Jan. 14, 1930. R. M. MARTENS 1,743,826

TOOL FOR MILLING INSULATED WIRES

Filed March 28, 1929

Fig. 1.

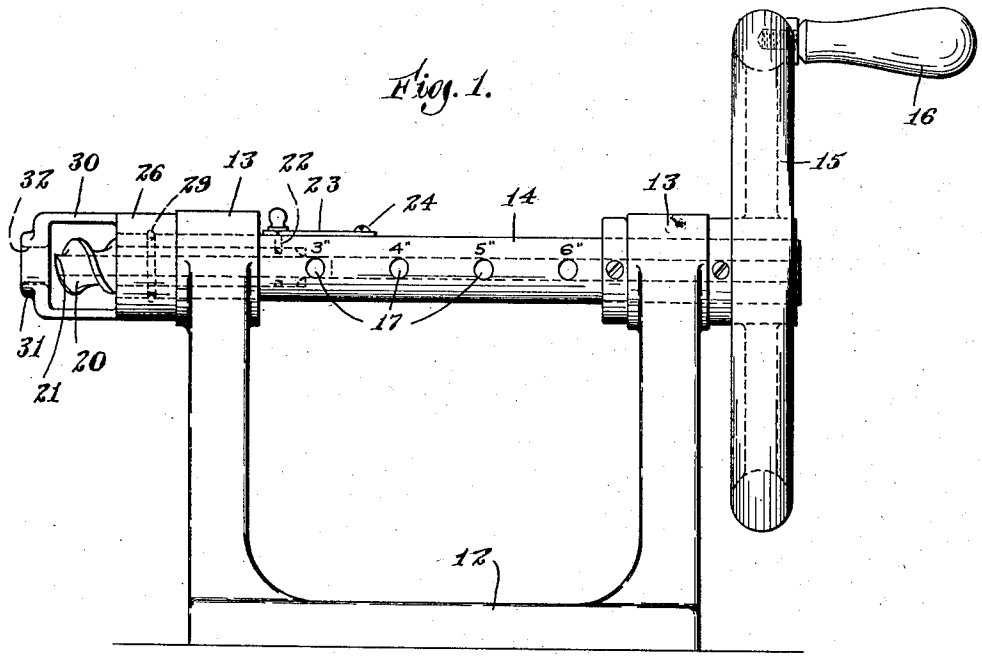


Fig. 2.

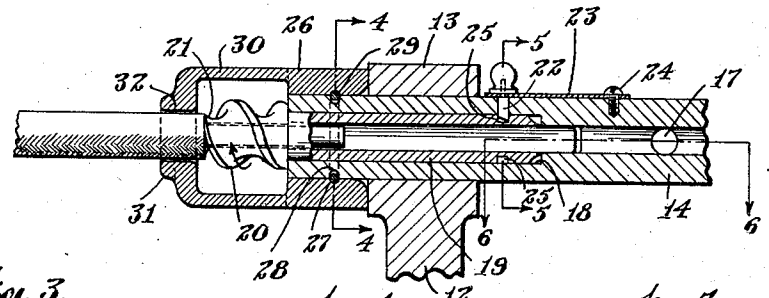


Fig. 3.

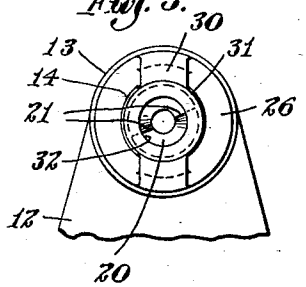


Fig. 4.

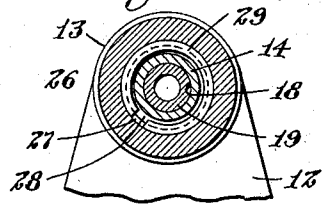


Fig. 5.

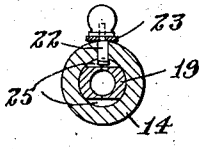
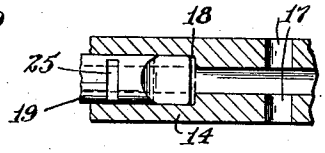


Fig. 6.



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UNITED STATES PATENT OFFICE

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TOOL FOR MILLING INSULATED WIRES

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This invention relates to means for preparing insulated wire for making connections such as splicing to other wires, or to binding posts of electric devices, or wherever conducting connections are to be made, and the invention has particular reference to means for milling away from the end of an insulated electric wire as much of the insulation as may be desired or is necessary in order to bare any length of the wire required.

The method heretofore most commonly employed to remove some of the insulation from a wire has been to use a knife blade to cut and pare the insulation in a manner similar to whittling a stick. This is a slow and tedious operation. Another practice has been to employ a device having rotary sharp-edged jaws which first make an annular cut in the insulation at a predetermined distance from the end of the wire, and then move the wire or the jaws in a longitudinal direction to cause the jaws to exert a pulling action on the insulation. This, owing to the very adhesive characteristics of the insulation, is impractical unless for a very short distance.

The object of my present invention is to provide a simple tool capable of rapidly removing insulation from a wire for any desired distance with accuracy, and especially for use by an electrician while out in the field at work.

With said object in view, the invention consists in the structure and combination of parts substantially as hereinafter described and claimed.

In the accompanying drawings:

Figure 1 is a side elevation illustrating my invention in a preferred embodiment thereof.

Figure 2 is a sectional view of the most essential portions of the tool, on a larger scale than Figure 1, and illustrating a piece of wire being operated upon.

Fig. 3 is an end view of a portion of the device, looking from the left in Fig. 1.

Fig. 4 is a section on line 4—4 of Fig. 2.

Fig. 5 is a section on line 5—5 of Fig. 2.

Fig. 6 is a section on line 6—6 of Fig. 2.

The frame 12 is preferably of such form and construction that the tool can be firmly secured in some convenient place for use, as by the employment of a clamp gripping the base of the frame to the lowered tail board of a work truck, or to any suitable bench or shelf. The frame has bearings 13 for a shaft 14 which at one end has a wheel 15 and crank handle 16 for the manual operation of the shaft. Sometimes, however, it may be desirable to connect a motor to the shaft. Said shaft is tubular or hollow throughout its length and preferably has transverse apertures 17 and scale marks, the object of which will be presently explained.

The other end of the shaft from the wheel 15 is interiorly enlarged as illustrated at 18 in Figure 2 to receive the tubular shank 19 of the tubular twist auger 20 the cutting edges 21 of which face or are presented to operate in a plane substantially perpendicular to the axis of the shaft. Suitable means are provided to enable the auger and its shank to be removably locked to the shaft, the means illustrated comprising a locking pin 22 carried by one end of a spring 23 secured to the shaft at 24, said pin extending through a hole in the shaft and entering a groove 25 in the shank of the auger. The inner end of the tubular shank 19 is somewhat flattened as illustrated by Figure 6, or otherwise made of irregular form, to fit a corresponding shape of the inner end of the enlargement in the shaft, to ensure rotation of the auger with the tubular shaft when the shank of the tool is locked in place by the pin 22 and the shaft is rotated. The structure just described enables the auger to be removed or re-set, when it is desired to sharpen the edges 21 of the tool or to change one tool for another. I have found in practice that three different sizes of twist augers will suffice for all the usual purposes, such three differing only as to the diameters of their central bores to permit the passage through or into the tubular tool of the bared ends of the wire, and also differing as to the radial lengths of the cutting edges 21. The structure and mounting of the members just described enables one tool to be quickly substituted for another.

Surrounding the auger is a wire-guiding member which also guards the user's fingers from being injured, said member being re-

movably mounted in position for use, its removability being to enable the tool to be removed. Said member comprises a sleeve portion 26 fitting the outer end of the shaft 14 and having an internal annular groove 27. The shaft 14 has an external annular groove 28 and a split spring ring 29 fits partially into both of the grooves 27, 28 and serves to hold the outer member on the shaft and yet permits the shaft to rotate during the operation presently described without transmitting rotary motion to the outer member. If a decided outward pull is exerted on said outer member, the spring ring 29 will yield sufficiently into one or the other of the annular grooves to enable the outer member to be separated from the shaft when access to the tool is desired for the purpose of removing the latter to sharpen it or substitute another therefor.

Two arms 30 extend from the sleeve 26 and carry the guide ring 31 which has a central hole 32 the outer end of which is preferably somewhat enlarged or tapered for a purpose presently explained.

In operation, the end of a piece of insulated wire such as illustrated at the left end of Figure 2 is pushed into the guiding hole 32 and the shaft and auger are then rapidly rotated. The guiding member 26, 31, does not rotate but as inward pushing of the wire continues, the insulation is cut away by the edges 21 and escapes through the openings between the arms 30 while the bared wire passes into and through the auger and as far into the tubular shaft as desired. The tool 20 being a closed twist auger, it serves to clean the wire core during operation. The holes 17 in the shaft enable the user to estimate the length of wire that has been bared by the auger. Owing to the fact that the shaft is tubular its entire length, any length of insulated wire may be bared. It is to be understood however that I do not limit myself to such structure, as said shaft need not be tubular for more than a part of its entire length.

During the pushing of the wire into the tubular auger and the rotation of the latter, the insulation is cut into particles by the edges 21 of the auger and thrown out through the spaces between the arms 30. Whenever sufficient baring of the wire has been accomplished, it is only necessary to pull the wire back and away from the tool. Owing to the fact that the cutting edges 21 of the auger are slightly prolonged beyond the end of the spiral body of the tool, said edges serve to lift chips the full cross section of the insulation while the ends of the spiral body back from said cutting edges serve to form edges to engage the wire core. And furthermore the two radially opposed cutting edges 21 assist in centering the flexible (wire) core.

During the use of the tool, the member which surrounds the auger serves three purposes; viz: its taper-entrance hole or opening 32 first properly directs the end of the wire that is to be operated upon to accurate position relatively to the end of the tool; said hole then guides and steadies the wire as it travels along; and the member as a whole guards the hands of the user from contact with the revolving auger within it.

Having now described my invention, I claim:

1. A tool for removing insulation from flexible wires, comprising a rotary tubular shaft having a tubular twist auger at its end.

2. A tool for removing insulation from flexible wires, comprising a rotary tubular shaft having a tubular closed twist auger at its ends, the shaft having openings to enable the operator to see the end of a wire therein.

3. A tool for removing insulation from flexible wires, comprising a rotary tubular shaft having a tubular twist auger at its end, said auger having radially opposed cutting edges.

4. A tool for removing insulation from flexible wires, comprising a rotary tubular shaft having a tubular twist auger at its end, and a ring-shaped guide having a sleeve portion mounted on said shaft in advance of the auger.

5. A tool for removing insulation from flexible wires, comprising a rotary tubular shaft having a tubular closed twist auger at its end, the cutting edges of said auger being slightly prolonged beyond the end of the spiral body to lift a chip the full cross section of the insulation while the ends of the spiral body back from the cutting edges themselves form edges to engage the wire core.

In testimony whereof I have affixed my signature.

RUDOLPH M. MARTENS.