

June 3, 1969

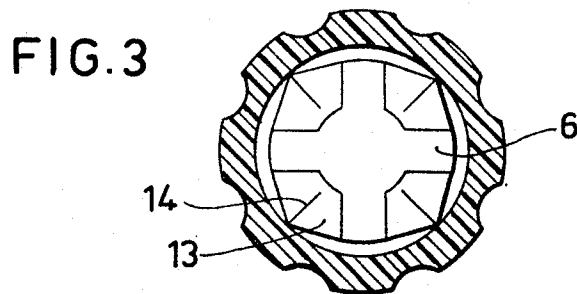
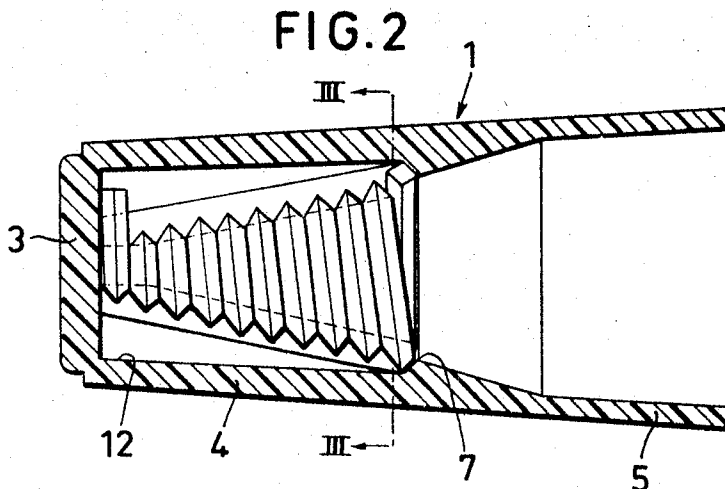
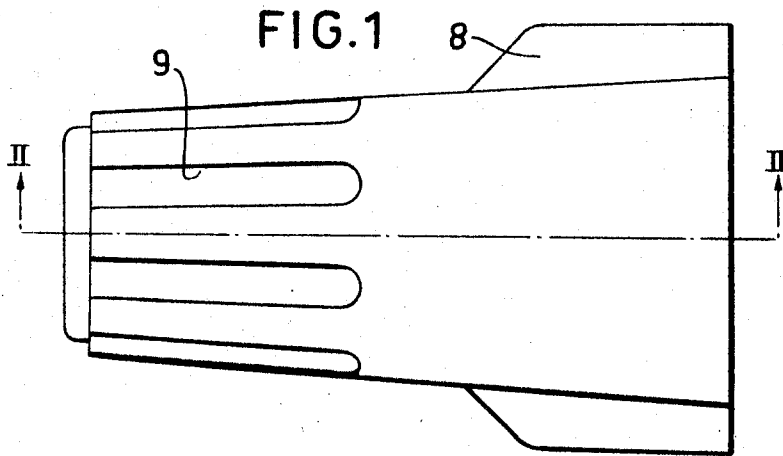
O. W. THORSMAN

3,448,223

CLAMP FOR CONNECTING ELECTRIC WIRES

Filed Dec. 29, 1967

Sheet 1 of 2



INVENTOR

OSWALD WILLY THORSMAN

BY

Burnbaugh, Free, Groves & Donohue

HIS ATTORNEYS

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O. W. THORSMAN

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FIG. 4

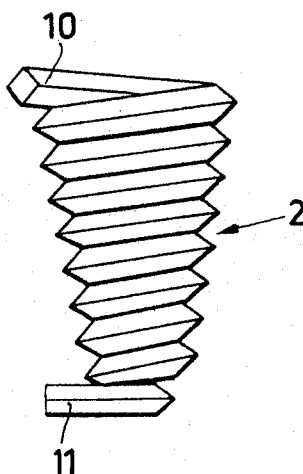
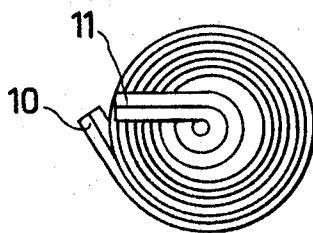


FIG. 5



INVENTOR

OSWALD WILLY THORSMAN

BY
Brennhaugh, Free, Gross & Donohue
HIS ATTORNEYS

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3,448,223

CLAMP FOR CONNECTING ELECTRIC WIRES

Oswald Willy Thorsman, Nykoping, Sweden

Filed Dec. 29, 1967, Ser. No. 694,468

Int. Cl. H02q 15/08; H01r 11/25

U.S. Cl. 174—87

1 Claim

ABSTRACT OF THE DISCLOSURE

An insulating connector for electric wires includes a plastic cap closed at one end and a tapered coiled spring inserted in the cap. The last interior turn of the spring is substantially closed and the end of the spring extends diametrically across and projects outwardly from the last coil turn. The projecting end engages a recess in the inner wall of the cap.

This invention relates to a clamp for connecting electric wires, comprising an insulating sleeve preferably made of thermoplastics and closed at one end, and a coiled spring inserted in the sleeve.

Clamps of the aforesaid type are previously known in a plurality of types, all of which, however, show several serious disadvantages. The known clamps include, for example, the risk that particularly the sleeve bottom is destroyed by the wires when they are being connected. The connection, moreover, cannot be dismantled in a way other than that the spring remains on the conductors. Furthermore, prior to the mounting of the clamp the wires must be twisted. In conventional constructions, finally, the spring is self-locking, and for the mounting a special tool is required.

The aforesaid disadvantages are entirely eliminated by the present invention which combines the essential properties and advantages as follows:

(1) No risk of destroying the sleeve bottom upon the mounting of the wires in the clamp.

(2) The connector can be dismantled without the spring remaining on the conductors, thereby rendering it possible, for example, to connect additional conductors without having to make a new peeling of the previously connected conductors.

(3) The twisting of the conductors is made when the clamp is being mounted, thereby eliminating the previously necessary operation of twisting the conductors prior to the mounting.

(4) The clamp is so constructed that the conductors can be mounted in the clamp without a special tool.

(5) The spring is not self-locking for the wire ends.

As a further advantage can be mentioned, that the clamp is so designed that a necessary storage is comparatively limited.

These characterizing properties and advantages of the invention are achieved at a clamp of the type referred to in the introductory portion and having the characterizing features as they are defined in the following claim.

A preferred embodiment of the invention is described in the following, with reference to the accompanying drawing figures.

FIG. 1 shows a side view of a clamp.

FIG. 2 shows a longitudinal section along the line II—II in FIG. 1.

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FIG. 3 shows a section along the line III—III in FIG. 2, the spring in the clamp, however, being removed.

FIGS. 4 and 5 show a side view and a view from below, respectively, of the spring.

The clamp comprises two main components, i.e., the sleeve 1 and the spring 2 inserted in the sleeve.

The sleeve 1, preferably made of amide resin, is open at one end and provided at the other end with a bottom 3. On its outside the sleeve is shaped slightly conical to the bottom 3. With respect to its functional construction, the sleeve may be said to have a lower and an upper portion 4 and 5, respectively. The lower portion 4 encloses the coiled spring 2 and its inside outline tapers conically downwards. On its inside the lower portion is provided with longitudinal grooves 6. The bottom surfaces 12 of said grooves form an outline which is substantially cylindric or slightly conical and in parallel with the outside outline of the sleeve. The grooves decrease in depth from the sleeve bottom 3 upwardly and end at the upper portion of the sleeve portion 4, close to an inwardly projecting collar 7 extending all the way around. The side walls 13 of the grooves are rounded and meet in edges 14. On its inside the upper sleeve portion 5 tapers from the opening first slightly conically and then transforms to cone shape with greater conicity to form the upper surface of the collar 7. On its outside the upper sleeve portion 5 is provided at the opening with two projecting wings 8 of diametric arrangement, the lower sleeve portion 4 having longitudinal grooves 9 extending from the bottom. By this external design of the sleeve, the turning motion which is necessary for mounting the clamp can be carried out without the use of special tools.

The spring 2 inserted in the sleeve 1 is shown in greater detail in FIGS. 4 and 5. The spring is wound of wire having square cross-section with slightly rounded edges. The winding is made with the profile placed on edge, so that the coiled spring after the completed winding can be said to have an outwardly and inwardly screw-thread shape. The upper helix end 10, which projects tangentially slightly outside of the upper spring coil, abuts against the lower face of the collar 7, when the spring is inserted in the sleeve 1, which collar hereby has an inclination suitably adjusted to the shape of the spring. The other, lower end 11 of the spring also projects tangentially from the lowermost spring coil and in inserted position is placed close to the sleeve bottom 3 in one of the grooves 6. By this arrangement of the spring in the interior of the sleeve designed as described above, the spring is safely secured in the sleeve, but not self-locking. The spring, furthermore, is so wound that its helical shape tapes substantially conically from the uppermost coil turn downwards to slightly above half of the spring length, whereafter it transforms into some turns with substantially constant cross-section and thereafter again increases in tightness. The lowermost coil turn is wound so tightly that the spring downwardly is almost entirely closed. The opening left by the lowermost turn is under all circumstances too small for permitting any wire to penetrate through the opening when the clamp is being mounted.

Instead of making the spring end 11 to project tangentially from the lowermost coil turn, it also is possible to place the end diametrically over the coil turn (not shown) whereby the spring downwardly is entirely closed.

Other embodiments than that shown and described

above are, of course, imaginable within the scope of the the following claim:

What I claim is:

1. A clamp for connecting electric wires comprising a hollow sleeve of insulating material closed at one end, the inner wall of said sleeve being provided with a plurality of recesses, and a coiled spring inserted in said sleeve, said spring tapering substantially conically towards the closed end of said sleeve with its last coil turn adjacent to said end substantially entirely closed, said spring further including an end portion extending diametrically across and projecting outwardly of said last coil turn into engagement with one of said recesses in said sleeve.

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DARRELL L. CLAY, *Primary Examiner.*

U.S. Cl. X.R.

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