

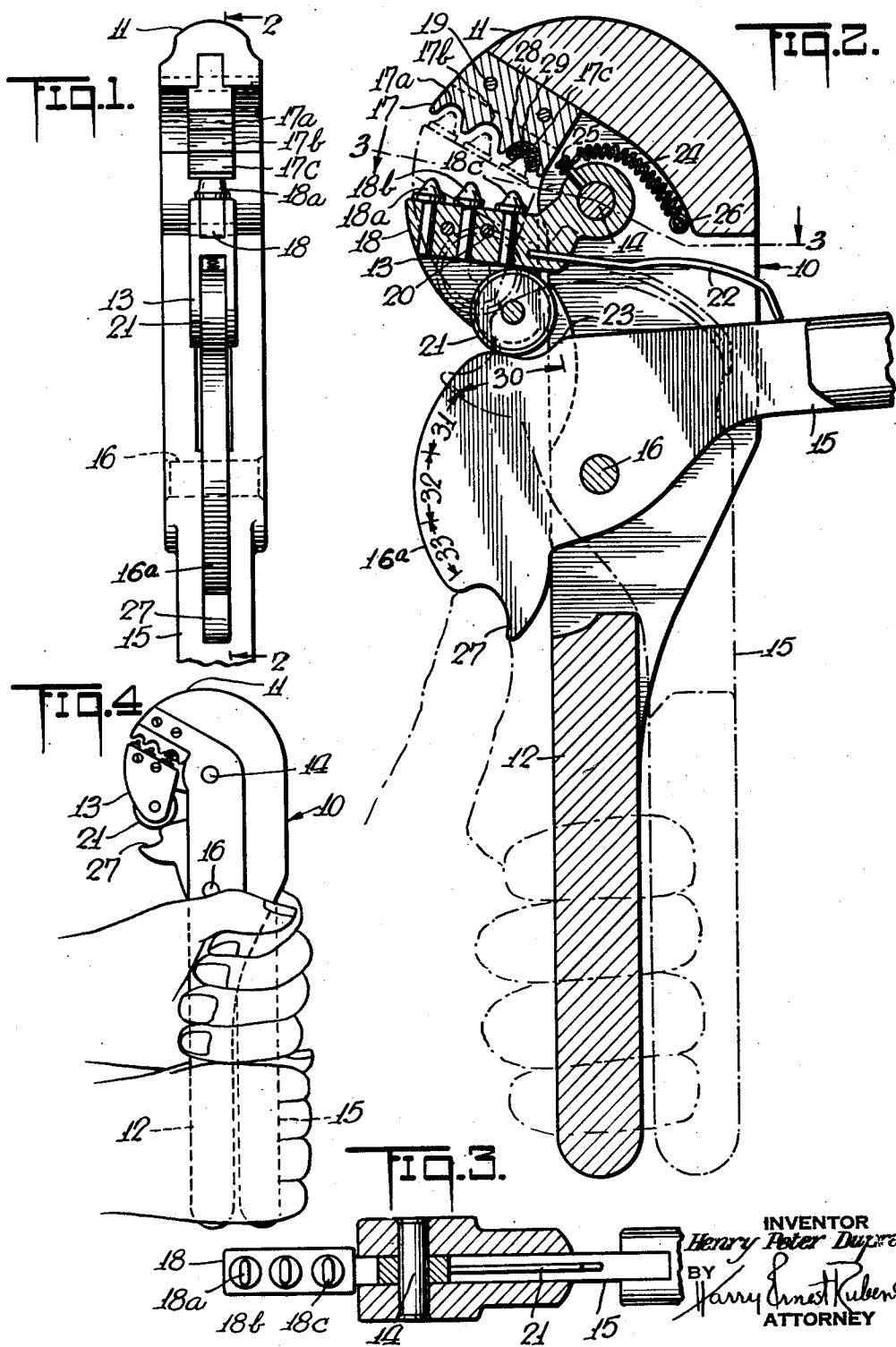
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CAM ACTUATED CRIMPING PLIERS

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CAM ACTUATED CRIMPING PLIERS

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My invention relates to cam actuated tools, and particularly to such a tool for crimping or indenting electrical connectors.

In the past, the only tool available for such purpose has been the standard fulcrum type tool, employing single or multiple fulcrums. Sometimes these tools have been supplied with a link mechanism attached to the handles permitting a variable mechanical advantage. The control was entirely dependent on the link length, which does not change the characteristic shape of the mechanical advantage curve.

I have adapted a cam actuated tool hitherto employed for other purposes, for indenting electrical connectors. I have discovered that the curve of force needed for indentation purposes may be obtained from a suitably shaped cam.

Accordingly the principal object of my invention consists in providing a compressing tool having a cam operated jaw, the cam being shaped so as to closely conform to the variable forces required to start, continue and complete the indentation of an electrical terminal to a conductor.

Other objects are to provide a hand operated compression tool wherein the position of the tool handles, at the time when the maximum applied pressures should be of the highest order, will permit the operator's fingers to span both handles enabling the maximum pressures to be applied; to provide a tool having a movable jaw which can be maintained in open position by the same hand that supports the tool allowing the other hand to be freed to position the connector; to provide such a tool having a movable jaw which will automatically grip the positioned work when the jaw is manually released; to provide means adapted to keep the jaws in open position when the tool handles are opened; to provide spring means which will close the jaws when the pressure holding the handles apart is released; and to provide an arrangement of parts which will permit maximum accessibility of the head of the tool in restricted areas.

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 partial front elevational view of the opened tool.

Fig. 2 is a longitudinally sectional view of the tool taken in the plane 2-2 of Fig. 1.

Fig. 3 is a transversely sectioned view taken in the plane 3-3 in Figure 2.

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Fig. 4 is a side elevation view of the tool in final closed position, the handles being grasped by both hands of the operator.

Referring more particularly to the drawing my tool shows in portable form a body member 10 having a fixed jaw 11 at one end with an extending handle 12 at the other, and a movable jaw 13 pivoted to the body at 14 and a movable lever 15 pivoted to the body at 16, having a cam 16a at one end for actuating the jaw.

The fixed and movable jaws 11 and 13 are provided with complementary working members 17 and 18 respectively which are detachably affixed to the jaws by screws 19 and 20.

A roller 21 is mounted to the movable jaw 13 which rides on the cam 16a, and from one side of the jaw an opening member 22 extends, which may be a spring, and rides over a ridge 23 at the end of the cam when the lever 15 is opened. Thus the jaw is forced to open position against the action of closing spring 24 one end of which is secured to the jaw by pin 25, the other being secured to the body by pin 26.

A finger hold 27 projects from the lever 15 to enable the thumb of the hand supporting the tool to hold the lever 15 in open position against the action of closing spring 24, the jaw 13 thus being maintained in opened position through opening spring 22. The free hand may then be used to insert a connector 28 applied to a conductor 29 to one of the grooves such as 17c of the working member, after which the thumb is freed from the finger hold 27 enabling the movable jaw to clamp and hold the connector so that both hands may be used to operate the tool.

The cam is designed to enable the maximum pressures to be applied when needed. This occurs when the indenting tooth 18c has collapsed the connector wall and the conductor is being extruded into indented position. At that moment the lever 15 is positioned near the handle 12 so that the fingers of both hands can be used to span both handles in which position the maximum pressures can be manually applied as shown in Fig. 4.

The cam is provided with four surfaces running smoothly into each other. One is the curved section 30 which permits the roller to recede opening the jaw to maximum width. Another surface 31 which causes the jaw to be closed when the thumb frees the lever 15. A third is surface 32 which causes the handles to move to finger spanning position while the indenter 18c collapses the connector wall and starts the indenting operation and lastly the

full indenting surface 33 where the mechanical advantage is greatest and the spanned fingers can apply the greatest force.

Three working positions are shown, namely grooves 17a, 17b and 17c with complementary indentors 18a, 18b and 18c. The largest size connector is positioned nearest the jaw pivot 14, to permit maximum pressures to be applied. It is apparent that any type of working surfaces may be employed.

I am thus able by opening the tool fully to automatically open the movable jaw, holding it open by the same hand which supports the tool. The jaws are then closed by simply releasing the finger hold; the levers closing until the indenter clamps the connector. The lever is then used to collapse the connector, the spanned fingers being next employed to apply the full indenting pressure.

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 body member having a fixed jaw at one end, and a supporting structure for enabling the tool to be held in position; a lever having a handle portion pivotally mounted with respect to the body member; a movable jaw in opposing relation to said fixed jaw pivotally mounted with respect to the body member; said lever and movable jaw being provided with a cam and a follower for closing said movable jaw upon the movement of said lever; spring biased means

for urging the lever and movable jaw to closed position, said lever having a finger hold portion at one end thereof for enabling the body member to be held with one hand with one finger in the hold to keep said lever open against the action of the spring biased means.

2. A body member having a fixed jaw at one end, and a supporting structure for enabling the tool to be held in position; a lever having a handle portion pivotally mounted with respect to the body member; a movable jaw in opposing relation to said fixed jaw pivotally mounted with respect to the body member; said lever and movable jaw being provided with a cam and a follower for closing said movable jaw upon the movement of said lever; and a spring, one end of which is secured to the movable jaw and the other end to the body member for urging the movable jaw into closed position in all positions of the lever; said movable jaw provided with an extending arm for engaging the lever in open position to open the movable jaw against the action of the spring.

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