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MACHINE FOR CRIMPING THE ARMS OF AN ELECTRICAL TERMINAL ABOUT AN ELECTRICAL CONDUCTOR

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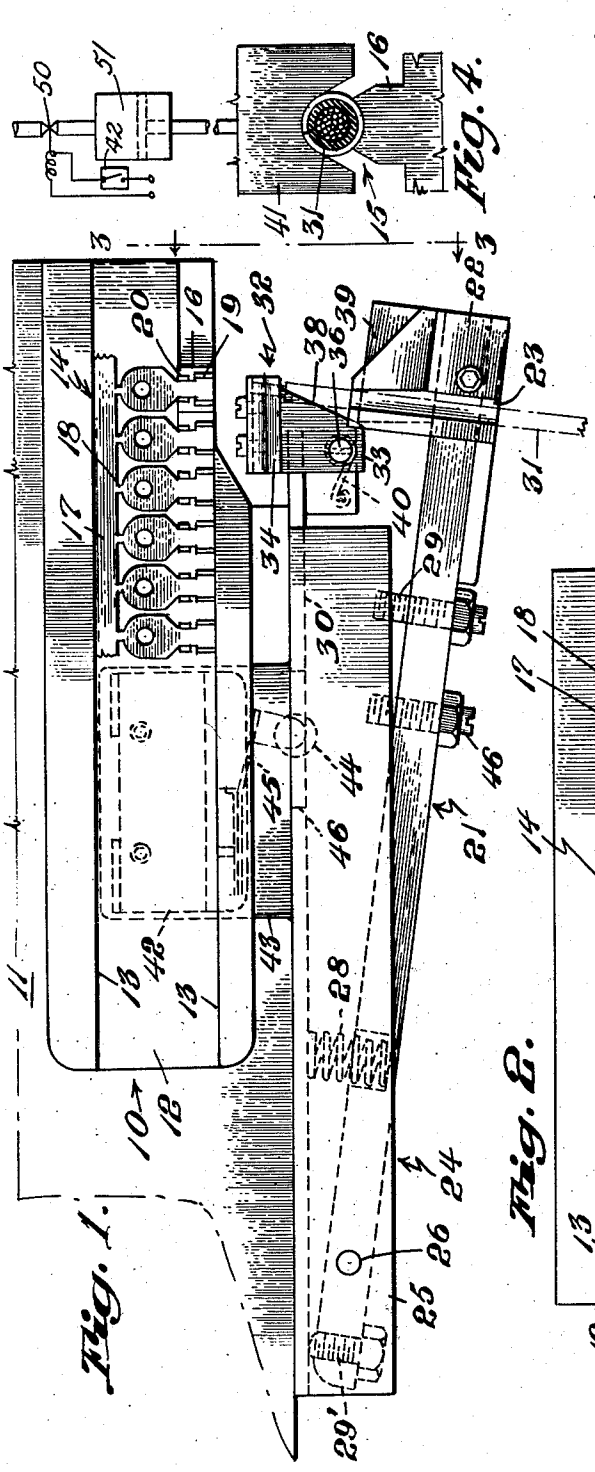


Fig. 1.

Fig. 4.

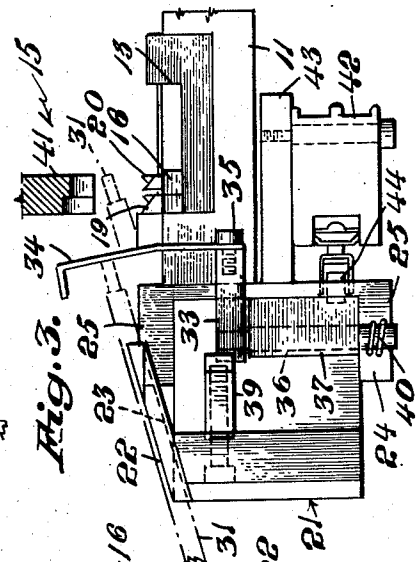


Fig. 3.

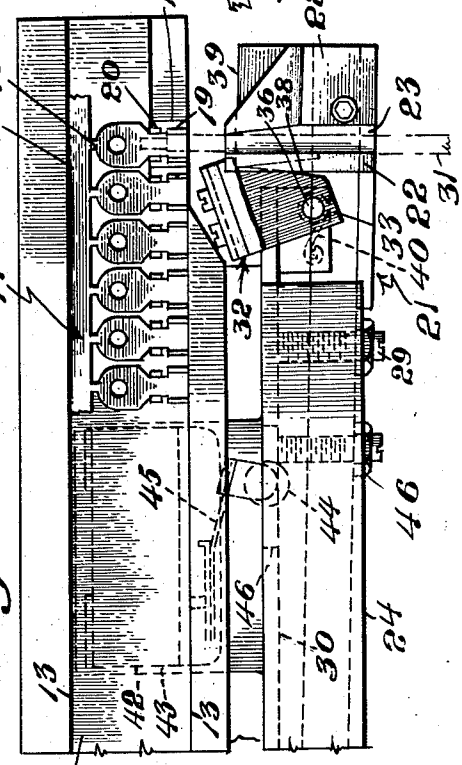


Fig. 2.

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MACHINE FOR CRIMPING THE ARMS OF AN ELECTRICAL TERMINAL ABOUT AN ELECTRICAL CONDUCTOR

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2 Claims. (Cl. 153—1)

The invention relates to a machine for crimping the arms of an electrical terminal about an electrical conductor.

An object of the invention is to provide a machine of the above character with an electrical conductor positioning means whereby the operator may accurately position and advance an electrical conductor in proper relation to the arms of the terminal to which the conductor is to be attached.

A more specific object of the invention is to provide a machine of the above character with a swingable lever which will operate to carry an electrical conductor in proper register with the electrical terminal to which the conductor is to be attached and also to actuate the means for setting the machine in motion to perform a crimping operation.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a top plan view of a fragmentary portion of a machine embodying my invention for crimping the arms of an electrical terminal about an electrical conductor;

Figure 2 is a similar view of a lesser portion than shown in Figure 1 and showing certain elements thereof in different relation;

Figure 3 is an end view looking towards the machine in the direction of the arrows on line 3—3 of Figure 1 with the view revolved clockwise 90°; and

Figure 4 is a fragmentary portion of the rolling tools drawn to an enlarged scale and showing the arms of a terminal crimped about an electrical conductor shown in section.

The invention in general comprises a swingable arm or lever in which a groove is formed for receiving the end portion of an electrical conductor that is carried by the lever to a position between the arms of a terminal. To assure the accurate position of the conductor relative to the arms of the terminal, a gauge is provided against which the extreme end of the conductor engages to properly position the same into said groove whereby the portion of the conductor free of insulation will be correctly positioned with relation to the arms of the terminal.

Referring to the drawing for a more detailed description of the invention, **10** designates generally a machine which is adapted for crimping the arms of an electrical terminal about the end portion of a wire electrical conductor. Only so much of the machine is shown as is believed necessary for an understanding of the present invention. The machine comprises a base or support **11** on which there is mounted a feed trough **12** having sides **13** between which the electrical terminals **14** are slidably advanced in position to be acted upon by forming dies or rolling tools, as they are known in the trade,

which are designated generally **15** (see Figure 4). The terminals **14** are advanced by known feed mechanism (not shown) to position the leading terminal in register with the lower die or anvil **16** and are made in strip form wherein each terminal in the present instance is connected to a marginal edge portion **17** of the parent stock by a narrow neck **18** which is severed during the operation of crimping the pairs of arms **19, 20** of the terminal about the electrical conductor.

Heretofore, the operator manually placed a prepared electric conductor between the arms of the terminal advanced to the position to receive the said conductor, thereafter the machine being set in motion for the crimping operation. The proper manual positioning of the conductor between the said arms depended entirely on the skill of the operator and thus determined the speed of operation of the machine. In accordance with the present invention, I provide a conductor positioning means or carrier in the form of a rockable arm or lever designated generally **21** which is provided at one end portion with an upper inclined side **22** (see Figure 3) in which there is formed a conductor receiving groove **23**. A channel like member **24** (Figures 1 and 2) is securely fastened to the front side of support **11** in any appropriate manner (not shown) with its opposite walls **25** extending outwardly. The lever **21** extends between the walls **25** and is pivotally attached thereto as at **26** (Figure 1) for rocking movement toward the anvil **16** against the action of a compression spring **28**. The inward movement of the lever is controlled by an adjustable stop **29** which is adapted to engage against the wall **30** of the channel. An adjustable stop **29'** carried at the opposite end portion of the lever is adapted to engage the wall **30** to limit the outward swing of the lever under urge of spring **28**. It will be apparent that a conductor **31** positioned and held in the groove **22** may be carried to a position in register with the dies **15** as the lever **21** is manually swung inwardly. Upon release of the lever, the same will return to the outward position thereof under urge of spring **28**.

In order to properly relate the conductor **31** in the groove **23**, a gauge **32** is provided which comprises a generally flat body **33** (see Figure 3) having a sheet metal plate **34** fastened thereto, by means of screws **35**, so as to extend upwardly therefrom at generally right angles opposite to the said groove **23** and spaced a predetermined distance therefrom. The body **33** is fastened to a vertical shaft **36** which is journaled for rotation in a bearing block **37** (Figure 3) attached to wall **30** and has an inclined side edge which forms a cam surface **38** (see Figures 1 and 2). A block **39** projects inwardly from the lever **21** into engagement with the said surface **38** and during the inward swing of the lever will swing the gauge **32** in a counter-clockwise direction (see Figure 2) out of its path of movement against the urge of a torsion spring **40**.

From the above description it will be apparent that the operator may position and hold the prepared wire conductor **31** in the groove **23** with the end of the conductor against the plate **34** (see Figure 3), then by swinging the lever **21** inwardly to its limit (see Figure 2) the conductor will be carried in proper position in register between the anvil **16** and the plunger **41** of the dies **15** and between the arms **19, 20** of the terminal ready for the crimping operation of the machine (see Figure 4). Thus, it will be clearly apparent that the skill required of an operator is materially reduced.

In the present disclosure the crimping operation of the machine is initiated by means of a micro-switch **42** which may be positioned in an electric circuit controlling the operation of the plunger **41** and a feed mech-

anism for the terminals. For example the mechanism may be similar to that shown in my Patent No. 2,494,-137 wherein the plunger control valve is a solenoid valve **50** that controls the admission of air to a piston **51** and the feed mechanism is a pivoted dog as shown in said patent. The switch **42** is mounted on a bracket **43** extending from the rear side of the channel **24** and the roller **44** of its operating arm **45** extends opposite to an opening **46** in the wall **30** to be engaged by an adjustable member **46** carried by the lever **21**. At near the inward movement of the said lever, the member **46** will engage the roller **44** (see Figure 2) to move the arm **45** to close the switch contacts in the usual manner, which will set the machine in motion by opening valve **50** to perform a crimping operation and a feed action of the terminal (not shown).

In the operation of the machine, the operator positions and holds a prepared conductor **31** in proper position in the groove **23**, then pushes the lever forward which carries the conductor end in register between the rolling tools. At near the forward swing of the lever the member **46** engages roller **44** to close the switch **42** to set the machine in motion for a crimping operation. The plunger **41** lowers and engages the conductor end to push the same between the arms **19**, **20** in position to have the said arms folded over the same during the engagement of the plunger therewith in the crimping operation. Upon release of the lever **21**, the same will return to the outward position under urge of spring **28**, the switch **42** returning to open position, completing the crimping operation of the machine.

I claim:

1. In a machine for crimping the arms of an electrical terminal about an electrical conductor and having a pair of dies operable to engage and bend said arms about the said conductor, a feed trough on which the electrical terminal is advanced in register with said dies, a carrier for said electrical conductor having a groove

in which said conductor is received, said carrier being movable to position the conductor held in said groove in register between the arms of said terminal during the crimping operation of the machine, and a gauge against which the end extremity of the conductor is engaged located between the terminals and the carrier and in line with said groove to correctly position the same in said groove, said gauge being rockably mounted and having an eccentrical surface thereon, adapted to be engaged by said carrier to move said gauge out of the path of travel of said carrier.

2. In a machine for crimping the arms of an electrical terminal about an electrical conductor and having a pair of reciprocating dies between which said terminal may be positioned and operable to engage and bend the arms of the terminal positioned in register with said dies, a die actuator, means in circuit with said actuator to control the operation thereof, a pivoted lever having a groove for receiving the said conductor therein and manually movably toward said dies to position said conductor between and in register with the said arms of a terminal positioned between said dies, a gauge against which the end extremity of the conductor is engaged located between the dies and said lever and in line with said groove, said gauge being rockably mounted and having a surface adapted to be engaged by said lever, said lever engaging said gauge to rock it out of the path of travel of a conductor in said groove, said lever near the end of the feed stroke thereof engaging said actuator to operate said dies and perform a crimping operation.

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