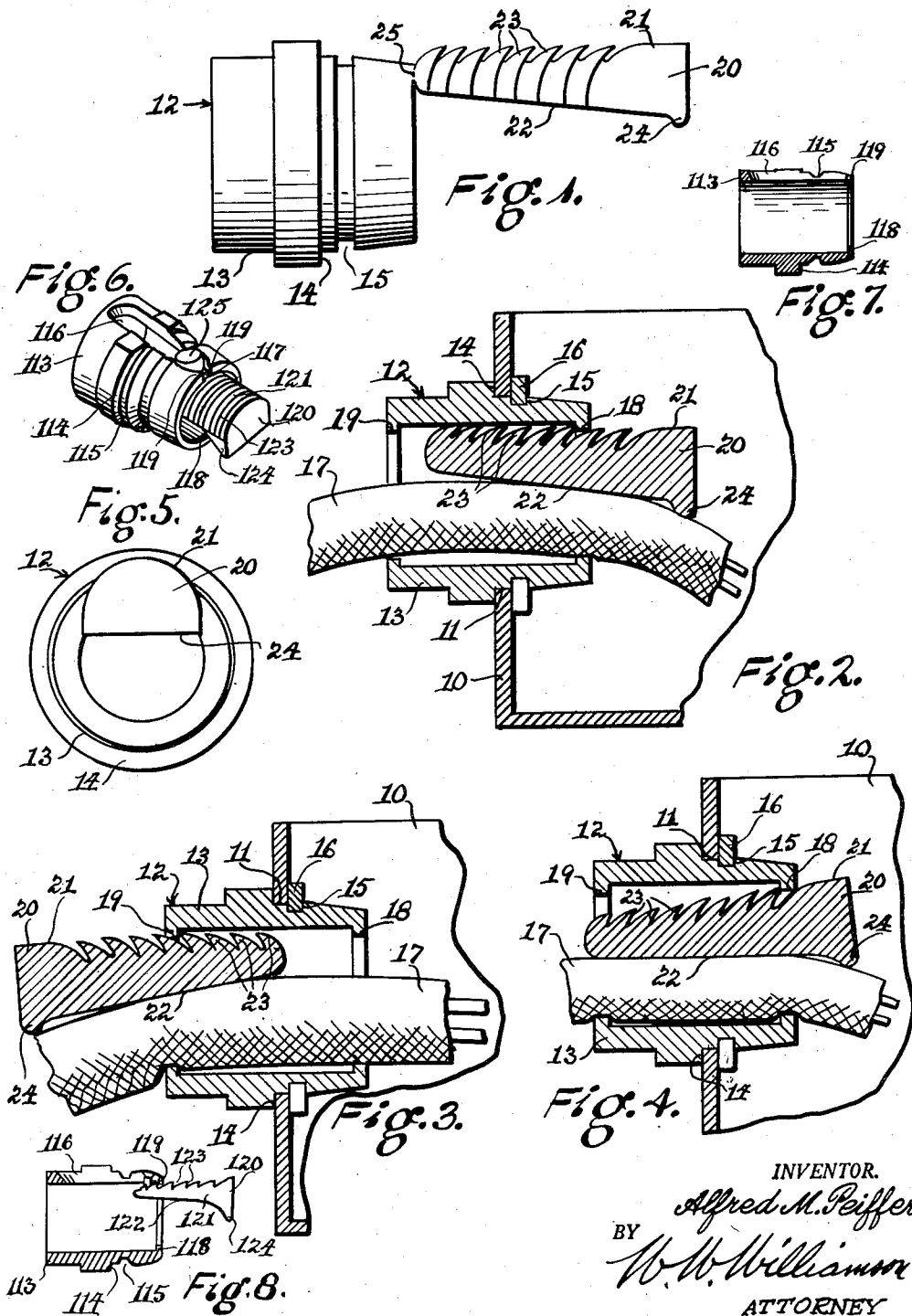


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ELECTRICAL WIRE CLAMP
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ELECTRICAL WIRE CLAMP

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4 Claims. (Cl. 285—138)

My invention relates to a new and useful electrical wire clamp which embodies some of the features of the article disclosed in my co-pending application, filed August 7, 1953, Serial No. 372,892.

The wire clamp is of the type employed in association with junction boxes wherein the bushing body is inserted in a hole in any wall of the box and temporarily removably fastened in place, said bushing adapted to receive a wire which is held in place by a wedge to prevent accidental displacement of said wire due to the application of extraordinary force thereon, such as an outward substantially longitudinal pull thereon.

An object of this invention is to produce an electrical wire clamp comprising a bushing with a captive wedge therein for clamping a conductor wire against outward or retrograde longitudinal movement after assembly in said electrical wire clamp.

Another object of the invention is to provide the bushing with an intumed flange for coaction with serrations on the back of the wedge to prevent accidental outward movement of said wedge after being placed in operative clamping position.

Another object of the invention is to provide an electrical wire clamp consisting of a bushing having a slot substantially the full length thereof, said slot having an opening at one end which is closed by barrier projections, and a wedge movable lengthwise within said bushing and having a lug slidable in the slot and insertable therein by temporarily spreading the slot walls to retract the barrier projections which are subsequently closed to retain the lug within the confines of the slot walls to hold the wedge captive.

Another object of the invention is to so fashion the wedge that the electrical wire clamp is adapted to accommodate various types of insulated electrical conductors in a large range of sizes.

Another object of the present invention is to provide in combination with the bushing and wedge, structural means whereby the wedge is quite securely held or locked in either end of the bushing.

Another object of the invention is to construct the bushing with a circumferential internal flange at both ends for coaction with ratchet teeth on the back of the wedge whereby the latter may be selectively inserted into either end of the bushing. The wedge being selectively insertable at either end enables the installing electrician to decide whether or not the thicker base end of the wedge would project too far into the interior of the junction box if inserted in the inner end of the bushing thereby permitting him to reverse the wedge when desirable.

A further object of this invention is to provide the wedge shaped clamping member with a transverse rib on the face opposed to the ratchet teeth at the base or larger end to assist in clamping a small gage wire in place.

A still further object of the invention is to construct the bushing and wedge as an integral unit with a weakened juncture line whereby the parts or bushing and wedge sections will remain intact to prevent possible

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separation and loss until ready for use at which time the two sections can be broken apart and separated for application as a clamping means for wires of different gages.

5 With the above and other objects in view this invention consists of the details of construction and combination of elements hereinafter set forth and then designated by the claims.

In order that those skilled in the art to which this 10 invention appertains may understand how to make and use the same I will describe its construction in detail referring by numerals to the accompanying drawing forming a part hereof, in which:

Fig. 1 is a side elevation of one form of my invention 15 wherein the bushing and wedge are originally constructed in one piece although they can be manufactured as separate elements.

Fig. 2 is a longitudinal sectional view of the wire clamp shown in a junction box, partly broken away, and illustrating the manner of clamping a medium gage wire in 20 place with the wedge inserted in the bushing from the inside of said box.

Fig. 3 is a similar view illustrating the wedge inserted into the bushing from the outside of the box for clamping a large gage wire in place.

Fig. 4 also is a similar view showing a small gage wire clamped in position and the wedge inserted into the bushing from the inside of the box and the clamping 25 rib providing an additional holding effect on the wire.

Fig. 5 is an end view of Fig. 1 looking at the right hand end thereof.

Fig. 6 is a perspective view of an electrical wire clamp, on a reduced scale, illustrating my invention embodied in another and, possibly, the preferred form.

Fig. 7 is a longitudinal sectional view of the bushing 30 element of the connector.

Fig. 8 is a similar view with the wedge element in elevation and connected to the bushing element.

In carrying out my invention as herein embodied, reference being first had to Figs. 1 to 5, 10 represents any ordinary or conventional junction box having any number of holes 11 in the different walls thereof, one being shown for purposes of illustration. These holes are either originally formed in the box walls or provided after knock-outs have been removed. An electrical wire 35 clamp 12 is assembled in any one or each of a number or all of said holes 11 as required or desired according to the type of wiring installation to be accomplished.

The electrical wire clamp includes a tubular bushing 40 13 having a forward end of a size to be projected through a hole 11, a rear or outer end and an annular exterior enlargement providing a shoulder 14 to engage the exterior face of a wall of the box for positioning the bushing whereby the annular groove 15 is just inside of the box 45 to receive a clip 16, such as a horseshoe fastener, to removably hold the bushing in place.

The bushing is open from end to end to receive a wire 17 which usually is projected through the bushing from the outer end of said bushing into the junction box. The wire may be of any appropriate gage and a number of different sizes can be employed with one wire clamp. At the inner and outer ends of the bushing are formed the intumed or interior flanges 18 and 19, respectively.

Cooperating with the bushing 13 is a wedge or wedge shaped clamping member 20 having a transversely curved back 21 and an opposed substantially flat clamping surface 22, said back and clamping surface converging from the rear end towards the forward end to provide the wedge formation although the sides are parallel. On the 50 curved back, which is substantially in the same arc as the circumferential flanges 18, 19, are formed a plurality of ratchet teeth 23 in spaced relation to one another

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from the smaller forward end of the wedge to a location adjacent the larger rear end thereof. These ratchet teeth extend, by preference, completely across the curved back from one side to the other of the flat clamping surface. At said rear end of said wedge is a transverse rib 24 projecting outwardly from and substantially at right angles to the flat clamping surface 22.

In order to keep the parts of the wire clamp together during shipment, storage and while carrying the wire clamps on and about the job I have found that this can readily be accomplished by forming the bushing and wedge in one integral unit, preferably in endwise alignment, as shown in Fig. 1, with a weakened juncture 25 between the bushing and wedge sections whereby, when the wire clamp is to be installed, the sections may easily be broken apart and separated to permit the wedge to be inserted into the bushing.

In practice, the bushing is assembled in a hole in a wall of the junction box 10 and an insulated wire is projected through said bushing and the wedge inserted in said bushing between the wire and an opposed portion of the bushing. As the wedge is inserted it is forcibly propelled forwardly until the wire is firmly clamped in place and the ratchet teeth engage a contiguous interior flange on the bushing to lock the wedge in position.

When the wire is of small or medium gage the wedge can be inserted into the bushing from the inside of the junction box because only a small part of said wedge will protrude from the bushing, Figs. 2 and 4, and will not extend into the box a sufficient distance to interfere with other installations in said box but when the wire is of heavy gage, Fig. 3, the wedge can be inserted into the outer end of the bushing from the outside of the box and the extra long overhang being on the outside will not interfere with anything within the box. When very small gage wire is used, Fig. 4, the wedge can be projected far enough into the bushing to cause the rib 24 to further close the space between said rib and the adjacent end of the bushing and provide a secondary clamping action on the wire. It will be apparent, naturally, that the wedge can be inserted into the bushing from either end regardless of other conditions so long as there is sufficient space for handling the wedge.

In the form of electrical wire clamp illustrated in Figs. 6, 7 and 8 the reference numeral 113 represents the tubular bushing similar to the one above described and including a tapered forward end, a rear or base end and an annular exterior enlargement providing a shoulder 114 for positioning the bushing on a wall of the junction box whereby an annular groove 115 is just inside of said box to receive a clip to removably hold the bushing in place.

The bushing is open from end to end to receive any appropriate insulated conductor wire and on the forward or tapered end of said bushing is formed an interior or intumed flange 118. This bushing also is provided with a longitudinal slot 116, the walls of which, preferably, are beveled and said slot extends from a location adjacent the rear or base end of said bushing to and through the forward end thereof whereby said slot is provided with an opening 117, Fig. 6, at one end. It is possible to reverse the location of the opening and have it at the rear end of the bushing. The opposite side walls of the slot contiguous the opening 117 are provided with opposed barrier projections 119 which normally extend across said opening 117 to substantially normally close the same. The opening 117 can be opened for endwise access to the slot by forcing the walls of said slot apart and subsequently squeezing them together to dispose the barrier projections across the opening or the bushing can be originally made in somewhat elliptical form with the opening to the slot in open condition and later closed by squeezing the bushing into circular shape.

Cooperating with the bushing 113 is a wedge or wedge shaped clamping member 120 having a transversely curved

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back 121 and an opposed substantially flat smooth clamping surface 122, said back and clamping surface converging from the thicker base or outer end towards the apex or inner end to provide the wedge formation although the sides of said clamping member are parallel. On the curved back are formed a plurality of ratchet teeth 123 properly spaced apart for coaction with the intumed or interior flange 118 on the forward end of the bushing.

The major body portion of the wedge shaped clamping member is quite thin adjacent its apex or inner end in order to provide a relatively large space between the inner portion of the wedge and the opposed internal surface of the bushing to accommodate large gage wires. The space between the wedge and the forward end of the bushing is gradually decreased as said wedge is projected into said bushing for a considerable portion of its length and said space is further and abruptly decreased by the transverse rib 124, which depends a considerable distance below the wedge back, as said rib approaches the forward end of the bushing from the outside of the latter.

The wedge shaped clamping member 120 is connected with bushing 113 by a headed lug 125 projecting from the back adjacent the inner or apex end of said clamping member and slidable in the slot 116. An insulated conductor is projected through the bushing from the rear end thereof and the wedge forced into the bushing until said wedge firmly clamps the conductor in place at which time the cooperation of the teeth 123 with the interior flange 118 will prevent accidental retraction of the clamping member. Any outward pull upon the conductor will have a tendency to more tightly clamp the conductor and thereby prevent its withdrawal.

Of course I do not wish to be limited to the exact details of construction herein shown and described as these may be varied within the scope of the appended claims without departing from the spirit of my invention.

Having described my invention what I claim as new and useful is:

1. An electrical wire clamp comprising a tubular bushing having an internal flange at one end thereof, a wedge shaped clamping member considerably smaller than the inside diameter of and slidable longitudinally within said bushing and having a transversely curved serrated back for cooperation with the internal flange and a smooth clamping surface opposed to the back and for engaging an insulated conductor to clamp the latter in the bushing, and means to slidably captively attach the clamping member to said bushing.

2. The structure according to claim 1, in combination with a transverse rib on the thicker end only of the clamping member in opposed relation to the back of said clamping member.

3. The structure according to claim 1 wherein the bushing is provided with a longitudinal slot, in combination with a headed lug projecting from the back of the wedge adjacent the smaller or apex end of said wedge and slidable longitudinally in said slot, said headed lug holding the wedge captive to the bushing.

4. A wire clamp comprising a tubular bushing having a single straight open-ended symmetrical bore, a pair of internal annular flanges in said bushing at opposite ends of said bore, said bore and flanges being adapted to loosely receive a wire extending therethrough, an elongate solid wedge having its smaller end insertable into a selected end of said bushing bore through the adjacent flange alongside of said wire with its larger end exteriorly of said bushing to cause the portion of said adjacent flange opposite to said wedge to firmly grip said wire, ratchet teeth on said wedge arranged longitudinally therealong on the portion of said wedge proximate to said adjacent flange for holding engagement with the latter, and a

transverse rib on said wedge opposite to said teeth at the thicker end of said wedge for additional gripping engagement with said wire.

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