May 29, 1956 S. L. GOOKIN 2,748,368

ELECTRIC WIRE TERMINALS

Filed April 13, 1953

Fig. 1

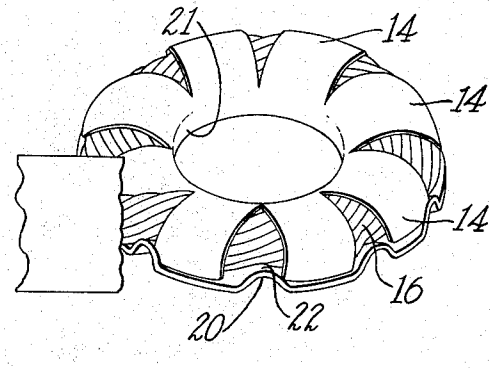


Fig. 2

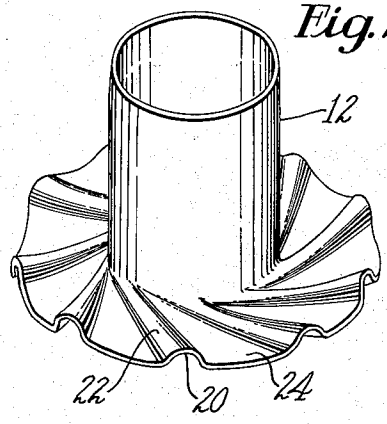


Fig. 3

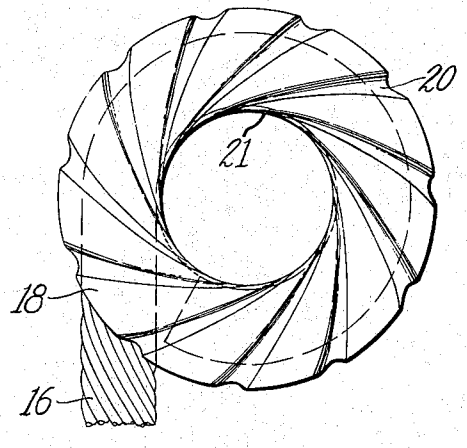


Fig. 4

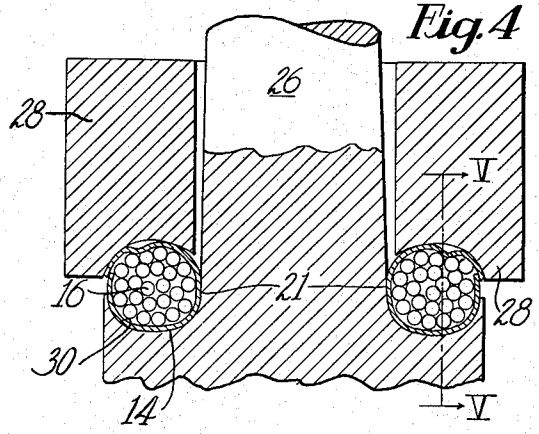


Fig. 5

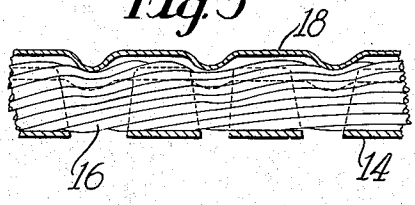
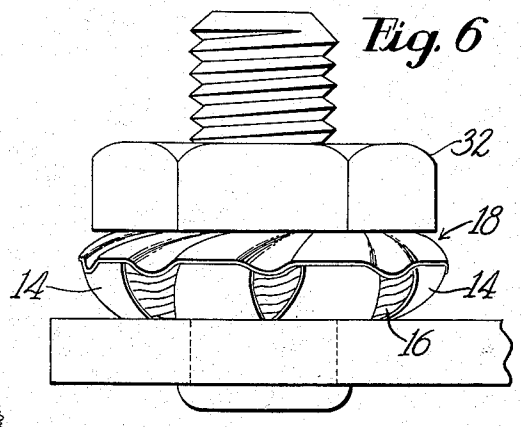


Fig. 6



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ELECTRIC WIRE TERMINALS

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5 Claims. (Cl. 339—276)

This invention relates to improvements in electric wire terminals of the type which present an open eye, on the end of a stranded conductor wire, through which eye the threaded bolt of an electric binding post may be inserted so that the end of the conductor wire can be secured to the post by a threaded nut.

One example of such an electric terminal is illustrated and described in United States Letters Patent No. 2,442,767, issued in my name June 8, 1948. The terminal disclosed in my said patent is formed by clenching a special eyelet within the looped end or eye of a stranded wire, so that the encircling strands of wire are firmly compressed and gripped between the flange portion of the eyelet and the prongs of the eyelet barrel. In accordance with my prior patent, the flange of the eyelet is formed with a series of radially extending indentations in its crowned side thus to provide similarly arranged ribs on the opposite wire engaging side of the flange. When the eyelet is clenched, the ribs extending transversely across the wire become partially embedded in the wire, thus obtaining far better gripping or holding power than was previously obtainable with a conventional eyelet having a uniform or smooth crowned flange portion.

Heretofore when ordinary eyelets have been used for forming wire terminals, the wires could be jerked or pulled unintentionally with sufficient force to cause the wire loop to be pulled free from the eyelet. So frequently was this difficulty encountered that it had become a practice in the electrical trades to dip the clenched terminals in a bath of solder to thus prevent the strands from being accidentally pulled out from the eyelet. This precautionary measure not only added to manufacturing costs, but was also objectionable because the heat of the solder was destructive to the insulation material adjacent the terminal. In addition the solder could build up in the throat opening of the eyelet, thus reducing the opening so that it could not accommodate the intended binding post.

An object of my present invention is to provide a novel and improved eyelet which, when clenched about the looped end of a conductor wire, is capable of exerting substantially greater holding power upon the enclosed strands of wire than that which could be procured with my previously described eyelet.

Another object is to provide an electric wire terminal which, when attached to a fixed binding post, will satisfactorily withstand abnormal forces tending to pull the conductor wire free from the terminal.

In accord with the above objects, the novel and advantageous features of the present invention reside in the construction of the annular flange portion of the eyelet, and especially those portions of the flange which are designed to bite into the eye of the wire when the eyelet is clenched. This flange is provided upon its wire gripping side with a series of ribs so constructed as to be adapted not only to bite into the wire when the eyelet is

clenched to frictionally retard the wire from being pulled out across the ribs, but also adapted to bite the strands in a novel manner such that when a pull is exerted sufficient to overcome the frictional bite upon the strands and thus commence a relative movement of the wire with respect to the ribs this movement immediately produces a jamming hold upon the wire, due to the fact that each rib is diagonally inclined outwardly in the direction in which the end of the wire is bent around the barrel of the eyelet with the result that the wire cannot be withdrawn across the ribs without thereby being forcibly deflected or plowed by the ribs into tighter wedging engagement with the concaved wall of the throat portion of the eyelet.

The above and other advantageous features of this invention will be more fully understood and appreciated when considered with the following detailed description in connection with the drawings, and will be pointed out further in the appended claims.

In the drawings,

Fig. 1 is a perspective view of a wire terminal, formed in accordance with the present invention, and viewed flange side down;

Fig. 2 is a similar perspective view of an unclenched eyelet constructed in accordance with the present invention;

Fig. 3 is a plan view showing the eyelet, flange side up;

Fig. 4 is a vertical section of a terminal before being removed from between a set of clenching dies;

Fig. 5 is a vertical section viewed along an arc indicated by the line V—V of Fig. 4, and as seen looking in the direction of the arrows; and

Fig. 6 is an elevation illustrating the terminal secured to a binding post.

The wire terminal illustrated in Fig. 1 is fabricated in accordance with this invention by employing an eyelet such as shown in Figs. 2 and 3. While it is not a necessary feature of the present invention, it is preferable that the eyelet barrel **12** terminate, opposite the flange end, with a slight inward constriction or taper in order to facilitate the splitting and curling of the barrel during the upsetting operation, thus to provide a series of evenly distributed radial prong members **14** which are each clenched around the strands **16** of the conductor wire. The crown side of the eyelet flange **18** is sharply indented as shown in Fig. 3, to provide a circular series of grooves **20** each of which extends, not radially in a straight line, but diagonally across the annular flange in an arcuate path running outwardly from a throat portion **21** of the eyelet in a clockwise direction. Each of the grooves **20** progressively increases in depth and width from its inner or throat extremity toward the outer periphery of the flange. The other side of the flange, as shown in Fig. 2, is contoured to form the direct complement of the crown side, so that the indented grooves **20** on the crown side provide sharply defined arcuate ribs **22** upon the wire engaging side; adjacent ribs being spaced apart by a trough-like area **24** dimensionally corresponding to the areas of the nonindented portions upon the crown side.

In accordance with a feature of this invention, the diagonal ribs **22**, representing the direct complement of the above-described grooves **20**, extend outwardly from the throat portion **21** in counterclockwise arcuate paths as shown in Fig. 2. It may be seen from the illustrations that the direction of these ribs corresponds to the direction in which the free end of the wire **16** has been looped around the barrel or throat of the eyelet. Whether the ribs are inclined in a clockwise or a counterclockwise direction is, of course, immaterial to the successful practice of this invention provided the free end of the wire is always wrapped around the eyelet throat in the same

direction as that in which the ribs extend away from the throat. After thus wrapping the end of the wire about the barrel, the eyelet is upset and then clenched about the eye of the wire by placing the assembly between two relatively movable upsetting or clenching dies such as illustrated in Fig. 4. It is to be understood that in so placing the assembly the eyelet is impaled upon a tapered upstanding pilot pin **26**, with the flange end of the eyelet uppermost, so as to be engageable upon its crown side with a vertically movable setting tool **28**, which when lowered forces the eyelet downward thus progressively splitting the barrel **12** and forming the prongs **14** which are progressively forced downward into engagement with an upsetting anvil in the form of a concave shoulder **30** surrounding the base of the pin **26**. Continued relative movement of the tool dies causes the prongs first to be curled around the wire, then clenched under the crown of the eyelet flange. During this operation the compression forces distort the normal lay of the wire strands into partial conformity with the contour of the surrounding adjacent portions of the completely clenched eyelet. The manner in which the lay of the wire strands is displaced and indented by the structure of the ribs **20** is shown in Figs. 4 and 5.

When the terminal of Fig. 1 is connected to an electric binding post, as illustrated in Fig. 6, the tightening of the binding nut **32** further compresses the flange toward the prongs thereby increasing the diagonal bite of the ribs **20** upon the strands of wire.

From the foregoing description of the cooperative relationship between the structure of the ribs **22** and the wrapped end of the wire, it will be clear that the construction of the ribs is effectively designed to increase the frictional bite upon the strands whenever force is exerted upon the conductor tending to withdraw the strands by a movement or slipping of the wire in a direction opposite to the direction in which the free end is wrapped about the throat portion of the eyelet. This increased holding power is due to the fact that the slightest tendency toward a withdrawing movement of the wire from out the flange causes the ribs, which are as above described partially embedded within the strands, to plow the wire diagonally into a jammed condition against the wire engaging side of the eyelet throat.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A wire terminal comprising an eye formed by looping the free end of a wire in a given circular direction, and a clenched eyelet the throat of which is installed within the eye, the eyelet having a crowned flange and deflecting means on the wire engaging side of the flange for jamming the wire of the eye against the throat portion to thereby prevent the wire from being pulled free from the eyelet.

2. A wire terminal comprising an eye formed by looping the free end of a wire in a given circular direction, and a clenched eyelet the throat of which is installed within the eye, the eyelet having a crowned flange and a plurality of clenched prongs engaging and confining the eye of wire, the flange being provided with a circular series of wire engaging ribs each extending outwardly from the throat portion in arcuate paths diagonally inclined in the same direction in which the free end of the wire is looped.

3. A wire terminal comprising an eye formed by bending the free end of a wire in a given circular direction, and a clenched eyelet the throat of which is installed within the eye, the eyelet having a crowned flange and a plurality of clenched prongs engaging and confining the eye of the wire, the flange being provided with a series of wire gripping ribs each tangentially extending from the throat portion outward across the wire of the eye in the same circular direction in which the free end of the wire is bent.

4. A structure such as defined in claim 3 wherein each rib extends diagonally across the wire of the eye in a path outwardly curved toward the direction in which the wire is bent, and the ribs being partially embedded into said wire whereby, when the wire is pulled, the ribs will deflecting jam the wire inwardly against the throat portion to hold the wire against further movement.

5. An eyelet for making a wire terminal, the eyelet having a crowned flange and a central barrel portion, the flange being provided on its wire engaging side with a series of ribs extending from the juncture of the flange and barrel portions diagonally across the flange in arcuate paths.

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