Sept. 13, 1960 M. EHRLICH 2,952,831

CONTACT AND PRESSURE-LOCK TERMINAL

Filed July 18, 1957

Fig. 1.

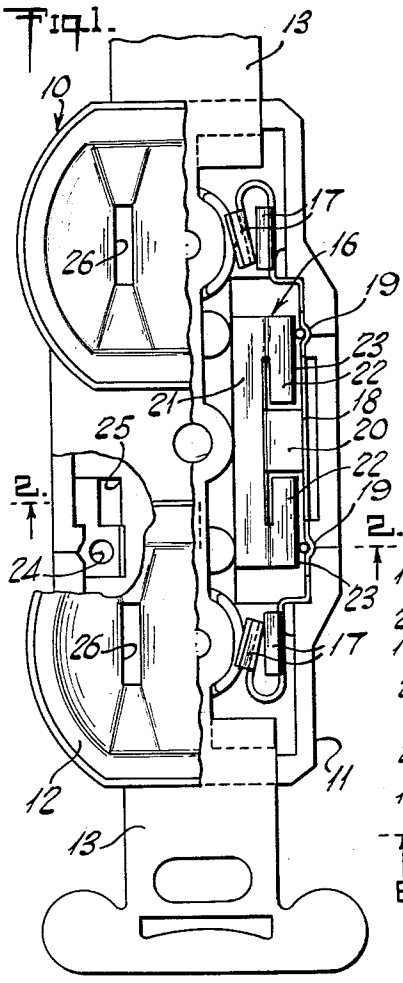


Fig. 2.

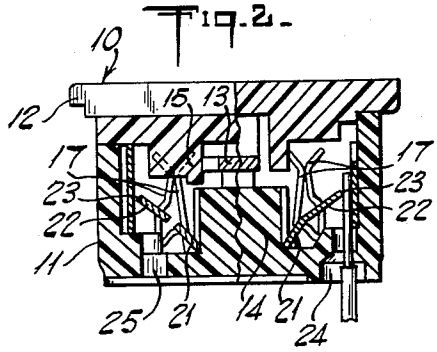


Fig. 3.

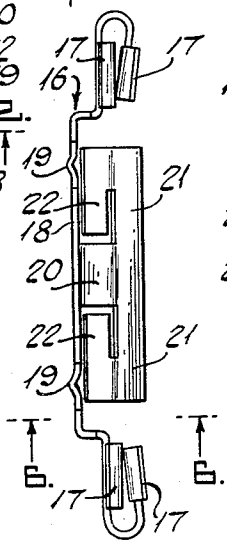


Fig. 4.

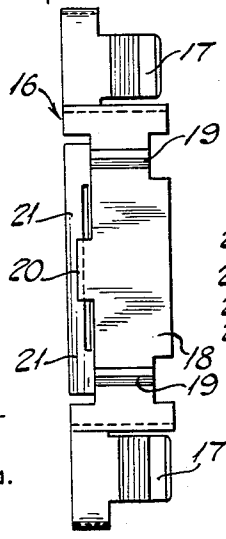


Fig. 7.

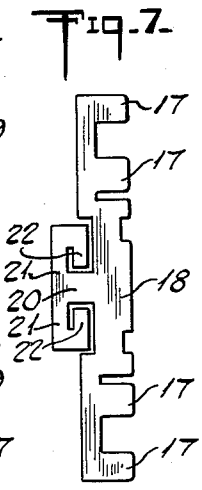


Fig. 5.

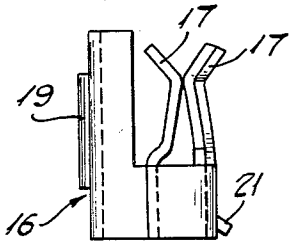
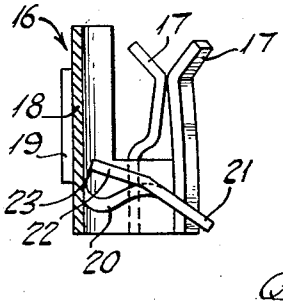


Fig. 6.



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CONTACT AND PRESSURE-LOCK TERMINAL

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6 Claims. (Cl. 339—95)

The present invention relates to a contact and pressure-lock terminal for an electrical wiring device.

A pressure-lock terminal is one which does not require the use of screws or the like for the connection of the conductor wires to the wiring device and an example of such a terminal is shown in the Benander Patent No. 2,705,785 dated April 5, 1955. An object of the invention is to simplify the construction of such a terminal and thereby to reduce manufacturing costs for a wiring device in which such a terminal is employed.

In a contact and pressure-lock terminal made in accordance with the present invention, the wire-engaging members, the terminal portions and the contact elements are permanently connected to each other, being formed integrally from the same stock and separate members of special shape or different materials, such as spring steel, are not required. Such an arrangement reduces the cost of forming the contact and terminal and of assembly.

Other advantages and objects of the invention will be apparent and best understood from the accompanying drawings in which:

Fig. 1 is a top plan view of a duplex plug receptacle having a portion of its cover broken away and which embodies the invention;

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

Fig. 3 is a top plan view of a contact and terminal strip embodying the invention;

Fig. 4 is a side elevation of the contact and terminal strip shown in Fig. 3;

Fig. 5 is an end view of the contact and terminal strip shown in Fig. 3;

Fig. 6 is a section view taken along the line 6—6 of Fig. 3; and

Fig. 7 is a plan view of a blank from which the contact and terminal strip shown in Fig. 3 is formed.

Referring to the drawings in detail, and to Fig. 1 in particular, there is a duplex wiring receptacle **10** which includes a hollow base **11**, a cover **12** and a supporting strap **13** which are held together in the usual manner by rivets or screws (not shown).

The base **11** of the receptacle has a raised central boss **14** which extends lengthwise on the interior thereof. The boss **14** in conjunction with a mating boss **15** on the lower surface of the cover divides the receptacle into two chambers, each of which contains a contact and terminal strip **16**. The supporting strap **13** extends through a groove in the boss **15** on the cover and projects beyond the receptacle at the ends thereof.

As is shown best in Figs. 3 through 7, the contact and terminal strip **16** is formed from a blank of electrically conductive material, such as brass or the like. A set of opposing spring contact elements or fingers **17** are formed at each end of a central portion **18** by bending the ends of the blank to bring the fingers of each set of contact elements into opposing relation. The tops of the contact elements of each set are flared outwardly to permit a

contact blade of an attachment plug (not shown) to be inserted therebetween and the resilience of the material from which the blank is formed causes the contact elements to engage with the contact blade with a spring action.

The central portion **18** of the strip which serves as a terminal for connecting a conductor wire to the strip, is disposed in a vertical plane and has wire-guiding grooves **19** formed at the ends thereof adjacent each set of contact elements. A supporting leg **20** is bent upwardly from the lower edge of the central portion of the strip at the center thereof and extends inwardly therefrom.

Arms **21** are connected to the supporting leg at the outer end thereof and extend from each side of the leg lengthwise of the central portion of the strip to a point beyond the wire-guiding grooves formed therein. The arms extend outwardly and downwardly from the leg in a transverse direction and are disposed in angular relation to the plane of the central portion of the strip. When the contact and terminal strip **16** is assembled in the base of the receptacle, the outer side of the central portion of the strip bears against an outer side wall of the base with the lower edges of the arms abutting the central boss at the point where it joins the bottom of the base.

A wire-engaging member **22** is connected to the top of each of the arms at the outer end thereof. The wire-engaging members extend lengthwise in opposing relation to the central or terminal portion of the strip and the wire-receiving grooves therein. The wire-engaging members also extend upwardly and inwardly from the arms in a transverse direction and are disposed in angular relation to the terminal portion of the strip, with the angle of the wire-engaging members relative to the terminal portion of the strip being somewhat greater than the angle of the arms relative to the terminal portion.

The lower corner of the top of the wire-engaging member forms a sharp edge **23** which engages with the bared end of a conductor wire when the wire is inserted in one of the wire-guiding grooves between the terminal portion and the wire-engaging member. The edge of the wire-engaging member is spaced from the terminal portion by a distance slightly less than the diameter of the smallest conductor wire that is to be connected to the receptacle so that the spring pressure of the wire-engaging member will hold the wire firmly against the terminal portion and in good electrical contact therewith. The flexing of the wire-engaging member will also allow larger diameter wires to be inserted within limits.

The bottom of the base is provided with wire-receiving openings **24** which are aligned with the wire-guiding grooves in the terminal portions of the strips so that the bared end of the conductor wire can be inserted through the base and between the wire-engaging member and the terminal portions of the respective strips therein. Adjacent each of the wire insertion openings, elongated openings **25** are provided in the base through which a tool may be inserted to engage with the wire-engaging member to release it from engagement with the conductor wire.

The cover of the receptacle is provided with the usual pairs of spaced openings **26** through which the contact blades of an attachment plug may be inserted into engagement with the contact elements on two of the strips in the customary manner.

A blank suitable for forming the contact and terminal strips **16** is shown in Fig. 7. The blank may be stamped from a flat strip of the conductive metal and then be shaped to the desired configuration by suitable forming dies. The metals usually used for forming contact and

terminal strips will provide sufficient spring action for the functioning of the wire-engaging members as described above. Thus, the spring action of the wire-engaging members is obtained without the use of separate parts made from special material, such as spring steel.

When the bared end of a conductor wire is inserted through one of the openings in the base and between the wire-engaging member and terminal portion of the strip, the wire-engaging member flexes upwardly to permit entry of the wire and the bared end of the wire is forced against the terminal portion of the strip by the wire-engaging member, as described above. However, if a downward pull is exerted on the wire, the sharp corner of the wire-engaging member bites into the wire and prevents withdrawal of the wire. The downward pull on the wire tends to bend the end of the wire-engaging member downwardly and toward the terminal portion of the strip, with the result that the wire is clamped more tightly between the wire-engaging member and the terminal portion of the strip. Such bending of the wire-engaging member is resisted by the arms which are in engagement with the boss in the base. In addition, the engagement of the arms with the boss in the base tends to minimize distortion or twisting of the wire-engaging members by repeated insertion of a wire or releasing tools through the openings in the base.

It will be understood that various changes and modifications may be made in the particular embodiment of the invention illustrated and described herein without departing from the scope of the following claims.

I claim:

1. In a combined contact and pressure-lock terminal for an electrical wiring device, the improvement which comprises a strip of electrically conductive material, said strip including a terminal portion having a flat face with a wire-guiding groove formed therein, said groove extending transversely across said face of the terminal portion, a leg integrally connected to the terminal portion at a point spaced from said groove, said leg extending from the terminal portion in angular relation to the flat face thereof and having an end spaced from said face, an arm integrally connected to said end of the leg and extending lengthwise therefrom in opposing relation to the face of the terminal portion, said arm also extending outwardly and downwardly from said leg in a transverse direction and being disposed at an angle with respect to the face of the terminal portion and a wire-engaging member integrally connected to the arm and extending toward the face of the terminal portion in opposing relation to the wire-guiding groove, said wire-engaging member being disposed at an angle of less than ninety degrees with respect to the face of the terminal portion and having an edge spaced from the face of the terminal portion by a distance less than the diameter of a bare conductor wire.

2. In a combined contact and pressure-lock terminal, the improvement as defined in claim 1 wherein the wire-engaging member and the arm are disposed at different angles with respect to the face of the terminal portion.

3. In a combined contact and pressure-lock terminal for an electrical wiring device, the improvement as defined in claim 1 which includes a pair of spaced spring contact fingers integrally connected to the terminal portion of the strip adjacent the wire-guiding groove.

4. In a combined contact and pressure-lock terminal for an electrical wiring device, the improvement which comprises a strip of electrically conductive material, said strip including a terminal portion having a flat face and wire-guiding grooves formed at the ends of said face, said grooves extending transversely across the face of said terminal portion, a leg integrally connected to the terminal portion at a point intermediate the grooves, said leg extending from the terminal portion in angular relation to the flat face thereof and having an end spaced from said face, arms integrally connected to said end of the leg and extending lengthwise in opposite directions therefrom in opposing relation to the terminal portion, said arms also extending outwardly and downwardly from said leg in a transverse direction and being disposed at an angle with respect to the face of the terminal portion and a wire-engaging member integrally connected to each of said arms, each of said wire-engaging members extending toward the face of the terminal portion in opposing relation to one of the wire-guiding grooves and being disposed at an angle of less than ninety degrees with respect to the face of the terminal portion, said wire-engaging members having ends spaced from the face of the terminal portion by a distance less than the diameter of a bare connector wire.

5. In a combined contact and pressure-lock terminal for an electrical wiring device, the improvement as defined in claim 4 wherein the wire-engaging members and the arm are disposed at different angles with respect to the face of the terminal portion.

6. In an electrical wiring device of the character described, the improvement which comprises a housing of insulating material having a recess formed therein, said recess being defined on one side by an upstanding wall and on the other side by an abutment spaced from and opposing said wall, a combined contact and pressure-lock terminal formed from a single strip of electrically conductive material located in said recess, said strip including a terminal portion having a flat face with a wire-guiding groove formed therein, said terminal portion being disposed against the upstanding wall on one side of the recess with the wire-guiding groove being aligned with a wire-receiving opening in the housing, a leg extending inwardly from the terminal portion of the strip and toward the other side of the recess, an arm carried by the leg and extending lengthwise therefrom in opposing relation to the terminal portion of the strip, said arm also extending outwardly and downwardly from the leg in angular relation to the terminal portion of the strip and engaging with the abutment at the other side of the recess and a wire-engaging member carried by said arm and extending toward the terminal portion of the strip in opposing relation to the wire-guiding groove formed therein, said member being disposed at an angle of less than ninety degrees with respect to the terminal portion of the strip.

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