Nov. 24, 1970 J. SCHMIER 3,543,221

PRESSURE LOCK TERMINAL

Filed Aug. 27, 1968 2 Sheets-Sheet 1

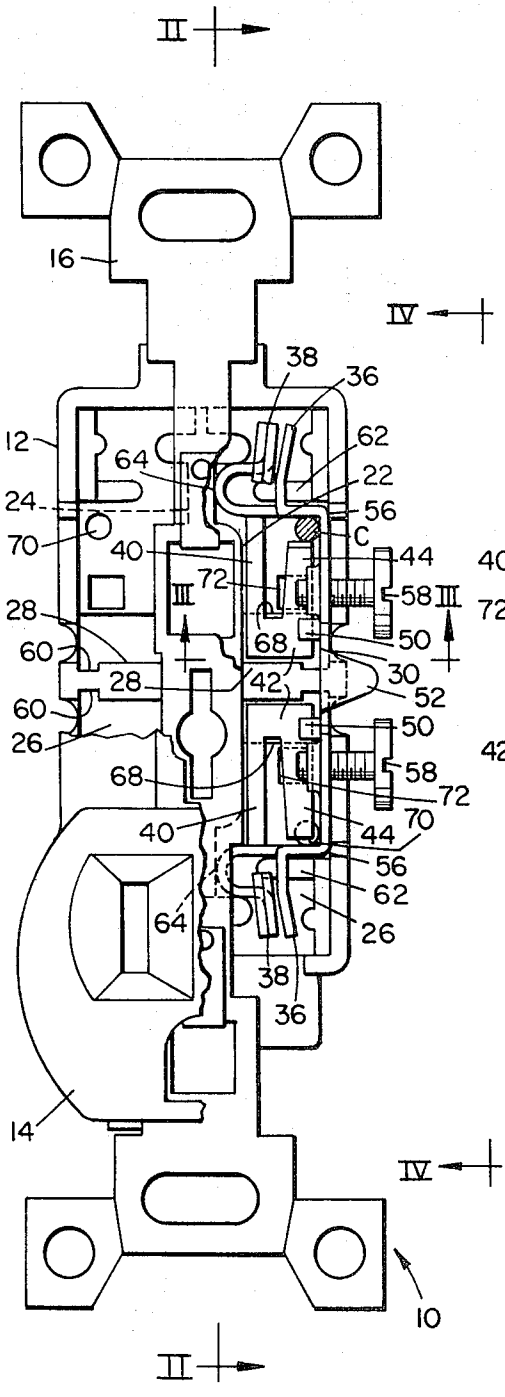


FIG. 1

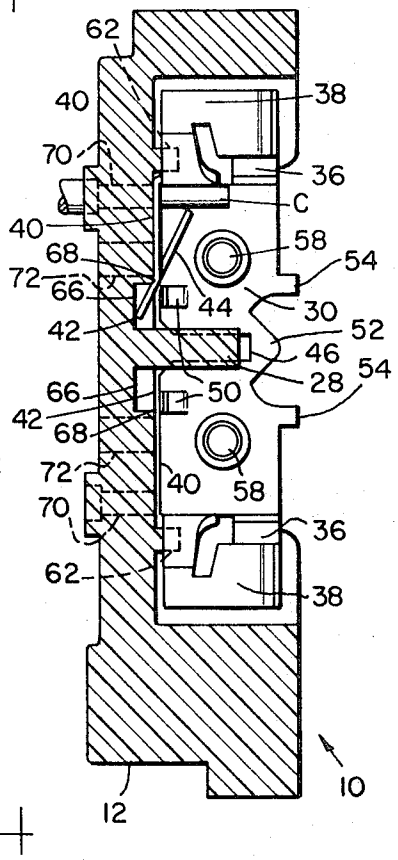


FIG. 2

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FIG. 3

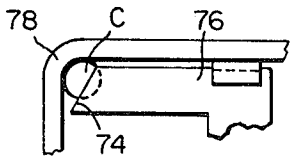
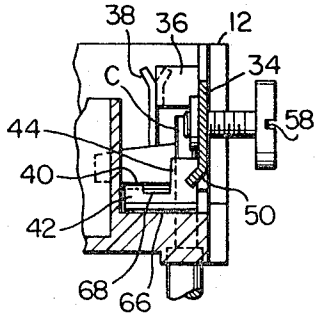


FIG. 6



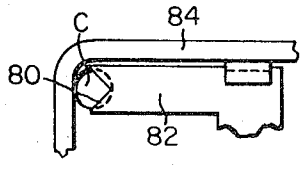


FIG. 7

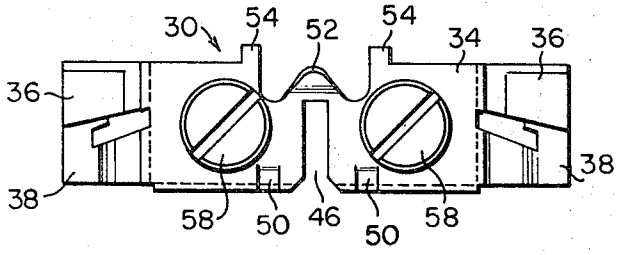


FIG. 4

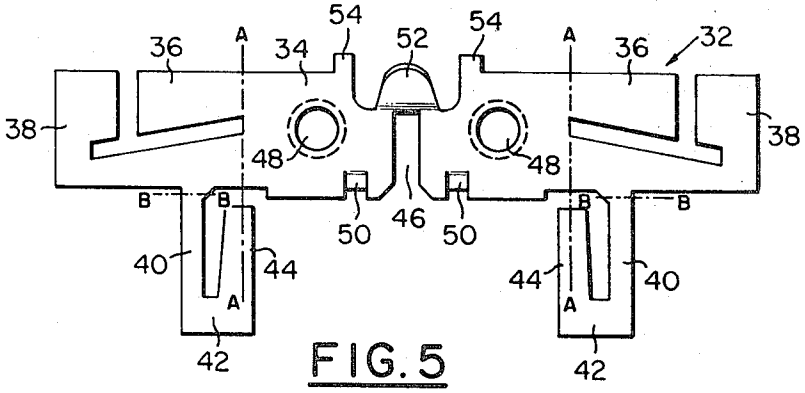


FIG. 5

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3,543,221

PRESSURE LOCK TERMINAL

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Int. Cl. H01r 11/20
U.S. Cl. 339—95 6 Claims

ABSTRACT OF THE DISCLOSURE

A single piece of sheet metal stock is formed to provide a pressure-lock terminal strip.

BACKGROUND OF THE INVENTION

Field of the invention

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

Description of the prior art

A pressure-lock terminal strip is one in which the pressure-lock terminal does not require screws or the like for connection of the conductor wire to the strip. An example of such a terminal is shown in Ehrlich Pat. No. 2,952,831, dated Sept. 13, 1960.

SUMMARY OF THE INVENTION

An object of the invention is to simplify the construction of a pressure-lock terminal strip by provision of wire engaging means that is extremely simple in form, and by provision of fully adequate wire guiding means without any special forming of the strip. In addition, when the strip is provided with a plurality of pressure-lock terminals, each wire engaging element may be operated without affecting the other, either to secure a wire or release the wire.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a duplex plug receptacle having a portion of its cover broken away to expose one of the terminal strips, the other terminal strip being removed to expose certain details of the base;

FIG. 2 is a longitudinal section on line II—II in FIG. 1;

FIG. 3 is a transverse section on line III—III in FIG. 1;

FIG. 4 is a side view of the terminal strip alone, as indicated by the line IV—IV in FIG. 1;

FIG. 5 is a plan view of a partially formed blank from which the terminal strip is fabricated;

FIG. 6 is a fragmentary view showing a modified wire engaging element; and

FIG. 7 is a fragmentary view showing another modified wire engaging element.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The following description is directed to the specific embodiment of the invention disclosed in the drawings. It is not addressed to the scope of the invention, which may be practiced in a variety of forms.

Referring to the drawings, the duplex wiring receptacle, generally designated **10**, comprises a hollow base **12**, a cover **14** and a supporting strap **16** suitably secured together by means not shown. The vase **12** and cover **14**

preferably are made of Bakelite, and the strap **16** is made of suitable sheet metal. The base **12** is provided with a partition consisting of a hollow boss **22** and a pair of sections **24** conjointly dividing the interior of the base **12** into laterally spaced compartments **26**. Extending laterally respectively from opposite sides of the boss **22** are a pair of walls **28** sub-dividing the compartments **26**. Each compartment **26** accommodates a contact and terminal strip **30** formed from a blank of electrically conductive material, such as brass or the like. The blank, generally designated **32**, is shown in partially formed condition in FIG. 5.

Referring to FIG. 5, the blank **32** has a main body part **34** at each end of which is suitably formed a set of spring contact elements **36** and **38**. Depending from the elements **38** is an arm **40** terminating in a lateral extension thereof designated **42**. The extension **42** carries a wire engaging arm or element **44**. The part **34** is centrally recessed, as at **46**, and is provided with a pair of openings **48** respectively on opposite sides of the recess. The lower marginal portion of the part **34** is provided with a pair of struck out tabs **50** respectively on opposite sides of the recess. The upper marginal area of the part **34** is provided with a tab **52** turned outwardly from the plane of the part **34** and disposed over the recess **46**. It is also provided with a pair of upright tabs **54** respectively on opposite sides of the tab **52**.

In completing the forming of the blank, the opposite end portions thereof are bent at right angles to the part **34**, upon the lines A—A, to form a pair of shoulders **56**. Then the contact elements **36** and **38** are suitably formed (as shown) for receiving therebetween the contact blades (not shown) of an attachment plug inserted through the usual openings in the cover **14**. In addition, the arms **40** are turned upwardly on lines B—B to position the arms **40**, the extensions **42** thereof and the wire engaging elements **44** in coplanar relation.

Each part **34** is provided with a pair of screws **58** respectively threaded into the openings **48** and is disposed in a vertical plane, against the opposed outer wall of the base **12**, with the opposite sides of the recess **46** engaged respectively in a pair of grooves **60** formed in the associated wall **28**. When the strip **30** is thus positioned, the shoulders **56** respectively are disposed close adjacent a pair of bosses **62** formed on the bottom surface of the compartment **26**. In addition, the innermost portions, designated **64**, of the contact elements **38** respectively are disposed close adjacent the walls **24**. Thus it will be seen that the strip **30** is secured against longitudinal and lateral movement in the compartment **26**. When the cover **14** is positioned over the base **12**, the tab **52** abuts the undersurface of the cover, and the pair of tabs **54** respectively are received in depressions (not shown) formed in the undersurface of the cover **14**, providing further against movement of the strip **30** in the compartment **26**.

Initially, the arm **40** and wire engaging element **44** of strip **30** are seated upon the bottom surface of the compartment **26**. The lateral extension **42** of the arm **40** overlies a depression **66** in the bottom surface of the compartment, next to the associated wall **28**, which depression forms a shoulder **68**. The extension **42** overhangs the shoulder **68**. Overlying the extension **42** is the associated tab **50**.

The lower corner at the free end of the wire engaging element **44** forms a sharp edge which bites into the bared end portion of a conductor wire C when the same is projected into the receptacle through an opening **70** in the bottom of the base **10**. The opening **70** is located so that the wire is projected upwardly into the angle or corner former on the inside of the shoulder **56**, along the bend A—A, as shown. Thus the wire is pressed into good elec-

trical contact with the surfaces meeting at said corner, which surfaces coact to guide the wire into the desired position. It will be noted that when the wire is inserted through the opening **70**, it raises the wire engaging element **44** and turns the lateral extension **42** of the arm **40** down into the depression **66**. The wire engaging element **44** and the lateral extension **42** remain coplanar. It will be appreciated, therefore, that the arm **40** bends over the shoulder **68** at the juncture thereof with its lateral extensions **42**. The function of the tab **50** is to assure that the arm **40** and its lateral extension **42** are not raised with the wire engaging element **44** by the wire, and to coact with the shoulder **68** in assuring the desired pivoted movement of the wire engaging element **44** and the lateral extension **42** of the arm **40** as a unit about the shoulder **68** relative to the arm **40**.

If a pull is applied to the wire to remove it from the receptacle, the sharp corner of the wire engaging member **44** bites into the wire and prevents withdrawal thereof. The downward pull on the wire tends to bend the end of the wire engaging element **44** downwardly, with the result that the wire is held more tightly in the corner in which it nests.

When it is desired to release the wire and to disconnect the same from the receptacle, a suitable tool (not shown) is projected through an opening **72** formed in the bottom of the base **10**. The end of the tool engages the undersurface of the wire engaging element **44** intermediate the end thereof, at a point spaced from the associated tab **50**, and raises it, thus effecting disengagement of the wire engaging element **44** from the wire, whereupon the wire may be removed. When the wire is removed and the wire engaging element released, the inherent resilience of th spring metal out of which the strip **30** is fabricated causes the wire engaging element **44** and the lateral extension **42** of the arm **40** to spring back to their initial positions. The metals usually used for forming contact and terminal strips provide sufficient spring action for functioning of the wire-engaging members in the manner indicated.

The free end of the wire engaging element **44** is spaced from the opposed portion of the contact element **38** 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 element will hold the wire firmly thereagainst and in good electrical contact therewith. Within limits, the flexing of the wire engaging element will also allow larger diameter wires to be inserted.

It will be noted that the arm **40** are not interconnected in any way except through the parts **34**, and that they branch off respectively from opposite ends of the strip **30** independently of each other. As a consequence, when either wire engaging element **44** is flexed, either when a wire is inserted into the receptacle for connection thereto or when a tool is inserted into the receptacle to release a wire therefrom, the other wire engaging element is unaffected so that there is no danger of loosening the grip of the other wire engaging element on a wire held in place thereby.

While in accordance with the provisions of the patent statutes, I have illustrated and described the best form or embodiment of my invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the device described without departing from the spirit and scope of the invention. For example, referring particularly to FIG. 6, the terminal edge **74** of the free end portion of the wire engaging element **76** is cut at an angle so that when a conuctor wire is projected into the device, it is cammed into the corner formed by the main body part **78**, as shown. In addition, referring particularly to FIG. 7, the terminal edge **80** of the free end portion of the wire engaging element **82** is recessed so that when a conductor wire is projected into the device, it is guided by said free end portion and held firmly against the main body part **84**.

Having thus described my invention, I claim:

1. Pressure-lock terminal means for an electrical wiring device, said means consisting of a single sheet metal stamping of electrically conductive metal including

(A) a main body part having opposite end portions turned in the same direction from a central portion and disposed approximately at right angles thereto,

(B) a pair of J-shaped appendages turned inwardly respectively from said opposite end portions of the main body part and disposed approximately at right angles thereto, each of said appendages including

(1) a first arm extending away from the associated end portion of the main body part,

(2) a lateral extension of said arm, and

(3) a second arm disposed between said first arm and the central portion of said main body part and extending from said lateral extension back toward the associated end portion of the main body part, the terminal edge of the free end portion of said second arm being set back from the associated end portion of said main body part a distance less than the diameter of the conductor wire to be accommodated by said pressure-lock terminal.

2. A pressure-lock terminal means according to claim **1** wherein the terminal edge of the free end portion of each second arm is disposed at an angle, the line thereof extending across the corner formed by juncture of the associated end portion of the main body part with the central portion of the main body part, said terminal edge being operative to cam a conductor wire projected into said terminal means, between said terminal edge and main body part, into said corner for guidance thereof.

3. A pressure-lock terminal means according to claim **1** wherein said means is housed in a casing provided with openings for receiving the conductor wires and guiding the same respectively into the corners at the junctures of the opposite end portions of the main body part with the central portion of the main body part for further guidance thereby.

4. A pressure-lock terminal means according to claim **3** wherein at each end of said means the lateral extension of the first arm overlies an area of the bottom surface of the casing which is depressed whereby to form a shoulder extending across the first and second arms at the juncture of said arms with the lateral extension of said first arm, and the main body part carries means disposed in close overhanging relation to said lateral extension of the first arm overhanging said shoulder, the last mentioned means being operative to secure said first arm and said lateral extension of the first arm against being raised with said second arm when a conductor wire is projected into the terminal.

5. A pressure lock terminal for an electrical wiring device, said pressure lock terminal consisting of a single sheet metal stamping of electrically conductive metal including

(A) a main body part, and

(B) a generally J-shaped appendage disposed in a plane approximately at right angles to said main body part including

(1) a first arm extending from said main body part in a first direction,

(2) a lateral extension of said arm, and

(3) a second arm extending from said lateral extension back in a direction opposite to said first direction, the terminal edge of the free end portion thereof being set back from the opposed area of said main body part a distance less than the diameter of the conductor wire to be accommodated by said pressure lock terminal, and

(C) means carried by said mean body part and disposed in close overhanging relation to the lateral extension of the first arm, said means being operative to secure the first arm and said lateral extension

of the first arm against being raised with said second arm when a conductor wire is projected into the terminal.

6. A pressure-lock terminal according to claim 5 wherein the main body part comprises two portions which meet to form a corner proximate the terminal edge of the free end portion of the second arm, said pressure-lock terminal is house in a casing with an opening therein for receiving the conductor wire and guiding the same into said corner for further guidance thereof, and the lateral extension of the first arm overlies an area of the bottom surface of the casing which is depressed whereby to form a shoulder extending across the first and second arms at the juncture of said arms with the lateral extension of said first arm.

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U.S. Cl. X.R.

339—164