Feb. 7, 1933. W. P. MARR 1,896,322

WIRE CONNECTER

Filed Nov. 24, 1930

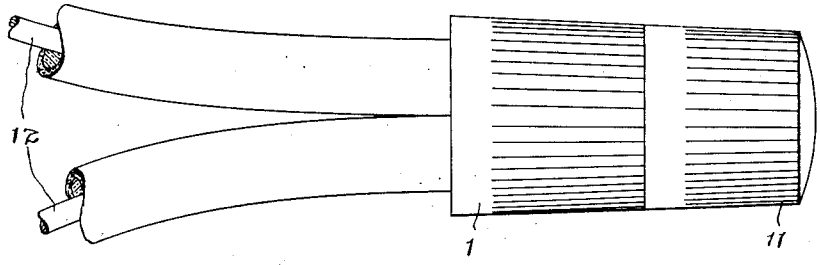

Fig. 1.

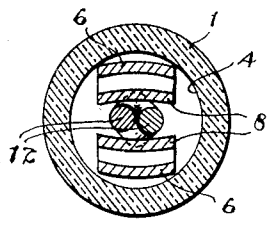

Fig. 3.

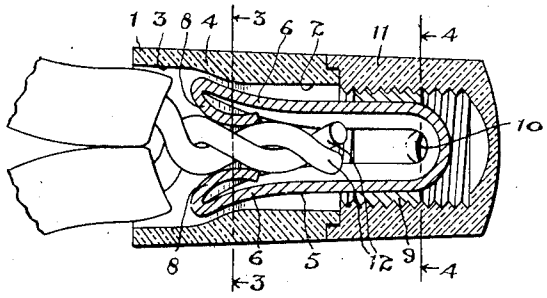

Fig. 2.

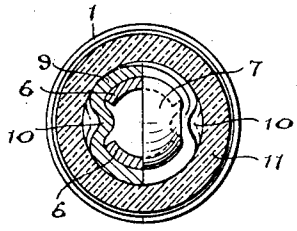

Fig. 4.

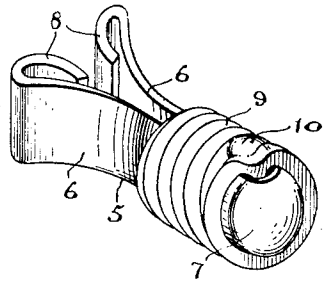

Fig. 5.

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UNITED STATES PATENT OFFICE

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WIRE CONNECTER

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The principal object of the invention is to provide a connecter for electric wires which will ensure a positive and permanent connection and which may be quickly applied without the use of tools.

A further object is to provide a connecter of this type which will be self-insulating and which may be manufactured in quantities at very low cost.

A still further object of the invention is to provide a connecter which will grip the wires securely without injuring or cutting the same.

The principal features of the invention consist in the novel construction and arrangement of parts whereby a constrictable metallic element nested within an insulating thimble member is drawn into intimate contact with the wires by an insulated cap member.

In the accompanying drawing, Figure 1 is an enlarged view of a connecter constructed in accordance with the present invention showing same connecting a pair of wires.

Figure 2 is a mid-sectional view of the connecter shown in Figure 1 illustrating the arrangement and relation of the component parts.

Figure 3 is a cross section taken on the line 3—3 of Figure 2.

Figure 4 is a part cross section taken on the line 4—4 of Figure 2.

Figure 5 is an enlarged perspective view of the gripping element.

The use of mechanical connecters in electrical wiring is rapidly transplanting the cumbersome soldered type of connection due to the ease and rapidity with which the mechanical connecter may be applied and the security which it affords against short circuits and loose connections.

The present invention proposes to construct a connecter which will be highly efficient ensuring a positive mechanical and electrical contact as well as the required insulation of the wire and metal parts.

In carrying the present invention into effect an insulating sleeve 1 is provided having a central bore 2 which is counterbored at 3 forming an annular internal taper shoulder 4 intermediate of the length of the sleeve.

It is preferably that the wall of the counterbore 3 be slightly tapered and the shoulder 4 at the bottom of the counterbore is preferably rounded to co-operate with the wire-gripping member presently to be described.

Arranged within the sleeve 1 is a wire-gripping member 5, this member being preferably formed from a length of spring material such as hard brass bent intermediate of its length into substantially U-shaped formation having the side gripping arms 6 connected by the head portion 7 and the outer free ends thereof flared outwardly and adapted to be accommodated within the counterbore 3 of the sleeve 1.

The end extremities 8 of the arms 6 are bent inwardly and preferably present an outward flared curvature more pronounced than the curvature imparted to the outward ends of the arms and are preferably concaved slightly in a transverse direction to conform somewhat to the curved periphery of the wires to be connected.

The base ends of the arms 6 are spaced and curved in cross section to form arcs of a circle and a threaded sleeve member 9 is pressed thereover. Indents 10 are formed in the end of the sleeve on the inward side of the head portion 7 and between the arms 6 and this securely locks the threaded sleeve 9 against withdrawal axially and also prevents its rotation relative to the member 5. The snug fit of the threaded sleeve 9 on the arms of the member 5 definitely limits the outward displacement of the spring arms 6 which are preferably held under permanent tension by the sleeve.

The member 5 is adapted to fit loosely within the sleeve 1 with the threaded sleeve 9 extending partly beyond the end of the sleeve and an insulating cap member 11 is threaded onto the sleeve member 9 so that when the cap 11 is rotated to the right it will cause the sleeve 9 to thread thereinto drawing the wire gripping member axially.

The axial movement thus imparted to the member 5 causes the outwardly flared ends of the gripping arms 6 to engage the annular shoulder 4 at the bottom of the counterbore thereby constricting the outward ends of the arms and forcing the inturned por-

tions 8 thereof into intimate gripping contact with the twisted group of wires 12 inserted between the arms. A secure grip on the wires is thus obtained and due to the spring construction of the member 5 the desired resiliency of contact is provided.

The cross-sectional curvature of the fingers 6 is preferably more shallow than the curvature of the shoulder 4 so that the corners of the fingers will contact the wall or shoulder of the sleeve in a manner which will effectively lock the member 5 against free rotation in the sleeve so that by holding the knurled sleeve the cap 11 may be threaded onto the threaded portion 9 of the member 5 without danger of the member 5 rotating in the sleeve so that the device may be tightened securely without imposing disruptive twisting or straining forces on the wires themselves.

The invention however is not limited to the formation of the sleeve and cap separately or to the interlocking features of the fingers and sleeve since it may be found desirable to form the cap and sleeve integral so that the shoulder 4 would rotatably engage the flared outer ends of the fingers in pressure contact to constrict the fingers.

On the unthreading of the cap member the natural resiliency of the member 5 maintains the sloping or flared outer portions of the spring arms in contact with the shoulder 4 causing the member 6 to retreat from the cap permitting the arms 5 to dilate.

The contacting portions of the sleeve 1 and cap member 11 are preferably shouldered so that they will fit snugly together and will be retained in axial alignment with each other and the outer surface of the members 1 and 11 are preferably tapered toward the cap end and each member is suitably knurled to provide a gripping surface for the fingers in turning the cap member.

The members 1 and 11 together form an insulating enclosure for the bared wire ends completely enclosing the same, together with the metallic connecting element, and the counterbore 3 forms an enlarged cavity for accommodating the bulky ends of the insulating wire coverings.

The construction illustrated in the drawing is directed to a preferred embodiment of the present invention and it will be understood that various alterations may be resorted to without departing from the spirit of the invention.

What I claim as my invention is:—

1. A wire connecter comprising a constrictable spring member, and means comprising a pair of relatively rotatable insulating closure members encircling said spring member and engaging each other in pressure contact when rotated relative to each other to constrict said member to grip the wires to be connected.

2. A wire connecter comprising an internally converging sleeve, a spring member non-rotatably confined within said sleeve adapted on being displaced longitudinally therein to slidably engage the converging sleeve wall and constrict laterally, and means for displacing said spring member longitudinally.

3. A wire connecter comprising a wire gripping member formed of spring material adapted to be constricted to grip the wire, an insulating sleeve encircling said gripping member and confining the latter therein against rotation relative thereto and adapted when said member is displaced longitudinally thereof to effect the lateral constriction of said member, and means for forcing said member longitudinally of said sleeve.

4. A wire connecter comprising a wire gripping member formed of spring material adapted to be constricted to grip the wire, an insulating sleeve encircling said gripping member and confining the latter therein against rotation relative thereto and adapted when said member is displaced longitudinally thereof to effect the lateral constriction of said member, and an insulating closure cap member threadedly engaging said gripping member and rotatably engaging said insulating sleeve in pressure contact to force said member longitudinally of said sleeve.

5. A wire connecter comprising a wire gripping member presenting free divergent gripping fingers adapted to be constricted to grip the wire, an insulating sleeve slidably encircling said divergent fingers and having an annular shoulder on its inner wall for engaging and constricting said divergent fingers on the relative longitudinal displacement of said sleeve and member, and means rotatably engaging said gripping member and said sleeve in pressure contact to effect the relative longitudinal displacement of said sleeve and member.

6. A wire connecter comprising a wire gripping member formed of a length of spring material doubled intermediate of its length to form a base portion and free arm portions adapted to be constricted to grip the wire, an insulating sleeve encircling said gripping member and axially slidable thereon adapted when displaced longitudinally thereof to engage the lateral constriction of the free arm portions of said member, and an insulating cap threaded onto said base portion of the gripping member and engaging said sleeve to force the gripping member axially thereof.

7. A wire connecter comprising a member having resilient wire gripping fingers having their free ends flared outwardly, an insulating sleeve encircling said member and presenting an internal shoulder intermediate of its length cooperating with the flared portions of said fingers to constrict the same

on the wire, and means for relatively displacing said sleeve and member to move the sleeve shoulder into variable pressure contact with said flared portions.

8. A wire connecter comprising a member having resilient wire gripping fingers having their free ends flared outwardly, an insulating sleeve encircling said member and presenting an internal shoulder intermediate of its length co-operating with the flared portions of said fingers to constrict the same on the wire, and threaded means co-operatively arranged between said member and its encircling sleeve for forcing the flared ends of said gripping fingers into cam or pressure engagement with said internal sleeve shoulder to constrict said fingers.

9. A wire connecter comprising a substantially U-shaped gripping member having outwardly flaring free ends and a threaded portion at its base, an internally tapered insulating sleeve encircling said gripping member with the divergent end of the taper disposed toward said outwardly flared ends and adapted when moved toward the free flaring ends of said U-shaped member to engage the outwardly flared ends to constrict the latter, and means threaded on the threaded portion of said gripping member and co-operating with the other or convergent end of said sleeve to move the latter to a position to constrict the outwardly flared ends of said U-shaped member.

10. A wire connecter comprising an elongated laterally constrictable member having an externally threaded portion at one end thereof, an insulating sleeve bored to receive said member and to loosely accommodate the threaded portion thereof, said sleeve being slidable axially of said constrictable member and formed to effect the lateral constriction of said member on the relative axial movement of said sleeve and member, and an internally threaded insulating cap member threaded onto the threaded portion of said constrictable member and rotatably engaging the adjacent end of said sleeve to slide said sleeve axially of said member, and means for maintaining said cap and sleeve in concentric relation.

11. A wire connecter comprising a wire-gripping member formed of a length of spring metal doubled intermediate of its length to form a base portion and free arm portions, the outward ends of the latter being flared laterally outward and the inward ends of said arms adjacent to the base being curved in cross section forming arcs of a circle, a threaded sleeve fitting snugly over the curved inward ends of said arms and locked thereto, means encircling said gripping member adapted to engage the flared arms to constrict the latter on relative longitudinal movement of said member and said encircling means, and means threaded onto the threaded sleeve of said gripping member for effecting the relative longitudinal movement of said member and encircling means.

12. A wire connecter comprising a wire-gripping member formed of a length of spring metal doubled intermediate of its length to form a base portion and free arm portions, the outward ends of the latter being flared laterally outward and the inward ends of said arms adjacent to the base being curved in cross section forming arcs of a circle, a threaded sleeve fitting snugly over the curved inward ends of said arms, said sleeve being deformed and locked to said member against withdrawal and against relative rotation, a sleeve forming an insulating enclosure for said gripping member co-operating with the outwardly flared portions of said arms, and a cap threaded to engage said threaded sleeve and cooperating with said insulating sleeve to effect the constriction of said arms on the wires to be connected.

WILLIAM P. MARR.