

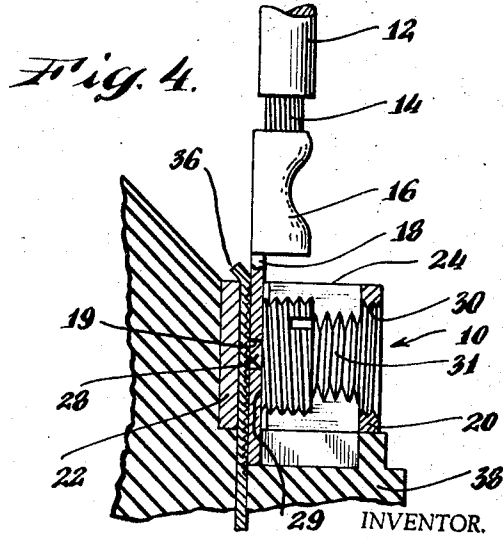
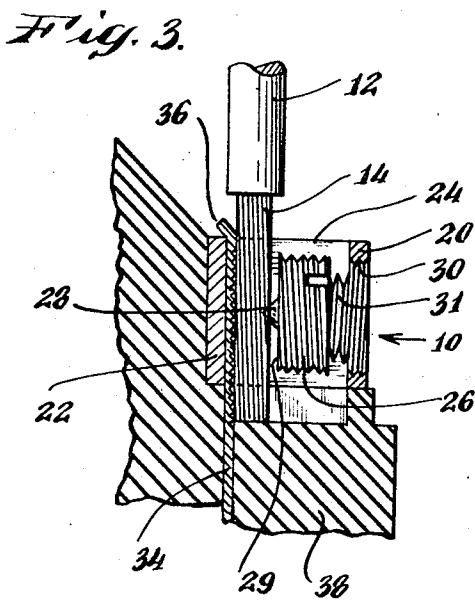
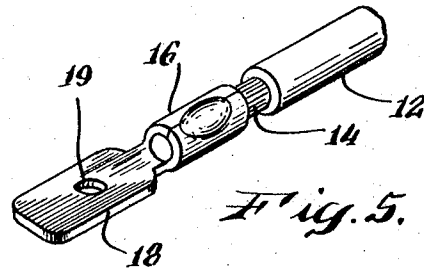
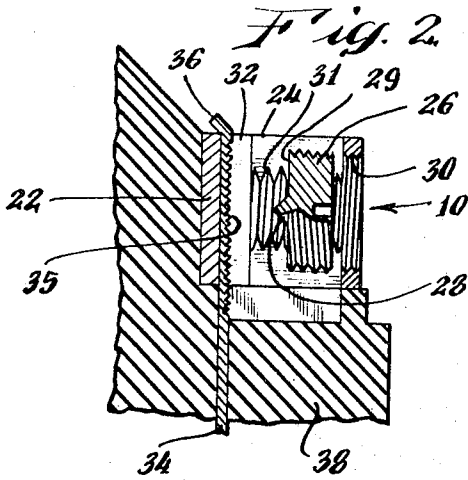
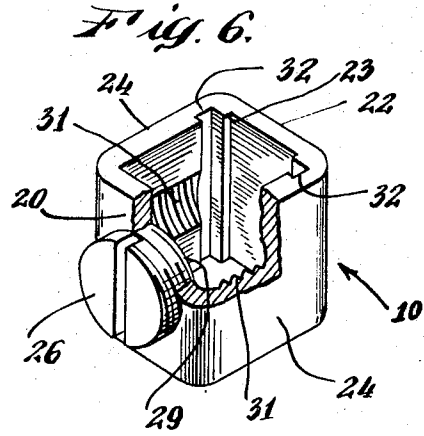
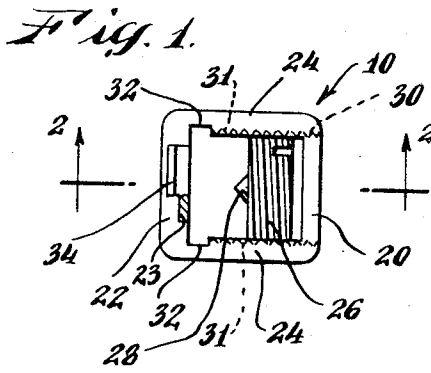
June 24, 1969

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3,452,317

CLAMP-TYPE TERMINAL

Filed Feb. 9, 1967



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3,452,317

CLAMP-TYPE TERMINAL

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Filed Feb. 9, 1967, Ser. No. 614,979

Int. Cl. H01r 11/20, 7/12

U.S. Cl. 339-95

5 Claims

ABSTRACT OF THE DISCLOSURE

An improved clamp-type terminal capable of receiving either wire conductors or terminal lugs, and having slots in the terminal body side walls adjacent a clamping wall thereof, and a clamping slug threadedly mounted in the terminal body, having a central projection and movable toward the clamping wall.

This invention relates to clamp-type electrical terminals and, more particularly, to providing in them an improved means for readily accepting electrical conductors of either the bared wire or washer-type terminal lug types.

Clamp-type terminals usually include a body with a clamping wall and a clamping screw mounted in the housing and disposed to selectively clamp an electrical conductor against the clamping wall. Clamp-type terminals are well suited to accept conductors of either the stranded wire type, but are also capable of accepting solid wire, or flat terminal lugs of crimped wire terminations.

The requirements of some applications of clamp-type terminals, such as those of the automotive industry, require that they accept crimped washer-type terminal lugs that are attached to the bared wire ends of electrical conductors. This requirement has necessitated the development of dual purpose electrical terminal constructions.

It has been a practice in the prior art when connecting washer-type terminal lugs to a terminal, to use a flat terminal and pass a binding head screw through the hole in the washer-type lug of the usual crimped wire termination and anchor the screw in a tapped hole in the terminal. This is an effective connection, but when it became necessary to connect a stranded wire electrical conductor to the terminal, the lug had to be removed and the wire wrapped about the shank of the screw between the screw head and the terminal. This is not a particularly effective connection for a stranded wire conductor, and if a solid wire conductor had to be connected, only an unsatisfactory connection could be made.

Improved means have, however, been provided in the prior art for satisfying the dual requirement in a clamp-type terminal, by securing the usual clamp-type terminal directly to a terminal element in an electrical wiring device with a binding head screw. Thus, a stranded wire electrical conductor may be secured in the clamp-type terminal in the normal manner by being clamped by the usual clamping screw. When the use of a washer-type terminal lug is required, the user must unscrew the binding head screw, remove and set aside the clamp-type terminal and secure the washer-type terminal lug directly to the electrical terminal element, by inserting the shank of the binding head screw through the opening in the washer-type lug and anchoring it in the terminal element.

A serious disadvantage of the prior art dual purpose clamp-type terminal is that the clamp-type terminal must be removed and set aside when the washer-type terminal lug is used and, thereafter, the terminal element of the device may not readily accept a stranded wire conductor. Furthermore, to connect a washer-type terminal lug, it is necessary for the assembler to first disconnect

the binding head screw that mounts the clamp-type terminal to the terminal element and then remount the binding head screw with the washer-type terminal lug in place. The latter is a time-consuming operation. Also, when the clamp-type terminal is removed, it is susceptible to loss. Further, when a wire conductor is connected to this mounting of a clamp-type terminal, it is not directly in contact with the terminal element.

Accordingly, it is the primary object of this invention to provide an improved clamp-type electrical wiring terminal which will readily accept either the washer-type terminal lug type or the bared wire conductor type, either solid or stranded wire conductors, quickly and without requiring removing any of the parts.

It is a further object to eliminate the necessity for a clamp mounting binding head screw, thereby eliminating one of the parts required in the prior art.

It is a still further object to provide direct electrical contact between the conductor element to be connected and the terminal element of the device over the greatest possible area, thereby providing a better electrical connection.

It is another object to provide a terminal connection with maximum mass of metal for all types of connections, thereby aiding in dissipating the heat generated by current flow.

To accomplish these objects in one form, an improved clamp-type electrical terminal is provided comprising: a tubular body having a front wall defining a tapped opening, a rear clamping wall spaced from the front wall; side walls connecting the front and rear walls; a threaded clamping screw-lug threadedly mounted in the tapped opening having a projection facing the rear wall; an electrical terminal element to which a conductor is to be connected located within said tubular body adjacent the rear wall; and aligned slots in said side walls adjacent the rear wall arranged to receive the side portions of a washer-type terminal lug.

Other objects and further details of that which I believe to be novel and my invention will be clear from the following description and claims taken with the accompanying drawing wherein:

FIG. 1 is a plan view of a clamp-type electrical wiring terminal constructed in accordance with the present invention;

FIG. 2 is a sectional view taken substantially along line 2-2 of FIG. 1 showing the clamp-type terminal mounted upon an electrical wiring device without a conductor connected to it;

FIG. 3 is a sectional view similar to that of FIG. 2 showing a bared stranded wire conductor clamped in the terminal;

FIG. 4 is a sectional view similar to that of FIG. 2 showing a washer-type terminal lug clamped in the terminal;

FIG. 5 is a perspective view of a washer-type terminal lug; and

FIG. 6 is a perspective view of the clamp-type terminal body alone.

With particular reference to the drawings, there is illustrated an improved clamp-type electrical terminal designated generally by reference numeral 10 mounted on the insulator body 38 of an electrical wiring device. The invention may be utilized in a large variety of electrical wiring devices, and it is contemplated that a plurality of the improved clamp-type terminals will be used; however, for disclosure purposes only one is illustrated. The clamp-type terminal 10 is shown held in place on the insulator body 38 by the retaining tab 36 located at the end of the electrical terminal element 34, the lower portion of which, not shown, may conveniently be formed into a contact element. The terminal element is made of

a suitable conducting material, has a serrated gripping surface 35 and is securely mounted in the insulator body 38 in any convenient manner. See copending application of Vincent F. Lipinski for patent for Electrical Connector, Ser. No. 547,475, filed May 4, 1966, assigned to the assignee of the instant application, for a more detailed description of the type of terminal element that may be used. It should be understood that the clamp-type terminal 10 may alternatively be retained by staking the end of the terminal 34 or by other suitable means. In any event, the terminal element 34 is disposed for direct contact by a conductor connected to the terminal 10.

The clamp-type terminal 10 comprises a tubular body of substantially, though not necessarily, rectangular cross section having a front wall 20, a spaced flat rear wall 22 and side walls 24. Rear wall 22 defines a groove 23 for positioning the terminal element 34. The front wall defines a tapped opening 30, and side walls 24 have scored tap grooves 31 forming partial threads that are continuations of the threads of the tapped opening. A threaded clamp screw slug 26 is threadedly mounted in opening 30 and serves to urge a conductor to be connected to terminal 10, such as the bared stranded wire 14 of conductor cable 12, against the electrical terminal element 34, which lies adjacent the rear wall 22 as shown in FIG. 3.

If, however, it is required to employ a washer-type terminal lug, such as crimped termination 16, shown by itself in FIG. 5, secured to the bared stranded wire 14, the improved clamp-type electrical terminal of the present invention will accommodate such an alternative conductor as shown in FIG. 4. Slots 32, spaced and aligned, are provided in the side walls 24 adjacent rear wall 22, and will accept the side portions of the washer-like lug portion 18 of the crimped termination 16 so as to guide the lug portion into position adjacent the electrical terminal element 34. The threaded slug 26 is kerfed at one end and is provided with a centrally located pointed projecting tip 28 surrounded by a pressure-transmitting wall 29 at its leading end which faces rear wall 22 and terminal element 34. The tip 28 is shorter than the thickness of the lug portion 18 of the washer-type crimped termination 16, so that when the slug 26 is moved towards the lug portion 16, the tip enters the aperture 19 in the lug portion and the pressure-transmitting wall 29 that surrounds the tip 28 firmly urges the lug portion against the electrical terminal element 34. The insertion of the pointed tip 28 into the aperture 19 effects a secure connection and insures that the electrical terminal lug cannot be accidentally removed. When a stranded wire conductor is connected, the tip 28 penetrates it and enhances the connection.

It will be noted that an improved clamp-type electrical terminal has been provided which utilizes a minimum of parts, as it does not require a binding head mounting screw, and can readily and quickly accept either the stranded or solid wire conductors or the washer-type terminal lug conductor required in certain applications, such as the automotive industries. Furthermore, the improved clamp-type terminal insures that any type of conductor can be secured at any time without requiring adjustments to be made, such as removal or addition of any parts. Regardless of the type of conductor connected, it is in firm, direct contact with the terminal element that mounts the clamp-type terminal in the wiring device. Further, there is always present a large mass of heat-dissipating

metal, because the clamp-type terminal is employed to connect all types of conductors.

It should be understood that the present disclosure has been made only by way of example, and that numerous changes in details of construction may be resorted to without departing from the spirit and scope of the invention.

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

1. A clamp-type electrical terminal for readily accepting either bared wire conductors or washer-type electrical terminal lugs, comprising: a tubular body having a front wall defining a tapped opening, an opposed spaced rear clamping wall and connecting side walls; movable clamping means threadedly mounted in the tapped opening and having a pressure transmitting wall selectively movable from said front wall to said rear wall to selectively contact and urge either a bared wire conductor or a terminal lug disposed adjacent to said rear wall toward said rear wall; positioning means disposed in said tubular body comprising opposed slots defined in said side walls adjacent said rear wall, which are arranged to receive side portions of a terminal lug to maintain the lug adjacent said rear wall in position to be selectively clamped by said clamping means; and a recess defined in said rear wall arranged to receive an electrical terminal element in position to be contacted directly by either a wire conductor or a washer-type terminal lug.

2. The clamp-type electrical wiring terminal defined in claim 1, wherein said movable clamping means comprises a threaded slug having a slot at one end and a pressure-transmitting wall at its other end.

3. The clamp-type electrical wiring terminal defined in claim 2, wherein said threaded slug has disposed upon the pressure-transmitting end a centrally disposed axially extending projection arranged to either penetrate a wire conductor disposed in the body or be introduced into the central aperture in a washer-type terminal lug disposed in the body.

4. The clamp-type electrical wiring terminal defined in claim 1 wherein an electrical terminal element is positioned within said recess in said rear wall.

5. The clamp-type electrical wiring terminal defined in claim 4 wherein said clamping means comprises a threaded slug having a pressure-transmitting wall facing said terminal element; and a centrally disposed axially extending projection on said wall.

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U.S. Cl. X.R.

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