May 26, 1964 D. G. KIMBALL ETAL 3,134,632

ELECTRICAL CONNECTOR

Filed Dec. 5, 1960 2 Sheets-Sheet 1

Fig. 1.

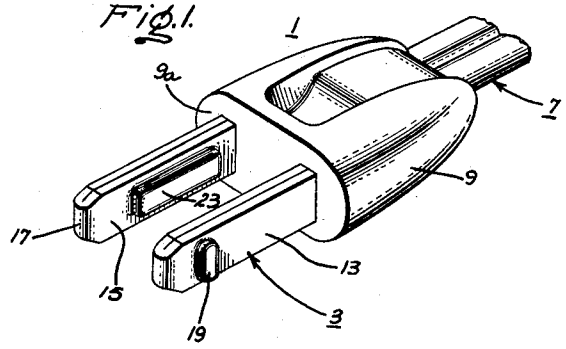


Fig. 4.

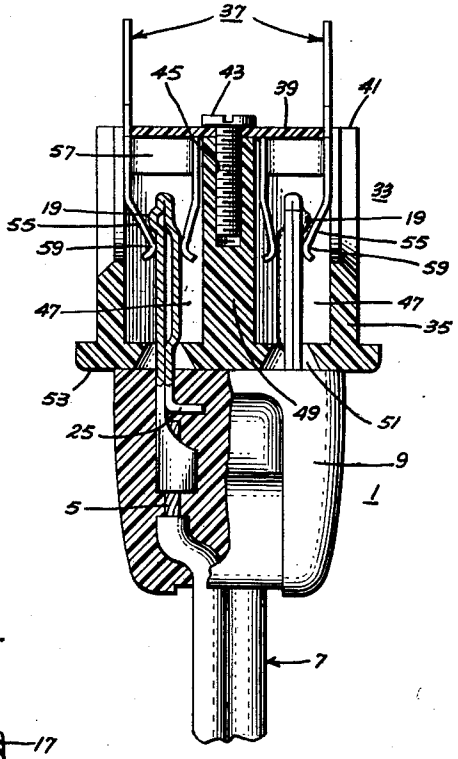


Fig. 2.

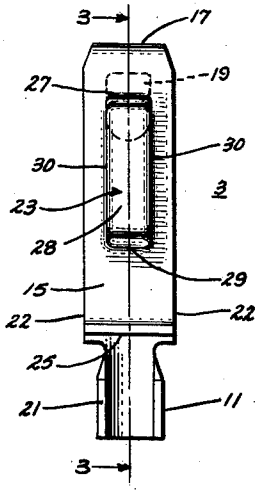


Fig. 3.

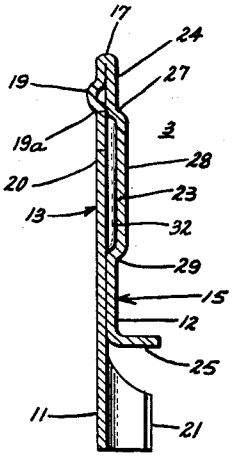


Fig. 5.

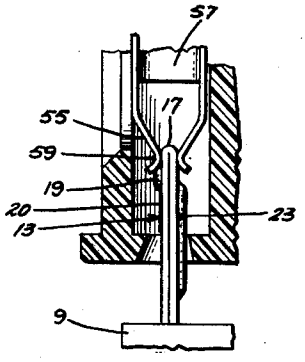
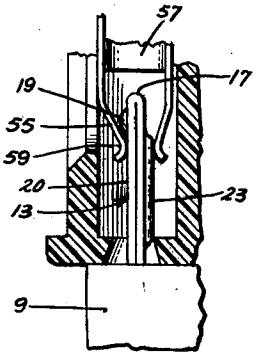


Fig. 6.



Inventors:
Donald G. Kimball,
William Vermeulen,
by Thomas A. Briody
Attorney.

May 26, 1964 D. G. KIMBALL ETAL 3,134,632

ELECTRICAL CONNECTOR

Filed Dec. 5, 1960 2 Sheets-Sheet 2

Fig. 7.

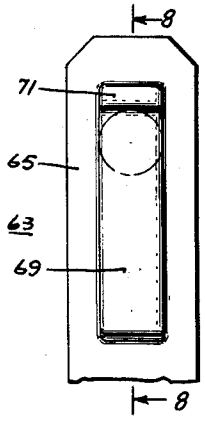


Fig. 8.

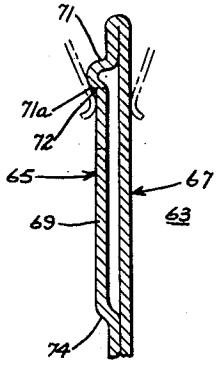


Fig. 9.

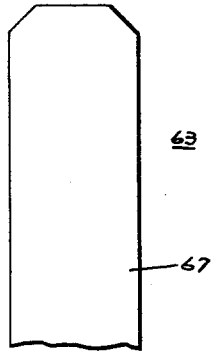


Fig. 10.

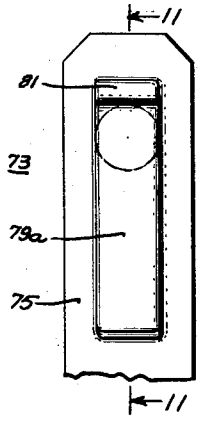


Fig. 11.

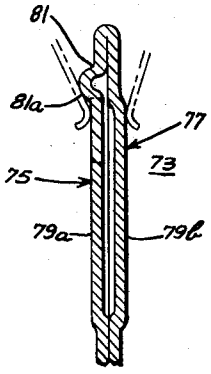
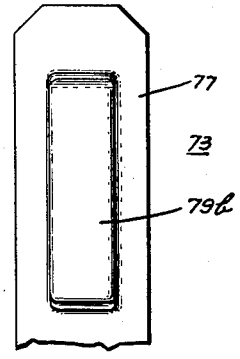


Fig. 12.



Inventors:
Donald G. Kimball,
William Vermeulen,

by Thomas A. Briody
Attorney.

United States Patent Office 3,134,632 Patented May 26, 1964

3,134,632

ELECTRICAL CONNECTOR

Donald G. Kimball, Stratford, and William Vermeulen, Fairfield, Conn., assignors to General Electric Company, a corporation of New York

Filed Dec. 5, 1960, Ser. No. 73,761
9 Claims. (Cl. 339—195)

The present invention relates to electrical connector plugs for use with receptacles and other power outlets, having a particular relation to the contact blades which form a part of such plugs.

Obtaining efficient and dependable electrical contact between the contact blades of connector plugs and the cooperating contacts of receptacles and other power outlets, has for many years presented a very considerable problem to the electrical industry. One type of plug contact blade in the prior art consists of a flat, rigid, and solid conductive member having suitable standardized dimensions for engaging the resilient contacts of the receptacles and outlets. Such a contact blade has been found to provide maximum contact pressure when it is manufactured to the proper standardized thickness. But the solid blade construction involves a restrictive material cost due to the relatively high mass of conductive metal which is used in each blade. In addition, the solid blade type of contact does not lend itself to the well-known and expeditious modern manufacturing technique of compressing or "crimping" the blades to associated cord conductors. More specifically, the usual contact thickness for a plug blade is in the order of between .055" and .065", and solid or one-ply blades having a uniform thickness such as this may not be efficiently "crimped" to associated conductors for attachment thereto.

Another type of plug blade of the prior art is the flat and rigid "two-ply" blade. This type of blade includes a strip of conductive material which is folded over upon itself to form a pair of integral opposed contact portions in contiguous face-to-face relationship. The two-ply rigid blade, due to the relative thinness of the conductive strip from which it is formed, may be readily crimped to a cord connector. However, prior art plug blades such as this also involve a restrictive material cost, due to the over-all mass of conductive material required for each blade. In addition, the two-ply rigid blades have not heretofore included an efficient means for assuring maximum contact pressure. It has, therefore, been found desirable to provide an improved connector plug which includes novel two-ply blades that have a substantially lower over-all cost. It also has been found desirable to provide two-ply contact blades for a connector plug which are sturdy, versatile, dependable, and cooperate with mating contacts of receptacles or power outlets to furnish an extremely efficient electrical contact.

When connector plugs are used with electrical appliances, such as vacuum cleaners, irons, etc., they must be constructed so that the plug may be readily inserted into a wall receptacle or convenience outlet and held therein against accidental pulls upon the attached cord incident to the normal use of the attached electrical appliance. It frequently happens, however, that such is not the case, and the connector plug is so loosely held by the receptacle that it may be easily disconnected therefrom even by very slight pulls on the cord. In some cases, this condition may become so aggravated that the plug will simply fall out of the receptacle. Very often this is due to defective engagement of the plug with the receptacle, which may be caused by ineffective detenting or restraining cooperation between the plug and the receptacle. This condition may be caused by variation in the dimensions and configuration of the receptacle contacts. Defective engagement of

the plug with the receptacle may also be caused by excessive wear and bending of the plug contact blades. In order to overcome these defects, numerous attempts have been made to provide an efficient and flexible detenting or restraining means for holding the plug in virtually any appropriate receptacle, against accidental pulls. It has, therefore, been found desirable to provide a new and improved contact blade for a connector plug which includes a relatively low cost detent means that is efficient and versatile and cooperates with a wide variety of receptacle contacts.

Accordingly, it is the general object of this invention to provide an improved electrical connector plug which facilitates an efficient and dependable electrical contact between the plug contact blades and the contacts of a mating receptacle or power outlet.

Another object of this invention is to provide an improved two-ply contact blade for a connector plug which due to its relative simplicity can be manufactured at a reduced cost.

A further object of this invention is to provide an improved rigid two-ply contact blade for a connector plug of the class described, which is more rugged and foolproof than two-ply contact blades heretofore in use, which will remain serviceable and provide an efficient electrical connection, notwithstanding severe abuse to which the plug may be subjected and notwithstanding wear and tear or deterioration of the receptacles and power outlets with which it is used, and which readily cooperates with virtually any appropriate type of receptacle contact now in use or on the market to restrain the connector plug therein against accidental pulls.

In carrying out the present invention, in one form thereof, it is applied to an electrical connector plug of a general type often used with electrical appliances. This connector plug includes a pair of two-ply contact blades which are spaced apart within an insulating body. Each blade comprises a relatively thin and flat metal strip folded upon itself at the outer end of the blade to provide a pair of contact portions in substantially contiguous face-to-face relationship. On the outer surface of one of the contact portions of the blade and near to the outer end thereof, a detent embossment is formed. This detent embossment moves behind an appropriate receptacle contact and cooperates therewith to help hold the plug against the face of a receptacle against accidental pulls. Also, on at least one of the contact portions of each blade, an embossed contacting plateau is formed. This plateau is disposed longitudinally on the outer surface of its associated contact portion and is longitudinally offset inwardly from the detent embossment to provide an elongated longitudinal contact surface for engagement with one of the receptacle contact members. This elongated longitudinal contact surface is arranged to provide a rigid and uniform blade contacting thickness that is greater than twice the thickness of the strip. By forming each contact blade in this manner, a very rugged, dependable, and efficient plug blade structure and connector plug has been thereby achieved.

Further aspects of this invention will become apparent hereinafter, and the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which we regard as our invention. The invention, however, as to organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following descriptions when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of an improved electrical connector plug embodying our invention;

FIG. 2 is an elevational view of one of the contact blades of the plug of FIG. 1;

FIG. 3 is a sectional view of the contact blade of FIG. 2, taken along the line 3—3;

FIG. 4 is an elevational view partially in section and partially broken away of our improved connector plug when it is in engagement with a typical mating receptacle;

FIG. 5 is a fragmentary view partially in section to show one of the contact blades of the improved connector plug of FIG. 4, in the position which it assumes as it initially engages a mating receptacle contact upon insertion of the connector plug into the receptacle;

FIG. 6 is a view similar to that of FIG. 5, where the contact blade of the connector plug is shown in its seated position after the plug has been inserted in the receptacle;

FIG. 7 is a fragmentary elevation view of a two-ply contact blade for a connector plug, embodying the present invention in alternate form thereof;

FIG. 8 is a sectional view of the contact blade of FIG. 7, taken along the line 8—8;

FIG. 9 is a fragmentary elevation view of the blade shown in FIG. 7, from the other side thereof;

FIG. 10 is a fragmentary elevation view of another two-ply contact blade for a connector plug, embodying the present invention in a further alternate form thereof;

FIG. 11 is a sectional view of the contact blade of FIG. 10, taken along the line 11—11; and

FIG. 12 is a fragmentary elevation view of the blade shown in FIG. 10, from the other side thereof.

Referring first to FIGS. 1 and 4 of the drawings, there is illustrated electrical connector plug 1. Plug 1 is of the "molded-on" type in which the electrical connections between the contact blades 3 and conductors 5 of the cord 7 are made prior to the molding operation. In manufacturing connector plugs of this type, the contact blades are first compressed or crimped to bared ends of the conductors. Then after the electrical connections are made, the conductive parts are placed in a suitable mold, and an insulating plug body 9 is molded about the ends of the cord conductors and the shank sections of the contact blades. However, it will be understood that the use of these improved contact blades is not limited to plugs of the "molded-on" type; this improved blade may be used in various other types of connector bodies and also with other connectors.

Plug body 9 is made of molded insulating material such as any suitable plastic compound. A particularly satisfactory example of such a plastic material is one of the vinyl molding compounds. The molded insulating material of body 9 surrounds the bared ends of the conductors 5 (FIG. 4) and associated blade shank sections 11 and 12, to insulate and house the crimped connections and also serve as a support for the contact blades.

The present invention is concerned primarily with the construction of improved, efficient, and low cost plug contact blades or terminal members. In this connection, it is initially worthy of note that certain standardized specifications for plug contact blades or terminal members have existed in the electrical industry for many years. These specifications, which have been promulgated by the Underwriters' Laboratories, Inc., under the sponsorship of the National Board of Fire Underwriters, define standard dimensions for the blade elements, and the allowable manufacturing tolerances. It is by means of these specifications and similar specifications for the receptacles, power outlets, and other associated apparatus, that electrical cord connectors have become substantially interchangeable.

The improved contact blade 3 of the present invention, as illustrated in FIGS. 2 and 3, constitutes a two-ply or folded-over type of rigid construction, which in its physical dimensions, accurately conforms to the dimensional requirements of the Underwriters' Laboratories, Inc. The blade 3 is manufactured by folding over and shaping a strip of suitable conductive material of standard prong width so as to provide two oppositely disposed contact

portions 13 and 15 in substantially contiguous face-to-face relationship. The thickness of this blade material may be in the order of .0225". To properly support each of the contact portions in the plug body, shank or supporting portions 11 and 12 are arranged on the inner ends of these contact portions.

To form the two-ply rigid blade 3, contact portions 13 and 15 are folded over at outer end 17. Before folding over these contact portions, however, to provide an efficient and dependable detent means for each blade, a transverse embossment or bump 19 is shaped outwardly from the surface of the part of the conductive strip which is to be formed into contact portion 13. Embossment 19 projects perpendicularly outwardly from the outer surface 20 of contact portion 13 (FIG. 3), for approximately .012–.018", and extends transversely to the longitudinal axis of the blade. As shown in FIG. 2, the embossment 19 is also located in the center of the strip between sides 22, and extends generally parallel to outer end 17 (FIG. 3 also). On the inner or lower side of each embossment 19, a substantially accurately located wall 19*a* is included. Wall 19*a* is located about .542" from the front face 9*a* of the plug body 9 (FIG. 1), and is generally tangential to the outer extremity of the detent hole which has been commonly used in prior art plugs. To illustrate for purposes of reference, the location which the prior art detent hole might assume in our improved plug blade 3, in FIGS. 2 and 3, such a hole is shown by dot and dash lines. By means of the location of wall 19*a* of embossment 19, an efficient and versatile detent means is expeditiously achieved, which compensates for any absence of detent bumps in receptacles and power outlets. The detent effects achieved by bump 19 shall be described in detail hereinafter.

To attach each two-ply blade to an appropriate conductor, shank portion 11 extends inwardly from contact portion 13, or downwardly as shown in FIG. 3. A pair of flaps or tabs 21 are formed on portion 11 near its inner end or bottom. The tabs 21 may be conveniently compressed or crimped against each bared end of conductor 5 by rolling them over and against the conductor until they engage it in the well-known manner.

Turning now to a further and very important aspect of the present invention whereby an improved electrical contact action is achieved for my plug 1, as shown in FIG. 2, contact portion 15 of each blade 3 includes an elongated embossed contacting plateau 23 which is also formed before the conductive strip is folded over. Plateau 23 is shaped perpendicularly outwardly from the principal outer surface 24 of contact portion 15, as shown in FIG. 3, by rectangularly arranged walls (FIG. 2), and it extends longitudinally along the strip at a location between outer end 17 and end limb 25. Outer end wall 27 of plateau 23 is in transverse alignment with inner end wall 19*a* of bump 19. The main contacting surface 28 of plateau 23 extends generally parallel to and in spaced relationship with contact portion 13, between outer end wall 27 and inner end wall 29. Longitudinal side walls 30 of plateau 23 are generally parallel to sides 22 of the strip and spaced equidistant therefrom (FIG. 2). It will thus be seen that plateau 23 is disposed with respect to adjacent contact portion 13 to provide an elongated area of contact thickness for each blade 3 which is two-ply, hollow underneath, uniform, and sturdily supported. The sturdy support for the plateau 23 is obtained by means of the structural configuration of plateau 23, as well as by the peripheral engagement of the surface sections of portion 15 opposite to (i.e., inside of) the bottoms of walls 27, 29, and 30, with adjacent surfaces of contact portion 13. To put this another way, plateau 23 is sturdily supported by peripheral engagement of contact portion 13 with the reactangular inner rim surrounding the recess 32 formed by plateau 23. (See FIGS. 2 and 3.) Embossed plateau 23 also serves as a strengthening means for contact portion 15. The depth of plateau 23 provides a uniform

contact thickness for each blade in the order of between .057–.063", and the plateau extends longitudinally about .449" to permit a maximum contact pressure to be realized over an elongated longitudinal contact area when the blade is inserted into an appropriate receptacle or power outlet. The length of the contact embossment **23** is preferably approximately ⅔ of the length of the two-ply blade which protrudes outwardly from plug body **9**.

End limb **25** extends outwardly from and at a right angle to the longitudinal axis of contact portion **15**, to serve the double function of both providing a stop for the end of the conductor when it is crimped to the blade, and helping to anchor the blade in the plug body.

Turning now to a detailed discussion of the improved performance achieved by the inventive structure of blades **3** of connector plug **1**, there is shown in FIG. 4 a typical receptacle **33** with which plug **1** may be efficiently utilized. Receptacle **33** includes an insulating base or housing **35**, a pair of identical female contacts **37** supported therein, and an insulating cover plate **39** which is attached to recessed back end **41** of housing **35** by means of engagement between screw **43** and threaded recess **45** of the housing. Housing **35** includes two contact receiving chambers **47** which are spaced apart by an intervening wall **49**. Appropriate apertures **51** are formed in the front wall **53** of housing **35** to receive blades **3** of plug **1**. The female contacts **37** each include a pair of resilient contact fingers **55** which are joined together by a bridging shoulder **57**. Each of the resilient fingers **55** includes an inwardly extending curved or generally V-shaped contact section **59**. Sections **59** of each pair of fingers **55** are resiliently biased toward each other and spaced apart to provide a relatively slight initial resistance to the thickness of blade **3** at outer end **17**, when the blades of the plug initially engage the contact **37**. (See FIG. 5.) The thickness of blade **3** adjacent outer end **17** is preferably in the order of, but will be understood as not limited to, .0450". As the blades **3** of the plug **1** are then pushed further into their seated positions in receptacle **33** (as shown in FIG. 4), transverse bumps **19** of the blades force the mating fingers **55** further apart. When blades **3** are then seated in receptacle **33**, as shown in FIGS. 4 and 6, the bottom transverse walls **19***a* of bumps **19** engage behind curved sections **59** of the female contacts, and the resilient biasing forces of the curved sections **59** cause them to firmly engage the thickness provided by surface **28** of contacting plateau **23** and the oppositely disposed relatively flat outer surface of contact portion **13**. This thickness is in the order of .057–.063". With transverse bumps **19** disposed behind curved sections **59** of the female contacts, plug **1** will be held generally toward or against the front face of the receptacle **33** by engagement of the bumps with contact sections **59** to thereby prevent any accidental removal of the plug from the receptacle in response to a relatively low "pull-out" force. When it is desired to remove plug **1** from engagement with the receptacle **33**, a deliberate manual force exerted upon the plug perpendicularly away from or outwardly of receptacle wall **53** will readily remove the plug by overcoming the biasing of the resilient contacts **37**.

FIGS. 7, 8, and 9 illustrate one modified form of the present invention, wherein blade **63** is of the two-ply type and includes contact portions **65** and **67**. Contact portion **65** of blade **63** has an elongated embossed contacting plateau **69** which is formed in the same manner as plateau **23** of blade **3**. Plateau **69** also generally resembles plateau **23**. Instead of being located in the contact portion opposite to the portion wherein the detent bump **71** is formed, however, plateau **69** is formed in the same ply or contact portion as the detent bump. As shown in FIGS. 7, 8, and 9, detent bump **71** is formed on contact portion **65** with inner end wall **71***a* of the bump in an appropriate detenting position with relation to the front face of the plug body (not shown). Outer end **72** of plateau **69** abuts inner end wall **71***a* of bump **71**. Bump **71** projects transversely outwardly by a dimension in the order of approximately .010–.020" from the outer surface of the plateau **69**, to provide the desired detent depth in a manner similar to that described for plug blades **3** of FIG. 4. Plateau **69** extends longitudinally inwardly, terminating at inner end **74**, and also projects transversely outwardly from the principal outer surface of contact portion **65** by about .020" to provide an over-all blade contact thickness in the order of between .055–.065". It will be understood that blades **63** of a connector plug (not shown), such as plug **1**, will cooperate with female contacts of a mating receptacle in a manner similar to that described for blades **3** of plug **1**.

FIGS. 10, 11, and 12 illustrate an additional modified form of the present invention, wherein blade **73** is of the two-ply type and includes contact portions **75** and **77**. Contact portions **75** and **77** have elongated embossed contacting plateaus **79***a* and **79***b* formed upon them (FIG. 11). The plateaus **79***a* and **79***b* are in general oppositely disposed and extend transversely outwardly in opposite directions to provide an over-all contact thickness in the order of between .055–.065". Due to the fact that two contacting plateaus are formed on each of the two blades instead of one, the depth of projection is therefore less for each plateau (e.g., in the order of approximately .010" outwardly from the principal outer surface of the associated contact portion). Bump **81** is formed on contact portion **75** so that inner end wall **81***a* of the bump is in an appropriate detenting position with relation to the front face of the plug body (not shown). Bump **81** is also formed to project transversely outwardly for a dimension in the order of between .015–.025". It will be understood that blades **73** of a connector plug (not shown), such as plug **1**, will cooperate with female contacts of a mating receptacle in a manner similar to that described for blades **3** of plug **1**.

It will thus be seen that by means of the present invention, an improved two-ply rigid contact blade for a connector plug has been provided. This blade may be made of relatively thin conductive strip material (in the order of .0225"), and the effect of a solid blade may be obtained in an elongated contact area by shaping one or both sides of the folded over strip outwardly to form an elongated contacting plateau. This improved contacting plateau does not compress when it cooperates with female contacts of receptacles or power outlets, and thus insures maximum contact pressure for an improved current carrying capability. A detent embossment is positioned on the blade in such a manner as to compensate for the absence of a detent bump in the receptacle contact and to securely restrain the plug toward or against the face of the receptacle. An efficient and versatile plug blade detent means has thus been obtained which precludes any accidental removal of the plug from the receptacle. The plug blade contacts of this invention are simple, low in cost, and when incorporated in the improved connector plug **1** provide a connector unit having a very high efficiency and improved versatility. It should be realized that certain aspects of this invention may be efficiently and beneficially incorporated in numerous other types of connector units.

While in accordance with the patent statutes, we have described what at present are considered to be the preferred embodiments of our invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from this invention, and we, therefore, aim in the following claims to cover all such equivalent variations as fall within the true spirit and scope of this invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A two-ply, one-piece blade for electric connector plugs and the like comprising a generally flat metal strip folded upon itself at the outer end of the blade to provide a pair of contact portions in substantially contiguous face-to-face relationship, raised detent means formed on the

outer surface of one of said contact portions near the outer end thereof and spaced inwardly from the sides thereof, and an embossed contacting plateau formed on the outer surface of at least one of said contact portions and spaced inwardly from the sides thereof, said plateau being elongated longitudinally and including a main contacting section parallel to and spaced transversely outwardly by a substantially uniform dimension from the other of said contact portions thereby to provide a rigid and uniform blade contacting thickness that is greater than twice the thickness of said strip, said plateau being spaced rearwardly from said raised detent means toward the inner end of said blade.

2. A two-ply, one-piece blade for electric connector plugs and the like comprising a generally flat metal strip folded upon itself at the outer end of the blade to provide first and second contact portions in substantially contiguous face-to-face relationship, an embossed bump projecting outwardly from a flat outer surface of said first portion near the outer end of the blade and spaced inwardly from the sides thereof, said bump positioned to serve as a detent means for said blade, and an embossed contacting plateau formed on the outer surface and intermediate the sides of said second contact portion, said plateau being elongated longitudinally and including a main contacting section parallel to and spaced transversely outwardly by a substantially uniform dimension from said first contact portion thereby to provide a rigid and uniform blade contacting thickness that is greater than twice the thickness of said strip, said plateau being located rearwardly of said embossed bump toward the inner end of said blade.

3. A two-ply, one-piece blade for electric connector plugs and the like comprising a generally flat metal strip folded upon itself at the outer end of the blade to provide first and second contact portions in substantially contiguous face-to-face relationship, an embossed bump projecting outwardly from a flat outer surface of said first portion near the outer end of the blade and spaced inwardly from the sides thereof, said bump having at least one transverse wall facing away from the outer end of said blade, said wall positioned to serve as a detent means for said blade, and an embossed contacting plateau formed on the outer surface and intermediate the flat outer edges of said second contact portion and having an outer end wall in general alignment with the transverse wall of said bump, said plateau being elongated longitudinally and including a main contacting section parallel to and spaced transversely outwardly by a substantially uniform dimension from said first contact portion thereby to provide a rigid and uniform blade contacting thickness that is greater than twice the thickness of said strip, said plateau being located rearwardly of said embossed bump toward the inner end of said blade.

4. A two-ply, one-piece blade for electric connector plugs and the like comprising a generally flat metal strip folded upon itself at the outer end of the blade to provide a pair of contact portions in substantially contiguous face-to-face relationship, a transverse embossed detent means formed on the outer surface of one of said contact portions near the outer end thereof and spaced inwardly from and generally perpendicular to the longitudinal sides of said contact portion, and an embossed contacting plateau formed on the outer surface of the other of said contact portions, said plateau being elongated longitudinally and comprising side and end walls arranged in a rectangular configuration and a main contacting section supported by said walls, said side walls spaced inwardly from and generally parallel to associated longitudinal sides of said last mentioned contact portion, said end walls spaced inwardly from and generally parallel to the outer end of the blade, said main contacting section being parallel to and spaced transversely outwardly by a substantially uniform dimension from the first mentioned contact portion thereby to provide a rigid and uniform blade contacting thickness that is greater than twice the thickness of said strip, said plateau being spaced rearwardly from said detent means toward the inner end of said blade.

5. A connector plug for a receptacle having spaced contact members, said plug comprising a body of insulating material, a plurality of contact blades extending outwardly from said body in spaced parallel relationship, each blade comprising a generally flat metal strip folded upon itself at the outer end of the blade to provide a pair of contact portions in substantially contiguous face-to-face relationship, said contact portions being engaged continuously about their entire peripheries outwardly of said body, embossed detent means formed in one of said contact portions near the outer end thereof and spaced from the sides thereof, said detent means arranged to cooperate with an associated one of the receptacle contact members when said plug is positioned within said receptacle, and an embossed contacting plateau formed on the outer surface of the other of said contact portions, said plateau being elongated longitudinally and including a main contacting section parallel to and spaced transversely outwardly by a substantially uniform dimension from the first mentioned of said contact portions thereby to provide a rigid and uniform contacting thickness that is greater than twice the thickness of said strip for engagement with said one of the receptacle contact members, said plateau being spaced inwardly from the sides of said blade and located rearwardly of said detent means toward said body of said plug.

6. A connector plug for a receptacle having spaced contact members, said connector plug comprising a body of insulating material, a plurality of contact blades extending outwardly from said body in spaced parallel relationship, each blade comprising a generally flat metal strip folded upon itself at the outer end of the blade to provide first and second contact portions in substantially contiguous face-to-face relationship, crimpable means extending into said body from one of said contact portions, said crimpable means securely compressed about an associated conductor thereby to affix said conductor to said blade within said body, an embossed bump projecting outwardly from a flat outer surface of said first portion and spaced inwardly from the sides thereof near the outer end of the blade, said bump having at least one transverse wall facing away from the outer end of said blade, said wall positioned to serve as a detent means for said blade by cooperating with one of the receptacle contact members when said plug is positioned within said receptacle, and an embossed contacting plateau formed on the outer surface of said second contact portion and having an outer end wall in general alignment with the transverse wall of said bump, said plateau being elongated longitudinally and including a main contacting section parallel to and spaced transversely outwardly by a substantially uniform dimension from said first contact portion thereby to provide a rigid and uniform blade contacting thickness that is greater than twice the thickness of said strip for engagement with said one of the receptacle contact members, said plateau being spaced inwardly from the sides of said blade and located rearwardly of said embossed bump toward said body of said plug.

7. A two-ply, one-piece blade for electric connector plugs and the like comprising a generally flat metal strip folded upon itself at the outer end of the blade to provide a pair of contact portions in substantially contiguous face-to-face relationship, an embossed detent means formed in one of said contact portions near the outer end thereof and spaced inwardly from the sides thereof, and an embossed contacting plateau formed in said one contact portion and spaced inwardly from the sides thereof, said plateau being elongated longitudinally and including a main contacting section parallel to and spaced

transversely outwardly by a substantially uniform dimension from the inner surface of the other of said contact portions thereby to provide a rigid and uniform blade contacting thickness that is greater than twice the thickness of said strip, said plateau being located rearwardly of said embossed detent means toward the inner end of said blade.

8. A two-ply, one-piece blade for electric connector plugs and the like comprising a generally flat metal strip folded upon itself at the outer end of the blade to provide a pair of contact portions in substantially contiguous face-to-face relationship, an embossed detent means formed in one of said contact portions near the outer end thereof and spaced inwardly from the sides thereof, and an embossed contacting plateau formed on the outer surface of each of said contact portions, said plateaus being elongated longitudinally and each including a main contacting section parallel to and spaced transversely outwardly by a substantially uniform dimension from the principal outer surface of the contact portion on which the plateau is formed thereby to provide a rigid and uniform blade contacting thickness that is greater than twice the thickness of said strip, said plateau being spaced inwardly from the sides of said blade and located rearwardly of said embossed detent means toward the inner end of said blade.

9. A connector plug for a receptacle having spaced apart contact members, said plug comprising a body of insulating material, a plurality of contact blades extending outwardly from said body in spaced parallel relationship, each blade comprising a generally flat metal strip folded upon itself at the outer end of the blade to provide a pair of contact portions in substantially contiguous face-to-face relationship, an embossed detent bump formed in one of said contact portions near the outer end thereof

and spaced inwardly from the sides thereof, said detent bump arranged to cooperate with an associated one of the receptacle contact members when said plug is positioned within said receptacle, and an embossed contacting plateau formed on the outer surface of the other of said contact portions and spaced inwardly from the sides thereof, said plateau being elongated longitudinally for approximately two-thirds of the length of the two-ply blade of said plug which protrudes outwardly from said plug body, said plateau including a main contacting section parallel to and spaced transversely outwardly by a substantially uniform dimension from the first mentioned of said contact portions thereby to provide a rigid and uniform contacting thickness that is greater than twice the thickness of said strip for engagement with said one of the receptacle contact members, said plateau being located rearwardly of said embossed detent bump toward said body of said plug.

References Cited in the file of this patent

UNITED STATES PATENTS

1,917,683	Anderson	July 11, 1933
2,130,424	Grant	Sept. 20, 1938
2,205,186	Andre	June 18, 1940
2,248,082	Herman	July 8, 1941
2,249,827	Herman	July 22, 1941
2,272,432	Rogie	Feb. 10, 1942
2,284,392	Heiser	May 26, 1942
2,734,177	Gilbert	Feb. 7, 1956
2,739,208	Ullrich	Mar. 20, 1956
2,813,258	Klumpp	Nov. 12, 1957
2,866,172	Sapper et al.	Dec. 23, 1958
2,965,872	Linn	Dec. 20, 1960
2,974,302	Ellis	Mar. 7, 1961
3,015,877	Francis	Jan. 9, 1962