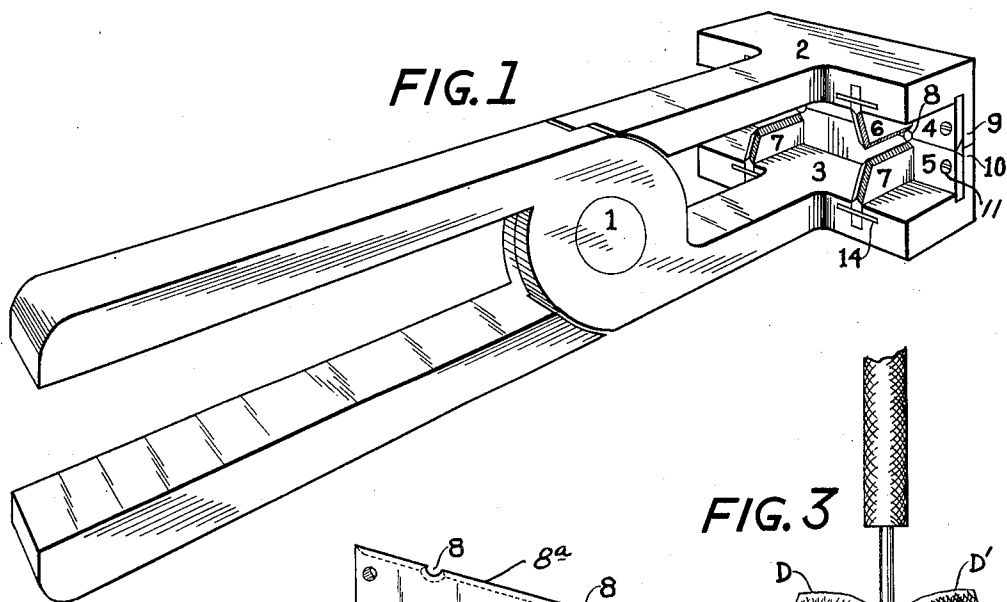
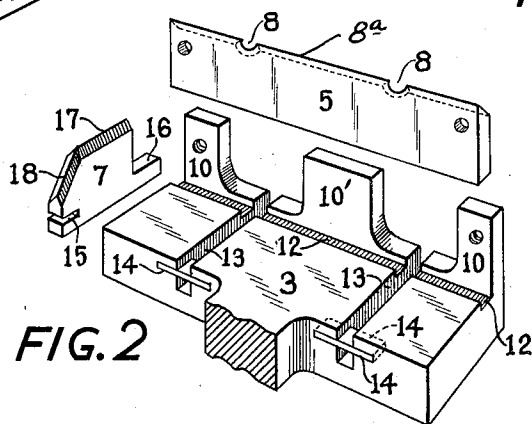
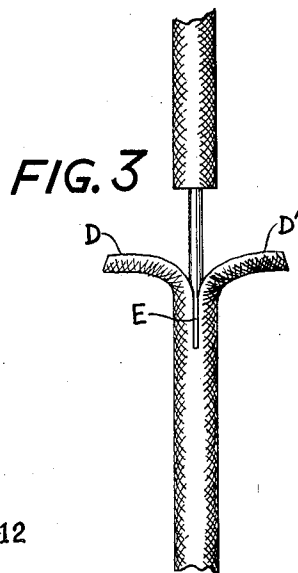
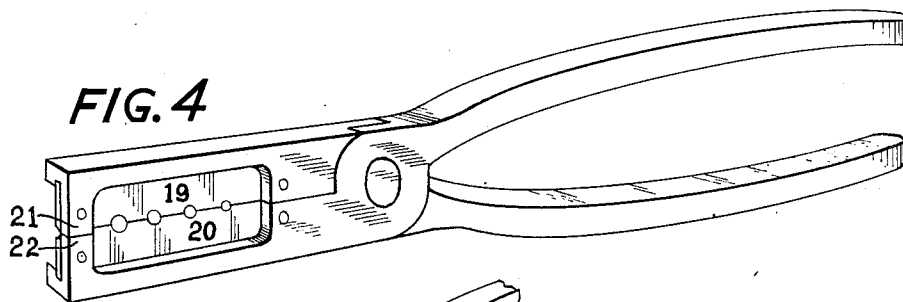
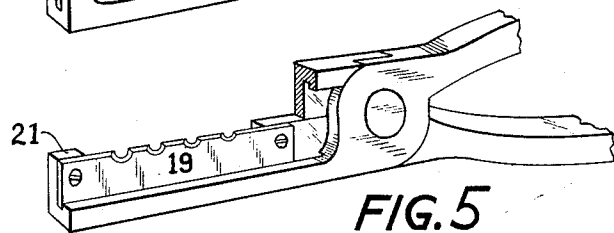


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INVENTOR
E. E. Ferguson

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INSULATION STRIPPING TOOL

Elmer Elie Ferguson, Spokane, Wash.

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4 Claims. (Cl. 81—9.5)

The present invention relates to improvements in an insulation stripping tool for removing insulation from electrical wire. Means are provided for simultaneously cutting, splitting and scraping the insulation from the wire, whereby a predetermined amount of insulation may be removed quickly and easily, without damage to the wire.

The tool is adapted to fit various sizes of wire, whereby it may be alternately used to cut and remove the insulation from different sizes of wires, with assurance that the wire will not be either mutilated or severed.

It is the general practice to remove insulation from electrical wires, by cutting or scraping, usually with a pocket knife; and in the case of relatively small wire there is danger of severing the wire, or at least mutilating it so as to weaken the already frail strand. In the case of larger wire having a relatively tough insulation, there is inconvenience and undue waste of time in cutting away the insulation and scraping the wire to free it of adhering particles so as to assure a proper contact surface. The tool of my invention provides means for quickly and easily removing heavy insulation, leaving a bare wire free of adhering particles which would otherwise interfere with proper electrical contact. Various inaptitudes of the prior art are eliminated by the tool of my invention.

The invention resides in certain novel structures and in the combination and arrangement of the parts as will hereinafter be more fully set forth and claimed. It will be understood that the invention is not restricted to the exact structures herein illustrated and described, but that modifications may be made in the disclosed structures without departing from the principles of the invention and the intent of the claims.

Preferred examples of the physical embodiment of the invention are illustrated in the accompanying drawing.

Figure 1 is a perspective view of the invention.

Figure 2 is an enlarged perspective view of the lower jaw disassembled.

Figure 3 illustrates work done by the invention.

Figure 4 shows a simplified form of the invention.

Figure 5 shows the reverse side of Figure 4, parts being broken away.

The invention is preferably fashioned as a pair of pliers, pivoted at 1 in the conventional manner to provide for opening and closing of the jaws. As seen in Figure 1, the jaws are each fashioned with a crosshead as indicated at 2

and 3. Each crosshead carries a blade as indicated at 4 and 5 and each blade is provided with a straight cutting edge interrupted by one or more semicircular cutting edges continuous therewith. The blades 4 and 5 are disposed in the same plane, whereby their straight cutting edges 8a coincide when the jaws are closed and the semicircular cutting edge of one blade registers with that of the other blade, to form a circular cutter as indicated at 8. The circular cutter thus formed is adapted to cut to the depth of the bare wire and therefore is of the same diameter as the bare wire.

As seen in Figure 1, the cutters 4 and 5 are preferably fashioned with a single bevel on the outer face. Heavy insulation is inclined to pack under a bevel and necessitate a stronger grip to hold the cutter in contact with the wire, therefore a plain surface on the scraping side of the cutter greatly facilitates the removal of the insulation and materially lessens the effort required to accomplish the task.

A pair of blades 6 and 7 are disposed in the vertical plane of the axis of the circular cutter, one in each of the jaws 2 and 3, with the cutting edge 17 of each blade registering with the vertex of the respective semicircular cutting edge of the circular cutter 8; and their cutting edges 17 and 17 are parallel for an appropriate distance; whereby, when the jaws are closed upon the insulated wire, the insulation will be simultaneously cut circumferentially of the wire and split longitudinally of the wire for a distance equal to the length of the parallel edges 17 and 17 of the blades 6 and 7 which are designed to cut against the bare wire having the same diameter as the circular cutter 8. The unobstructed ends of the blades 6 and 7 are each provided with a second cutting edge 18 (Fig. 2) which serves to split the insulation as the wire is drawn through the cutters. The cutting edge 18 joins the cutting edge 17 at an appropriate angle to assure efficient cutting with minimum effort.

When the jaws are closed upon an insulated wire, the cutting edges 17, longitudinally incise the insulation as the circular cutter 8, supplemented by the straight cutting edges 8a, simultaneously cuts the insulation circumferentially of the wire. Plainly the split effected by the cutting edges 17—17 prepares a limited section of the insulation for immediate cleavage. When the wire is drawn through the cutters, the circular cutter 8 being of the same size as the wire will effectively scrape the wire free of all insulation and simultaneously the cutting edge 18 will split

the insulation in advance of the cleavage. The wire being longitudinal of the tool, affords convenient purchase for the vigorous pull required for heavy insulation and greatly lessens the effort required to strip the insulation from the wire, than would otherwise be required by a tool requiring the wire to be drawn transversely of the tool. The closure of the jaws is limited by impingement of the members 9 and 10, thereby assuring that the wire will not be mutilated, nor the cutting edges damaged.

As seen in Figure 1, like provision is provided on each wing of the crossheads; and preferably, the two circular cutters are adapted to different gauge wire. It should be mentioned that the prime purpose of the crossheads is to provide for laterally displacing the cutters sufficiently to position the wire parallel with and adjacent to the side of tool, whereby the wire may be drawn straight through the cutters, as would be impossible were the circular cutter central of the jaws. The blades 6 and 7 cut longitudinally of the wire; and obviously, the wire should be longitudinal of the blades; and equally obvious, such would be difficult were the blades 6 and 7 centrally positioned on the jaws.

The insulation being split vertically, it normally cleaves laterally and as seen in Figure 1, there is ample room between the jaws 2 and 3, for the escape of the denuded insulation. It should also be pointed out, that when the blades 6 and 7 incise the insulation, the split ends are of course separated by the thickness of the blades, thereby directing the split halves oppositely, which facilitates cleavage. Figure 3 illustrates the result of drawing the wire through the cutters; and as shown at E, the insulation is always split in advance of the cleavage, which greatly facilitates removal of the insulation which will normally cleave as indicated at D and D'.

It will be readily understood that since this tool both splits and strips the insulation, that it can be employed to remove any desired length of insulation from an intermediate section of the wire, the tool being alternately applied to the opposite extremes of the selected section and drawn towards the center of the section in each instance, thereby effectively removing the insulation from the selected section as is sometimes required where a wire is to be tapped without cutting. Obviously, this tool is equally serviceable for end stripping and of course may be made for any size wire.

The described cutting blades may be made integral with the jaws 2 and 3, as for instance by drop forging; but preferably, the blades are made removable, whereby they may be renewed or replaced by blades for different size wire.

Figure 2 shows an enlarged detail perspective of the preferred embodiment of the removable blades. As shown in this figure, each jaw is provided with a number of right angle projections as indicated at 10; continuous with the rear face of these projections, is a groove 12, for the reception of the blade 5. Transversing the groove 12 are deeper grooves 13 and 13 each for the reception of a blade 7 which is slotted at 15 for engagement with the key 14, which is disposed in the end of the groove 13. The opposite end of the blade 7 is provided with a spur 16; when the blade 7 is positioned in the groove 13 with the slot 15 engaged with the key 14, the blade proper extends to the rear edge of the groove 12 and the spur 16 fills the remainder of the groove 13 to the level of the bottom of the groove 12. The blade

5 seats upon the spur 16 and is secured to the projections 10—10 in any suitable manner, as for instance by screws 11 threaded into projections 10—10.

From this description it will be clear that the three blades are securely held in position by two screws and that the blades may be assembled or disassembled in a minimum of time, whereby they may be renewed or exchanged with facility. The keys 14 may be fashioned in any practical manner and are preferably rigid in the grooves 13 as there is no necessity for their removal. The projections 10 serve as bracket-like braces supporting the blade 5 against the force of drawing the insulated wire through the tool, and these may be supplemented by an additional projection 10' centrally located. Similar means are provided on each jaw and the blades fit tightly in their respective grooves, thereby forming a sturdy assembly adapted to severe usage.

The tool may be made with parallel jaws, but the illustrated single pivot jaws are preferable, as this arrangement provides a better shear action for blades disposed longitudinal of the pliers. A low lever ratio is sufficient for the requirements and the radius of the jaws should be sufficient to afford adequate opening at a slight angle.

For stripping insulation from the ends of wire, particularly when the wire is small and the insulation light, it is not essentially necessary that the insulation be longitudinally split, the prime necessity being to cut the insulation to the bare wire without mutilating or severing the wire. Figure 4 shows a simplified form of the invention adapted to light work restricted to end stripping. The blades 19 and 20 are equivalent to the blades 4 and 5 of Figure 1 and are secured to the tool in the previously described manner, except that they are placed longitudinal of the pliers. As shown in Figure 4, the straight cutting edges are designed to contact each other when the jaws are closed; whereby, the semicircular cutting edges will then form a circular cutting edge for cutting against the wire as previously explained. Several circular cutting edges each adapted to fit a standard gauge wire, are provided on a single tool. The impinging projections 21 and 22, serve as stops, whereby the closure of the jaws is limited to contact of the straight cutting edges thereof and whereby excessive pressure will neither injure the cutting edges, nor mutilate the wire. The blades may be integral with the jaws or they may be removable in the previously described manner.

The utilization of the tool will be readily apparent to any electrical worker, and no great skill is required for its operation. It is a simple matter to select the circular cutter which is of the same diameter as the bare wire, the jaws are then opened sufficiently and the insulated wire placed in the selected cutter, the jaws being closed in the conventional manner a cut will be made entirely through the insulation. The wire will then be in contact with the cutter and is withdrawn while the jaws are closed, whereby that portion of the insulation which has been severed, will be scraped from the wire, thereby providing a clean bare surface as is essentially necessary for proper electrical contact.

It will be readily understood that the amount which may conveniently be removed at one bite will vary with the tenaciousness of the insulation; however, the usual requirements can be accomplished at one stripping. Where the insulation is tenacious or particularly adherent to the wire, the preferred embodiment of the tool shown in

Figure 1, will effectively remove any required amount of insulation, either from the end of the wire or from an intermediate section.

In the invention herein disclosed, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A tool comprising a pair of jaws adapted to open and close, spaced right angle projections on each jaw registering with like projections on the other jaw, a channel in each of said jaws and continuous with the rear face of said projections, a secondary channel transverse of the channel aforesaid, a slotted blade fitted into said secondary channel, a key in said secondary channel and engaging the slot in said blade, a spur on the other end of said blade, a blade fitted into the first channel aforesaid and seating upon said spur, means for securing the blade in the first channel aforesaid, whereby that blade secures the other blade in the secondary channel and whereby both blades are removable.

2. A tool comprising a pair of jaws adapted to open and close, spaced right angle projections on each jaw registering with like projections on the other jaw, a channel in each of said jaws and continuous with the rear face of said projections, a blade tightly fitted into said channel and secured to said projections, a secondary channel transverse of the channel aforesaid, a blade tightly fitted into said secondary channel, one end of the latter blade being interlocked with the former blade and the other end being keyed in said secondary channel.

3. A pair of pliers having a crosshead on each jaw, each crosshead forming a pair of wings extending outwardly from opposite sides of the jaws, spaced right angle projections on each crosshead registering with like projections on the other crosshead, a channel in each of said crossheads

and continuous with the rear face of said projections, a blade tightly fitted into said channel and secured to said projections, said blade having a semicircular cutting edge continuous with a straight cutting edge occupying the same plane, a secondary channel transverse of each channel aforesaid, a key member in one end of each secondary channel, a blade tightly fitted into each secondary channel, one end of the latter blade being interlocked with said key and the other end having a spur interlocked with the former blade, said secondary blades being situated on corresponding wings of the crossheads and disposed in a common plane, each secondary blade having a cutting edge registering with the vertex of one of said semicircular cutting edges, each secondary blade having an additional cutting edge inclined relative to its cutting edge aforesaid and continuous therewith in said common plane.

4. A pair of pliers having a crosshead on each jaw, each crosshead forming a pair of wings projecting laterally outward from opposite sides of the jaw, a pair of blades, one on each crosshead, each blade having a semicircular cutting edge continuous with a straight cutting edge occupying the same plane, a pair of secondary blades disposed in a common plane at right angles to the aforementioned blades, one of said secondary blades being disposed on the laterally projecting wing of one of said crossheads and the other secondary blade disposed on the corresponding wing of the other crosshead, each secondary blade having a straight cutting edge registering with the vertex of one of said semicircular cutting edges, and each secondary blade having an additional cutting edge inclined relative to its cutting edge aforesaid and continuous therewith in said common plane.

ELMER ELIE FERGUSON.