a tine cooperating with a shoulder provided in the housing recess.

A further object of the present invention is to provide a spring receptacle contact including a base and a pair of resilient levers in compressive engagement against opposed sidewalls of a housing recess, thus cooperating to laterally support the contact therein.

Yet another object of the present invention is to provide a spring receptacle contact having an embossed elongated base terminating in a T-shaped end portion which laterally bridges a housing recess for laterally supporting and aligning the contact within the recess.

Yet a further object of the present invention is to provide a spring receptacle contact laterally supported and precision aligned with a housing recess, with an electrical post fixedly secured at two locations to the contact.

Still another object of the present invention is to provide a spring receptacle contact having a pair of resilient spring fingers each provided with a projecting knob which compressively engages against the sidewall of a housing recess to laterally support the contact within the recess.

Another object of the present invention is to provide a housing for receiving a precision aligned, laterally supported contact therein, wherein the contact is resiliently locked in place within the housing.

Other objects and many attendant advantages of the present invention will become apparent upon perusal of the following detailed description taken in conjunction with the accompanying drawings and claims.

FIG. 1 is an enlarged plan view of a spring receptacle contact according to the present invention; FIG. 2 is an elevation of the preferred embodiment illustrated in FIG. 1; FIG. 3 is an enlarged plan view illustrating a flattened unitary construction of the contact shown in FIG. 1; FIG. 4 is an enlarged fragmentary longitudinal section illustrating the contact of FIG. 1 mounted in a recess of a housing; FIG. 5 is a fragmentary section taken along the line 5—5 of FIG. 4; FIG. 6 is a fragmentary section taken along the line 6—6 of FIG. 5; FIG. 7 is a fragmentary section taken along the line 7—7 of FIG. 5; and FIG. 8 is a fragmentary section taken along the line 8—8 of FIG. 5.

Detailed description of the preferred embodiments

With more particular reference to FIG. 3 of the drawings, there is indicated generally at 1 a flattened unitary construction resilient spring receptacle contact according to the invention. The contact 1 is characterized by a pair of elongated, generally trapezoidal shaped spring fingers 2 and 4 respectively provided with buttons 6 and 8 adjacent to corresponding ends of the fingers. The fingers 2 and 4 are respectively provided with elongated tapered outer surfaces 10 and 12 which terminate in chamfered terminal end portions 14 and 16. The ends of the spring fingers adjacent to the buttons 6 and 8 are integrally provided on either side of a web 18 extending therebetween. Between the spaced fingers 2 and 4, a resiliently engaged generally rectangular base 20 extending longitudinally of and in spaced relationship with respect to each of the fingers 2 and 4. The elongated base 20 is integral with the web 18 and includes an elongated embossment 22, extending longitudinally of the base 20 and into a portion of the web 18. The base 20 additionally terminates in a generally T-shaped end portion 24 having generally planar, parallel side edges 26 and 28 for a purpose to be described hereinafter. A resilient time 30 is partially severed from the T-shaped end portion and extends generally along the longitudinal axis of the elongated base 20. The partially severed configuration of the time also projects toward the web 18 located at the opposite end of the base 20 from the T-shaped end portion 24.

An elongated notch 32 is generally adjacent to the button 6, extends generally diagonally toward the web 18. The diagonally extending notch 32 defines a generally elongated, diagonally projecting lever 34, which tapers to a generally planar edge 36 extending perpendicular to the longitudinal axis of the elongated base 20. In similar fashion, the end of resilient finger 4 adjacent to the button 8 is provided with an elongated, generally diagonally notched edge 38 similar in configuration to that of the notch 32. The notch 38 defines an elongated diagonally projecting lever 40, similar in configuration to the lever 34 and tapering to terminate in a generally planar edge 42, in line with the corresponding edge 36 of the lever 34 and perpendicular to the longitudinal axis of the elongated base 20.

The resilient levers 34 and 40 additionally include generally converging lateral side edges 44 and 46, respectively. The edges 44 and 46 are immediately adjacent to enlarged V-shaped notches 48 and 50 which define therebetween a relatively narrow dimensioned neck portion 52 of the web 18. Immediately adjacent to the notches 48 and 50 is a laterally projecting, generally trapezoidal flap 54, cooperating with a similar laterally projecting flap 56 adjacent to the corresponding V-shaped notch portion 58. The flaps 54 and 56 project in opposite directions laterally of a narrow terminal end portion 50 of the web 18 integral with the flaps. For example, the terminal end 58 may be integral with a carrier strip (not shown).
Typically, the contact 1 is fabricated from a single strip of electrically conducting material by a stamping and forming operation which necessitates the use of a carrier strip for conveying the material through successive stages of the stamping and forming operation.

Generally centrally of the web 18 is provided a projecting tab 60. The tab 60 is partially severed from the web 18 and extends generally longitudinally of the base 20. The tab 60 additionally is located adjacent to an end of the embossment 22 and is in spaced relationship from the flaps 54 and 56.

With more particular reference being made to FIGS. 1 and 2, the completed contact 1 will be shown and described in detail. Thus, FIG. 1 shows an elongated electrical post 62 generally in alignment with the longitudinal axis of the elongated base 20 and projecting from the terminal end 58 of the web 18. One end portion of the post 62 is provided with a generally rectangular, shallow notch 64 receiving the tab 60 therein. More particularly, the tab 60 is deformed, by crimpping, for example, to resiliently grip the notched end portion of the post 62. Additionally, the flaps 54 and 56 are folded to overlie the post 62, the flaps being crimpped in gripping relationship on the post. The overlying tab 60 and the flaps 54 and 56 rigidly secure the post 62 in place on the contact 1 and support the post 62 spaced locations, thereby precision aligning the post with respect to the contact and restraining it from motion relative to the contact.

As shown in both FIGS. 1 and 2, the fingers 2 and 4 are folded along the lines 66 indicated in FIG. 3 to form the web portion 18 into a generally U-shaped channel configuration partially circumscribing the tab 60 and the notched end portion 64 of the post 62 therein. More particularly, the levers 34 and 40 are in parallel opposed planes on either side of the tab 60. The levers also extend diagonally in directions away from the plane of the base 20. Additionally, the buttons 6 and 8 will project outwardly on the opposed sides of the U-shaped channel thus defined. Additionally, the bend lines 66 generally converge in the area of the neck portion 52 so that the channel has a narrowed U-shaped configuration 66 immediately adjacent to the folded over and crimped flaps 54 and 56. Such reduced channel section 66 laterally supports the post 52 preventing motion thereof with respect to the contact 1.

Still with reference to FIGS. 1 and 2, the fingers 2 and 4 are each provided with a reversely bent configuration. More particularly, the fingers are bent at 68 and 70 diagonally toward each other. The fingers are additionally reversely bent in diverging diagonal relationship, generally at the locations indicated at 72 and 74 respectively. Thus, the chamfered end portions 14 and 16 provide a flared entryway overlying the T-shaped end portion 24 of the base. The reversely bent locations 74 and 72 provide a reduced width receptacle contact area for an electrical post to be inserted therebetween. Thus, the fingers 2 and 4 provide resilient cantilever spring fingers overlying the base 20. The fingers are characterized by a flared entryway and a reduced width receptacle contact area for resiliently gripping an electrical post removably inserted therebetween. To complete the contact, the time 30 is bent to project from the surface of the base 20 in a direction opposite to the location of the fingers 2 and 4 which overlie the base 20. The base 20 accordingly overlies the projecting tine when the fingers 2 and 4 overlie the base.

As shown in FIG. 4, taken in conjunction with FIG. 5, a portion of a housing is generally indicated at 76. One planar surface 78 of the housing is provided with a recess having opposed parallel planar sidewalls 80 and 82. As shown in FIG. 4, the contact 1 is inserted in the recess with buttons 6 and 8 to laterally compressibly impinged against the parallel sidewalls 80 and 82 and providing lateral support for the contact. Additionally, the parallel side edges 26 and 28 of the T-shaped end portion extend laterally of the recess and are in adjacent proximity to the walls 80 and 82, further providing lateral support for and alignment of the contact. Thus, the edges 26 and 28 cooperate with the buttons 6 and 8 to laterally support and maintain the contact in precision alignment within the recess of the housing. Also, with reference to FIG. 4, the flared entryway formed by the end portions 14 and 16 of the spring fingers are immediately adjacent to a reduced diameter bore 84 provided in the planar surface 86 of the housing 76. More particularly, the bore 84 is provided with a tapered counterbore 88 and is in communication with the recess formed by the sidewalls 80 and 82. For example, an electrical contact post (not shown) may be inserted through the counterbore 88 and between the flared end portions 14 and 16 of the contact 1. Additionally, such post will be resiliently gripped between the reversely bent narrowed portions 72 and 74 of the spring fingers.

With more particular reference to FIG. 5, the remaining structural features of the housing 76 will be described in detail. Thus, a pair of opposed sidewalls 90 and 92 extend generally perpendicular to the parallel walls 80 and 82 of the recess. A planar shoulder portion 94 is perpendicular to the planar sidewall 90 and extends between the sidewalls 90 and a second sidewall 96. A chamfer 98 is provided at the intersection of the planar surface 78 and the sidewall 96. In similar fashion, a chamfer 100 is provided at the junction of the surface 78 and the sidewall 92 opposite to the chamfer 98. Additionally, a recess is provided in the planar surface 86 of the housing 76 in spaced relationship to the counterbore 88. The recess 102 additionally communicates laterally with the recess along a portion of the sidewall 92 and terminates in a perpendicularly shoulder 104. When the contact 1 is inserted within the recess formed in the surface 78, the chamfer 100 will engage against the projecting time 30 resiliently bending the base 20 in cantilever action toward the spring fingers 72 and 74 allowing further insertion of the contact 1. During such insertion, the time 30 will slidably follow along the planar sidewall 92 until it registers within the recess 102. The time 30 will then impinge against the cooperating shoulder 104 preventing removal of the contact 1 once inserted.

Also, as the contact 1 is inserted, the chamfer 98 will impinge on the levers 34 and 40 resiliently deforming them in cantilever action allowing further insertion of the contact 1 until each of the levers, which project longitudinally of the contact toward the flared entryway and the T-shaped end portion, are impinged against the shoulder 94. At the same time that the edges 36 and 42 of the levers impinge against the cooperating shoulder 94, the tang 30 will register in the recess 102 and impinge against the shoulder 104. Thus, the levers cooperate with the tang 30 to lockingly retain the contact 1 within the recess of the housing 76. Additionally, the levers 34 and 40 will be resiliently compressed against the sidewall 96 forcing the longitudinal base 20 of the contact to seat compressibly against the sidewall 92. Thus, the contact 1 is laterally supported within the recess by the cooperating base 92 and the pair of levers 34 and 40.

Other embodiments and modifications of the present invention will become apparent from the scope of the appended claims. For example, to remove the contact 1, a suitable tool is inserted into the recess 102 to resiliently deform the time 30 and disengage the same from the shoulder 104. This allows removal of the contact from the recess provided in the planar surface 78 with the time thus slidably following along the planar sidewall 92 of the recess during removal of the contact.

What is claimed is:
1. A resilient spring receptacle contact, comprising: an elongated base having an integral T-shaped end portion, a pair of elongated resilient fingers overlying said base and defining a contact receptacle, said resilient fingers extending generally longitudinally of said elongated base and being reversely bent in a direction generally longitudinally of said elongated base to define a flared entryway on said receptacle, said entryway overlying said T-shaped end portion, each of said elongated fingers including a generally elongated lever projecting generally forwardly of a longitudinal axis of a corresponding elongated finger and generally toward said flared entryway and said T-shaped end portion, each one of said levers being cantilever mounted on a corresponding spring finger, each of said spring fingers including a notch portion defining a cor-
responding projecting lever, a web joining said spring fingers with said base, said base and said T-shaped end portion and said web together defining a bottom wall of a generally U-shaped channel, one of said spring fingers defining a sidewall of said generally U-shaped channel, and the other of said spring fingers defining another sidewall of said generally U-shaped channel, said sidewalls being in mutual opposed relationship and connected to said bottom wall in order to form said generally U-shaped channel.

2. The structure as recited in claim 1, and further including: a tine on said T-shaped end portion projecting from said bottom wall of said U-shaped channel, said bottom wall of said U-shaped channel generally overlying said tine, and said entryway overlying said bottom wall.

3. The structure as recited in claim 2, and further including: a raised elongated embossment extending longitudinally of said base.

4. The structure as recited in claim 2, and further including: electrical post means projecting longitudinally of said base, and connection means on said web for electrically connecting said electrical post means to said spring receptacle contact at two spaced locations.

5. The structure as recited in claim 4, wherein, said connection means includes: a tab partially severed from said web and engagable on said post means, and a pair of flaps in spaced relationship with respect to said tab and wrappingly engaged on said post means, said post means being secured at one of said locations by said tab and at another of said locations by said flaps.

6. The combination of a spring receptacle contact as recited in claim 1, lockingly secured in a recess provided in a housing, comprising: a housing including a recess receiving said spring receptacle contact, a first sidewall of said housing recess including a first shoulder internally of said housing recess, a second sidewall of said housing recess including a second shoulder internally of said housing recess, said contact being insertable in said housing recess between said first and said second sidewalls of said housing recess, said tine in abutment against said first shoulder, at least one of said levers in abutment against said second shoulder, said base seated against said first sidewall of said recess, and at least one of said levers in compression against said second sidewall of said recess and forcing said base in seated relationship on said first sidewall of said recess.

7. The structure as recited in claim 6, and further including: a third sidewall and a fourth sidewall of said housing recess, said T-shaped end portion of said spring receptacle contact extending between said third sidewall and said fourth sidewall to laterally support and align said spring receptacle contact in said housing recess.