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TOOL FOR HANDLING HIGH TENSION ELECTRIC WIRES

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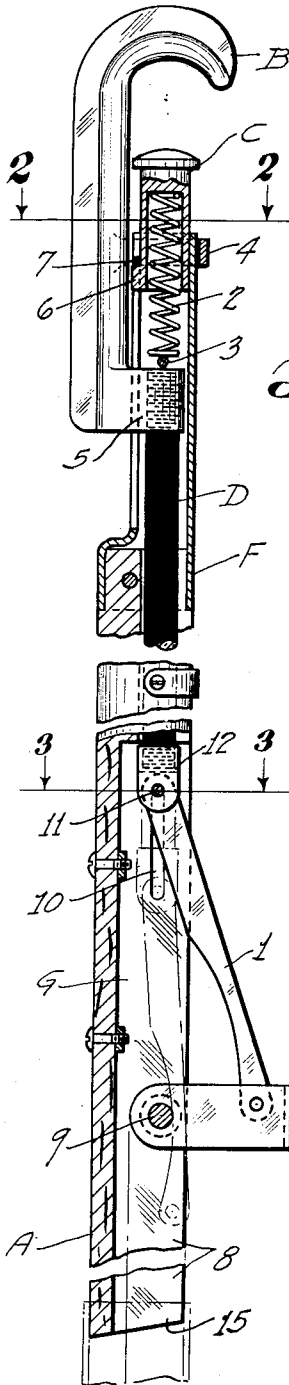


Fig. 1.

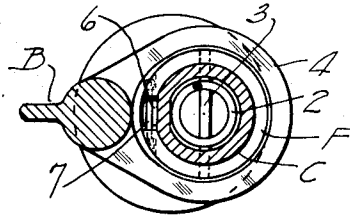


Fig. 2.

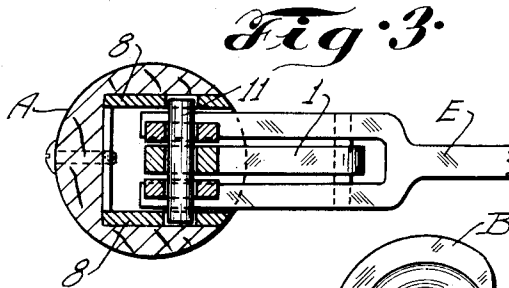
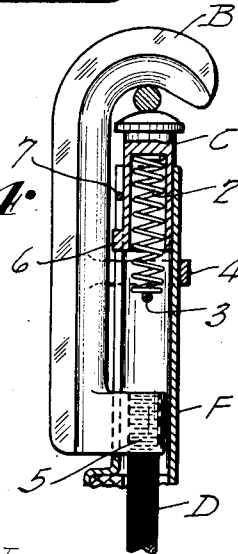


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE

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TOOL FOR HANDLING HIGH-TENSION ELECTRIC WIRES.

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This invention relates to tools of the class known commercially as "hot line" tools, which are used by linemen in the operation of handling high tension electric wires.

5 One object of our invention is to provide a lineman's tool adapted to be used for picking up and handling electric wires, that affords absolute protection to the person using the tool and which is of such construction
10 that it will automatically adapt itself to wires of various diameters.

Another object is to provide a lineman's tool of the kind referred to that can be operated quickly and easily to clamp or release
15 a wire and which is of such construction that there is no liability of the wire dropping out of the tool or becoming accidentally released when the tool is being manipulated. Other objects and desirable features of our
20 invention will be hereinafter pointed out.

Figure 1 of the drawings is a vertical longitudinal sectional view, partly in side elevation, of a lineman's tool constructed in accordance with our invention.

25 Figures 2 and 3 are horizontal sectional views, taken on the lines 2—2 and 3—3, respectively, of Figure 1; and

Figure 4 is a detail view, partly in side elevation and in vertical section, illustrating the jaws or wire gripping members of the tool closed or arranged in engagement
30 with a wire.

Referring to the drawings, A designates a long wooden pole or a handle formed of
35 any suitable non-conducting material, B and C designate opposed jaws or wire gripping members arranged adjacent the upper end of said handle, D designates an actuating rod for moving one of said wire gripping
40 members relatively to the other and E designates an operating lever mounted on the lower end portion of the handle A and connected by a link 1 or other suitable means with the lower end of the actuating rod D so
45 as to permit the jaws or wire gripping members of the tool to be opened by swinging the lever E upwardly, as shown in Figure 1, and closed by swinging said lever downwardly. The wire gripping members B and C are
50 carried by a metallic head piece F mounted on the upper end of the handle A, and the actuating rod D is preferably housed in the handle A and is connected at its upper end to the wire gripping member B. In order to

afford absolute protection to the person 55 using the tool, the actuating rod D is either constructed of insulating material or suitable insulating devices are interposed between the wire gripping member B and the operating lever E, so as to prevent the elec- 60 tric current from passing through the wire gripping member B to the operating lever when the tool is in use.

The wire gripping member C is carried by the head piece F and the wire gripping 65 member B is reciprocatingly mounted on said head piece and is provided with a laterally-projecting portion that is arranged in opposed relation to the member C so as to enable a "hot" electric wire to be picked 70 up and gripped by the tool, by first separating the jaws B and C of the tool, then manipulating the tool so as to position the wire between said jaws, and thereafter moving the operating lever E downwardly so as 75 move the jaw B longitudinally of the head piece F of the tool and cause said jaw to clamp the wire against the opposed jaw C, as shown in Figure 4. In order that the tool may be used for handling wires of vari- 80 ous diameters, one of the jaws or wire gripping members of the tool or a wire engaging portion on one of said members is backed up by a spring which permits said member or portion to move sufficiently relatively 85 to the other wire gripping member of the tool to accommodate a wire of relatively small diameter or a wire of relatively great diameter and still insure the wire being securely clamped by the jaws of the tool when 90 said jaws are in their closed position. In the form of our invention herein illustrated the wire gripping member C is constructed in the form of a hollow plunger that is slidingly mounted in a tubular portion of 95 the head piece F, and a coiled expansion spring 2 is arranged between the upper end of said plunger and a stationary stop 3 on the head piece F so as to normally hold the wire gripping member C in such a position 100 that it will co-operate with the member B to firmly clamp a wire of the smallest diameter which the tool is capable of handling when the member B is in its operative position, or, in other words, after said member 105 B has been moved towards the wire gripping member C. When the tool is being used to handle a wire of greater diameter the spring

2 will yield or give slightly when the jaw B is moved towards the jaw C, thereby causing the jaw C to automatically adapt itself to the wire clamped between said jaws and insure said wire being held just as securely as a wire of smaller diameter. In other words, our improved tool comprises two opposed jaws or wire gripping members that are adapted to be moved relatively to each other to open or close the jaws of the tool, and one of said jaws or a wire engaging portion on same is constructed so that it can yield or give according to the diameter of the wire engaged by the tool, thereby insuring the jaws of the tool exerting substantially the same clamping pressure on wires of various diameters. While we have herein illustrated our invention embodied in a tool in which the inner jaw is backed up by a spring or other suitable resilient element and the outer jaw is connected to the operating rod that is used to close and separate said jaws, we wish it to be understood that it is immaterial which jaw of the tool is backed up by a resilient device or provided with a wire engaging portion that is capable of yielding slightly according to the diameter of the wire being handled, and it is also immaterial whether the actuating rod is connected to the inner jaw or to the outer jaw. The particular method of mounting the jaws or wire gripping members of the tool and connecting the movable jaw to its actuating means is immaterial, so far as our broad idea is concerned, but we prefer to provide the member B with a sleeve 4 that loosely surrounds the tubular portion of the head piece F and provide the shank of said member B with a portion 5 that projects into the tubular portion of the head piece F through an elongated slot in same, the actuating rod D being threaded into the portion 5 of the member B or connected to said portion in any other preferred way. In order to limit the outward movement of the member C relatively to the tubular portion of the head piece F, said member is provided at its lower end with a lug 6 arranged in the elongated slot in the tubular portion of the head piece and adapted to strike against a stationary stop 7 on the head piece F when the jaws of the tool are separated, as shown in Figure 1.

In order that the operating handle E and the link 1 will not project laterally from the handle A of the tool after the jaws or wire gripping members B and C of the tool have been closed to engage the wire, the handle A is provided adjacent its lower end with a longitudinally-disposed slot for receiving said link and operating lever, and in order to strengthen the slotted portion of the handle A, a metallic reinforcing member G is combined with said handle, as shown in Figures 1 and 3. The reinforcing member

G preferably comprises side pieces 8 which carry a pintle pin 9 on which the operating lever E is oscillatingly mounted, and said side pieces are provided adjacent their upper ends with elongated slots 10 that form a guideway for a pin 11 that connects the upper end of the link 1 to a metallic cap piece 12 on the lower end of the actuating rod D, thereby insuring said rod moving in a straight line when the lever E is operated to separate or close the jaws B and C of the tool.

Means is provided for locking the jaw B of the tool in its closed position or operative position, and in order to overcome the necessity of requiring a separate movement on the part of the lineman to lock said jaw, after the lineman has actuated the lever E to clamp the wire, we have provided the lever E with a spring-actuated sleeve 16, which is so arranged that it will move automatically into telescopic relationship with the lower end of the handle A when the lever E is moved into a position to draw the jaw or member B of the tool towards the member C. As shown in Figure 1 of the drawings, the lever E is provided with a portion 13 of substantially the same diameter and cross-sectional shape as the handle A of the tool, and the sleeve 16 is reciprocatingly mounted on the portion 13 and is acted upon by a spring 14 which normally exerts pressure on said sleeve in a direction tending to hold the upper end of same projected slightly beyond the end of the portion 13 on the lever E. When the lever E is swung downwardly from the position shown in Figure 1 to cause the jaws of the tool to clamp the wire, the upper end of the sleeve 16 strikes against an inclined surface 15 on the lower end of the handle A which acts as a cam to move the sleeve 16 longitudinally of the portion 13 on the lever E in opposition to the spring 14, and after said lever E reaches such a position that the portion 13 thereon aligns with the handle A, the sleeve 16 will move upwardly under the influence of the spring 14 into telescopic relation with the lower end of the handle A, thereby securely locking the lever E, the actuating rod D and the wire gripping member or jaw B connected to said rod. When it is desired to release the wire the user has to move the sleeve 16 downwardly sufficiently to clear the lower end of the handle A, after which the lever E can be swung upwardly into the position shown in Figure 1.

A lineman's tool of the construction above described can be used for picking up and handling "hot" wires of various diameters; it is of such design that it can be operated quickly and easily to grasp or release a wire; it affords absolute protection to the user; it is strong and rugged enough to successfully withstand the rough usage to

which such tools are subjected, and the parts of same are of simple design and are easy to assemble, thereby enabling the tool to be manufactured at a low cost.

5 Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A lineman's tool, comprising a handle, a head piece on the upper end of said handle, a spring supported wire gripping member in said head piece, a reciprocating wire gripping member on said head piece, an operating lever at the lower end of said handle, and an actuating link on said handle for transmitting movement from said lever to said reciprocating wire gripping member and for insulating said lever from said member.

2. A lineman's tool, comprising a handle, a head piece on the upper end of said handle, a plunger in said head piece that acts as a wire gripping member, a spring for backing up said plunger, a reciprocating wire gripping member having a portion arranged in opposed relation to said plunger, co-operating guiding means on said head piece and reciprocating member, an operating lever at the lower end of said handle, and an insulated actuating rod for connecting said lever with said reciprocating member.

3. A lineman's tool, comprising a handle constructed of insulating material, a head

piece at the upper end of said handle provided with a tubular portion, a spring supported plunger in the tubular portion of said head piece that acts as a wire gripping member, a reciprocating wire gripping member mounted on the tubular portion of said head piece and provided with a portion that is arranged in opposed relation to said plunger, an insulated actuating rod in said handle connected to said reciprocating wire gripping member, a lever at the lower end of the handle, a link for connecting said lever to said actuating rod, and a spring-pressed device on said lever arranged so as to co-operate with the handle to automatically lock said lever when said lever is actuated to cause the wire gripping members to clamp a wire.

4. A lineman's tool, comprising a handle, opposed wire gripping members at the upper end of said handle, one of said gripping members being reciprocatingly mounted, an operating lever at the lower end of said handle, an insulated actuating rod for connecting said lever with said reciprocating wire gripping member, and an automatically operating means for locking said lever to said handle when said wire gripping members are engaged with a wire.

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