

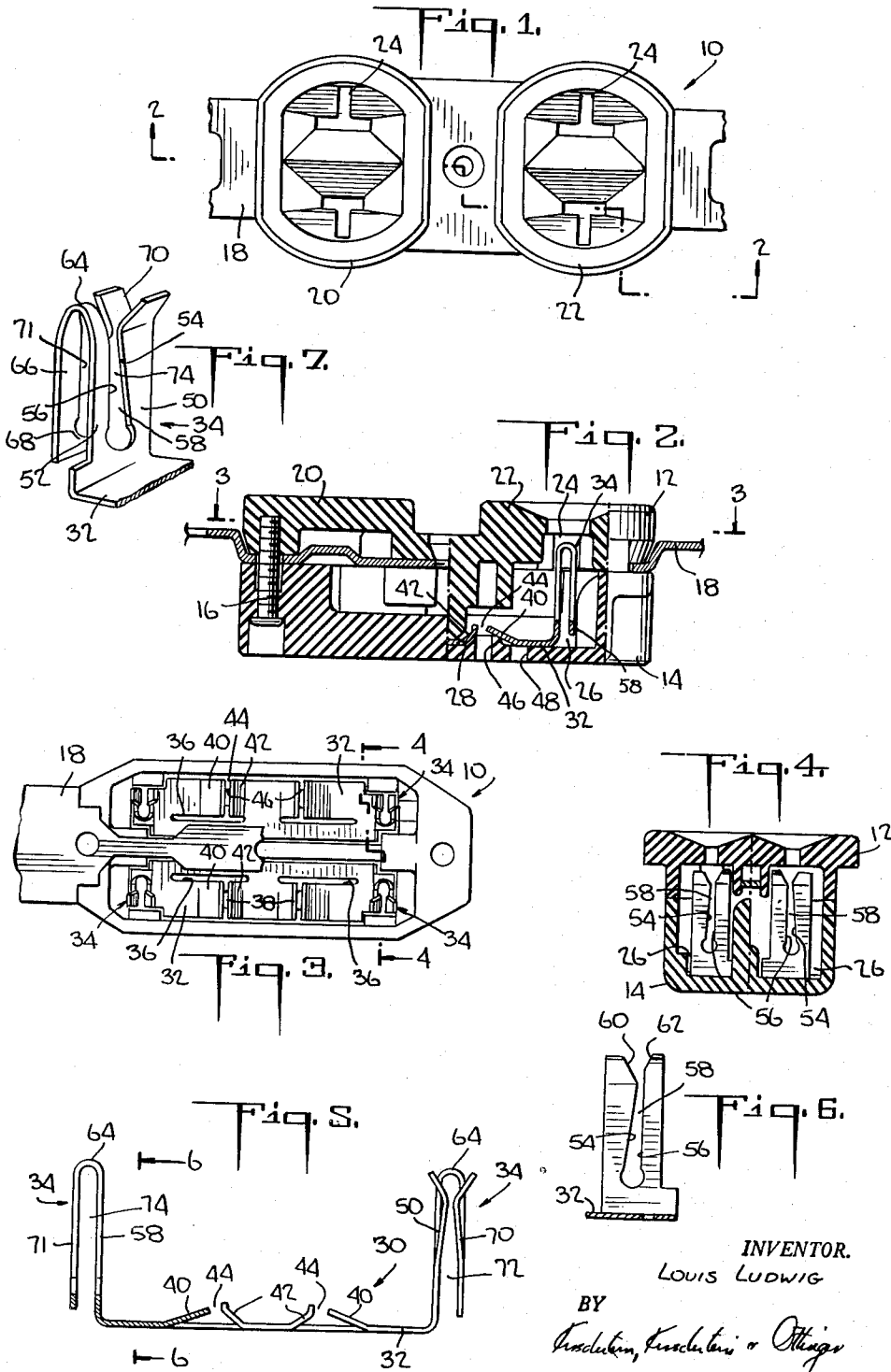
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FEMALE CONTACT FOR ELECTRICAL OUTLET RECEPTACLE

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FEMALE CONTACT FOR ELECTRICAL OUTLET
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The invention relates to female contacts for electrical receptacles.

It is an object of my invention to provide an improved female contact which, although of an extremely simple unitary construction that is easy and inexpensive to fabricate, affords a novel and unusually good engagement with a male contact blade.

It is another object of my invention to provide a contact of the character described which utilizes a unique combination of forces to create an excellent electrical engagement that effectively will withstand long and rough usage.

It is another object of my invention to provide a contact of the character described which will efficiently engage both tandem and parallel blades.

Other objects of my invention in part will be obvious and in part will be pointed out hereinafter.

My invention accordingly consists in the features of construction, combinations of elements and arrangements of parts which will be exemplified in the device hereinafter illustrated and described and of which the scope of application will be indicated in the appended claims.

In the accompanying drawings in which is shown one of the various possible embodiments of my invention,

Fig. 1 is a front view of a duplex electric receptacle in which there are incorporated female contacts constructed in accordance with my invention;

Fig. 2 is a sectional view taken substantially along the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken substantially along the line 3—3 of Fig. 2, and showing the receptacle as it appears with the top housing removed;

Fig. 4 is a sectional view taken substantially along the line 4—4 of Fig. 3;

Fig. 5 is an elevational view of one of the contact pieces;

Fig. 6 is a sectional view taken substantially along the line 6—6 of Fig. 5; and

Fig. 7 is a perspective view of a portion of one of the contact pieces, to wit, the female contact, which constitutes the novel feature of the present invention.

Referring now in detail to the drawings, the reference numeral 10 denotes a duplex electric receptacle which is conventional except for the female contacts. Said receptacle includes a casing comprising two parts, to wit, a top housing 12 and a bottom housing 14 both of which are fabricated from electrically non-conductive material that is resistant to mild heat, a typical material being a phenolformaldehyde condensation resin. The two housing parts are attached to one another in any suitable fashion, for instance by a screw 16 the head of which is seated in an aperture in the bottom housing and the shank of which is screwed into a tapped well in the top housing.

Clamped between the two housing parts is the usual mounting strap 18.

The top housing is formed to provide two identical outlets 20, 22 each of which is adapted to have inserted

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therein a pair of male contact blades. For this purpose each outlet includes two T-shaped through openings 24, as is customary. Beneath each of the T-shaped openings in each outlet the two housing parts define a chamber 26, so that in all there are four chambers in the receptacle 10.

The chamber 26 of any given outlet is connected to the matching chamber of the other outlet by a low passageway 28. The chambers are internally shaped to accommodate the ends of contact pieces 30. There are two contact pieces 30 in the receptacle, each having at each end thereof a female contact. Each female contact is located in a different chamber 26.

Each contact piece 30 is fabricated from a single strip of flat resilient sheet metal of good electrical conductivity, e.g., spring brass or phosphor bronze. Typically, each contact piece has a shank 32 from the opposite ends of which the female contacts 34 extend. The middle of each shank is snugly received in a different passageway 28.

Each shank includes on opposite sides of its center a slit 36 which extends parallel to the longitudinal axis of the contact piece and is disposed between the lateral edges thereof. The material between each slit and a lateral edge, e.g., the outer lateral edge, of the shank is formed with a transverse slit 38 extending from the slit 36 to said longitudinal edge, so as to provide a pair of resilient tongues 40, 42. The tongues are shaped so that in relaxed positions their tips are slanted into the chamber to define between them a slot 44 which is slightly smaller than a bare solid conductor such as is commonly used in house wiring. Thereby, when insulation is stripped from the conductor and the conductor thrust into the slot 44, it will force apart the tongues 40, 42 which will bite into the conductor and prevent the same from being withdrawn.

Such a conductor is inserted into the slot through an opening 46 in the lower wall of the bottom housing 14. Another opening 48 in said wall beneath the tongue 40 is included to permit the conductor to be released by forcing the tongue 40 away from such conductor as by inserting a nail through the opening 48 to bear against the tongue 40. This arrangement is well known and forms no part of my invention.

In accordance with the present invention I form the female contacts 34 to an unusual and special construction whereby to create contacts which are capable not only of receiving either tandem or parallel male contact blades with the use of a minimum of material, but also of engaging a parallel blade in a manner such as to provide an unusually good electrical contact therewith.

Each female contact 34 includes first and second flat legs 50, 52 in one piece with and extending upwardly from the shank 32. The legs are substantially in a common plane, the slight deviation from coplanarity being described in detail hereinafter. Said two legs are approximately parallel, that is to say, their inner edges 54, 56 which face one another are in substantial parallelism. Actually, these edges are not exactly parallel, but converge from near the shank 32 upwardly as best can be seen by inspection of Fig. 6. Thereby, said edges form, in effect, a slot 58 extending upwardly from the shank. The outer end of the slot is flared by provision of outwardly diverging camming portions 60, 62 on the edges 54, 56. Said camming portions are included to facilitate entry of a male blade therebetween.

The second leg 52 is formed at its upper tip with a retroverted bend 64 from which there extends downwardly a third flat leg 66 that is substantially parallel to the second leg 52. Phrased differently, the second and third legs 52, 66, together with the retroverted bend 64, define a U-shape (see Fig. 5). At the bottom tip of the

third leg 66 I provide a flat cross member 68 in one piece with said leg 66. Extending upwardly from the cross member is a fourth flat leg 70 in substantially the same plane as the third leg 66 and substantially parallel to the first leg 50. The inner edges of the third and fourth legs 66, 70 are shaped in exactly the same manner as the inner edges 54, 56 of the first and second legs 50, 52, so that these two pairs of inner edges are in registry. Said inner edges of the third and fourth legs 66, 70 define a second upwardly extending slot 71 of the same shape and dimensions as the slot 58 and in registry therewith.

Desirably, the first and fourth legs 50, 70 slightly converge upwardly toward one another (see Fig. 5) out of the planes of the second and third legs 52, 66 and at their outer extremities flare apart to facilitate entry of a tandem male contact blade. The first and fourth legs provide between them a third slot 72 at right angles to and intersecting a fourth slot 74 defined by the registered slots 58, 71.

The aforesaid fourth slot 74 is adapted to receive a parallel male contact blade, while the third slot 72 is adapted to receive a tandem male contact blade. It will be apparent that the female contacts are so located in their respective chambers 26 that the said third and fourth slots of each will be located directly below and in registry with the associated parts of a T-opening 24 in the top housing 12. Thereby, when either a parallel or tandem blade is inserted in the proper portion of a T-shaped opening, it will enter the correct slot of the contact. A tandem blade will enter the slot 72 and a parallel blade will enter the slot 74. Thereby, with an extremely simple construction of female contact utilizing a flat strip whose width does not exceed that necessary for the shank 32 I am able to form a female contact capable of efficiently receiving either a tandem or a parallel blade.

I have found that the engagement effected between a parallel blade and the novel female contact is unusually good and surpasses that which would be secured if the third slot 72 were omitted, this being due to the combination of forces which are created upon the insertion of such a blade and which arises from the presence of said slot 72. When a parallel blade enters the fourth slot 74, instead of merely flexing the pair of first and fourth legs 50, 70 away from the pair of second and third legs 52, 66, the blade additionally twists the legs 52, 70 about their bases, so that the resultant force is a combination of compression and torque. This complex combined force acting upon a parallel blade has been found to create a particularly good electrical contact which withstands long and hard usage.

It thus will be seen that I have provided a female electrical contact which achieves the several objects of my invention and is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of my invention and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein described or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent:

1. A female contact at an end of a wide flat shank, said contact comprising a first leg, a second leg, a third leg, a fourth leg, a retroverted bend and a cross member,

all in one piece with the shank, said first and second legs extending upwardly from the end of the shank in substantially parallel relationship, the upper end of the first leg being free, the retroverted bend connecting the upper ends of the second and third legs, the cross member connecting the lower ends of the third and fourth legs, the upper end of the fourth leg being free, the third leg being substantially parallel to the second leg in a direction transverse to the direction of parallelism of the first and second legs, the fourth leg being substantially parallel to the third leg in a direction parallel to the direction of parallelism of the first and second legs, the fourth leg being substantially parallel to the first leg in a direction parallel to the direction of parallelism of the second and third legs, the first and second legs defining between them a first upwardly extending slot, the third and fourth legs defining between them a second upwardly extending slot, said first and second slots being registered and mutually forming a third upwardly extending slot, said first and fourth members defining between them a fourth upwardly extending slot running transversely into the third upwardly extending slot between the first and second upwardly extending slots.

2. A contact as set forth in claim 1 wherein all the legs are flat, wherein the first and second legs are in substantially a first common plane and wherein the third and fourth legs are in substantially a second common plane that is parallel to the first common plane.

3. A female contact comprising a first leg, a second leg, a third leg, a fourth leg, a retroverted bend, a first cross member, and a second cross member, all in one piece, said first and second legs extending upwardly from the end of the first cross member in substantially parallel relationship, the upper end of the first leg being free, the retroverted bend connecting the upper ends of the second and third legs, the second cross member connecting the lower ends of the third and fourth legs, the upper end of the fourth leg being free, the third leg being substantially parallel to the second leg in a direction transverse to the direction of parallelism of the first and second legs, the fourth leg being substantially parallel to the third leg in a direction parallel to the direction of parallelism of the first and second legs, the fourth leg being substantially parallel to the first leg in a direction parallel to the direction of parallelism of the second and third legs, the first and second legs defining between them a first upwardly extending slot, the third and fourth legs defining between them a second upwardly extending slot, said first and second slots being registered and mutually forming a third upwardly extending slot, said first and fourth members defining between them a fourth upwardly extending slot running transversely into the third upwardly extending slot between the first and second upwardly extending slots.

4. A contact as set forth in claim 3 wherein all the legs are flat, wherein the first and second legs are in substantially a first common plane and wherein the third and fourth legs are in substantially a second common plane that is parallel to the first common plane.

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