

**Description**

This invention relates to sheet metal electrical contact terminals of the type used in a multi-contact connector to form electrical connections between the terminal pads on a substrate and conductor on a circuit board. The substrate may have mounted thereon an integrated circuit with conductors extending from the integrated circuit to the terminal pads on the substrate.

There is shown in U.S.—A—4,268,102 a flat sheet metal electrical contact terminal having a contact portion which is intended to contact a mating contact surface on a substrate or the like. The terminal has a spring on which the contact surface of the terminal is provided and the spring is in engagement with a latch arm that extends to a yoke portion of the terminal which in turn has a solder tab for soldering to a circuit board conductor. The spring arm is relatively long so that it is able to undergo flexure while the latch arm is relatively short and provides a direct and shortened conductive path to the solder tab and to the circuit board conductor. When the terminal is placed in service, the spring is flexed to thereby provide the contact force for the electrical contact with the terminal pads on the substrate. The electrical current does not flow through the spring arm but rather flows through the end portion of the spring arm to the latch arm and then to the solder post or tab. The terminal shown in U.S.—A—4,268,102 is advantageous in that because of the shortened electrical path through the latch arm, undesirable self-inductance effects are minimized in the terminal.

Terminals of the type shown in U.S.—A—4,268,102 can be used advantageously under many circumstances, however, it would be desirable to increase the amount of contact pressure which is developed in the spring arm when the contact surface on the spring arm engages the terminal pad on a substrate. Terminals of the type under consideration must quite often be produced in extremely small sizes from thin sheet metal stock and under such conditions, it is particularly difficult to obtain a high contact force. The small size of the terminals and the thinness of the metal stock tends to limit the contact force which is obtainable.

The present invention is directed to the achievement of an improved terminal of the general type described in US—A—4,268,102.

In accordance with one aspect of the invention an electrical contact terminal of the type having a contact portion which is adapted to contact a mating contact surface and a spring for maintaining the contact portion against said mating contact surface, the terminal being of the flat complanate type having substantially all of its parts lying in a single plane, the terminal having a spring arm and a latch arm, the arms having free ends which are in overlapping latched relationship, the free end of the spring arm being movable in one direction along the latch arm, the contact portion comprising contact edge portions

of the spring arm, the terminal is characterized in that;

the latched position of said free end of the spring arm is a displaced position relative to a relaxed, non-latched position of the free end of said spring arm being adjacent to, and beyond, the free end of the latch arm,

the spring arm being in a prestressed and flexed condition as a result of the displacement of the free end of said spring arm, and the free end of the spring arm being resiliently biased against the latch arm whereby,

upon movement of the mating contact surface against the contact portion and the bias of the spring arm, the free end of the spring arm is moved in one direction along the latch arm with accompanying further flexing of said spring arm and with a resulting development of a predetermined contact force at the interface of the mating contact surface and current flows from said contact surface through the interface and through the latch arm. When the terminal is placed in service, the spring is further flexed and the spring arm moves along an edge of the latch arm and remains in contact with the latch arm. Increased contact force is achieved because of the fact that the spring arm is in a prestressed condition and further flexure of the spring arm gives rise to contact forces which are substantially greater than the forces which would be obtained if the spring arm were not prestressed. When the contact terminal is placed in service, the electrical path from the contact portion of the spring arm to the solder tab of the terminal or its equivalent is through the end portion of the spring arm to the latch arm and then to the circuit board conductor. This circuit path reduces the self-inductance effects in the terminal.

In accordance with a further aspect of the invention a method of manufacturing an electrical contact terminal of the flat complanate type having substantially all of its parts lying in a single plane, the terminal further having a spring arm and a latch arm, the arms having free ends which are in overlapping latched relationship and which are held in a latched position in a manner which permits movement of the free end of the spring arm in one direction along the latch arm and which prevents movement of the free end of the spring arm in the opposite direction, the spring arm having a contact portion on each portion thereof, the method comprising the steps of:

forming a flat blank for the contact terminal having the free end of spring arm integral with the free end of the latch arm and having the free ends in non-overlapping relationship,

severing the blank along a severing line which extends between the free end of the spring arm and the free end of the latch arm and which forms the latch on the free ends of the arms,

flexing at least one of the arms and displacing the one arm to position the free ends of the arms in said overlapping latched relationship whereby, the spring arm is in a preloaded condition and

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upon engagement of the contact portion of said spring arm by a mating contact surface, a predetermined increased contact force is established at the interface of said contact portion and said mating contact surface.

The invention will now be described by way of example, with reference to the accompanying partly diagrammatic drawings, in which:—

Figure 1 is a perspective view of a contact terminal in accordance with the invention,

Figure 2 is a perspective view of a connector containing contact terminals of the type shown in Figure 1, the parts of the connector being exploded from each other,

Figure 3 is a view taken along the lines 3—3 of Figure 2 but with the parts assembled to each other.

Figure 4 is a view similar to Figure 3 but showing the position of the parts when the substrate is assembled to the connector,

Figure 5 is a view taken along the lines 5—5 of Figure 3,

Figure 6 is a plan view of a short section of a strip of terminal blanks,

Figure 7 is a side view showing a blank positioned adjacent to tooling members which function to move the spring arm of the terminal to its latch position,

Figures 8 and 9 are views similar to Figure 7 illustrating the manner in which the spring arm is displaced to its latched position.

An electrical contact terminal 2, Figure 1, in accordance with the invention is intended for use in a connector 18 as shown in Figure 2 which serves to provide conducting paths between terminal pads 4 on the underside 6 of a substrate 8 and terminal pads 10 on the ends of conductors 12 which are on the upper side 14 of a circuit board 16.

The connector 18 comprises a rectangular frame member 20 of suitable insulating material which is centrally open and which is formed by four side rails 22 having enlarged corners 24. Openings are provided in the corners for screws 26 which secure the connector to the circuit board and which clamp the substrate against the contact terminals in the connector.

The internal surface 40 of each of the side rails 22 is provided with a ledge 28 which supports the margins of the underside of the substrate 8 when the substrate is positioned in the connector. The corners of the substrate are notched, as shown at 30, and these notches receive wedge-shaped projections 32 in the corners of the housing, one corner 34 of the substrate being beveled for cooperation with a spring member (not shown) in the housing which biases the remaining three corners against the wedge members 32 thereby accurately to position the substrate in the connector.

A plurality of slot-like cavities 36 are provided in the housing side rails in side-by-side relationship, each cavity extending inwardly from the lower surface 38 of the housing and inwardly from the inner surface 40 of the side rail. These cavities

intersect and open onto the ledge 28 as shown in Figure 2 so that portions of each terminal will project above the ledge.

The substrate 8 is retained in the housing by means of a square metallic clamping frame 42 which fits over the substrate and over the upper surface of the housing. The screws 26 extend through holes in the corners of the frame, through the housing, through oversized holes in the circuit board 16, and through oversized holes 46 in a plastic insulating plate 44. The screws are threaded into threaded holes 48 in a metallic clamping plate 50 so that the stresses developed as a result of clamping the substrate against the contacts are not borne by the circuit board.

The individual terminals 2 each has a yoke portion 52 from which solder tabs 58, 59 extend. The solder tab 58 extends directly from the yoke portion while the solder tip 59 extends from the end of a connecting arm 57 which is integral with the left hand side of the yoke portion. When an individual terminal is assembled to the housing, one of the solder tabs 58, or 59, is removed from the terminal and the remaining solder tab is inserted into a circuit board hole, as shown in Figure 5. The terminal pads on the side 14 of the circuit board are of the conventional IL type and those terminals which have arms 57 and solder tabs 59 extending therefrom are connected to the L-type terminal pads, as also shown in Figure 5. Under some circumstances, both of the solder tabs 58, 59 may be removed and the lower edge of the yoke portion soldered to the terminal areas on the upper surface of the circuit board.

The cavities in the housing are relatively narrow and have parallel spaced-apart sidewalls which are adjacent to the side surface of the terminals so that the terminals are retained in a prestressed and latched condition which is described below. The individual terminals are retained in their cavities by means of retaining ears 78 which extend upwardly from the upper edge of the yoke portion of the terminal. These ears are partially sheared as shown at 80, adjacent to the yoke portion and are formed slightly outwardly from the plane of the yoke portion so that the ears provide an interference fit of each terminal in its cavity.

Each terminal has a latch arm 54 and a spring arm 56 extending from its yoke portion. The spring arm 56 has a first portion 60 which extends laterally away from the yoke and is reversely curved at 62. The spring arm extends from the curve as shown at 64 back towards the lefthand end of the terminal and is again gently curved at 65 and reversed at 66 so that a U-shaped section is formed which is spaced from the latching arm 54. The outwardly facing edge 67 of this U-shaped portion serves as a contact portion for the terminal as will be described below. An end portion of the terminal 68 extends from the reverse curve 66 down to the free end 70 of the spring arm and the outwardly facing edge 72 of this free end is against the rightwardly facing edge 79, as viewed in Figure 1, of the latch arm 54. The upper free end

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74 of the latch arm extends arcuately over the surface 72 on the free end 70 of the spring arm so that the spring arm is restrained from moving leftwardly from the position as shown.

The terminal in the condition shown in Figure 1 is in a flexed and stressed condition in that the free end 70 of the spring arm is displaced from the normal position of this spring arm to the latched position shown. The normal position of the free end of this arm would be adjacent to, and slightly beyond, the free end of the latch arm and the entire upper portion of the spring arm would, therefore, normally be displaced upwardly from the position shown. Additionally, the latch arm and the spring arm are resiliently biased against each other as a result of the fact that the spring arm is displaced from its normal position.

Figure 6 shows the blank from which the terminal of Figure 1 is produced and Figures 7-9 illustrate the manner in which the spring arm of the terminal is moved to a displaced position and thereby prestressed when it is positioned in the housing. As shown in Figure 6, the terminal blank has the free end 74' of the latch arm integral with the free end 70' of the spring arm. Subsequent to stamping, the free ends 74', 70' are separated from each other by shearing the blank along a shear line 86 which defines the upper end of the latch arm and the lower end of the spring arm, as viewed in Figure 6.

After the shearing operation has been carried out, the terminal strip is fed by means of a guide 88 to locate the leading terminal of the strip adjacent to tools, 90, 92, Figure 7, which move the free end of the spring arm to its displaced position from its normal position which is shown in Figure 7. The tool 90 engages the free end 70 of the spring arm and moves generally arcuately from the position of Figure 7 to the position of Figure 8, thereby pushing the free end of the spring arm beyond the edge 79 of the latch arm. When the free end of the spring arm is moved rightwardly in this manner, the entire spring arm is, of course, stressed to some extent. The tool 92 then moves downwardly from the position of Figure 8 to the position of Figure 9 and engages the spring arm at the reverse curve 66 thereof adjacent to the contact portion 67. The downward movement of the spring arm brings the arcuate surface 72 against the edge surface 79 of the latch arm and, by virtue of the fact that the spring arm is stressed along its length and is flexed in its end portion 68, the free end 70 of the spring arm will be resiliently biased against the edge 79 of the latch arm. Advantageously, the latch arm has a small lip 94 at its upper end which assists in retaining the spring arm in its flexed and latched condition. The spring arm can then be moved downwardly a further distance along the edge 79 when the substrate is positioned in the connector and crimped against the contact portions of the contact as shown in Figure 4.

When the connector is placed in service, current will flow from the conductors 4 on the underside of the substrate 8 through the second or end

portions 68 of the spring arms of the contacts and across the electrical interface at the ends of these spring arms to the lower portions of the latch arms. It will thus be apparent that a very short electrical path is provided between the terminal pads 4 and the yoke portions 52 of the terminals. Current will be discouraged from flowing through the spring arm of each terminal because of the length of this spring arm and the high resistance which will exist in its because of its length. The short path, of course, provides for a minimum of self-inductance effect in the circuit when the terminal is in use.

It will be apparent that a wide variety of specific terminal designs can be produced in accordance with the principles of the invention. By virtue of the fact that the mechanical function of developing the spring characteristics necessary for the contact force in the contact terminal are separated from the electrical function of transmitting the current from the contact portion of the terminal to the yoke portion or its equivalent, the spring arm can take any form which is required by the circumstances under which the terminal will be used. Thus, the spring arm could be of a more complex shape than that shown in the drawing and it could be somewhat longer than the arm shown. The contact force which is developed by the spring arm can further be controlled within precise limits because of the fact that the designer is free to design the spring arm such that it will achieve the desired contact force. The designer need not concern himself with the electrical characteristics of the terminal in his designs of the spring arm.

Terminals in accordance with the invention can be made within wide varying dimensional limits, as required. One version of a terminal is substantially as shown in the drawing, is produced from sheet metal stock having thickness of 0.38 mm and is intended for use in a connector having a center-to-center spacing between adjacent terminals of 1.27 mm. The terminal used under these conditions has an overall height as measured from the lower edge of the yoke to the contact portion of about 3.6 millimeters, and has a length as measured between the contact arm and the reverse curve 62 of about 5.4 mm. These dimensions do not represent the lower limit of size which can be achieved when terminals are designed in accordance with the principles of the invention. It is entirely practical to produce terminals from metal stock having a thickness of about .17 mm which would be suited for use in connectors having a center-to-center spacing of adjacent terminals of 0.5 mm.

#### Claims

1. An electrical contact terminal (2) of the type having a contact portion (67) which is adapted to contact a mating contact surface (4) and a spring for maintaining the contact portion (67) against said mating contact surface, the terminal (2) being of the flat complanate type having substantially

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74 of the latch arm extends arcuately over the surface 72 on the free end 70 of the spring arm so that the spring arm is restrained from moving leftwardly from the position as shown.

The terminal in the condition shown in Figure 1 is in a flexed and stressed condition in that the free end 70 of the spring arm is displaced from the normal position of this spring arm to the latched position shown. The normal position of the free end of this arm would be adjacent to, and slightly beyond, the free end of the latch arm and the entire upper portion of the spring arm would, therefore, normally be displaced upwardly from the position shown. Additionally, the latch arm and the spring arm are resiliently biased against each other as a result of the fact that the spring arm is displaced from its normal position.

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It will be apparent that a wide variety of specific terminal designs can be produced in accordance with the principles of the invention. By virtue of the fact that the mechanical function of developing the spring characteristics necessary for the contact force in the contact terminal are separated from the electrical function of transmitting the current from the contact portion of the terminal to the yoke portion or its equivalent, the spring arm can take any form which is required by the circumstances under which the terminal will be used. Thus, the spring arm could be of a more complex shape than that shown in the drawing and it could be somewhat longer than the arm shown. The contact force which is developed by the spring arm can further be controlled within precise limits because of the fact that the designer is free to design the spring arm such that it will achieve the desired contact force. The designer need not concern himself with the electrical characteristics of the terminal in his designs of the spring arm.

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#### Claims

1. An electrical contact terminal (2) of the type having a contact portion (67) which is adapted to contact a mating contact surface (4) and a spring for maintaining the contact portion (67) against said mating contact surface, the terminal (2) being of the flat complanate type having substantially



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all of its parts lying in a single plane, the terminal (2) having a spring arm (56) with a latch arm (54), the arms having free ends (70, 74) which are in overlapping latched relationship, the free end (70) of the spring arm being movable in one direction along the latch arm (54), the contact portion comprising contact edge portions (67) of the spring arm (56), the terminal being characterized in that:

the latched position of said free end (70) of the spring arm (56) is a displaced position relative to a relaxed, non-latched position (70') of the free end of said spring arm (56) being adjacent to, and beyond, the free end (74) of the latch arm (54),

the spring arm (56) being in a prestressed and flexed condition as a result of the displacement of the free end (70) of said spring arm, and the free end of the spring arm (56) being resiliently biased against the latch arm (54) whereby,

upon movement of the mating contact surface (4) against the contact portion (67) and the bias of the spring arm (56), the free end (70) of the spring arm (56) is moved in one direction along the latch arm (54) with accompanying further flexing of said spring arm (56) and with a resulting development of a predetermined contact force at the interface of the mating contact surface (4) and current flows from said contact surface (4) through the interface and through the latch arm (54).

2. A contact terminal (2) as set forth in claim 1, characterized in that the terminal is contained in a slot-like cavity in an electrical connector housing, the cavity having parallel sidewalls which are immediately adjacent to side surfaces of the terminal and which prevent lateral movement of the spring arm whereby the spring arm is maintained in a latched position.

3. A metal contact terminal (2) as set forth in claim 2, characterized in that the terminal has a yoke portion (52), the latch arm (54) and the spring arm (56) extending from the yoke portion.

4. A metal contact terminal as set forth in claim 3, characterized in that the yoke portion has a solder tab (58, 59) extending therefrom.

5. A metal contact terminal as set forth in claim 3, characterized in that the latch arm (54) and the spring arm (56) extend from the yoke portion (52) at spaced-apart locations, the spring arm (56) having a first portion (62) which extends arcuately away from the yoke portion (52) to the contact portion (67), the spring arm (56) being reversely curved (66) at the contact portion (67) and having a second portion (68) which extends from the contact portion (67) to the free end (70) of the said spring arm.

6. A method of manufacturing an electrical contact terminal (2) of the flat complanate type having substantially all of its parts lying in a single plane, the terminal further having a spring arm (56) and a latch arm (54), the arms having free ends (70, 74) which are in overlapping latched relationship and which are held in a latched position in a manner which permits movement of the free end (70) of the spring arm

(56) in one direction along the latch arm (54) and which prevents movement of the free end (70) of the spring arm in the opposite direction, the spring arm (56) having a contact portion on each portion (67) thereof, the method comprising the steps of:

forming a flat blank for the contact terminal having the free end (70') of spring arm (56) integral with the free end (74') of the latch arm (54) and having the free ends in non-overlapping relationship,

severing the blank along a severing line (86) which extends between the free end (70') of the spring arm and the free end (74') of the latch arm (54) and which forms the latch on the free ends of the arms

flexing at least one of the arms (56) and displacing the one arm to position the free ends (70, 74) of the arms in said overlapping latched relationship whereby,

the spring arm (56) is in a preloaded condition and upon engagement of the contact portion (67) of said spring arm (56) by a mating contact surface (4), a predetermined increased contact force is established at the interface of said contact portion (67) and said mating contact surface (4).

7. A method as set forth in claim 6, characterized in that the blank is produced by stamping sheet metal stock.

8. A method as set forth in claim 7, characterized in that a multiplicity of terminals identical to the terminal are produced as a continuous strip (82).

## Patentansprüche

1. Elektrischer Anschlußkontakt (2) derjenigen Art, die einen Kontaktabschnitt (67) aufweisen, der dazu ausgebildet ist, in Kontakt mit einer dazupassenden Kontaktfläche (4) zu treten, sowie eine Feder zum Halten eines Kontaktabschnitts (67) gegen die dazupassende Kontaktfläche, wobei der Anschluß (2) vom ebenflächigen Typ ist, bei dem alle seine Teile im wesentlichen in einer einzigen Ebene liegen, wobei ferner der Anschluß (2) einen Federarm (56) und einen Verriegelungsarm (54) aufweist und diese Arme freie Enden (70, 74) haben, die in überlappend verriegelter Beziehung stehen, wobei das freie Ende (70) des Federarms in einer Richtung entlang des Verriegelungsarms (54) bewegbar ist und der Kontaktabschnitt Kontaktantenabschnitte (67) des Federarms (56) umfaßt, dadurch gekennzeichnet, daß die verriegelte Stellung des freien Endes (70) des Federarms (56) eine ausgelenkte Position relativ zu einer entspannten, nicht verriegelten Position (70') des freien Endes des Federarms (56) ist und in der Nähe von und jenseits des freien Endes (74) des Verriegelungsarms (54) liegt, daß der Federarm (56) sich in einem vorgespannten und gebogenen Zustand befindet, und zwar als Ergebnis der Auslenkung des freien Endes (70) des Federarms, und daß das freie Ende des Federarms (56) elastisch gegen den Verriegelungsarm (54) vorgespannt



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ist, wodurch bei Bewegung des dazupassenden Kontaktoberfläche (4) gegen den Kontaktabschnitt (67) und die Vorspannung des Federarms (56) das freie Ende (70) des Federarms (56) in einer Richtung entlang des Verriegelungsarms (54) mit begleitendem weiteren Biegen des Federarms (56) bewegt wird, sowie mit einer resultierenden Entwicklung einer vorbestimmten Kontaktkraft an der Zwischenfläche der zusammenpassenden Kontaktoberfläche (4) und wobei ein Strom von der Kontaktoberfläche (4) durch die Zwischenfläche und durch den Verriegelungsarm (54) fließt.

2. Anschlußkontakt (2) nach Anspruch 1, dadurch gekennzeichnet, daß der Anschluß in einem schlitzzähnlichen Hohlraum in einem elektrischen Verbindergehäuse enthalten ist, daß der Hohlraum parallele Seitenwände aufweist, die unmittelbar an die Seitenflächen des Anschlusses angrenzen und eine Seitliche Bewegung des Federarms verhindern, wodurch der Federarm in einer verriegelten Stellung gehalten ist.

3. Metallanschlußkontakt (2) nach Anspruch 2, dadurch gekennzeichnet, daß der Anschluß einen Jochteil (52) hat, und daß der Verriegelungsarm (54) und der Federarm (56) sich von dem Jochteil weg erstrecken.

4. Metallanschlußkontakt nach Anspruch 3, dadurch gekennzeichnet, daß der Jochteile eine Löt-lasche (58, 59) aufweist, die sich von ihm weg erstreckt.

5. Metallanschlußkontakt nach Anspruch 3, dadurch gekennzeichnet, daß der Verriegelungsarm (54) und der Federarm (56) sich von dem Jochteil (52) an im Abstand gelegenen Stellen weg erstrecken, daß der Federarm (56) einen ersten Abschnitt (62) aufweist, der sich bogenförmig von dem Jochteil (52) weg zum Kontaktabschnitt (67) erstreckt, daß der Federarm (56) am Kontaktabschnitt (67) rückwärts gekrümmt (66) ist und einen zweiten Abschnitt (68) aufweist, der sich von dem Kontaktabschnitt (67) zum freien Ende (70) des Federarms hin erstreckt.

6. Verfahren zur Herstellung eines elektrischen Anschlußkontaktes (2) des ebenflächigen Typs, bei dem im wesentlichen all seine Teile in einer einzigen Ebene liegen, wobei der Anschluß überdies einen Federarm (56) und einen Verriegelungsarm (54) aufweist und die Arme freie Enden (70, 74) haben, die sich in überlappend verriegelter Beziehung befinden und in einer verriegelten Position in einer Art und Weise gehalten sind, die eine Bewegung des freien Endes (70) des Federarms (56) in einer Richtung entlang des Verriegelungsarms (54) gestattet und eine Bewegung des freien Endes (70) des Federarms in der entgegengesetzten Richtung verhindert, und wobei der Federarm (56) einen Kontaktabschnitt an jedem seiner Abschnitte (67) aufweist, und wobei das Verfahren die folgenden Schritte umfaßt: Formen eines flachen Rohlings für den Anschlußkontakt, wobei das freie Ende (70') des Federarms (56) einstückig mit dem freien Ende (74') des Verriegelungsarms (54) ausgebildet ist und die freien Enden in nicht überlappenden Beziehung stehen,

Abtrennen des Rohlings entlang einer Trennlinie (86), die sich zwischen dem freien Ende (70') des Federarms und dem freien Ende (74') des Verriegelungsarms (54) erstreckt und den Riegel an den freien Enden der Arme formt, Biegen wenigstens eines der Arme (56) und Auslenken des einen Arms zur Positionierung der freien Enden (70, 74) der Arme in der überlappenden verriegelten Beziehung, wodurch der Federarm (56) in einem vorbelasteten Zustand ist und beim Eingriff des Kontaktabschnitts (67) des Federarms (56) mit einer dazupassenden Kontaktfläche (4) eine vorbestimmte erhöhte Kontaktkraft an der Zwischenfläche des Kontaktabschnitts (67) und der dazupassenden Kontaktoberfläche (4) gebildet wird.

7. Verfahren nach Anspruch 6, dadurch gekennzeichnet, daß der Rohling durch Stanzen von Metallblech erzeugt wird.

8. Verfahren nach Anspruch 7, dadurch gekennzeichnet, daß eine Vielzahl von Anschlüssen, die mit dem Anschluß identisch sind, als kontinuierlicher Streifen (82) erzeugt werden.

#### Revendications

1. Borne de contact électrique (2) du type comportant une partie de contact (67) qui est conçue pour porter contre une surface de contact complémentaire (4) et un ressort destiné à maintenir la partie de contact (67) contre ladite surface de contact complémentaire, la borne (2) étant du type plat monoplan dont pratiquement toutes les pièces s'étendent dans un seul plan, la borne (2) comportant un bras à ressort (56) et un bras de verrouillage (54), les bras ayant des extrémités libres (70, 74) qui sont dans une disposition verrouillée de chevauchement, l'extrémité libre (70) du bras à ressort étant mobile dans un sens le long du bras de verrouillage (54), la partie de contact comprenant des parties de bord de contact (67) de bras à ressort (56), la borne étant caractérisée en ce que:

la position verrouillée de ladite extrémité libre (70) du bras à ressort (56) est une position décalée par rapport à une position relâchée, non verrouillée (70') de l'extrémité libre dudit bras à ressort (56), étant adjacente à, et au-delà de, l'extrémité libre (47) du bras de verrouillage (54),

le bras à ressort (56) étant dans un état précontraint et fléchi par suite du déplacement de l'extrémité libre (70) du bras à ressort, et l'extrémité libre du bras à ressort (56) étant rappelée élastiquement contre le bras de verrouillage (54) de manière que,

à la suite d'un mouvement par lequel la surface de contact complémentaire (4) s'applique contre la partie de contact (67) et le rappel du bras à ressort (56), l'extrémité libre (70) du bras à ressort (56) soit déplacée dans un sens le long du bras (54) de verrouillage, ce qui s'accompagne d'une poursuite de la flexion dudit bras à ressort (56) et ce qui a pour résultat un développement d'une force de contact prédéterminée à l'interface de la surface complémentaire (4) de contact et des circulations de courant de ladite surface de



contact (4) à travers l'interface et le bras (54) de verrouillage.

2. Borne de contact (2) selon la revendication 1, caractérisée en ce que la borne est logée dans une cavité analogue à une rainure ménagée dans un boîtier de connecteur électrique, la cavité comportant des parois latérales parallèles qui sont immédiatement adjacentes à des surfaces latérales de la borne et qui empêchent tout mouvement latéral du bras à ressort afin que le bras à ressort soit maintenu dans une position verrouillée.

3. Borne de contact (2) en métal selon la revendication 2, caractérisée en ce que la borne comporte une partie de base (52), le bras (54) de verrouillage et le bras (56) à ressort partant de la partie de base.

4. Borne de contact en métal selon la revendication 3, caractérisée en ce que la partie de base comporte une languette à souder (58, 59) qui en fait saillie.

5. Borne de contact en métal selon la revendication 3, caractérisée en ce que le bras de verrouillage (54) et le bras à ressort (56) partent de la partie de base (52) en des points espacés, le bras à ressort (56) ayant une première partie (62) qui s'éloigne en arc de la partie de base (52) jusqu'à la partie de contact (67), le bras à ressort (56) étant recourbé en arrière (66) à la partie de contact (67) et ayant une seconde partie (68) qui s'étend de la partie de contact (67) jusqu'à l'extrémité libre (70) du bras à ressort.

6. Procédé de fabrication d'une borne de contact électrique (2) du type plat monoplan dont pratiquement toutes les pièces s'étendent dans un seul plan, la borne comportant en outre un bras à ressort (56) et un bras de verrouillage (54), les bras ayant des extrémités libres (70, 74) qui sont dans une disposition verrouillée de chevauche-

ment et qui sont maintenues dans une position verrouillée d'une manière qui permet un mouvement de l'extrémité libre (70) du bras à ressort (56) dans un sens le long du bras de verrouillage (54) et qui empêche tout mouvement de l'extrémité libre (70) du bras à ressort dans le sens opposé, le bras à ressort (56) ayant une partie de contact sur chaque partie (67) de ce bras, le procédé comprenant les étapes qui consistent:

à former un flan plat pour la borne de contact, dans lequel l'extrémité libre (70') du bras à ressort (56) est solidaire de l'extrémité libre (74') du bras de verrouillage (54) et dans lequel les extrémités libres sont dans une disposition de non chevauchement,

à sectionner le flan suivant une ligne (86) de sectionnement qui s'étend entre l'extrémité libre (70') du bras à ressort et l'extrémité libre (74') du bras de verrouillage (54) et qui forme le verrou sur les extrémités libres des bras,

à faire fléchir au moins l'un des bras (56) et à déplacer le bras pour placer les extrémités libres (70, 74) des bras dans ladite disposition verrouillée de chevauchement, de manière que,

le bras à ressort (56) soit dans un état préchargé et, à la suite de l'application d'une surface complémentaire (4) de contact contre la partie (67) de contact dudit bras à ressort (56), une force de contact accrue et prédéterminée, soit établie à l'interface de ladite partie de contact (67) et de ladite surface complémentaire (4) de contact.

7. Procédé selon la revendication 6, caractérisé en ce que le flan est produit par découpage de métal en feuille.

8. Procédé selon la revendication 7, caractérisé en ce qu'un grand nombre de bornes identiques à la borne sont produites en une bande continue (82).

