

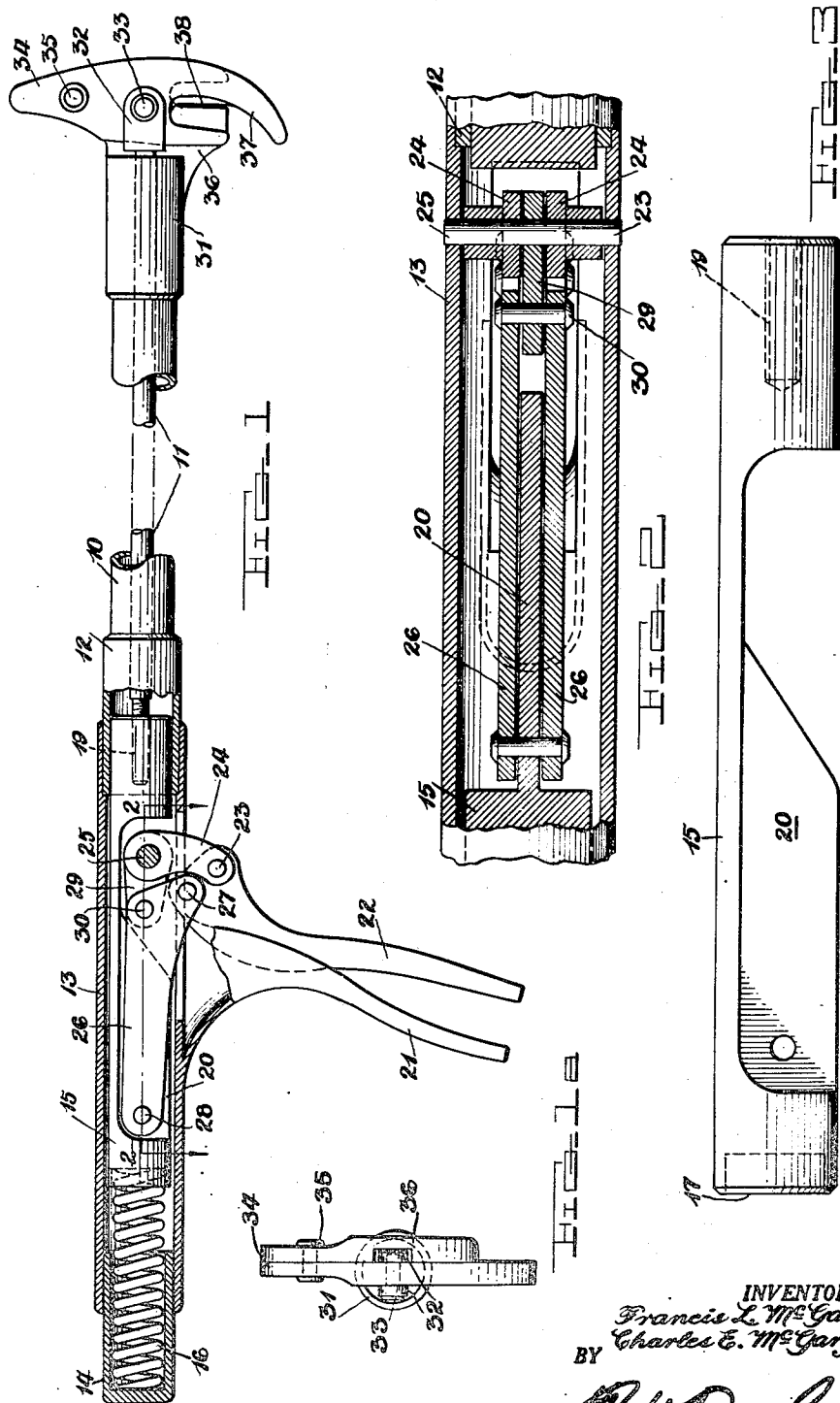
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F. L. MCGARY ET AL
CABLE CUTTING DEVICE

2,602,994

Filed Sept. 26, 1946

3 Sheets-Sheet 1



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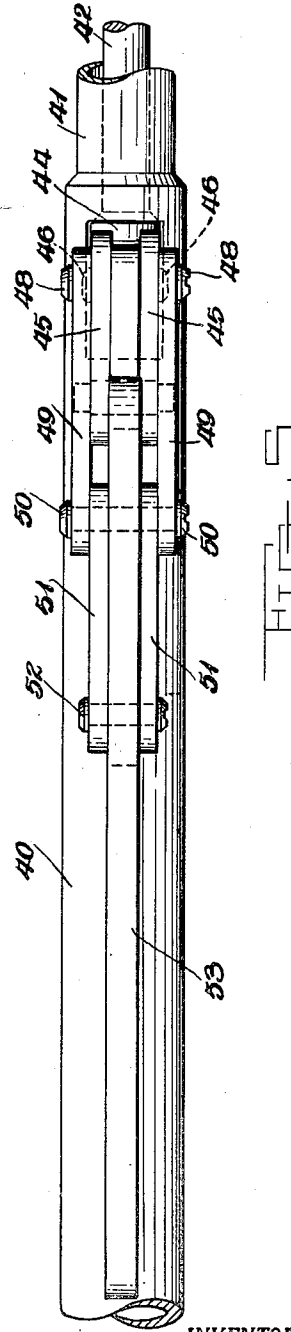
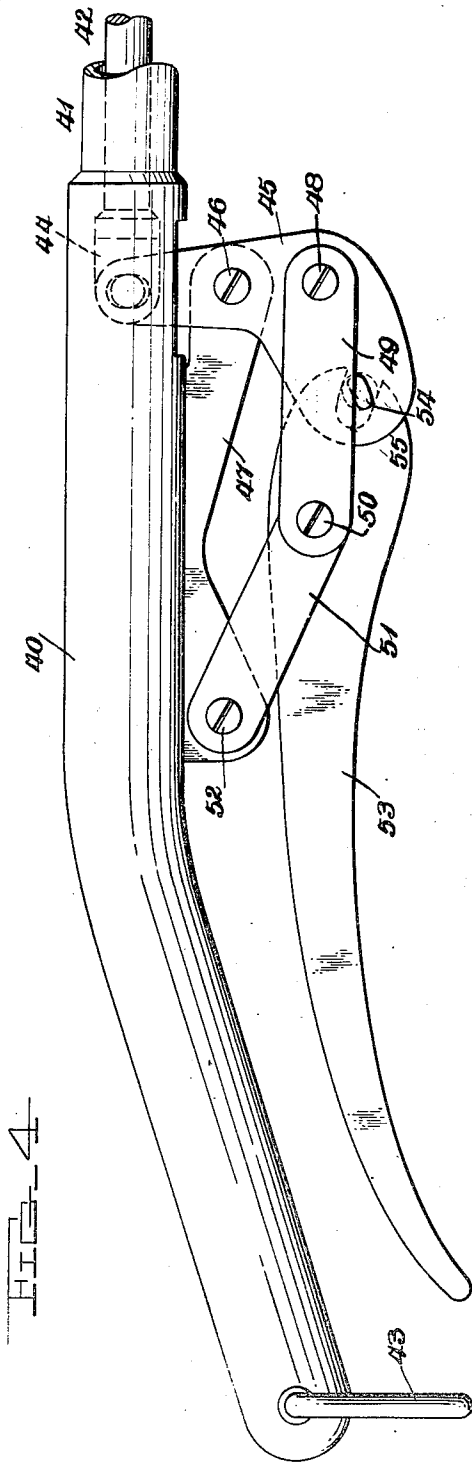
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3 Sheets-Sheet 2



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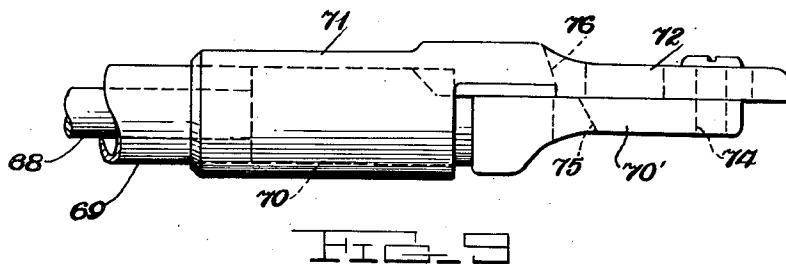
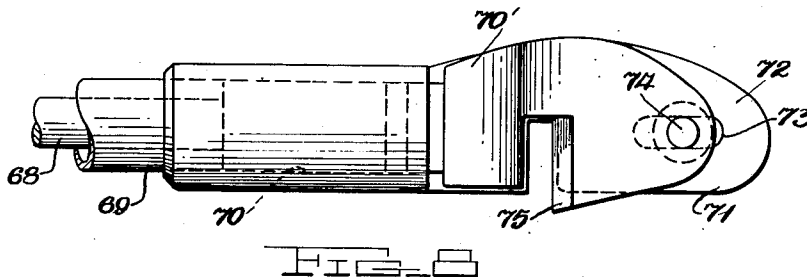
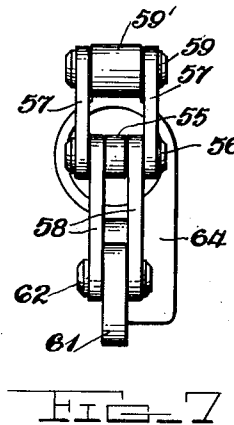
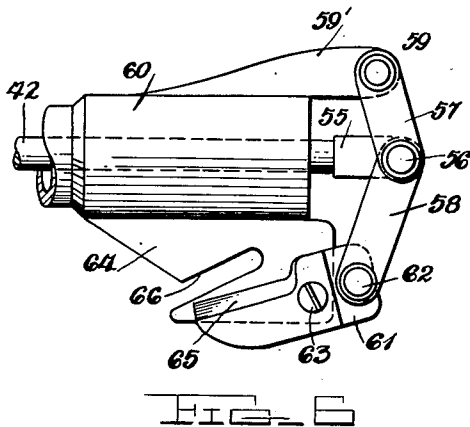
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3 Sheets-Sheet 3



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CABLE CUTTING DEVICE

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14 Claims. (Cl. 30—251)

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Our invention relates to a cable cutting tool, and it is an object of the same to provide a tool which shall be highly effective and quick acting for cutting cables such as the steel wire cables that are used in aircraft, it being a particular purpose of the device to provide means whereby cables can be cut with speed and convenience. There are times when speed is most essential, as after a crash when the plane may be afire and when lives may depend upon speedy action. For that end, the tool is preferably provided with a long handle, to permit the user to stand at a considerable distance from the fire and yet use the cutter effectively and with speed. It is contemplated that the overall length of the device may advantageously be about six feet, though we do not limit ourselves to any particular length, but in any event the device should be relatively long, yet light in weight and highly efficient in operation.

Another object of the invention is to provide a tool of the character described, with cutting means adjacent the outer end and with means for guiding the work into proper relation to the cutting means even though the operator is at a considerable distance from said end and even though his view may be obscured by smoke and flame or in other ways.

Another object is to provide a tool for cutting cables, such as may be made in large part or altogether of wires of specially hardened steel and so are very hard to sever, which tool shall be light in weight and easily manipulated, but not liable to get out of order.

Other objects and advantages will appear from the following specification and from the drawings, which are made a part of this application and in which similar reference characters indicate similar parts. In the drawings:

Fig. 1 is a side elevation of a tool according to my invention with parts in section and parts omitted,

Fig. 1a, an end elevation of the cutter head, Fig. 2, a horizontal longitudinal section on line 2—2 of Fig. 1, looking downward,

Fig. 3, an enlarged side elevation of a movable plunger shown in Figs. 1 and 2,

Fig. 4, an elevation of a modified form of operating means, the front portion being omitted,

Fig. 5, a top plan of the same,

Fig. 6, an elevation of a cutter head that may be used with either of the forms of invention shown in Figs. 1 and 4,

Fig. 7, a front elevation of Fig. 6,

Fig. 8, an elevation of another cutter head

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that may be used with either form of the invention shown, and

Fig. 9, a top plan of the device of Fig. 8.

In the drawings, reference character 10 indicates the tubular barrel of the tool in Fig. 1, in which a rod 11 is mounted for reciprocation. While I do not limit myself to any particular dimensions or materials, it is contemplated that the rodlike part 11 may consist of $\frac{3}{8}$ " tubing of 8630 steel which, after final hardening, will have a tensile strength of 125,000 lbs. per square inch, and that the tube 10 shall consist of $\frac{3}{8}$ " tubing having shrunk thereon a short sleeve 12, on which sleeve the sleeve 13 is shrunk, said sleeve 13 also being connected in like manner to a socket 14 at the rear end of the tool. By appropriately shrinking the parts together it is made certain that they shall not become disconnected regardless of however arduous may be the conditions of its use.

A slide 15 (Fig. 3) is mounted in the sleeve 13, it being here shown as guided in sleeve 12 and as being held in its forward position by a spring 16, though the spring may be omitted. The slide is cupped at its rear end at 17 (Fig. 3) to receive the end of the coil spring 16, is threaded at its front end at 19 for threaded engagement with rod 11, is cut away at its sides and underneath to accommodate the parts about to be described, and it has a vertical longitudinal web 20 in its rear portion.

A handle 21 is rigidly mounted on the sleeve 13, or integral therewith, and a cooperating finger lever 22 is pivoted at 23 on depending ears 24 which are held in fixed position by a pin 25 extending through the sleeve 13. Links 26, 26, at opposite sides of the handle 22, are pivoted to said finger-lever at 27 and to the slide 15 at 28. These links are also pivotally connected at 30 to a link 29 which is pivotally mounted on the pin 25 for rocking movement relative to said pin.

At the front end of the cutter a sleeve 31 is shrunk on the barrel 10 to afford a slightly larger bore, permitting the rod 11 to rock to a limited extent, as is desirable for reasons that will appear later. It will be understood that the number of successively larger sleeves at either end of the barrel 10 may be increased as desired, and that some of them may have screw connections or the like to facilitate assembly and disassembly of the device, as for repairs.

The rod 11, which may be hollow, is fixed at its front end to a yoke 33, or it may be made integral therewith. The operative parts of the

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cutting head include a jaw 34 pivoted at 35 to a head 36 fixed to the sleeve 31 or integral therewith. The jaw 34 has a curved cutting edge at 37 that coacts with a cutting edge at 38 on head 36 to produce a draw cutting action on the work.

In the operation of the device it will be seen that there is a sort of double toggle action at the handle end of the same, power being applied at point 27 to produce a toggle action with respect to points 23 and 30 to elevate point 30, while at the same time a toggle action occurs where point 30 exerts a spreading action for separating points 28 and 25, thereby forcing pivot 28 strongly to the left in Fig. 1 and moving the slide and the pivoted cutter 34 with like force against the work that is between the cutting jaws.

Figs. 4 and 5 exhibit another form of the operating handle parts, wherein a handle 40 is fixed to the barrel 41 in which the rod 42 is located. The handle is shown as having a ring 43 at its extreme end, for attachment of a line, or by means of which the tool may be hung on a convenient support. Such a ring may be provided in any of the tools contemplated herein. The rear end of the rod 42 has a head 44 and a pair of bent levers 45 are each pivoted at 46 on a fixed fin 47 on the handle 40. Each lever has at its elbow a pivot 48 for a link 49, provided at its other end with a pivot 50 which connects said link pivotally with one end of another toggle link 51, pivoted at its opposite end at 52 to the rear end of fin 47.

A finger lever 53 is mounted on the pivot pin of the toggle joint at 50 and has a pin-and-slot connection with the lower rear ends of the bent levers 45 by means of the flat-sided pin 54 engaging in the slots indicated at 55.

In this form of handle also there is a sort of double toggle action, in that the links 49 and 51 serve as a toggle to which power is applied at the point 50, whereas the levers 45 and 53 have power applied at the point 54 to align the points 48, 50 and 54 and thus to straighten the toggle, exerting powerful leverage on the rod 42 to close the cutting jaws.

Figs. 6 and 7 show respectively a side elevation and an end elevation of another form of cutter head such as can be used with either form of operating handle. In this form of cutter the rod 42 has a head 55 with a pivot 56 passing through the same and carrying one end of each link of two pairs of toggles comprising links 57, 57 and 58, 58. The links 57, 57 are pivoted at 59 on a fin 59' projecting from a sleeve 60 surrounding the end of rod 42 and the links 58, 58 are pivotally connected at 62 to the one end of a jaw 61 pivoted at 63 on another fin 64 of sleeve 60. The jaw 61 has a beveled cutting edge at 65, which cooperates with a cutting edge 66 on the fin 64. It will be noted that the pivot 63 of the movable jaw is offset with respect to the edge 66 so as to cause the edge 65 to have a draw cutting action with respect to the fixed cutting edge.

The pull on the rod 42 serves to straighten the toggle formed by links 57 and 48 and this action, when superposed on the toggle actions of the handle means gives a very powerful action, all the more when acting on blades having a draw cut, and thus the tool can sever with ease hardened steel cables that effectively resist the action of other cutters and can otherwise only be severed laboriously with hammer and cold chisel.

In the form of cutting head shown in Figs. 8

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and 9, the rod 68 and the barrel 69 may be as before described, but the rod carries a head 70 that is slidable in the sleeve 71, and the sleeve 71 has an extension 72 at one side, said extension being slotted at 73 to receive a slidable pin 74 that is threaded in the forward extension 70' of the head 70 and slides in the slot 73 to steady and reinforce the cutting jaw formed by the latter extension. The respective beveled cutting edges of the jaws are indicated at 75 and 76.

It will be obvious to those skilled in the art that many changes may be made in the devices of our invention, all without departing from the spirit of the invention; and therefore we do not limit ourselves to what is shown in the drawings and described in the specification, but only as indicated in the appended claims.

Having thus fully described our said invention, what we claim is:

1. A cable cutting tool having an elongated body with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the handle, a pull rod on said body, and connections from said pull rod to said finger lever and said movable jaw for operating the movable jaw upon actuation of the finger member, said connections including a toggle joint.

2. A cable cutting tool having an elongated body with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the fixed handle, a pull rod on said body, connections from said pull rod to said finger lever and said movable jaw for operating the movable jaw upon actuation of the finger member, including a toggle joint between the finger lever and the rod, and another toggle joint connection between the rod and said movable jaw.

3. A cable cutting tool having an elongated body with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the handle, a pull rod on said body, connections from said pull rod to said finger lever and said movable jaw for operating the movable jaw upon actuation of the finger lever including a fixed pivot for the finger lever, a link pivoted at one end to the lever and at the other end to the pull rod, and another link pivoted at one end to the first-named link and at its other end to a fixed part of the tool.

4. A cable cutting tool having an elongated barrel with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the handle, a pull rod in said barrel, connections from said pull rod to said finger lever and said movable jaw for operating the movable jaw upon actuation of the finger lever including fixed parallel ears on the tool, a pivot on said ears supporting the finger lever, fixed parallel links pivoted at their opposite ends to the finger lever and the pull rod respectively, and a link pivoted at its opposite ends to an intermediate part of said fixed parallel links and to a fixed part of the tool respectively.

5. A cable cutting tool having an elongated barrel with a fixed handle at one end and a head at the other end, a fixed cutting jaw on said head with a straight cutting edge extending at right

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angles to the axis of the tool, a movable jaw pivoted on said head at a point remote from the cutting edge of the fixed jaw, a pull rod in said barrel, said rod being pivoted to the movable jaw between the pivot of the movable jaw and said fixed cutting edge, a curved cutting edge on the movable jaw for coacting with said fixed cutting edge for trapping a cable as the jaws close and to effect a draw cutting action thereon, and a finger lever for pulling said pull rod to operate said movable blade.

6. A cable cutting tool having an elongated barrel with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the handle, a pull rod in said barrel, connections to said pull rod from said finger lever and said jaw for operating the movable jaw upon actuation of the finger member, links at the front of the tool pivoted to the pull rod and extending oppositely therefrom, said links respectively being pivoted to a fixed part of the tool and to the movable jaw, a fixed fin on the tool, said fin having a rearwardly extending slot with a cutting edge at its inner side, and the movable jaw being pivoted to said fin.

7. A cable cutting tool having an elongated barrel with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the handle, a pull rod in said barrel, connections to said pull rod from said finger lever and said jaw for operating the movable jaw upon actuation of the finger member, said connections including links at the front of the tool, said links being pivoted to the pull rod and extending oppositely therefrom, said links respectively being pivoted to a fixed part of the tool and to the movable jaw, a fixed fin on the tool, said fin having a rearwardly extending slot with a cutting edge at its inner side, and the movable jaw being pivoted to said fin so as to maintain its cutting edge out of alignment with the cutting edge on said fin.

8. A cable cutting tool having an elongated barrel with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the handle, a pull rod in said barrel, connections to said pull rod from said finger lever and said jaw for operating the movable jaw upon actuation of the finger member, the barrel having an enlarged cylindrical bore at its front end and the pull rod having a cylindrical enlargement fitting in said bore, a fixed jaw at one side of the head of the tool with a slot therein having a forwardly directed cutting edge, and a movable jaw slidable with said pull rod, said movable jaw having a rearwardly directed cutting edge.

9. A cable cutting tool having an elongated barrel with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the handle, a pull rod in said barrel, connections to said pull rod from said finger lever and said jaw for operating the movable jaw upon actuation of the finger member, the barrel having an enlarged cylindrical bore at its front end and the pull rod having a cylindrical enlargement fitting in said bore, a fixed jaw at one side of the head of the tool with a slot therein having a forwardly directed cutting edge, and a movable jaw slidable

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with said pull rod, said movable jaw having a rearwardly directed cutting edge, one of said jaws having a longitudinal slot and the other having a pin slidable in said slot for the purpose set forth.

10. A cable cutting tool having an elongated barrel with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the handle, a pull rod in said barrel, connections to said pull rod from said finger lever and jaw for operating the movable jaw upon actuation of the finger lever, said connections including a lever pivoted at one end to the pull rod and at an intermediate part to a fixed part of the tool, a toggle joint having links pivotally connected below said barrel, one of said links being pivoted to said lever below its connection to said fixed part and the other being pivoted to the handle rearwardly of said lever, and means for straightening the toggle.

11. A cable cutting tool having an elongated barrel with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the handle, a pull rod in said barrel, connections to said pull rod from said finger lever and said jaw for operating the movable jaw upon actuation of the finger member, said connections including a lever pivoted at one end to the pull rod and at an intermediate part to a fixed part of the tool, a toggle joint having links pivotally connected below said barrel, one of said links being pivoted to said lever below its connection to said fixed part and the other being pivoted to the barrel rearwardly of said lever, a finger lever on the pivot between the toggle links, and a pin-and-slot connection between the finger lever and the first-named lever.

12. A cable cutting tool having an elongated barrel with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the handle, a pull rod in said barrel, connections to said pull rod from said finger lever and said jaw for operating the movable jaw upon actuation of the finger member, including a bent lever having one arm pivoted between its ends to a fixed part of the tool, the free end of said arm being connected to the pull rod, toggle links connecting the other end of said arm to the handle, and a finger lever mounted on the common pivot of said toggle links and pivotally connected to the other arm of said bent lever.

13. A cable cutting tool having an elongated barrel with a fixed handle at one end and cable cutting means at the other end, said cable cutting means including a fixed jaw, a jaw movable with relation to the fixed jaw, a finger lever adjacent the handle, a pull rod in said barrel, connections to said pull rod from said finger lever and jaw for operating the movable jaw upon actuation of the finger member, including a bent lever having an arm connected to said pull rod and pivoted below such connection to a fixed part of the tool, a toggle joint connecting said arm below its pivot to a fixed part of the handle, a finger lever on the toggle pivot, and a slip connection between the finger lever and the other arm of the bent lever.

14. A cable cutting tool comprising an elongated body, a fixed handle at one end of the body,

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a pivoted finger lever adjacent the fixed handle, a head at the other end of the body, a fixed cutting jaw on the head, a movable jaw coacting with the fixed jaw, a pull rod attached at one end to the movable jaw, and a toggle joint between the other end of the rod and the finger lever, with a pivot common to the rod and the links of the toggle joint.

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