Dec. 20, 1932. P. F. REICHHELM 1,891,482

TOOL

Filed April 7, 1930

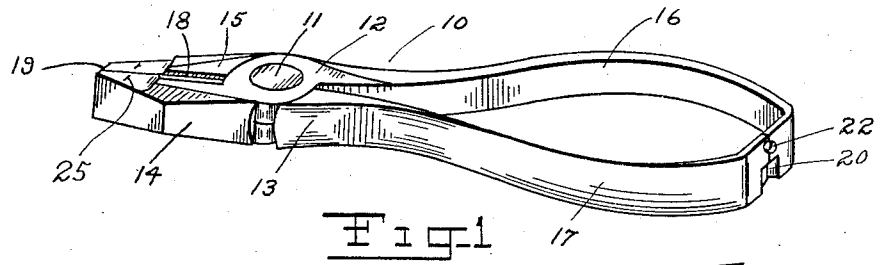


Fig-1

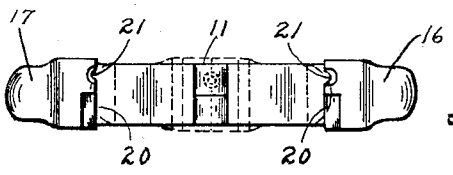


Fig-2

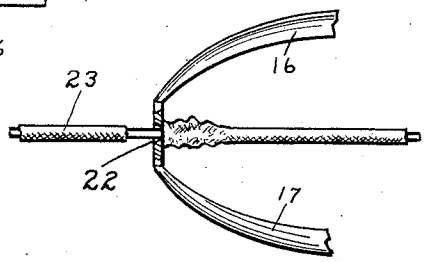


Fig 3

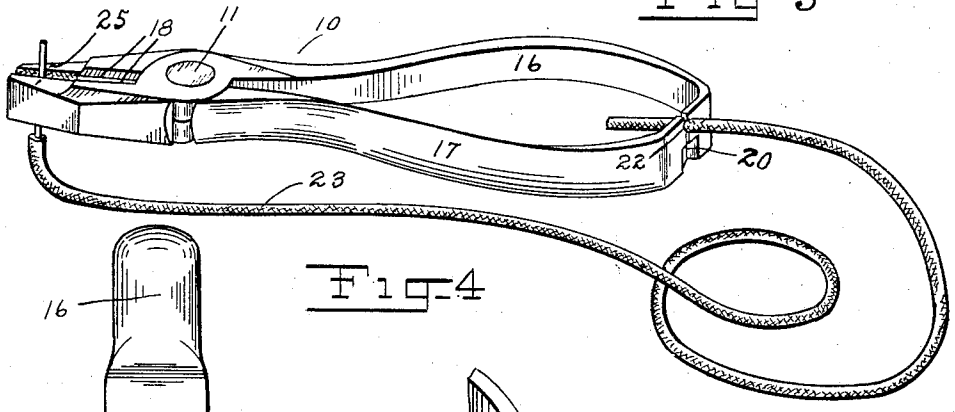


Fig-4

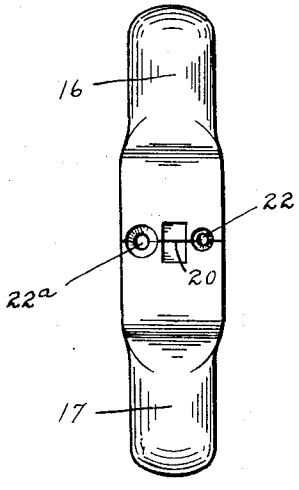


Fig-5

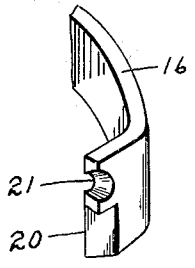


Fig-6

Inventor
Paul F. Reichhelm
By his Attorney S. J. Cox.

Patented Dec. 20, 1932 1,891,482

UNITED STATES PATENT OFFICE

PAUL F. REICHHELM, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO AMERICAN SWISS FILE & TOOL CO., OF ELIZABETH, NEW JERSEY, A CORPORATION OF NEW JERSEY

TOOL

Application filed April 7, 1930. Serial No. 442,119.

The present improvements relate, in general, to tools and more particularly to tools of the lever type adapted for cutting and stripping wire and insulation thereof.

A primary object, among others, of the present improvements is to provide a novel type of pliers adapted to a plurality of uses. A further object is to provide an improved tool adapted for cutting wire as well as cutting and stripping insulation therefrom and one wherein these operations can be practiced more conveniently and efficiently.

Another object is to provide an improved insulation cutter and stripper. The provision of a pliers construction for accomplishing the foregoing objects while also serving as a gauge for facilitating its action constitutes a further object of the invention.

Other objects will be apparent to those skilled in the art, upon reference to the accompanying specification and drawing, in which

Fig. 1 is a perspective of a pliers illustrating one embodiment of the improvements;

Fig. 2 is an end elevation of the insulation cutting jaws in open position;

Fig. 3 is a fragmentary side view of the plier handles showing the jaws in section and in use;

Fig. 4 is a perspective view illustrating the use of the improved pliers as a gauge;

Fig. 5 is a view similar to Fig. 2, with the jaws closed, illustrating a modified form;

Fig. 6 is a fragmentary view in elevation, of one insulation cutting jaw.

Referring to the drawing, the pliers 10 comprise the arms or levers 12 and 13 fulcrumed at pivot 11. The members 12, 13 respectively comprise arms 14 and 15 on one side of the fulcrum and arms 16 and 17 on the other side thereof.

Cooperating arms 14 and 15 constitute jaw members having cutting edges 18 disposed at right angles to fulcrum 11 as is customary. The jaws furthermore have cooperating inner knurled faces and may terminate with a flat nose portion 19. The use of the foregoing construction as pliers and for wire cutting is familiar, the entire tool, with handles 16 and 17, serving as a lever of the first class.

As illustrated, the arms 16 and 17 are turned inwardly at their free ends to provide cooperating jaw members. It is notable that these end portions of the arms are flattened in a plane substantially parallel to the axis of pivot 11. Each such portion is provided with beveled cutting edges 20 and 21, the former having a straight edge, while the knife portion 21 is curved as clearly seen in Figure 6. When the pliers are closed, as seen in Fig. 1, the edges 20 may substantially meet, while the curved portions 21 are in register providing an aperture 22 of frusto-conical form having an annular knife portion. The diameter of this annular portion formed by cutting edges 21, may be varied as desired to conform to different gauge wire. The aperture, at its cutting edge, however, should preferably have a diameter to substantially correspond to that of the wire from which the insulation is to be stripped.

It is to be noted that the construction just described constitutes a lever of the third class. In one use of the present improvements, the arms 16 and 17 may be grasped with the operator's middle finger between the arms for separating them. The separated jaws are then placed on either side of insulated wire 23 (Fig. 3) with the cutting portions 21 in line therewith. The jaws may now be closed about the wire, the portions 21 biting into the insulation but not into the wire or wire strands, which obtain in aperture 22. Upon twisting the closed arms once or twice about the wire as an axis, the insulation is completely and neatly severed and may be stripped from the wire by pulling the closed jaws longitudinally of the wire as seen in Fig. 3.

This operation, which may be readily accomplished, leaves the wire free for contact or other purposes and at the same time is scraped. The diameter of aperture 22 is preferably such that the knife portions 21 cannot bite the wire, but may graze the periphery thereof during the stripping operation so that corrosion or contact-impairing matter may be removed, thus leaving the surface clean. Manifestly the cutting and stripping of the insulation and the polishing of the

wire are all speedily accomplished in one operation, and thereby eliminate the necessity of employing several tools and operations.

As illustrated in Fig. 4, the length of the arms on either side of pivot 11 are proportioned in a prescribed ratio depending upon the type of wire to be stripped. In the present instance, the ratio is substantially three to one so that upon grasping of an insulated or an uninsulated portion of the wire at a gauge mark 25, the stripping jaws are separated a proportionally greater distance which is sufficient to receive an insulated portion thereof. While the wire is thus holding arms 14, 15, apart, the cutting edges may be forced toward each other for cutting and stripping the insulation as above described. Due to the distance between fulcrum 11 and the free ends of handles 16, 17, the latter may be forced toward each other against the opposition of the wire at 25. While these handles are normally rigid, nevertheless they may have sufficient resiliency to permit the above described operation, wherein the arms may subsequently part of their own initiative.

The advantages of this construction are apparent when it is noted that although cutting edges 21 and hole 22 are adapted for a certain gauge wire, the same tool, handled in the above described manner, may be used to strip the insulation from wire of greater diameter without danger of biting into the wire. Such a wire of greater diameter, upon insertion at 25 (Fig. 4), will permit the knife edges 21 to cut through the insulation, but, among other factors, the limited resiliency of arms 16, 17, together with the obstructing wire at 25, will prevent mutual approach of edges 21 beyond the periphery of the wire or into its body.

Upon reference to Fig. 5, a slightly modified form is illustrated. In this embodiment, a plurality of cutting edges defining apertures 22 and 22^a are provided, with elements 20 therebetween. The latter may be omitted entirely, if desired, and the number of apertures increased. Although not essential, the apertures 22, 22^a have been illustrated as having different diameters for accommodating various size wires. This tool may, likewise, be employed in the several ways already described.

Where cutting edges 20 are provided, it is manifest, that they may serve for various purposes, such as wire cutting and scraping, insulation cutting, marking purposes, or trimming or clipping frayed insulation or uneven wire strands. Members 20 and 18 therefore may be employed to make two cuts of the same wire at spaced points, or to cut two different wires simultaneously.

It will be apparent that the present invention provides a very compact tool, which is not to be limited to the illustrated embodiments, since it is adaptable for various types of lever constructions. When functioning as levers of both the first and third classes, the combined uses of the tool, include wire twisting, cutting, trimming and scraping, and insulation cutting and stripping. When embodied as a lever of the third class, the combined uses include insulation cutting, stripping and trimming, and wire cutting, scraping and trimming.

Various modifications within the scope of the present improvements, may occur to those skilled in the art and may be made without departing from the purview of the invention.

I claim:

A wire insulation cutting tool comprising pivoted arms having a common fulcrum between the ends thereof, cooperating arm portions on one side of said fulcrum adapted to hold a wire, cooperating handle portions of greater extent on the other side of said fulcrum having opposed curved cutting means adapted to encompass and cut the insulation of said wire, said fulcrum being positioned so as to proportion the clearance between adjacent portions in direct ratio to the wire and insulation diameters.

Witness my hand this 1st day of April, 1930, county of New York, State of New York.

PAUL F. REICHHELM.