June 17, 1930. D. G. ROBINSON 1,764,227

ELECTRIC COUPLING MEMBER

Filed Nov. 10, 1928

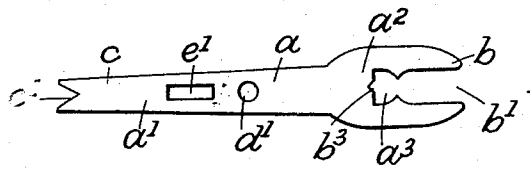


Fig. 1.

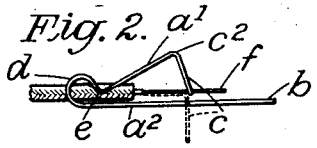


Fig. 2.

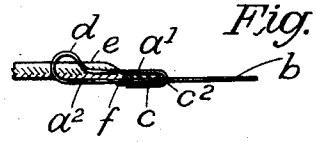


Fig. 4.

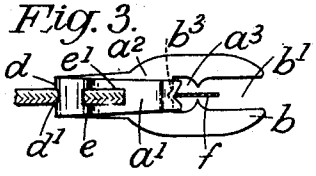


Fig. 3.

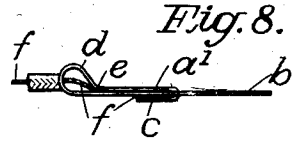


Fig. 8.

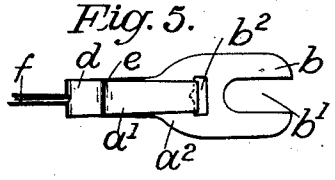


Fig. 5.

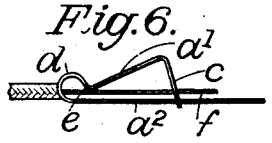


Fig. 6.

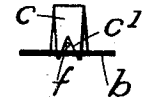
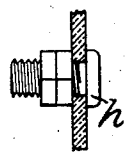
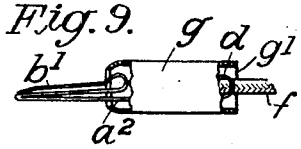
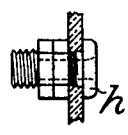
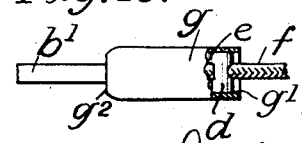


Fig. 7.









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UNITED STATES PATENT OFFICE

DOUGLAS GWYN ROBINSON, OF WEYMOUTH, ENGLAND

ELECTRIC COUPLING MEMBER

Application filed November 10, 1928, Serial No. 318,378, and in Great Britain November 22, 1927.

This invention has reference to improvements in electric wire couplings such as tag terminals. It has for an object to provide a simplified coupling which is easily attached, secured and locked in position to flexible wires or cables or to single strand wires, is inexpensive to make and is suitable for radio, automobile, telephone, battery and the like uses.

It has also for object to provide an electric coupling comprising a one-piece strip of metal, formed by pressing and folding a blank, having at one end a spade, fork, plug or like terminal member for engagement with a complementary coupling member, and at the other end a cranked tongue adapted to be passed through an aperture or recess in the first or engaging end, after the end of a wire, cable or other conductor has been entered between the superposed end portions of the folded strip, the tongue or cranked portion projecting through the aperture being then folded back over the extremity of the conductor.

Referring to the accompanying drawings which illustrate the present invention,

Figure 1 shows a suitable blank before folding.

Figure 2 is a side elevation and Figure 3 a plan view, showing a flexible insulated cable fitted with the improved coupling, prior to the arms of the coupling being forced together, as indicated by dotted lines in Figure 2.

Figure 4 is a side elevation showing the arms closed together and the projecting portion of the tongue folded back over the end of the conductor.

Figure 5 is a plan view of another form in which the stranded wire or cable has no insulation covering.

Figure 6 is a side elevation similar to Figure 2 showing an insulated cable in which the insulation is cut away just short of the coupling.

Figure 7 is an end view of Figure 6.

Figure 8 is a view in the closed position of the parts shown in Figure 6.

Figure 9 is a side elevation and Figure 10 a plan view of a modified construction, in which the coupling is provided with a spring plug for connection to a complementary socket fitting, the coupling being fitted with an insulating sheath.

The improved coupling or terminal consists of a one-piece strip of metal a, see for example Figure 1, which is provided at one end with a coupling member b and at the other end with a tongue c having a notch or recess c^1 therein; the coupling member may consist of a spade or fork as illustrated in Figures 1, 3 and 5, or a plug as illustrated in Figures 9 and 10, or any other suitable member according to requirements. This strip a is folded back on itself (see Figure 2) to form superposed arms a^1 a^2, which are subsequently forced together. This fold forms a loop d which acts as a spring hinge so that in the open position (Figure 2) the arms a^1 a^2 may be slightly divergent, whilst the said loop d will allow the arms to be forced together and to be locked in such closed position. The recessed tongue c at the end of the arm a^1 is cranked as at c^2 and adapted to be passed through the other arm a^2 forming the coupling member, whilst adjacent to the loop d, the arm a^1 of the strip is provided with an inturned ridge or similar engaging surface e, directed towards the other arm a^2; this ridge may be slotted as at e^1 to increase its grip upon the wire or cable.

The tongue c is passed through an aperture or gap a^3 in the arm a^2 which as shown in Figures 1 and 3 is immediately behind and in communication with the fork gap b^1; it will be obvious that the cranked end or tongue c might be passed through the actual fork gap b^1, or again through a transverse slot b^2 behind the fork gap, as in Figure 5.

The electric wire or cable f is passed through an aperture d^1 in the back of the loop d, below the inturned ridge e, between the superposed arms a^1 a^2, and through the recess c^1 in the aforesaid cranked tongue; see Figures 2 and 3. The superposed arms are then hammered, pinched, clamped or similarly forced together to embrace the length of wire or cable f which lies between the inturned ridge e and the cranked tongue c, the tongue itself being pushed through the registering aperture in the other arm a^2.

In this operation, the wire or cable which was threaded through the recess c^1 in the cranked tongue, as seen in Figure 2, is forced through the aperture in the arm a^2, both the wire and the projecting portion of the recessed tongue c being then folded back on the underside of the coupling arm a^2 of the strip and pinched or clamped in such position. The arrangement is preferably such that the ridge or jaw e adjacent to the loop d bears upon the wire or cable, whether covered by insulation at this point as in Figure 4 or bare as in Figures 5 and 8, with a positive engaging action, and the bare extremity of the wire or cable (engaged in the recess c^1 in the cranked tongue), subsequently tensions the wire or cable as the tongue c is pressed through the aperture a^3 in the arm a^2, so that the wire is firmly gripped and locked by the forcing together of the superposed arms a^1 a^2 of the coupling. The folding back of the recessed end c^1 of the cranked tongue also finally locks the superposed arms together, maintaining the pressure of the ridge e, and additionally locks the extremity of the wire or cable in place, while ensuring adequate metallic continuity. In the case of a wire of very small diameter, less than the width of the slot e^1, the ridge e may obviously straddle or bridge over the wire and press directly upon the arm a^2, the wire being then gripped by the adjacent faces of the two superposed arms.

The recess c^1 in the cranked tongue may be a V-shaped notch formed in its front edge, as illustrated in Figures 1 and 7. The aperture d^1 in the loop d of the coupling is preferably in the center thereof; similarly the slot e^1 in the ridge is disposed along the center line of the strip, and the arm a^1 which ends in the cranked tongue c is preferably narrower than the arm a^2 which ends in the fork or similar coupling member b.

In the rear edge of the aperture a^3 in the coupling arm a^2, I may with advantage form a V-shaped or rounded recess b^3, as shown in Figure 1, to facilitate the passing of the wire or cable through the gap or slot and under said arm, and to guide and maintain the wire or cable in place, when the cranked tongue is being pushed through the gap or slot. This recess b^3 also enables the tongue when the latter is being folded back, to bear directly on the edge of the aperture, instead of pressing on the wire only.

The coupling or terminal may be provided with an outer sheath of insulating material, preferably colored to indicate its position in the electrical circuit; for example, red and black insulating sheaths may be provided for the positive and negative terminals of battery leads, with additional colored bands or markings to distinguish high and low tension circuits of radio apparatus, and so on.

Figures 9 and 10 illustrate a sheathed coupling in which an insulating sheath g of hollow cylindrical form is mounted upon the exterior of the coupling a, the sheath fitting tightly upon the edges of the superposed arms a^1 a^2; one end g^1 contacts with the loop d of the coupling, while the other end g^2 of the sheath may be of tapered or part-spherical shape so as to enclose the terminal with the exception of the coupling end, which is here shown as a spring plug b^1 formed by folding over the end of the arm a^2, this spring plug b^1 projecting through the open end g^2 of the coupling, and being adapted for engagement with a complementary socket member h in the well known way.

The whole sheath is made of flexible or springy material, so as to accommodate itself to any slight variations in the width of the arms a^1 a^2 and to ensure its firm support upon the coupling a, while allowing of detachment when desired.

The improved coupling may be made of sheet brass, copper or other suitable metal and it is a one-piece article, which is free from pivot pins, screw threads and locking devices. On the other hand it is quickly affixed in position and gives a permanent contact, while the gripping arms a^1 a^2, which are themselves interlocked, also lock the wire or cable in place.

I wish it to be understood that the coupling terminal proper may be of any desired shape and construction to engage a complementary coupling member.

What I claim is:—

1. An electric coupling member, comprising a strip of metal, one end of said strip being formed to engage a complementary coupling member, the other end of said strip being cranked, and the body of said strip being folded to bring said ends together, said engaging end of the strip having an aperture to receive said cranked end, and the portion of said cranked end projecting through said aperture being adapted to be folded back upon said engaging end after a conductor has been passed through said aperture.

2. An electric coupling member, comprising a strip of metal, one end of said strip being formed to engage a complementary coupling member, the other end of said strip being cranked, said strip having an aperture intermediate of its ends and being folded in the vicinity of said aperture to bring its ends together, said engaging end having an aperture to receive said cranked end, and said cranked end being adapted to pass through said last mentioned aperture whereby the projecting portion can be folded back upon said engaging end after a conductor has been passed through said two apertures.

3. An electric coupling member, comprising a strip of metal, one end of said strip being formed to engage a complementary coupling member, the other end of said strip being cranked, said strip being folded to form

an intermediate loop and to bring its ends together, said engaging end having an aperture to receive said cranked end, and the portion of said cranked end projecting through said aperture being adapted to be folded back upon said engaging end after a conductor has been passed through said loop and said aperture.

4. An electric coupling member, comprising a strip of metal, one end of said strip being formed to engage a complementary coupling member, the other end of said strip being cranked, said strip being folded intermediate of its ends to form a loop and an inturned ridge and to bring its ends together, said engaging end having an aperture to receive said cranked end, and the portion of said cranked end projecting through said aperture being foldable back upon said engaging end after a conductor has been passed through said loop, beneath said ridge and through said aperture.

5. An electric coupling member, comprising a strip of metal, one end of said strip being formed to engage a complementary coupling member, the other end of said strip being cranked, said strip having an aperture intermediate of its ends and being folded in the vicinity of said aperture to form a loop and to bring its ends together, said engaging end having an aperture to receive said cranked end, and said cranked end being adapted to pass through said aperture, the projecting portion of said cranked end being foldable back upon said engaging end after a conductor has been passed through said loop and said apertures.

6. An electric coupling member, comprising a strip of metal, one end of said strip being formed to engage a complementary coupling member, the other end of said strip being cranked, said strip having an aperture intermediate of its ends and being folded in the vicinity of said aperture to form a loop and an inturned ridge and to bring its ends together, said engaging end having an aperture to receive said cranked end, and the portion of said cranked end projecting through said second mentioned aperture being foldable back upon said engaging end after a conductor has been passed through said first mentioned aperture, through said loop, beneath said ridge and through said second mentioned aperture.

7. An electric coupling member, comprising a strip of metal, said strip being formed to engage a complementary coupling member, one end of said strip being cranked, the other end of said strip having an aperture, said strip being folded intermediately to bring its ends together whereby said cranked end can be passed through said aperture, the portion of said cranked end projecting through said aperture being foldable back upon said apertured end after a conductor has been inserted between said ends and passed through said aperture.

8. An electric coupling member, comprising a strip of metal, said strip being formed to engage a complementary coupling member, one end of said strip being cranked, the other end of said strip having an aperture, said strip being folded intermediately to bring its two ends into superposed relation, said cranked end then registering with said aperture, the conductor for attachment being engaged between said superposed ends and passed through said aperture, said superposed ends being then closed together upon said conductor and said cranked end passed through said aperture, and the projecting portion of said cranked end being finally folded back upon said apertured portion over said conductor.

9. An electric coupling member, comprising a strip of metal, one end of said strip being formed to engage a complementary coupling member, the other end of said strip being cranked, said strip having an aperture intermediate of its ends and being folded in the vicinity of said aperture to form a loop and an inturned ridge, said ridge being slotted along the axis of said strip, said engaging and cranked ends being in superposed relation beyond said loop and said ridge, said engaging end having an aperture to receive said cranked end, and the portion of said cranked end projecting through said last mentioned aperture being foldable back upon said engaging end after a conductor has been passed through said first mentioned aperture, through said loop, along said slot and beneath said ridge into said last mentioned aperture.

10. An electric coupling member, comprising a strip of metal, one end of said strip being formed to engage a complementary coupling member, the other end of said strip being cranked, and the body of said strip being folded to bring said ends together, said engaging end of the strip having an aperture to receive said cranked end, and the portion of said cranked end projecting through said aperture being folded back upon said engaging end after a conductor has been passed through said aperture, in combination with a sheath of insulating material surrounding said folded strip, said sheath being supported by engagement with the lateral edges of said folded strip.

11. An electric coupling member, comprising a strip of metal, one end of said strip being folded to form a spring plug for engagement with a complementary socket member, the other end of said strip being cranked, and the body of said strip being folded to form a loop and to bring said ends together, said engaging end of the strip having an aperture to receive said cranked end, and the portion of said cranked end projecting through

said aperture being folded back upon said engaging end after a conductor has been passed through said aperture, in combination with a sheath of flexible insulating material surrounding said folded strip, said sheath being detachably supported upon the lateral edges of said folded strip and having one end adapted to contact with said loop.

In testimony whereof I hereunto affix my signature.

DOUGLAS GWYN ROBINSON.