DEVICE FOR CRIMPING CABLE CONNECTORS

Filed Dec. 2, 1950

2 Sheets-Sheet 2

FELIX M. ANTHONY
HARRY S. ANTHONY

ATTORNEY
This invention relates to devices for crimping cable connectors and particularly to a device for crimping connectors on cables that have been installed and therefore cannot be placed in a conventional crimping device mounted on a bench or the like.

The patent to Felix M. Anthony, No. 2,469,436, issued May 10, 1949, for a Device for Crimping Tubular Articles discloses a cable connector which comprises a metal tubular member into which the ends of two pieces of cable may be inserted and discloses a device by means of which the tubular member is crimped or pressed inwardly to form an inseparable connection between the cable ends in a manner which assures good conduction of electrical current through the cable. The device disclosed in this patent is, however, adapted to be secured to a bench so that the cable ends must be brought to the device and rolled or twisted during the formation of the crimp in the connecting member. There are many instances where a similar connection is required between cable ends where the cables have already been installed so that it is impossible to roll or twist them. Furthermore, in many cases the cable ends must be provided with a connecting lug secured thereto by crimping and only a short end of a cable projects from a junction box or switch panel. Consequently, it is desirable to have a crimping device that is portable and capable of operating on a cable without rotating the cable itself. It is, therefore, the object of the present invention to provide a portable device for crimping cable connectors comprising a vice-like member for holding the connector against rotation and a crimping device adapted to operate around the stationary cable for imparting a crimp in the tubular connecting member. Further and more specific objects and advantages of the invention are made apparent in the following specification wherein reference is made to the accompanying drawings illustrating a preferred form of the invention.

In the drawings:

Fig. 1 is a perspective view of the vice portion of a device for crimping cable connectors embodying the present invention;

Fig. 2 is a perspective view of the crimping portion of the same device;

Fig. 3 is a perspective view of two cable ends connected by a tubular member crimped with the device of the present invention;

Fig. 4 is a perspective view of a cable end having a lug secured thereto by crimping with the same device;

Fig. 5 is a plan view with the handle broken away of the vice member shown in Fig. 1;

Fig. 6 is a vertical sectional view through one of the vice elements on the vice member shown in Fig. 1;

Fig. 7 is a sectional view on the line VII—VII of Fig. 8 illustrating details of construction of the crimping member shown in Fig. 2;

Fig. 8 is a sectional view taken on the line VIII—VIII of Fig. 7; and

Fig. 9 is a sectional view taken on the line IX—IX of Fig. 8.

In Fig. 3 of the drawings, a tubular cable connector is illustrated at 10 as having cramped parts 11 by means of which it is firmly secured to the metallic core of a pair of cable ends 12 and 13. This cable connector 10 is applied to the ends of the cable as a simple cylinder or tube and the crimps are thereafter formed therein to secure it in place on the cable. Fig. 4 shows an end lug 14 having a cylindrical part 15 secured to a cable end as by a cramped portion 16. The device of the present invention is designed to form the crimps 11 and 16 in the tubular parts without rotating the cable as may be necessary where the cable has been installed before the end lug or the connectors are put in place. In order to accomplish this, the tubular cable connector or the end lug is held against rotation by the vice member illustrated in Fig. 1. This member comprises a pair of vices, generally indicated at 17, supported in spaced relation on a U-shaped bracket 18 from which extends a handle 19. The construction of the vices 17 is best illustrated in Figs. 5 and 6 wherein the U-shaped member 18 is shown as having spaced bars 20 and 21 extending from its upper spaced ends each of which supports a relatively stationary but adjustable vice jaw 22 and 23 respectively. As shown in Fig. 6, each of the vice jaws is loosely slidable on one of the members 20 and 21 and each jaw has a toothed part 23 engageable with serrations 24 formed on the topped edges of the bars 20 and 21. Each of the vices 17 has a movable jaw 25 shown at 25 and 26 respectively which are identical and, as illustrated in Fig. 6, the jaw 25 is slidable on top of the member 20 but held in a retracted position by a spring 27. The jaws 25 are guided for sliding movement between plates 28 and 29 secured to opposite sides of the members 20 and 21. The jaws may be advanced against the tension of the spring 27 by an eccentric cam shown at 30 in Fig. 6 as rotatable on a pin 31 supported between the plates 28 and 29 and each of the cams 30 is rotatable by a hand lever 32 formed as a part thereof. When the hand lever is raised from the position illustrated in Fig. 6, the jaw 25 is advanced toward the jaw 22. Since cable connectors come in various sizes, the jaw 22 will previously have been set to accommodate the size of connector to be crimped and as the handle 32 is raised, the jaw 25 will be advanced and the cable connector will be securely held against rotation between the vice jaws.

Either one or both of the vices may be used at a
time as the crimper is applied to the connector at a position between the jaws. For example, to form the two crimps 11, shown in Fig. 3, the connector may first be held centrally or adjacent outward between the jaws 22 and 25 while the left-hand crimper 11 is formed. By moving the vice member and clamping the connector between the jaws 23 and 26, the right hand crimper 11 may be formed. Other types of vice or holding members may be employed in place of those herein described. In fact a pair of pillars are sometimes employed in place of the vice unit where space is limited.

The crimping element of the device is illustrated in Figs. 2, 7, 8 and 9. This element comprises a crimping head, generally indicated at 40, a driving member 41 which surrounds the head and a lever 42 for actuating the driving member. The crimping head 40, as best shown in Figs. 7, 8, and 9, comprises a substantially annular housing 43 with a central opening and with a radial slot 44 communicating with said opening. Within the housing 43 are a pair of supporting rollers 45 and 46 journaled on shafts 47 and 48, respectively, the roller 46 preferably having a knurled surface. Opposed to the rollers 45 and 46 is a crimper roller 41 rotatable on a pin 48 extending through a lever 49. In order to support the roller 47 in the central cutaway portion of the lever as best illustrated in Fig. 8, the lever is supported for swinging movement about a pin 50 and normally urged to swing outwardly or away from the rollers 45 and 46 by a spring indicated at 51. A jack screw 52 is threaded through a boss 53 in the housing 43 and upon being advanced inwardly, engages and urges the lever 49 and the crimper roller 41 inwardly or toward the rollers 45 and 46. The jack screw 52 is rotatable by a handle 54 pivotally secured to its upper end as by a pin 55 and this handle has a squared and beveled end 56 engageable by a spring pressed detent 57 to retain it either in the position shown or in any other position where the detent engages one of the flat portions of its end. Consequently when a tubular member to be crimped is held in either one or the other of the vice jaws as previously described, the crimper head is placed over the tubular member and with the jack screw tightened until the crimper roller 47 presses the member against the rollers 45 and 46, the head is rotated and each time a complete rotation is made, the jack screw is tightened until a crimp of the desired depth is formed. In order to rotate the crimping head, it is provided with a plurality of equally spaced ratchet teeth 60, see Figs. 8 and 9, which project radially from its outer periphery and the advancing member 41 which is substantially annular and of U-shaped cross section encloses these teeth and carries a pair of pivoted pawls 61 urged into engagement with the teeth by springs such as shown at 62. Spacers 63 serve to hold the sides of the driving member in properly spaced relationship.

With the structure shown, oscillating movement of the handle 42 will effect rotation of the crimping head as desired.

In operation, the vice member is first brought into position to engage and clamp the tubular member to be crimped. When the part is firmly held in the vice member, the crimper element with the open part of the crimping head registering with the open part in the advancing member, as shown in Figs. 2, 7 and 9, is placed over the tubular member and the jack screw is tightened by means of the lever 54. Now by alternate oscillating of the handle 42 and tightening of the jack screw, a crimp of any desired depth will be formed in the tubular member. Because of the fact that there are two pawls 61 engageable with the teeth 60 on the crimping head, either one or the other of the pawls will act to advance the crimping head when the other occupies the space in the crimping head through which the tubular member is inserted.

With the device of the present invention, a cable end which protects but may be covered with a wall or junction box may have a connecting member or a lug applied and crimped thereto as it is unnecessary with the present device to rotate the cable or to lead it to the vicinity of the conventional bench tool. Furthermore the crimping device may be made sufficiently small and light to be carried in a workman's pocket.

We claim:

1. A device for crimping tubular articles which comprises an annular housing with a radial opening to admit an article to its center, rollers carried by the housing to engage and crimp an article, a lever pivoted in the housing and carrying one of said rollers at its free end for movement to and away from the article, a jack screw extending through the outer periphery of the housing and engaging said lever within the housing to urge said roller inwardly, ratchet teeth extending outwardly from the periphery of the housing, and means to rotate the housing including an annular member with a radial opening and pawl means carried thereby for engagement with said ratchet teeth, said jack screw and said ratchet teeth being disposed adjacent opposite faces of the housing to permit operation of the housing rotating means without interference between said annular member and the jack screw.

2. A device for crimping tubular articles which comprises an annular housing with a radial opening to admit an article to its center, rollers carried by the housing to engage and crimp an article, means supporting one of said rollers for movement toward the article, a jack screw extending through the outer periphery of the housing and engaging said roller supporting means within the housing to urge said roller inwardly toward crimping engagement with said article, ratchet teeth extending outwardly from the periphery of the housing, and means to rotate the housing including an annular member with a radial opening and pawl means carried thereby for engagement with said ratchet teeth, said jack screw and said ratchet teeth being disposed adjacent opposite faces of the housing to permit operation of the housing rotating means without interference between said annular member and the jack screw.

FELIX M. ANTHONY.
HARRY S. ANTHONY.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>827,800</td>
<td>Haas et al.</td>
<td>Aug. 7, 1906</td>
</tr>
<tr>
<td>854,869</td>
<td>Brinkman</td>
<td>May 28, 1907</td>
</tr>
<tr>
<td>1,000,185</td>
<td>Hitt</td>
<td>Apr. 29, 1913</td>
</tr>
<tr>
<td>1,178,347</td>
<td>Ratigan</td>
<td>Apr. 4, 1916</td>
</tr>
<tr>
<td>1,499,515</td>
<td>Berthold</td>
<td>May 18, 1924</td>
</tr>
<tr>
<td>1,619,094</td>
<td>Ferguson</td>
<td>Mar. 1, 1927</td>
</tr>
<tr>
<td>2,079,498</td>
<td>Douglas</td>
<td>May 4, 1937</td>
</tr>
<tr>
<td>2,235,516</td>
<td>Ice</td>
<td>Mar. 18, 1941</td>
</tr>
<tr>
<td>2,377,406</td>
<td>Dedrick</td>
<td>June 5, 1945</td>
</tr>
</tbody>
</table>
