Sept. 6, 1927. 1,641,223

A. C. GAYNOR

CONTACT RECEPTACLE

Filed April 23, 1924

Fig. 1.

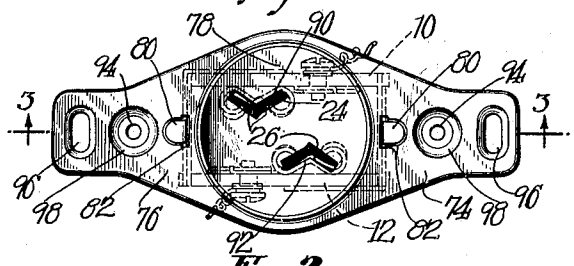


Fig. 2.

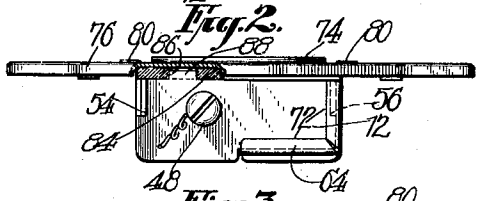


Fig. 3.

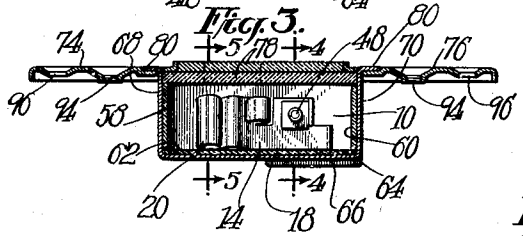


Fig. 6.

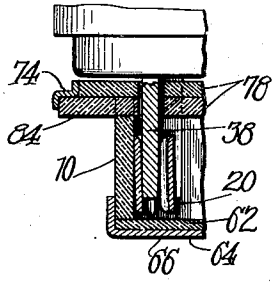


Fig. 4.

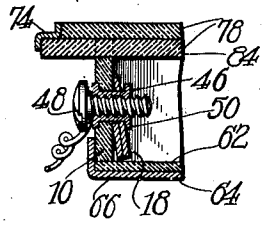


Fig. 5.

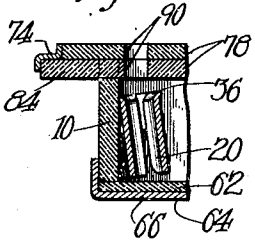


Fig. 7.

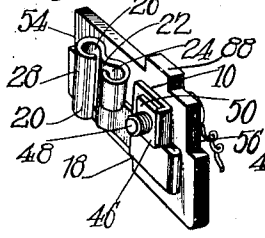


Fig. 8.

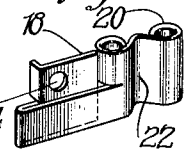
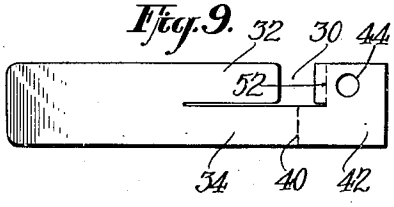


Fig. 9.



INVENTOR
ARTHUR C. GAYNOR.
BY Cornelius C. Billings
ATTORNEY

H. B. Harwood.

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UNITED STATES PATENT OFFICE.

ARTHUR C. GAYNOR, OF STRATFORD, CONNECTICUT.

CONTACT RECEPTACLE.

Application filed April 23, 1924. Serial No. 708,392.

This invention relates to a receptacle for electrical terminals adapted to receive and connect with contact jacks or blades of connecting plugs of electrical apparatus. More particularly, the invention relates to receptacles adapted to receive jacks or blades arranged either in parallel or in tandem.

In some types of electric connectors a pair of flat jacks or blades, through which contact connections are made, are arranged in parallel, spaced planes, while in other types, the blades are arranged in spaced positions in a single plane, this arrangement being known as a tandem. Inasmuch as a contact receptacle arranged to receive only one type of blades could not receive the other, because of its different special arrangement, contact receptacles have been designed with duplicate sets of blade receiving contacts, one for tandem blades and the other for parallel blades. This results in considerable duplication, in forming the receiving contacts of many connected pieces of metal, and, consequently, in an increase in the cost and complexity of the receptacles.

These defects and disadvantages are obviated by my present invention, an object of which is to provide a receptacle contact of a single piece of metal formed to receive a contact blade in either the parallel or tandem position.

Another object of the invention is to provide a contact terminal of the above type in which the metal is so formed or bent as to provide a wedging or resilient inclined contact surface between the blade and contact terminals in the receptacle.

Other objects of the invention are to provide a receptacle terminal and binding screw arrangement by which the binding screw receiving element is held in a fixed station on the receptacle terminal, to provide a receptacle enclosure of insulating material suitable for the accurate and ready positioning and mounting of the terminals therein, and to provide a form of bending the metal of which the terminals are formed by which a tilting of the terminals is readily obtained when these terminals are attached to the inner face of an insulated receptacle.

With these and other objects in view the invention comprises the receptacle and contacts described and set forth in the following specification and claims.

The various features of the invention are illustrated in the accompanying drawings, in which:

Fig. 1 is a plan view of a receptacle embodying a preferred form of the invention,

Fig. 2 is a side view of the receptacle shown in Fig. 1.

Fig. 3 is a longitudinal vertical section of the receptacle taken on line 3—3 of Fig. 1,

Fig. 4 is a detail sectional view of a portion of the receptacle and of a contact therein taken on line 4—4 of Fig. 3,

Fig. 5 is a detail sectional view of a portion of the receptacle and contact taken on line 5—5 of Fig. 3,

Fig. 6 is a sectional view similar to that of Fig. 5 and of a blade inserted into the receptacle showing the manner in which such a blade wedges with the receptacle contact,

Fig. 7 is a perspective view of a side of an insulating receptacle and of a contact terminal mounted thereon.

Fig. 8 is a perspective view of a contact terminal for the receptacle, and,

Fig. 9 is a side view of a strip of metal cut to a shape suitable for bending to the form shown in Fig. 8.

In my present invention, the blade receiving contacts are mounted on opposite inner faces of a receptacle of insulating material, the walls of the receptacle on which these contacts are mounted being so spaced as to bring a receiving portion of the contacts immediately under the respective openings in a cover through which the blades of the electrical apparatus are inserted. The blade receiving portion of the terminal is so mounted on the side of the receptacle that it does not lie flat against the face of the wall but tilts slightly away in a vertical direction so that a contact blade being inserted vertically will tend to bend the receiving portion of the terminal as it moves downwardly therein, thus insuring a positive pressure and an effective contact therebetween. This is preferably brought about, in making the terminal of a single strip of metal, by cutting away a part of the width of the strip, folding the end portion back on this cut away portion so that part of it overlaps the cut away portion and attaching the strip to the wall of the receptacle at this overlapping portion, the portion overlying the cut away half of the strip thus being forced closer to the wall and giving the strip

a sidewise tilt. The other end of the strip is bent to an angle or gable the sloping sides of which correspond to the blades of a tandem or parallel arrangement respectively and the strip is then curved towards these sloping surfaces to leave sufficient space therebetween to receive a contact blade in a tight frictional grip.

Referring more particularly to the accompanying drawings, a receptacle embodying the present invention is provided with a pair of side walls 10 and 12 on the opposing inner faces of which are mounted a pair of blade receiving contact terminals 14 and 16, respectively. Each contact terminal is formed with a flat portion 18 adapted to rest against the inner face of the respective wall on which the terminal is mounted, and a portion 20 at one end bent to such a form as to receive a contact blade in either of the two positions which it may occupy when in parallel or tandem arrangement.

The blade receiving portion 20 is formed from a strip of metal of which the terminals are formed by bending the strip away from the surface lying adjacent the supporting wall to form a ridge or angle 22 a short distance from one end of the strip having sloping side walls 24 and 26. The contact terminals are so proportioned that when mounted on the opposing inner faces of the walls 10 and 12 as indicated in Fig. 1, the sloping faces 24 lie in parallel planes and are spaced to contact with the outer faces of blades arranged in parallel and the faces 26 lie in approximately a single plane to contact with opposite faces of blades arranged in parallel.

To hold an inserted blade tightly against the surface of the sloping wall portion 26, the strip is continued beyond this portion and then bent cylindrically as at 28 until the end of the strip approaches sufficiently close to the sloping surface to tightly grip a blade therebetween. I provide a similar holding means for the sloping surface 24, the strip is notched at 30 a distance from the opposite end and slit horizontally from the bottom of the notch towards the end portion 28 forming a tongue 32 above the slit and a connecting strip portion 34 below the slit. The tongue 32 is then bent cylindrically towards the sloping surface 24 until its end is sufficiently close to tightly press an inserted blade against the surface 24. The upper edge of the sloping portion 24 and 26 is beveled as at 36 to facilitate and guide the entrance of the blade between the cylindrical and the sloping portions.

To provide the greatest pressure between the faces of the blades and the sloping faces 24 and 26, the terminals are preferably so tilted that their upper edges lie tightly against the inner face of the wall 10 or 12 and the lower edge is slightly spaced therefrom as indicated in Fig. 5. With this arrangement, when a blade 38 is inserted vertically, it tends to press the lower end of the receiving contact against the wall 10 or 12 as indicated in Fig. 6, thus increasing the pressure between the blade and contact and the surface of the terminal.

To give the terminal the desired tilted position, the flat attaching portion 18 is folded or doubled the underlying layer or fold lying adjacent the supporting wall serving to space the lower portion of an outer fold which extends upwardly above the upper edge of the underlying fold and is attached and drawn to the surface of the supporting wall by a rivet above the upper edge of said underlying spacing fold. For this purpose the strip of metal from which the terminal is to be formed is bent on a line 40 transverse to the connecting strip portion 34 outwardly from the supporting wall and folded tightly against the outer face of the strip portion 34, thus forming an overlying portion 42 composed of the portion of the strip between the line of folding 40 and the end of the strip. The lower half of the portion 42 lies over the strip portion 34 while the upper half lies over the cut out space formed by the curving of the tongue portion 32, and is therefore free to be drawn tightly against the surface of the supporting wall 10 or 12. To secure the portion 42 to the supporting wall, an opening 44 is provided in its upper portion through which a hollow rivet 46 may be passed to rivet the terminal to the wall 10 or 12, this rivet serving to draw the upper edge of the strip against the wall while the lower edge is spaced therefrom by the strip portion 34 and thus serving to give the inclination to the terminal indicated in Figs. 4 and 5.

The opening in the rivet 46 is threaded to receive the stem of a binding screw 48 by means of which a conductor or lead wire may be attached to the outer edge of the rivet. To resist the tendency of the binding screw to turn the rivet, the head 50 of the rivet lying against the terminal portion 42 is made square and the metal strip is bent upwardly on a line 52 a short distance from the edge formed adjacent the notch 30 to lie against one edge of the squared head 50.

To enable the walls 10 and 12 to be accurately spaced from each other so that the terminals may be at the required distance from each other, the walls of the receptacle in which the terminals are mounted are formed of plates or laminæ of insulating material accurately stamped or cut to the required size and fitted together to form a receptacle of the proper size. For this purpose the ends of the side walls 10 and 12 are notched as at 54 and 56 to interfit with suitable notches and lugs of end walls 58 and 60. These walls and a bottom wall 62 are then

held in position by a metal frame 64 having a bottom wall 66, end walls 68 and 70 and inwardly projecting flanges 72 to engage the edges of the insulating walls of the receptacle.

A cover member 74 is provided to cover and overly the receptacle formed by the insulating walls and is formed with a metallic frame portion 76 having a central opening in which a plate of insulating material 78, preferably of circular form may be inserted. The frame portion 76 is attached to the ends of the frame 64 by means of lugs 80 projecting upwardly from the ends of the frame 64 through openings 82 in the frame portion 76 and clinched thereover to hold the cover in place. A plate of insulating material 84 is also provided under the central insulating plate 78 of the cover 74. The plate 84 may be provided with openings 86 into which may fit lugs 88 extending upwardly from the side walls to hold these walls in their proper position. The plates 78 and 84 are also provided with angular openings 90 and 92 so shaped and positioned over the terminals as to permit contact blades to be inserted therethrough in either parallel or tandem relation into contact with the inclined faces 24 and 26 of the terminal members. The metallic frame 76 of the cover may also be provided with openings 94 and 96 by which the receptacle may be secured in place, one set of openings 94 being punched downwardly in such a manner as to form a countersunk outer face 98 and to thicken the metal about the opening that it may receive screw threads.

Through the above invention a contact receptacle is provided that may be formed of plates of insulating material easily and cheaply stamped to the required sizes. Contact terminals are also provided that may be easily and cheaply stamped from metal with a minimum waste. The various parts of the receptacle may be easily assembled without the necessity of embedding screws or similar attaching means in the walls of the receptacle and in which the binding screws and attaching connecting means are very accessible.

As changes of construction could be made within the scope of my invention it is intended that all matter contained in the above description or shown in the accompanying drawings be interpreted as illustrative and not in a limiting sense.

Having described the invention, what I claim and desire to secure by Letters Patent is:

1. A device of the type described which comprises, a strip of metal notched and slit to form a longitudinally extending tongue, said strip being bent near one end to form a ridge with angularly sloping sides and curved to bring the end of said strip to within a short distance of one of said sloping sides and the end of said tongue being curved to within a short distance of the other of said sloping sides, and the other end of said strip being folded flat on the same side of said strip as said ridge to overlap the space formed by cutting and curving the tongue portion.

2. A device of the type described which comprises, a strip notched and slit to form an L-shaped end and a tongue portion extending toward said L-shaped end, the strip being bent near its other end to form a ridge with sloping side portions and curved to bring its end into closely spaced position to one of said sloping side portions said tongue being curved to bring its end to within a short distance of the other sloping side portion, said L-shaped end being bent flat on said strip on a transverse line, a portion of said end overlapping the space left by the cutting out and bending of said tongue.

3. A device of the type described which comprises, a strip of metal notched and slit to form an L-shaped end and a tongue portion extending toward said L-shaped end, the strip being bent near its other end to form a ridge with sloping side portions and curved to bring its end into closely spaced position to one of said sloping side portions, said tongue being curved to bring its end to within a short distance of the other sloping side portion, said L-shaped end being bent flat on said strip on a transverse line, a portion of said end overlapping the space left by the cutting out and bending of said tongue, said overlapping portion being provided with an opening for the attachment of a rivet.

4. A device of the type described which comprises a strip of metal notched and slit to form an L-shaped end and a tongue portion extending toward said L-shaped end, the strip being bent near its other end to form a ridge with sloping side portions and curved to bring its end into closely spaced position to one of said sloping side portions, said tongue being curved to bring its end to within a short distance of the other sloping side portion, said L-shaped end being bent flat on said strip on a transverse line, a portion of said end overlapping the space left by the cutting out and curving of said tongue, said overlapping portion being provided with an opening for the attachment of a rivet, and an upturned edge on said overlapping portion adapted to rest against an edge of said rivet.

5. A device of the type described which comprises, a receptacle having a wall of insulating material, and a cover having openings slightly inward from the inner face of said wall, a contact, a terminal comprising a strip of metal having a substantially flat portion mounted on the inner face of

said wall, the strip being bent near one end to form a ridge with sloping side edges under said cover opening and curved to bring its ends to within a short space of one of said sloping sides and a tongue bent to bring its end within a short distance of the other sloping side, said strip being so mounted on said wall that its upper edge nearest said opening lies close against said wall and the lower edge is sprung away therefrom.

6. A device of the type described which comprises, a receptacle having a wall of insulating material and a cover having openings positioned slightly inwardly from the inner face of said wall, a contact terminal comprising a strip of metal having a flat portion adapted to lie against the inner face of said wall, said strip being bent near one end to form a ridge with sides sloping at an angle to said wall, and curved away from said wall to bring the end of said strip to within a short space of one sloping side, a longitudinal tongue portion cut from said strip and curved to bring its end to within a short space of the other sloping side, said spaces lying beneath said openings in said cover, the other end of said strip being folded tight against the face of said strip away from said wall and overlapping the space in said strip formed by the cutting and curving of said tongue, and means holding said overlapping portion close against said wall permitting the lower edge to spring away therefrom.

7. A device of the type described which comprises a receptacle having a wall of insulating material and a cover having an opening slightly spaced inwardly from said wall, a contact terminal comprising a strip of metal having a flat portion adapted to lie against the inner face of said wall, said strip being bent near one end to form a ridge with sides sloping at an angle to said wall, and curved away from said wall to bring the end of said strip to within a short space of one of said sloping sides, and a longitudinal tongue portion cut from said strip and curved to bring its end to within a short space of the other sloping side, said spaces lying beneath said opening in said cover, the other end of said strip being forced tight against the face of said strip away from said wall and overlapping the space in said strip formed by the cutting and curving of said tongue, and a tubular rivet extending through said wall and the overlapping portion of said strip holding said overlapping portion tight against said wall and permitting the lower edge to spring away therefrom, said rivet having a head with a straight edge, said strip having an edge turned upward against said straight edge of said rivet.

8. A device of the type described which comprises, a contact terminal formed of a strip of metal having a blade receiving portion at one end and a flat attachment portion at the other end, said flat attachment portion being partly cut-away and having a portion folded to overlap the cut-away section and means for attaching said overlapping portion to a supporting surface.

9. A device of the type described which comprises, a contact terminal formed of a strip of metal having a blade receiving portion at one end, and a flat supporting portion at the other end, said flat supporting portion having a double thickness at its lower edge and a single thickness at its upper edge to cause the lower edge of said blade receiving portion to be sprung slightly away from its supporting surface when the contact member is secured to a support at its upper edge.

ARTHUR C. GAYNOR.