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DE-U- 8 207 036

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EP 0 308 068 B1

Description

This invention relates to an electrical contact system comprising an electrical terminal and a pin portion which is matable therewith, and which allows for many insertions and withdrawals of the pin portion relative to the electrical terminal. The electrical contact system is configured such that as the pin portion is inserted and withdrawn relative to the electrical terminal, only minimal wear occurs on the surfaces of the contact areas of the pin portion and the electrical terminal.

In this age of pluggable computers, pluggable power supplies, and the like, it is important to provide an electrical contact system having electrical contacts which can be inserted and withdrawn many times without causing wear to the contact areas of the contacts. It is also essential to provide a system which is relatively inexpensive and reliable.

The disclosure of US-A-3 836 947 and US-A-4 030 804 are representative of what is available in the market place today. Both of these documents relate to a system in which the male terminal is plugged into the female terminal. As the insertion occurs, the contact section of the female terminal engages the contact surface of the male terminal. This results in the contact sections of the male terminal being slidably engaged with the contact section of the female terminal. This sliding engagement of the surfaces of the contact sections results in wear of the surfaces of the contact sections. This wear also results during withdrawal of the male terminal from the female terminal. As the insertion and withdrawal are repeated many times, the wear on the surfaces of the contact sections become significant, which could result in the contacts not being placed in electrical engagement as insertion occurs. This problem is magnified where the surfaces of the contact sections are plated. As the surfaces are slid across each other, the plating is quickly worn away. Consequently, if the electrical characteristics of the contact sections are to be enhanced by plating, the plating material must be placed on the contact sections in thick layers in order to withstand the sliding engagement.

As described in US-A- 4,514,032, less noble plating; e.g. tin, wears away quickly under sliding motion, including such motion induced by thermal expansion and contraction, and the resulting fretting corrosion causes reduced electrical contact between the abutting surfaces. Accordingly, such plating, although relatively inexpensive, is unacceptable for many contact surfaces which are slid across each other during insertion. Therefore, a plating material such as gold is required on the contact surfaces of the contact sections. The gold plating provides a tough surface capable of withstanding sliding motion between the two abutting surfaces. However, even a plating material such as gold must be thick in order to withstand a great number of insertions and withdraws, without showing signs of wear.

Consequently, if the terminals are to be inserted and withdrawn frequently, a thick layer of plating material must be used in order to insure that a reliable electrical connection will be made with each insertion. If a thick layer of plating material is to be applied, the price of the plating becomes significant with respect to the overall cost of the terminal. This is an unsatisfactory result.

In an attempt to reduce wear of the contact sections and provide a low insertion force connector, many low or zero insertion force connectors have been devised. These connectors generally required the use of some type of camming mechanism which when activated cams the terminals into engagement with mating terminals. This type of arrangement reduces wear. However, the use of a camming member is impractical and prohibitively expensive in many situations.

One type of low insertion connector which does not require a camming member is described in US-A-4,655,528. In this connector cantilever arms of the terminals are prestressed by ribs of the connector. However, the use of zero insertion force connectors described requires a housing member to cooperate with the terminals in order to provide the zero insertion force and low wear characteristics desired. This is not always practical, as individual terminals require low wear characteristics.

The present invention consists in an electrical terminal and a pin portion, as defined in claim 1.

DE-A-31 10 609 discloses an electrical terminal and a pin portion according to the preamble of claim 1.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawings in which Figures 1 to 6 are included only to assist the reader in a proper understanding of the present invention and in which:

FIGURE 1 is a perspective view showing a female terminal just prior to insertion onto a male terminal;

FIGURE 2 is a perspective view similar to that of Figure 1, showing wings of the female terminal in engagement with the male terminal;

FIGURE 3 is a perspective view similar to that of Figure 1, showing a contact section of the female terminal in engagement with a contact section of the male terminal;

FIGURE 4 is a perspective view showing a female terminal just prior to insertion onto another form of a male terminal;

FIGURE 5 is a perspective view similar to that of Figure 4, showing wings of the female terminal in engagement with the male terminal;

FIGURE 6 is a perspective view similar to that of Figure 4, showing a contact section of the female

terminal in engagement with a contact section of the male terminal;

FIGURE 7 is a perspective view of an embodiment of the present invention, showing a female terminal just prior to insertion onto a male terminal;

Figures 1 through 3 show an electrical connection system which has a male terminal 2 and a female terminal 4. The system allows for many insertions and withdrawals of female terminal 4 from male terminal 2 with only minimal wear occurring at contact sections 6, 8 of terminals 2, 4 respectively.

Male terminal 2 has a cylindrical configuration, as shown in Figures 1 through 3. Proximate a top end 10 of male terminal 2 is a recessed section 12. Recessed section 12 has a rectangular cross section as viewed from top end 10. Opposed side surfaces 13 of recessed section 10 defines contact section 6 of male terminal 2. A bottom end (not shown) of terminal 2 is placed in electrical engagement with a circuit board or the like in a manner well known in the industry.

Female terminal 4 is stamped and formed from a piece of sheet metal having the desired resilient and electrical characteristics. Female terminal 4 has a base plate 14 and two resilient arms 16, 18. A support portion 20 of base plate 14 extends from one resilient arm 16 to the other resilient arm 18, thereby providing the support necessary to maintain resilient arms 16, 18 in position. A curved portion 22 of base plate 14 extends from support portion 20 outwardly. A mating portion 24 is provided at the end of curved portion 22 which is opposite support portion 20. Mating portion 24 is provided to allow a mating connector or the like to be placed in electrical engagement with female terminal 4.

Positioned on either side of support portion 20 of base plate 14 and integrally attached thereto, are resilient arms 16, 18. Resilient arms 16, 18 extend in a plane which is essentially perpendicular to the plane of support portion 20 of base plate 14. Resilient arms 16, 18 also extend from support portion 20 in the opposite direction as does mating portion 24. However, resilient arms 16, 18 are not parallel to each other. Free ends 26 of resilient arms 16, 18 are positioned closer to each other than the ends of resilient arms 16, 18 which are integrally attached to support portion 20. Resilient arms 16, 18 have wide sections which are positioned proximate to support portion 20 of base plate 14. Narrow contact sections 30 are provided on resilient arms 16, 18 proximate free ends 26 thereof. Gradual transition sections 32 are provided between wide sections 28 and narrow contact sections 30.

Slots 34 are provided in wide sections 28, proximate mating portion 24. Slots 34 are provided to cooperate with a mating connector (not shown). The mating connector is inserted onto mating portion 24 and maintained in position by the frictional engagement of the mating connector with surfaces of slots 34. It should be noted that the other mating connectors may be attached to mating portion 24 in any number of different ways.

Wing members 36 extend from narrow contact sections 30, in the opposite direction as wide sections 28. Wing members 36 are wider than narrow contact sections 30, and extend at an angle from narrow contact sections 30. This angle allows wing members 36 to act as a lead in surface when female terminal 4 is inserted onto male terminal 2, as will be discussed. It should be noted that wing members 36 are wider than recessed section 12 of male terminal 2.

Each narrow contact section 30 has a first major surface 38 and a second major surface 40. Resilient arms 16, 18 of a respective female terminal 4 has first major surface 38 of narrow contact sections 30 facing each other. Plating is performed on first major surface 38 of each narrow contact section 30, the plating providing the enhanced electrical characteristics required to insure a reliable electrical connection. These plated first major surfaces 38 define contact sections 8 of female terminals 4.

The operation of the connector system is shown in Figures 1 through 3. As is shown in Figure 1, female terminal 4 is positioned proximate male terminal 2, such that narrow contact sections 30 of female terminal 4 are essentially in alignment with recessed section 12 of male terminal 2. A force is then applied to female terminal 4, causing female terminal 4 to engage male terminal 2. As shown in Figure 2, wing members 36 of female terminal 4 engage the outside circumference of male terminal 2. Consequently, as wing members 36 are wider than recessed section 12, wing members 36 do not engage side surfaces 13 of recessed section 12 as insertion of female terminal 4 onto male terminal 2 occurs.

The force on female terminal 4 is continued, causing wing members 36 to slide over the outside surface of male terminal 2. As the diameter of male terminal 2 is larger than the distance between first major surfaces 38 of wing members 36, wing members 36 are forced to move away from each other as wing members 36 are slid over male terminal 2. Consequently, narrow contact sections 30, which are integrally attached to wing members 36 are forced to move away from each other. As the insertion occurs, the alignment of sections 30 with recessed section 12 of male terminal 2 insures that major surfaces 38 of narrow contact sections 30 and side surfaces 13 of recessed section 12 will not engage each other or any other surfaces. This is because wing members 36 prevent first major surfaces 38 from entering into recessed section 12. It is important to prevent these surfaces from engagement during insertion, as these surfaces are plated to enhance the electrical characteristics of the terminals. As the plated surfaces do not slidably engage other surfaces, the wear of the

plating is essentially eliminated, allowing the plating on these surfaces to be provided in thin layers. Consequently, the cost of manufacture of the terminals is reduced, and the reliability of the terminals is increased.

As the force applied to female terminal 4 is continued, wing members 36 are slid past the surface of male terminal 2. The resilient nature of resilient arms 16, 18 forces wing members 36 to spring back toward their original position, as shown in Figure 3. As female terminal 4 is returned toward its original position, the external force applied to female terminal 4 is removed. The resilient nature of resilient arms 16, 18 insures that first major surfaces 38 of narrow contact sections 30 are positioned in electrical engagement with side surfaces 13 of recessed section 12 of male terminal 2. Wing members 36 are positioned proximate recessed section 12, but do not engage any surface of male terminal 2. Therefore, narrow contact section 30 and the surfaces of recessed section 12 are placed in electrical engagement. The cooperation of wing members 36 with the outside surface of male terminal 2 allows female terminal 4 to be easily inserted onto male terminal 2. However, even more important is the fact that nothing slidably engages narrow contact surfaces 38 or the surfaces of recessed section 12. As these are the only plated surfaces, this lack of engagement prevents wear to the plated areas, allowing reliable use of this system over many cycles.

Upon withdrawal from male terminal 2, female terminal 4 is retracted in the opposite manner as it is inserted. Wing members 36 again cooperate with the outside surface of male terminal 2, in order to disengage narrow contact sections 30 from the surfaces of recessed section 12. Consequently, neither the narrow contact section 30 nor the surfaces of recessed section 12 slidably engage any surface as withdrawal occurs.

Consequently, there is provided a connection system which is capable of withstanding 10,000 insertions/withdrawals without the need for a thick layer of very costly plating material.

Figures 4 through 6 show another form of male terminal. The configuration of female terminal 104 is essentially the same as the female terminal 4 described above. However, when viewed from above, male terminal 102 has a square shape rather than a round shape, as was previously described. The insertion of female terminal 104 onto male terminal 102 is essentially identical to the operation described above. For ease of understanding, the reference numerals used in Figures 4 through 6 are identical to those used in the previous description, with the exception that one hundred has been added to each numeral.

Figure 7 shows a male and a female terminal according to an embodiment of the present invention. As is shown in Figure 7, the connection system has a male terminal 202 and a female terminal 204. The overall operation is very similar to that previously described. However, differences are present.

Female terminal 204 is essentially identical to female terminal 4 described previously. However, wing members 236 extend from narrow contact portion 230 in a different direction to wing member 36. As shown in Figure 7, wing members 236 also extend inward, toward each other, rather than away from each other. Resilient arms 216,218 have the same configuration as was previously described, except that resilient arms 216,218 are essentially parallel to each other.

Male terminal 202 has many differences to male terminal 2 previously described. Male terminal 202 of this embodiment has a right angle provided therein. Contact surfaces 213 are provided proximate an end 215 of male terminal 202. Contact surfaces 213 are not of reduced width, but rather are positioned below a cavity 212 positioned in a top surface 210 of male terminal 202. Positioned between cavity 212 and end 215 are wing engagement surfaces 217. Wing engagement surfaces 217 have lead in surfaces 219 provided at the end thereof.

In operation, female terminal 204 is positioned proximate male terminal 202, as shown in Figure 7. A force is applied to female terminal 204, causing wing members 236 to engage lead in surfaces 219 of wing engagement surfaces 217. As the force is continued, wings slide along the surfaces of wing engagement surface causing wing members 236 and resilient arms 216, 218 to open.

Continued insertion of female terminal 204 onto male terminal 202 results in wing members 236 moving past wing engagement surfaces 217 and into cavity 212, thereby allowing the resilient nature of resilient arms 216, 218 to force resilient arms 216, 218 back toward their original position, such that resilient arms 216, 218 are essentially parallel with each other. This causes first major surfaces 238 of narrow contact sections 230 to engage contact surfaces 213 of male terminal 202. Insertion is complete, as narrow contact sections 230 of female terminal 204 is in electrical engagement with contact surfaces 213 of the male terminal 202.

The insertion and removal process of the terminals insures that only a very small amount of sliding motion occurs in the contact areas of the terminals. The lack of sliding motion across the contact areas significantly reduces the amount of wear in these areas. Low wear allows thin layers of plating to be used in the contact areas, even if many insertions and removals are planned for the terminals. This is a significant cost savings, as current terminals have a large portion of the cost associated with the thick plating layers which must be used in order to insure a positive electrical connection in the high wear contact areas.

Claims

1. An electrical terminal (204) and a pin portion (202) which is matable therewith, the electrical terminal (204) having a base plate which has resilient members (216,218) extending therefrom, each resilient member (216,218) having a first major surface and an oppositely facing second major surface, the resilient members (216,218) having fixed ends adjacent to the base plate and free ends which have contact sections (230) provided proximate thereto, the contact sections (230) cooperating with the matable pin portion (202), the electrical terminal (204) being characterised in that:

   wing means (236) are provided at the free ends of the resilient members (216,218), adjacent to the contact sections (230), the wing means (236) extending at an angle from the contact sections (230), the height of the wing means (236) being greater than the height of the contact sections (230); and in that the matable pin portion (202) is of substantially uniform width, the pin portion (202) having forward wing engagement surfaces (217) aligned with said wing means (236) for opening said contact arms (216,218), said pin portion (202) having a cavity (212) rearward of said wing engagement surfaces and transversely offset from said contact section (230), profiled to receive said wing means (236) moving said contact sections (230) into conductive engagement with contact surfaces (213) on said pin portion (202); the electrical terminal (.204) being matable with the pin portion (202), with the wing means (236) cooperating with the pin portion (202) to prevent contact between the contact sections (230) of the terminal (204) and the contact surfaces (213) of the pin portion (202) until after the wing means (236) has moved beyond the wing engagement surfaces (217).

2. An electrical terminal (204) and a pin portion (202) as recited in claim 1, characterised in that two resilient members (216,218) are provided in each electrical terminal (204).

3. An electrical terminal (204) and a pin portion (202) as recited in claim 2, characterised in that the first major surfaces of the resilient members (216,218) of a respective terminal (204) are positioned to face each other.

4. An electrical terminal (204) and a pin portion (202) as recited in claim 2, characterised in that the resilient members (216,218) are essentially perpendicular to the plane of the base member (20).

5. An electrical terminal (204) and a pin portion (202) as recited in claim 1, characterised in that the contact sections (230) have plating on the first major surface thereof the plating provided to enhance the electrical characteristics of the terminal (204).

6. An electrical terminal (204) and a pin portion (202) as recited in claim 1, characterised in that the contact sections (230) of the resilient arms (216,218) are positioned closer together than the fixed ends of the resilient arms.

7. An electrical terminal (204) and a pin portion (202) as recited in claim 6, characterised in that each wing means (236) extends from the contact section (230) in a direction away from the opposed resilient arm (216,218), thereby allowing the wing means (236) to act as a lead in surface as the electrical terminal (204) is inserted onto the matable electrical terminal (202).

8. An electrical terminal (204) and a pin portion (202) as recited in claim 1, characterised in that the resilient arms (216,218) are essentially parallel to each other.

9. An electrical terminal (204) and a pin portion (202) as recited in claim 8, characterised in that each wing means (236) extends from the contact section (230) in a direction toward the opposed resilient arm (216,218), thereby allowing the wing means (236) to cooperate with a lead in surface (219) of the matable pin portion (202), as the electrical terminal (204) is inserted onto the matable pin portion (202).

Patentansprüche

1. Elektrischer Anschluß (204) und Stiftabschnitt (202), der damit verbindbar ist, wobei der elektrische Anschluß (204) eine Grundplatte hat, die sich davon erstreckende nachgiebige Glieder (216, 218) trägt, wobei jedes nachgiebige Glied (216, 218) eine erste Hauptfläche und eine entgegengesetzt weisende zweite Hauptfläche hat, wobei die nachgiebigen Glieder (216, 218) feste Enden benachbart zu der Grundplatte und freie Enden haben, die Kontaktabschnitte (230) tragen, die benachbart dazu angeordnet sind, wobei die Kontaktabschnitte (230) mit dem damit zusammenfügbaren Stiftabschnitt (202) zusammenwirken, wobei der elektrische Anschluß (204) **dadurch gekennzeichnet** ist, daß
   Flügel (236) an den freien Enden der nachgiebigen Glieder (216, 218) benachbart zu den Kontaktabschnitten (230) vorgesehen sind, daß die

Flügel (236) sich unter einem Winkel von den Kontaktabschnitten (230) erstrecken, daß die Höhe der Flügel (236) größer ist als die Höhe der Kontaktabschnitte (230), und daß der anfügbare Stiftabschnitt (202) eine im wesentlichen gleichförmige Breite hat, daß der Stiftabschnitt (202) vordere Flügeleingriffsflächen (217) hat, die mit den Flügeln (236) ausgerichtet sind, um die Kontaktarme (216, 218) zu öffnen, daß der Stiftabschnitt (202) eine Ausnehmung (212) hinter den Flügeleingriffsflächen und quer gegenüber dem Kontaktabschnitt (230) versetzt aufweist, die so profiliert ist, daß sie die Flügel (236) aufnimmt und die Kontaktabschnitte (230) in leitenden Eingriff mit Kontaktflächen (213) an dem Stiftabschnitt (202) bewegt; wobei der elektrische Anschluß (204) mit dem Stiftabschnitt (202) zusammenfügbar ist, wobei die Flügel (236) mit dem Stiftabschnitt (202) zusammenwirken, um einen Kontakt zwischen den Kontaktabschnitten (230) des Anschlusses (204), und den Kontaktflächen (213) des Stiftabschnitts (202) zu verhindern, bis die Flügel (236) sich über die Flügeleingriffsflächen (217) hinaus bewegt haben.

2. Elektrischer Anschluß (204) und Stiftabschnitt (202) nach Anspruch 1, dadurch **gekennzeichnet**, daß zwei nachgiebige Glieder (216, 218) an jedem elektrischen Anschluß (204) vorgesehen sind.

3. Elektrischer Anschluß (204) und Stiftabschnitt (202) nach Anspruch 2, dadurch **gekennzeichnet**, daß die ersten Hauptflächen der nachgiebigen Glieder (216, 218) eines entsprechenden Anschlusses (204) so angeordnet sind, daß sie aufeinander zu weisen.

4. Elektrischer Anschluß (204) und Stiftabschnitt (202) nach Anspruch 2, dadurch **gekennzeichnet**, daß die nachgiebigen Glieder (216, 218) im wesentlichen senkrecht zu der Ebene der Grundplatte (20) sind.

5. Elektrischer Anschluß (204) und Stiftabschnitt (202) nach Anspruch 1, dadurch **gekennzeichnet**, daß die Kontaktabschnitte (230) eine Plattierung auf ihrer ersten Hauptfläche tragen, wobei die Plattierung vorgesehen ist, um die elektrischen Eigenschaften des Anschlusses (204) zu verbessern.

6. Elektrischer Anschluß (204) und Stiftabschnitt (202) nach Anspruch 1, dadurch **gekennzeichnet**, daß die Kontaktabschnitte (230) der nachgiebigen Arme (216, 218) enger zueinander angeordnet sind als die festen Enden der nachgiebigen Arme.

7. Elektrischer Anschluß (204) und Stiftabschnitt (202) nach Anspruch 6, dadurch **gekennzeichnet**, daß jeder Flügel (236) sich von dem Kontaktabschnitt (230) in einer Richtung weg von dem gegenüberliegenden nachgiebigen Arm (216, 218) erstreckt, um es dadurch den Flügeln (236) zu gestatten, als Einführleitfläche zu wirken, wenn der elektrische Anschluß (204) an den damit zusammenfügbaren elektrischen Anschluß (202) angesetzt wird.

8. Elektrischer Anschluß (204) und Stiftabschnitt (202) nach Anspruch 1, dadurch **gekennzeichnet**, daß die nachgiebigen Arme (216, 218) im wesentlichen parallel zueinander sind.

9. Elektrischer Anschluß (204) und Stiftabschnitt (202) nach Anspruch 8, dadurch **gekennzeichnet**, daß jeder Flügel (236) sich von dem Kontaktabschnitt (230) in einer Richtung auf den gegenüberliegenden nachgiebigen Arm (216, 218) zu erstreckt, wodurch es den Flügeln (236) gestattet ist, mit einer Einführleitfläche (219) des damit zusammenfügbaren Stiftabschnitts (202) zusammenzuwirken, wenn der elektrische Anschluß (204) an den damit zusammenfügbaren Stiftabschnitt (202) angefügt wird.

Revendications

1. Borne électrique (204) et partie à broche (202) pouvant être accouplée avec elle, la borne électrique (204) ayant une plaque de base de laquelle partent des éléments élastiques (216, 218), chaque élément élastique (216, 218) ayant une première surface principale et une seconde surface principale qui lui est opposée, les éléments élastiques (216, 218) ayant des extrémités fixes adjacentes à la plaque de base et des extrémités libres qui possèdent des sections de contact (230) située à proximité, les sections de contact (230) coopérant avec la partie à broche complémentaire (202), la borne électrique (204) étant caractérisée en ce que :

des moyens à ailes (236) sont prévus aux extrémités libres des éléments élastiques (216, 218), à proximité immédiate des sections de contact (230), les moyens à ailes (236) s'étendant depuis les sections de contact (230) en formant un angle, la hauteur des moyens à ailes (236) étant supérieure à la hauteur des sections de contact (230) ; et en ce que la partie à broche complémentaire (202) est d'une largeur sensiblement uniforme, la partie à broche (202) ayant des surfaces avant (217) d'engagement des ailes alignées avec lesdits moyens à ailes (236) pour ouvrir lesdits bras de contact (216, 218), ladite par-

tie à broche (202) présentant une cavité (212) en arrière desdites surfaces d'engagement des ailes et décalée transversalement de ladite section de contact (230), profilée pour recevoir lesdits moyens à ailes (236) déplaçant lesdites sections de contact (230) jusqu'en engagement de conduction avec des surfaces de contact (213) sur ladite partie à broche (202) ; la borne électrique (204) pouvant être accouplée avec la partie à broche (202), les moyens à ailes (236) coopérant avec la partie à broche (202) pour empêcher un contact entre les sections de contact (230) de la borne (204) et les surfaces de contact (213) de la partie à broche (202) jusqu'à ce que les moyens à ailes (236) se soient déplacés au-delà des surfaces (217) d'engagement des ailes.

2. Borne électrique (204) et partie à broche (202) selon la revendication 1, caractérisées en ce que deux éléments élastiques (216, 218) sont prévus dans chaque borne électrique (204).

3. Borne électrique (204) et partie à broche (202) selon la revendication 2, caractérisées en ce que les premières surfaces principales des éléments élastiques (216, 218) d'une borne respective (204) sont positionnées de façon à se faire face.

4. Borne électrique (204) et partie à broche (202) selon la revendication 2, caractérisées en ce que les éléments élastiques (216, 218) sont essentiellement perpendiculaires au plan de l'élément de base (20).

5. Borne électrique (204) et partie à broche (202) selon la revendication 1, caractérisées en ce que les sections de contact (230) ont une- métallisation sur leur première surface principale, la métallisation étant prévue pour améliorer les caractéristiques électriques de la borne (204).

6. Borne électrique (204) et partie à broche (202) selon la revendication 1, caractérisées en ce que les sections de contact (230) des bras élastiques (216, 218) sont plus rapprochées l'une de l'autre que les extrémités fixes des bras élastiques.

7. Borne électrique (204) et partie à broche (202) selon la revendication 6, caractérisées en ce que chacun des moyens à ailes (236) s'étend depuis la section de contact (230) dans une direction s'éloignant du bras élastique opposé (216, 218), permettant ainsi aux moyens à ailes (236) d'agir en tant que surface d'entrée lorsque la borne électrique (204) est insérée sur la borne électrique complémentaire (202).

8. Borne électrique (204) et partie à broche (202) selon la revendication 1, caractérisées en ce que les bras élastiques (216, 218) sont essentiellement parallèles entre eux.

9. Borne électrique (204) et partie à broche (202) selon la revendication 8, caractérisées en ce que chacun des moyens à ailes (236) s'étend depuis la section de contact (230) dans une direction orientée vers le bras élastique opposé (216, 218), permettant ainsi aux moyens à ailes (236) de coopérer avec une surface d'entrée (219) de la partie à broche complémentaire (202) pendant que la borne électrique (204) est insérée sur la partie à broche complémentaire (202).

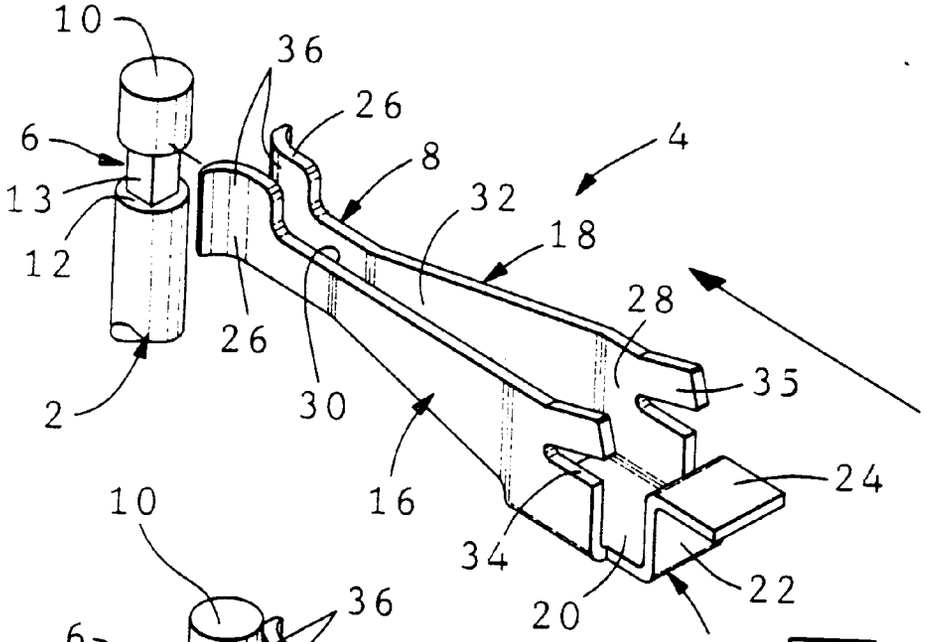

FIG.1

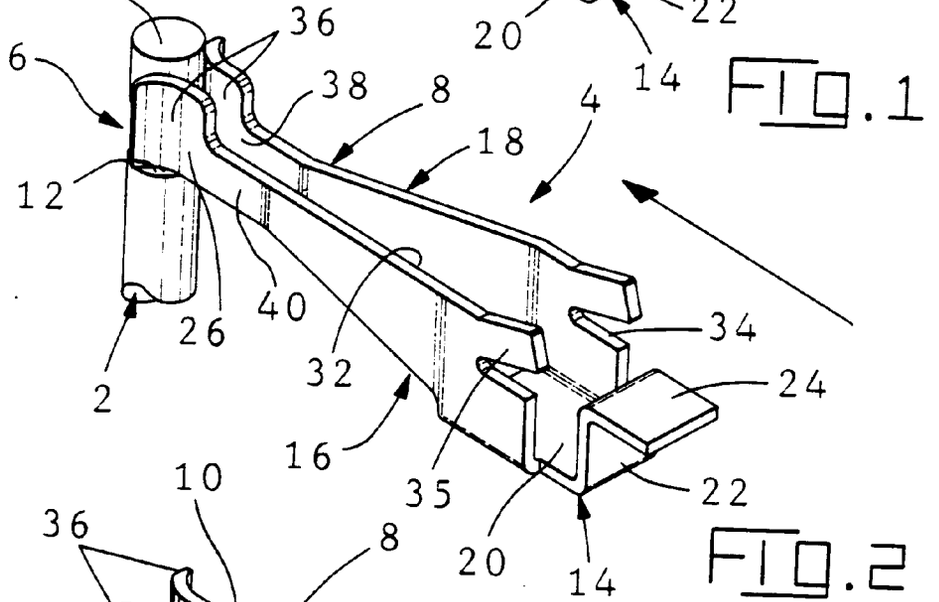

FIG.2

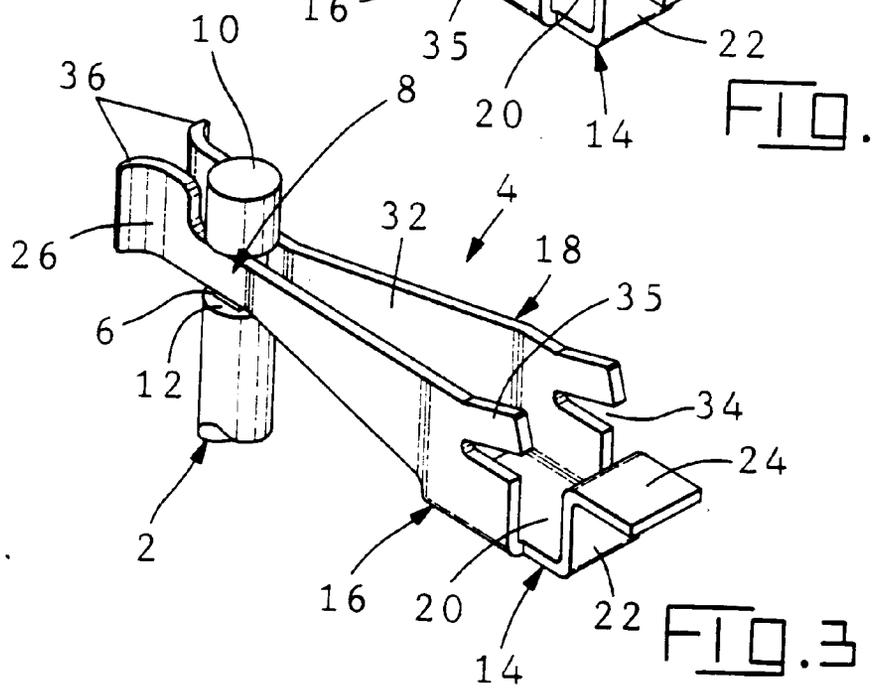

FIG.3

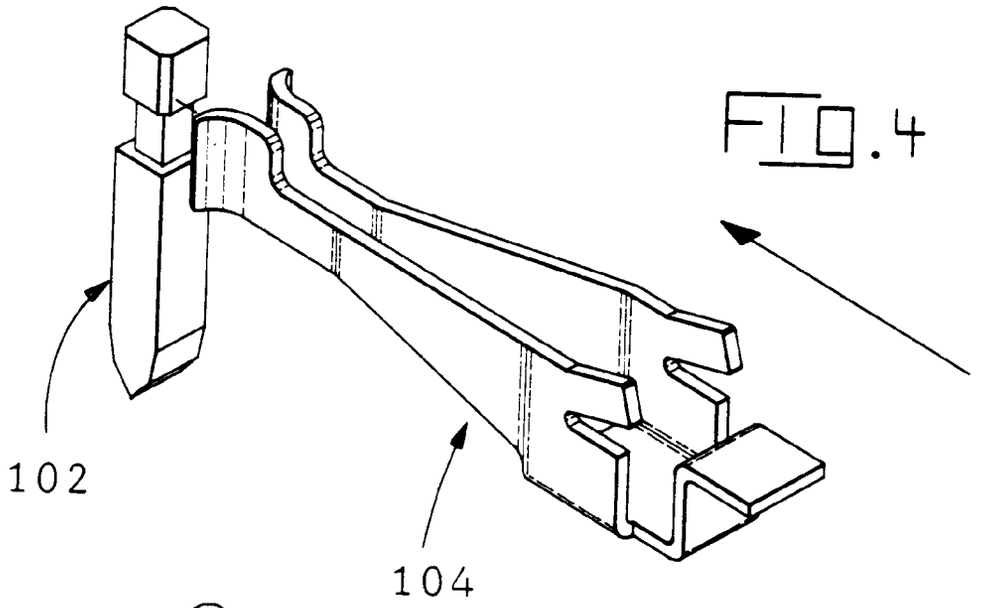

FIG.4

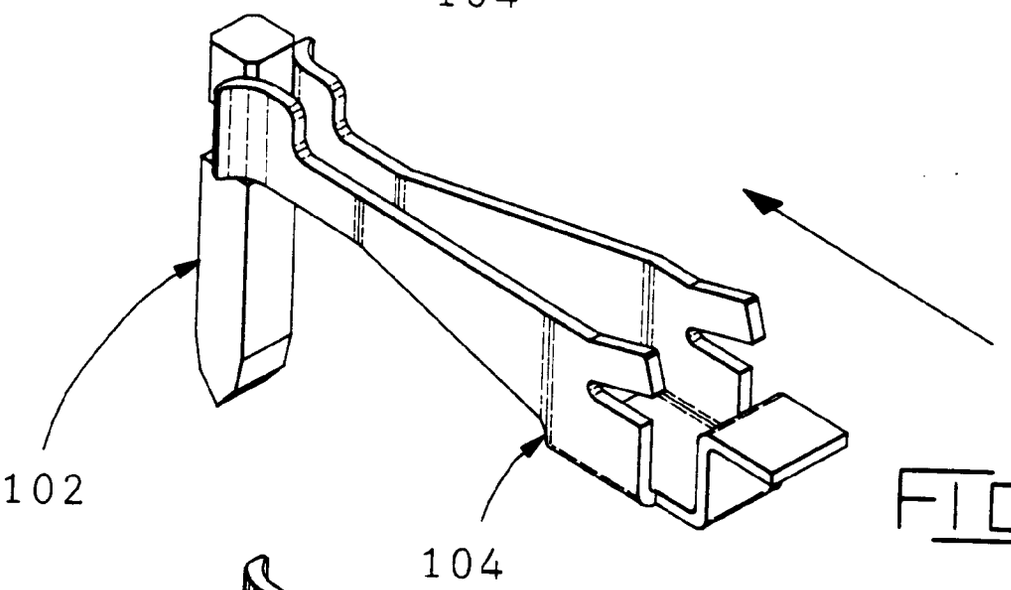

FIG.5

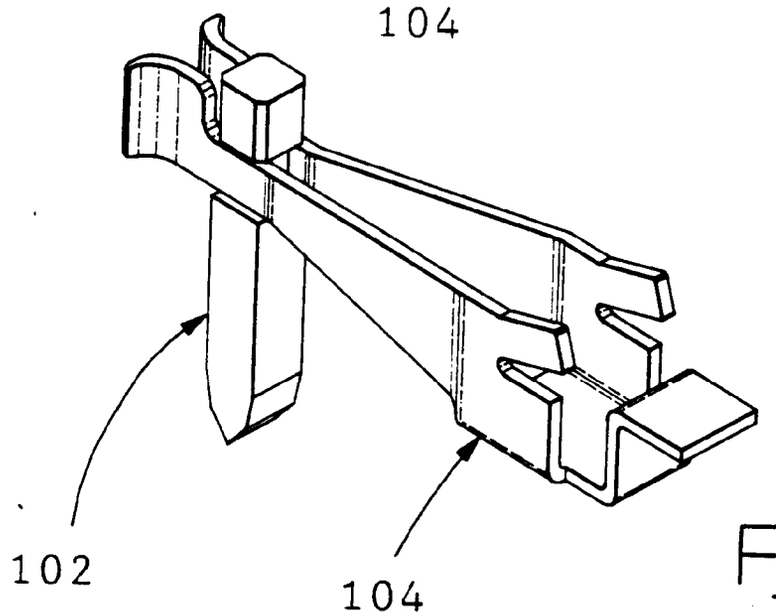

FIG.6

FIG.7