

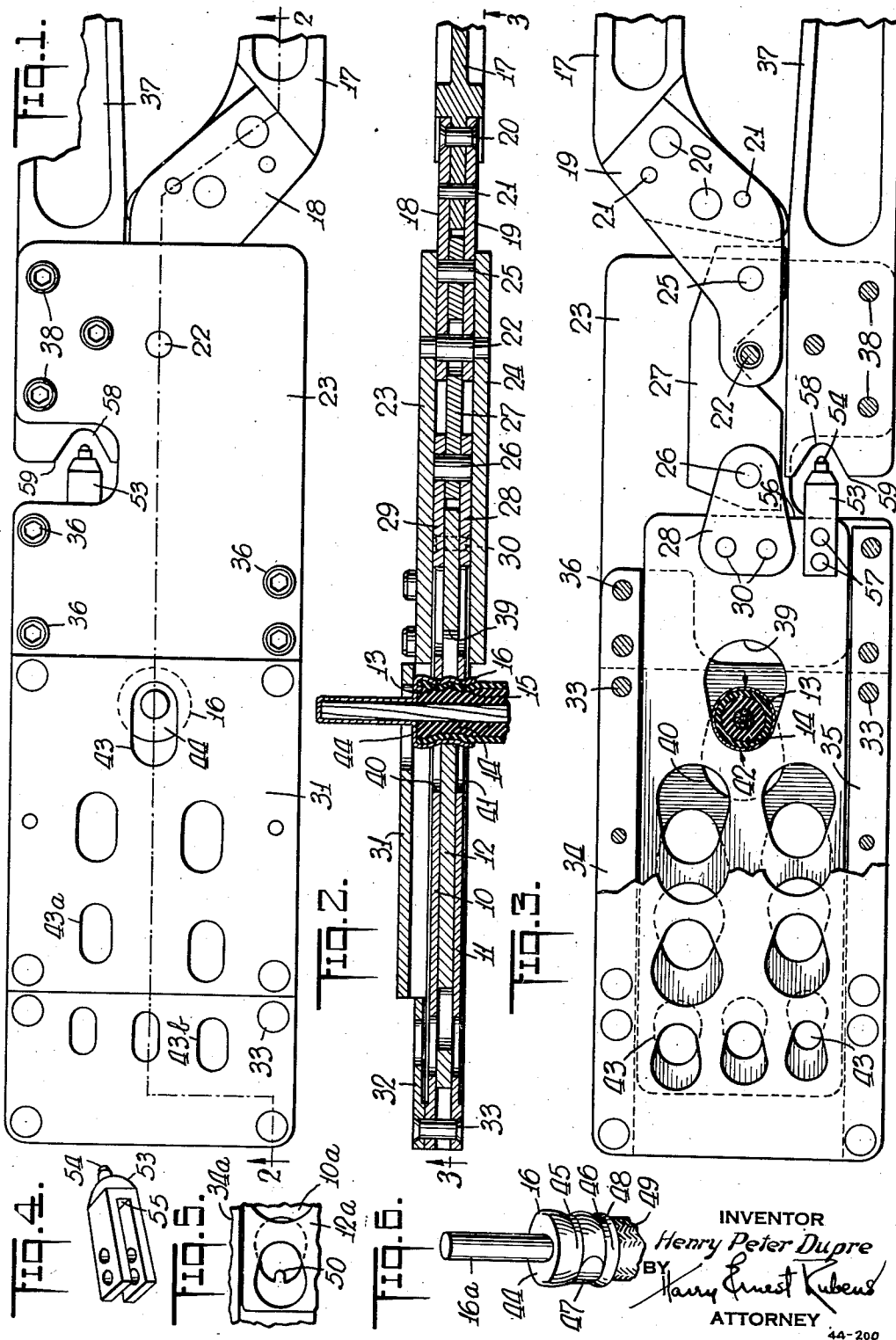
Dec. 28, 1948.

H. P. DUPRE

2,457,538

CRIMPING TOOL

Filed Nov. 11, 1944



UNITED STATES PATENT OFFICE

2,457,538

CRIMPING TOOL

Henry Peter Dupre, New York, N. Y., assignor to
Burndy Engineering Company, Inc., a corporation
of New York

Application November 11, 1944, Serial No. 563,029

4 Claims. (Cl. 153-1)

1.

My invention relates to a crimping tool for attaching an end-fitting to a cable or hose.

The primary object of my invention is to provide a tool for compressing the shroud of a connector over the insulation of an electric cable to form a water-tight joint capable of withstanding the high pressures encountered in marine installations.

Other objects are to provide a tool of the foregoing character capable of handling a wide variety of connector diameters; to provide a crimping tool that will not extrude the cable end during the crimping operation; that provides a plurality of semi-circumferential indentations of relatively narrow width about the connector; to provide in combination with the crimping element, means for indenting the main body of the connector to the metal of the cable; and to provide broadly, a type of semi-cylindrical indentation on the opposite sides of a cylindrically shaped body that is offset, one from the other.

I accomplish these and other objects and obtain my new results as will be apparent from the device described in the following specification, particularly pointed out in the claims, and illustrated in the accompanying drawing in which:

Fig. 1 is a rear view of my crimping tool with only a portion of the hand levers shown.

Fig. 2 is a longitudinal sectional view taken along the lines 2-2 of Fig. 1.

Fig. 3 is a front view of the tool with the front plate partially removed to show the inner arrangement of parts.

Fig. 4 is a perspective view of the indenting die.

Fig. 5 is a fragmental view of a sliding plate aperture provided with an indenting tooth.

Fig. 6 is a perspective view of a cable-end sleeve crimped to the insulation of a cable by my tool.

In the drawings, my invention consists of a pair of outer plates 10 and 11, held fixedly in position while a third sliding plate 12 supported between plates 10 and 11 is moved longitudinally of the fixed plates. A series of aligned apertures 13, 14 and 15 in the three plates supports the connector 16 to be crimped therein. The crimping action is caused by a movement of the movable plate 12 which restricts the effective aperture openings; as plate 12 is shifted with respect to plates 10 and 11.

The plate 12 is connected to a lever arm 17 by a link action as is shown in Fig. 3. A pair of lever plates 18 and 19 are secured to lever arm 17 by rivets 20 and dowel pins 21. A fulcrum pin 22 pivotally supports the lever plates 18 and 19

2

to lower cover plates 23 and 24. Link pins 25 and 26 permit the link 27 to transfer the movement of the lever arm 17 to the braces 28 and 29, which in turn are secured to the sliding plate 12 by link pins 30.

A stop plate 31 is positioned a predetermined distance from the back of the outer plate 10 to support in proper position certain of the large size connectors 16; during the crimping operation. Supplemental stop plate 32 is positioned closer to the outer plate for smaller size connectors.

A series of rivets 33 positioned around the longitudinal edges of the plates 10 and 11, and stop plates 31 and 32, lock the aforesaid elements in position. Spacers 34 and 35 of slightly greater thickness than sliding plate 12, are positioned between plates 10 and 11, along the longitudinal edges to provide sufficient space for a free movement of the sliding plate 12 during the operation of the tool.

The cover plates 23 and 24 are secured to each other, through spacers 34 and 35, by cap screws 36.

The assembly is completed by the lever arm 37 which is made integral with the outer plates 10 and 11 by the cap screws 38.

The series of apertures, 13, 14 and 15, in plates 10, 12 and 11 respectively, are substantially egg-shape in character with widest portion 39 of the aperture 14 in the sliding plate 12, oppositely positioned with respect to the widest portions 40 and 41 of plates 10 and 11 respectively.

In the non-crimping position of the plates, 35 the enlarged or widest portions 39, 40 and 41 are aligned to each other to provide the maximum opening for the connector. When the lever 17 is moved to the position shown, the narrowest portions of the apertures indicated by the arrows designated as 42 are cammed into position about the shroud of connector 16 and reduce it to the desired shape. The oval shaped apertures give the connector body a substantially circumferential compression which has been found, produces a seal of connector and insulation sufficient to withstand the high pressures encountered in marine installations.

Groups of apertures of various sizes, provide suitable compression means for the various sizes of connectors used.

The outer plates 10 and 11, may be made thinner than the central sliding plate 12. When the face 44 of the connector 16 is positioned against the stop plate 31, as illustrated in Fig. 2, the compression marks or grooves illustrated in Fig.

3

6, are formed when the lever 17 is manipulated to the position shown in Fig. 1. Plate 10 and 11 causes the semi-cylindrical grooves 45 and 46, and sliding plate 12 causes the wider groove 47. The thin groove positioned near the edge 48 of the connector 16, causes the insulation 49 to be forced towards the inside of the connector, and adds to the effectiveness of the seal. To prevent longitudinal bending of the connector body, the two outer plates should be spaced as close as possible to the intermediate plate.

Where a single indentation of the pointed type is desired, the smallest diameter of the aperture in the sliding plate may be provided with a tooth 50, as shown in Fig. 5. The indentation of this type may be used to indent a connector body 16, to an electric cable.

This general type of indentation may also be made by utilizing a portion of the device for that purpose as shown in Fig. 3. Here a die 53 having a suitable indenting tip 54, is provided with a slot 55, into which is inserted the edge 56 of sliding plate 12. Cap screws 57 lock the die 53 to the plate 12. A groove 58 is provided in the end 59 of the lever arm 37, for receiving the connector to be indented. When the sliding plate 12 carrying the die 53, is moved by reason of the operation of lever arm 17, any connector of suitable size, positioned in groove 58 will be indented thereby.

The resulting indentations are characterized by a pair of semi-cylindrically shaped grooves spaced apart a distance substantially equal to the width of the offset groove positioned on the reverse side of the connector body. The crimping operation may be repeated by rotating the connector body 180° in the plate apertures resulting in a triple ring of circumferential grooving which adds to the effectiveness of the seal.

The stationary plates may be increased with the intermediate plates positioned in between, to form a series of grooves on both sides of the connector.

The invention is applicable to all types of sleeve installation. The elongated holes 43, 43a, 43b, permit the connector stem 16a to be longitudinally moved therein, as the crimping action takes place.

For purposes of definition, by the use of the phrase "complementary working surfaces" is meant that portion of the intermediate plate and those portions of the adjacent plates which engage the article to bring about the forming operation. Similarly, by the words "working position" is meant the position of the complementary working surfaces at the moment the article is engaged by them.

I have thus described my invention, but I desire it understood that it is not confined to the particular forms or uses shown and described, the same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of my invention, and, therefore, I claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claims, and by means of which, objects of my invention are attained and new results accomplished, as it is obvious that the particular embodiments herein shown and described are only some of the many that can be employed to attain these objects and accomplish these results.

I claim:

1. A tool for reforming the shapes of articles comprising a plurality of plates, at least one of

4

said plates being intermediately positioned between two co-acting plates all of said plates being spaced immediately adjacent each other to prevent bending the article axially; means for moving the intermediate and the adjacent plates in a predetermined linear direction with respect to each other, during the reforming of the shapes of the articles and alternately returning the plates to their original positions each of said plates containing a plurality of cut-out sections arranged non-transversely to the direction of motion, each one of the cut-out sections in the intermediate plate being transversely aligned in position with respect to a cut-out section in each of the adjacent plates in their original positions to permit the article to be inserted transversely therethrough, at least one of said cut-out sections in each transverse aligned sections provided with a working die surface for reforming the shape of the article when the intermediate and adjacent plates are moved with respect to each other.

2. A tool for reforming the shapes of articles comprising a plurality of plates, at least one of said plates being intermediately positioned between two co-acting plates all of said plates being spaced immediately adjacent each other to prevent bending the article axially; means for moving the intermediate and the adjacent plates in a predetermined linear direction with respect to each other during the reforming of the shapes of the articles and alternately returning the plates to their original positions, each of said plates containing a hole, said three holes being arranged transversely to each other to permit the article to be inserted transversely through the three holes, at least one of said holes provided with a working die surface for reforming the shape of the article when the intermediate and adjacent plates are linearly moved with respect to each other.

3. The tool of claim 2 wherein the holes are oval-shaped, the widest portion of the transversely positioned holes in each plate being normally aligned with respect to each other and the narrowest portions of the holes being opposite each other when the intermediate and adjacent plates are moved with respect to each other.

4. A tool for reforming the shapes of articles comprising a plurality of plates, at least one of said plates being intermediately positioned between two co-acting plates all of said plates being spaced immediately adjacent each other to prevent bending the article axially; means for moving the intermediate and the adjacent plates in a predetermined linear direction with respect to each other during the reforming of the shapes of the articles, and alternately returning the plates to their original positions, each of said plates containing a cut-out section, said cut-out sections being transversely aligned in position with respect to each other, to permit the article to be inserted transversely therethrough, at least one of said cut-out sections provided with a working die surface for reforming the shape of the article when the intermediate and adjacent plates are moved with respect to each other, said means for moving the intermediate and the adjacent plates with respect to each other subjecting not less than one of the plates to a tensional force and thereby pulling said plate with its working die surface towards the working die surface of the other plates.

HENRY PETER DUPRE.

(References on following page)

2,457,538

5

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date	
24,689	Worthen et al. _____	July 5, 1859	
279,020	Ritchie _____	June 5, 1883	
540,009	Wick, Jr. _____	May 28, 1895	
568,386	Van Arsdale _____	Sept. 29, 1896	10
645,022	Smith _____	Mar. 6, 1900	
810,241	Wikstrom _____	Jan. 16, 1906	
951,630	Cooley _____	Mar. 8, 1910	
1,078,751	Rogers _____	Nov. 18, 1913	
1,264,854	Possons _____	Apr. 30, 1918	15

Number
1,620,260
1,627,307
1,761,521
1,858,418
2,002,502
2,158,855
2,231,278
2,359,084

Number
83,552
492,071

6

Name	Date
Kellogg _____	Mar. 8, 1927
Bernard _____	May 3, 1927
Eastman _____	June 3, 1930
Rowley _____	May 17, 1932
Douglas _____	May 28, 1935
Eby et al. _____	May 16, 1939
Miller _____	Feb. 11, 1941
Carlson _____	Sept. 26, 1944

FOREIGN PATENTS

Country	Date
Sweden _____	May 1, 1920
Great Britain _____	Sept. 14, 1938