

Sept. 4, 1945.

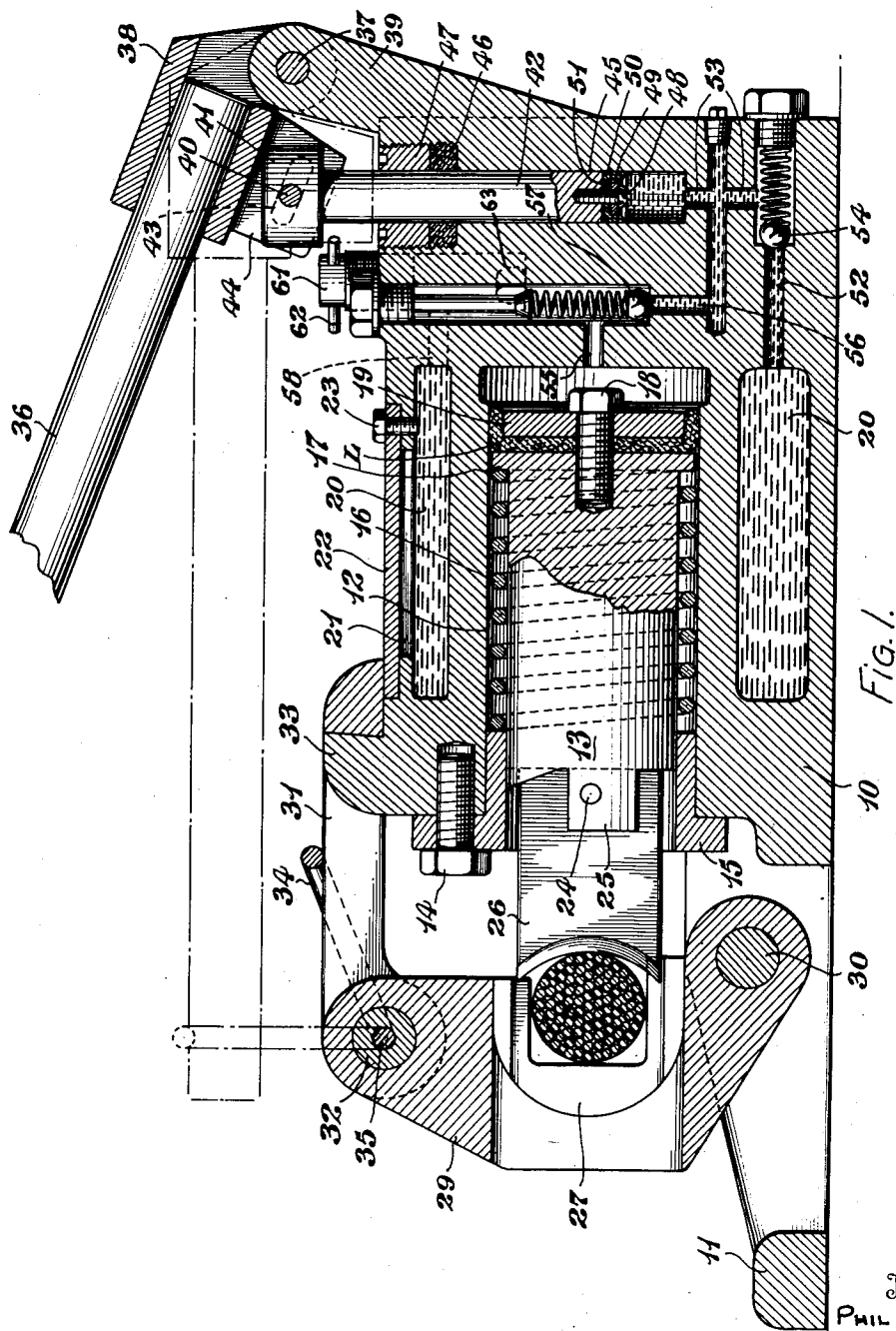
P. S. PELL ET AL

2,384,130

CABLE AND STRUCTURAL SHAPE CUTTER

Filed Sept. 18, 1944

2 Sheets-Sheet 1



Inventor
PHIL S. FELL
A.F. WALLACE

KARL W. FLOCKS
Attorney

இன்று

Sept. 4, 1945.

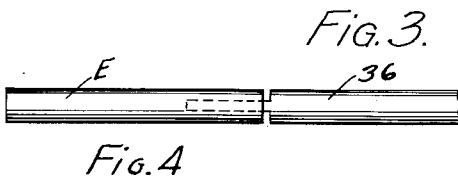
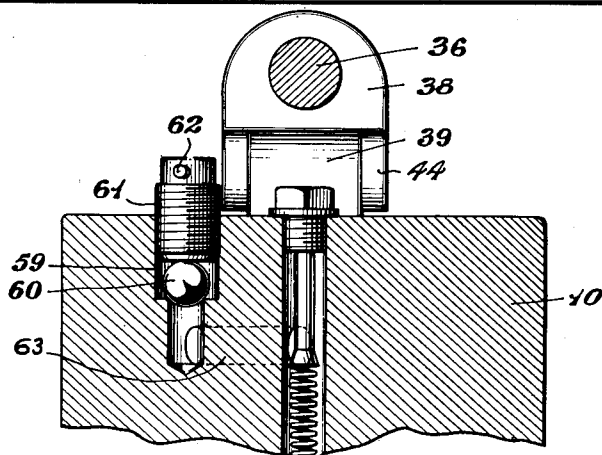
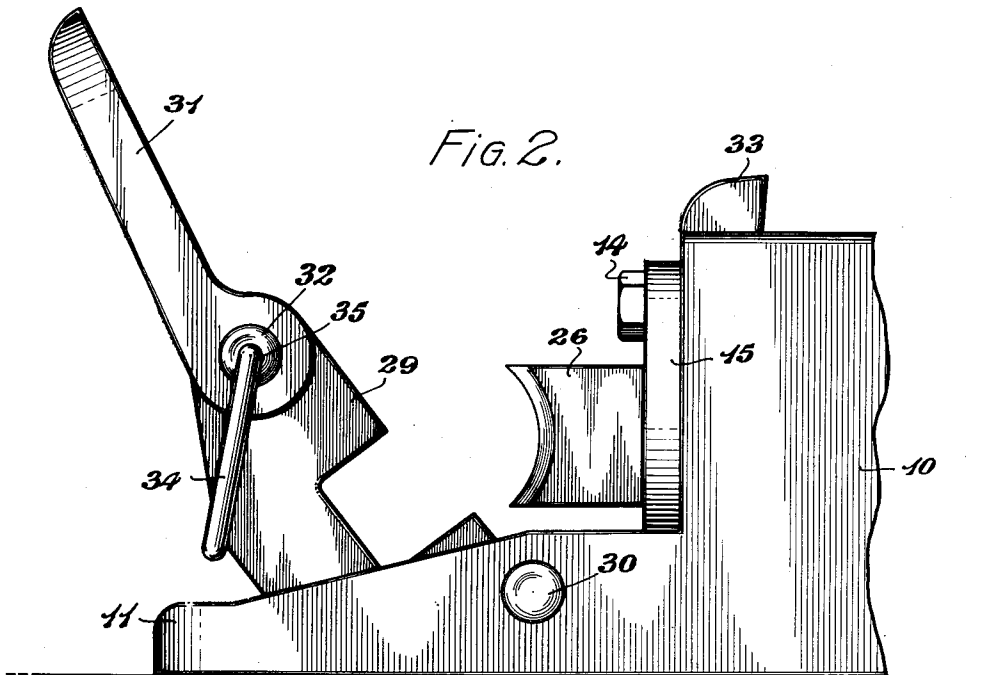
P. S. PELL ET AL

2,384,130

CABLE AND STRUCTURAL SHAPE CUTTER

Filed Sept. 18, 1944

2 Sheets-Sheet 2



Inventor

PHIL S. PELL
A.F. WALLACE

KARL W. FLOCKS
Attorney

UNITED STATES PATENT OFFICE

2,384,130

CABLE AND STRUCTURAL SHAPE CUTTER

Phil S. Pell and Arthur F. Wallace, Honolulu,
Territory of Hawaii

Application September 18, 1944, Serial No. 554,700

7 Claims. (Cl. 164—56)

This invention relates to cutters and more particularly to hand operated portable cutters for cutting cable and other structural shapes.

This application is an improvement over the invention of Phil S. Pell and Arthur F. Wallace as disclosed in U. S. Patent No. 2,236,833 granted April 1, 1941. The device described in this patent comprises a body construction having a relatively small horizontal base with the major portion of the body having a vertical axis. The axis of cutter movement in the device described in this patent is normally vertical. In accordance with the instant invention, the device comprises a body incorporating a relatively large horizontal base and the axis of cutter operation is normally horizontal, though the device is capable of use with the axis of cutter operation extending in any direction.

It is an object of the instant invention to provide an improved hydraulic operated cutter capable of general use.

Another object of the instant invention is to provide a novel portable hydraulically operated cable cutter capable of long life under severe conditions with minimum risk of failure or breakdown.

Other objects and the nature and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a vertical section with parts shown in elevation and with parts broken away showing a cable cutter in accordance with the invention;

Figure 2 is a fragmentary view in elevation of a portion of the cutter shown in Fig. 1;

Fig. 3 is a fragmentary transverse sectional view depicting the hydraulic relief mechanism, and

Figure 4 is a view in elevation with parts broken away showing the extension for the handle of the cutter device.

Referring to the drawings, the main body 10 of the cutter may consist of a casting of steel or other suitable metal, and is formed with a looped formation 11 which may serve as a carrying handle or as an eye for a hook when the device is supported vertically aloft aboard ship or elsewhere. Formed in the main body 10 is a cylinder 12 which is adapted to coact with the hydraulically operated ram 13. Secured to the main body 10, at its outer side, by three cap screws 14, is the ram collar 15, the inner end of which extends within the cylinder and serves as a base or stop for the ram retracting spring 16 which normally tends to push the ram into the cylinder. The

inner end of the spring 16 coacts with a shoulder 17 adjacent the inner end of the ram so that when the ram is forced outwardly under hydraulic pressure, the spring 16 is placed under compression and tends to push the ram inwardly. The cap screw 18 and the ram retainer 19 serve to secure the ram cup leather L to the ram in a manner such that the leather is always in contact with the inner walls of the cylinder 12 so that there is no tendency for the hydraulic medium to leak past the ram.

The cylindrically shaped reservoir 20, which is adapted to store the hydraulic medium, which may be oil or other suitable fluid, is provided with an opening 21 at the top, which opening is adapted to be covered by the cover plate 22 secured to the main body by four cap screws 23.

Pinned by the pin 24 to the projection 25, formed integral with the ram 13, is the cutter blade 26 which is adapted to coact with the die inserts 27 in a manner such that when the ram is forced outwardly, the wire strand cable will be neatly cut. The die inserts 27 are mounted within the die block 29 which is pivotally secured to the main body 10 by the pin 30. The pin 30 may have its head arranged flush with the main body 10. The die block latch 31 is of looped formation, is pivotally mounted to the die block 29 by the pin 32 and is adapted to engage the projection 33 extending from the main body 10, as shown in Figure 1.

The bail 34, pivoted at 35, serves to hold a pump handle 36 in place when not in use, as shown in broken lines in Fig. 1, and when the pump handle is in use the bail takes the position shown in full and dotted lines in this figure.

The pump handle hinge bolt 37 pivotally supports the pump handle socket 38 on the projection 39 extending from the main body 10. The plunger hinge bolt 40, secured through the head 41 of the plunger 42, is adapted to operate within the slots 43 formed within the ear-like projections 44 extending from the lower portion of the socket 38 in such a manner that when the pump handle 36 is pumped up and down the plunger 42 moves up and down within the vertical cylinder 45 formed within the main body 10. About the plunger 42 is located the packing 46 held in place by the plunger packing retainer 47.

The plunger leather retainer screw 48, under the head of which is located the plunger leather retainer 49, serves to secure the plunger leather 50 to the working head 51 of the plunger which tends to prevent the leakage of hydraulic medium past the plunger.

The passages 52 and 53 serve to connect the reservoir 20 with the cylinder 45 and the string pressed ball or check valve 54 controls this connection. The passages 55, 56, 57 serve to connect the cylinder 12 with the cylinder 45 and the spring pressed ball or check valve 57 controls this connection. The passage 58 serves to connect the top of the reservoir 20 with the relief opening 59; and the ball valve 60, controlled by the plug 61, the top of which is provided with an operating handle 62, normally closes this passage until it is desired to relieve the hydraulic system.

Though the pump handle 35 is shown in Figure 1 as being of a length approximating the length of the main body, it may be longer or it may be provided with an extension E (Fig. 4) so that greater leverage can be obtained.

In using the device in accordance with the invention, the device may be located on a table or floor or deck in horizontal position, or may be held in vertical position or suspended in vertical position and, accordingly, this portable device is capable of very general use. The bail 34, shown in Fig. 1 of the drawings, is swung in a counterclockwise direction so as to release the pump handle 36, the die block latch 31 is also swung in a counterclockwise direction and the die block itself also rotates in a counterclockwise direction. The cable or other element to be cut is then located across the cutter blade 26 as shown in Fig. 1, the die block rotated in clockwise direction in the position shown in Fig. 1, the die block latch closed and the pump handle operated upwardly and downwardly to cause the plunger 42 to move upwardly and downwardly and suck in the hydraulic medium past the intake ball or check valve 54 into the cylinder 45 and pump it past the discharge ball or check valve 57 into the cylinder 12, and cause the ram 13 to move with great force outwardly so that the cutter blade 26 cooperates with the die inserts 27 and neatly cuts the cable 28 or other element to be cut.

After the cutting operation has been effected, the hydraulic system may be relieved by unscrewing the plug 61 by means of the handle 62 so that the ball valve 60 will be opened slightly by the pressure from the hydraulic system against the ball. The hydraulic medium within the cylinder 45 may then be forced downwardly by downward operation of the pump handle 36 past the discharge valve 57 through the passage 63 past the ball valve 60 back into the top of the reservoir 20. The weight of the pump handle 36 itself may be sufficient to relieve the hydraulic system and cause flow of the hydraulic medium within the cylinder 45 back to the reservoir 20. The plug 61 is then tightened down by means of the handle 62 and the device is again ready for cutting operation when desired. When the pressure within the hydraulic system is relieved by the opening of the ball valve 60, the hydraulic medium within the cylinder 12 will be forced through passage 55, passage 63 past valve 60 and back into the top of the reservoir 20 under the influence of the spring 16. When the ram 13 is moved inwardly to the cylinder 12 under the influence of the spring 16, the cutter blade 26 will also be moved inwardly so that the device will again be capable of receiving cable or other elements to be cut.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and

therefore the invention is not limited to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

What is claimed is:

1. A portable manually operated tool for cutting cable or other elements, comprising a body member, a driven hydraulic ram cooperating with a cylinder formed in said body, a reservoir for hydraulic medium located in said body, a driving plunger coacting with a hydraulic cylinder located in said body, fluid passages connecting said cylinder cooperating with said driving plunger with the cylinder cooperating with said driven hydraulic ram, a cutter blade pinned to said hydraulic ram and adapted to move with said ram, a die block pivotally mounted to said body, a die set mounted in said die block, adapted to cooperate with said cutter blade, a latch for locking said die block to said body so as to hold said die set within said die block in relatively fixed position with respect to said movable cutter blade and means for operating said driving plunger, fluid passage means connecting said reservoir to said driving plunger cylinder and a check valve located in said fluid passage means.

2. A portable manually operated tool for cutting cable or other elements, comprising a body member, a driven hydraulic ram cooperating with a cylinder formed in said body, a reservoir for hydraulic medium located in said body, a driving plunger coacting with a hydraulic cylinder located in said body, fluid passages connecting said cylinder cooperating with said driving plunger with the cylinder cooperating with said driven hydraulic ram, a cutter blade pinned to said hydraulic ram and adapted to move with said ram, a die block pivotally mounted to said body, a die set mounted in said die block, adapted to cooperate with said cutter blade, a latch for locking said die block to said body so as to hold said die set within said die block in relatively fixed position with respect to said movable cutter blade and means for operating said driving plunger, fluid passage means connecting said reservoir to said driving plunger cylinder, a check valve located in said fluid passage means, and a check valve located in the passage leading from the driving plunger cylinder to the driven ram cylinder.

3. A portable manually operated tool for cutting cable or other elements, comprising a body member, a driven hydraulic ram cooperating with a cylinder formed in said body, a reservoir for hydraulic medium located in said body, a driving plunger coacting with a hydraulic cylinder located in said body, fluid passages connecting said cylinder cooperating with said driving plunger with the cylinder cooperating with said driven hydraulic ram, a cutter blade pinned to said hydraulic ram and adapted to move with said ram, a die block pivotally mounted to said body, a die set mounted in said die block, adapted to cooperate with said cutter blade, a latch for locking said die block to said body so as to hold said die set within said die block in relatively fixed position with respect to said movable cutter blade and means for operating said driving plunger, fluid passage means connecting said reservoir to said driving plunger cylinder, a check valve located in said fluid passage means, a check valve located in the passage leading from the driving plunger cylinder to the driven ram cylinder, and spring means located about a portion of said ram and within said ram cylinder for moving said ram

inwardly when the pressure within the passage leading from said driving plunger cylinder to said ram cylinder is relieved.

4. A portable manually operated tool for cutting cable or other elements, comprising a body member, a driven hydraulic ram cooperating with a cylinder formed in said body, a reservoir for hydraulic medium located in said body, a driving plunger coacting with a hydraulic cylinder located in said body, fluid passages connecting said cylinder cooperating with said driving plunger with the cylinder cooperating with said driven hydraulic ram, a cutter blade pinned to said hydraulic ram and adapted to move with said ram, a die block pivotally mounted to said body, a die set mounted in said die block, adapted to cooperate with said cutter blade, a latch for locking said die block to said body so as to hold said die set within said die block in relatively fixed position with respect to said movable cutter blade and means for operating said driving plunger, fluid passage means connecting said reservoir to said driving plunger cylinder, a check valve located in said fluid passage means, a check valve located in the passage leading from the driving plunger cylinder to the driven ram cylinder, spring means located about a portion of said ram and within said ram cylinder for moving said ram inwardly when the pressure within the passage leading from said driving plunger cylinder to said ram cylinder is relieved, and means for relieving said hydraulic system when the cutting operation has been completed, said last mentioned means including a passage leading from said ram cylinder back into said reservoir and a passage leading from said plunger cylinder back into said reservoir, a valve for controlling said two last mentioned passages, and means for controlling said valve so as to permit passage of hydraulic medium through said two last mentioned passages.

5. A portable manually operated tool for cutting cable or other elements, comprising a body member, a driven hydraulic ram cooperating with a cylinder formed in said body, a reservoir for hydraulic medium located in said body, a driving plunger coacting with a hydraulic cylinder located in said body, fluid passages connecting said cylinder cooperating with said driving plunger with the cylinder cooperating with said driven hydraulic ram, a cutter blade pinned to said hydraulic ram and adapted to move with said ram, a die block pivotally mounted to said body, a die set mounted in said die block, adapted to cooperate with said cutter blade, a latch for locking said die block to said body so as to hold said die set within said die block in relatively fixed position with respect to said movable cutter blade and means for operating said driving plunger, said body being arranged generally horizontally, said ram cylinder being arranged so as

to have a horizontal axis, said plunger cylinder being arranged so as to have a generally vertical axis, said hydraulic medium reservoir being of generally cylindrical shape and having a horizontal axis and being located generally about said ram cylinder.

6. A portable manually operated tool for cutting cable or other elements, comprising a body member, a driven hydraulic ram cooperating with a cylinder formed in said body, a reservoir for hydraulic medium located in said body, a driving plunger coacting with a hydraulic cylinder located in said body, fluid passages connecting said cylinder cooperating with said driving plunger with the cylinder cooperating with said driven hydraulic ram, a cutter blade pinned to said hydraulic ram and adapted to move with said ram, a die block pivotally mounted to said body, a die set mounted in said die block, adapted to cooperate with said cutter blade, a latch for locking said die block to said body so as to hold said die set within said die block in relatively fixed position with respect to said movable cutter blade and means for operating said driving plunger, a pump handle pivotally mounted to said body and operably connected to said driving plunger, and ball means pivotally connected to said die block and arranged to be looped over said pump handle so as to lock said pump handle to said body when the device is not in use.

7. A portable manually operated tool for cutting cable or other elements, comprising a body member, a driven hydraulic ram cooperating with a cylinder formed in said body, a reservoir for hydraulic medium located in said body, a driving plunger coacting with a hydraulic cylinder located in said body, fluid passages connecting said cylinder cooperating with said driving plunger with the cylinder cooperating with said driven hydraulic ram, a cutter blade pinned to said hydraulic ram and adapted to move with said ram, a die block pivotally mounted to said body, a die set mounted in said die block, adapted to cooperate with said cutter blade, a latch for locking said die block to said body so as to hold said die set within said die block in relatively fixed position with respect to said movable cutter blade and means for operating said driving plunger, a pump handle pivotally mounted to said body and operably connected to said driving plunger, ball means pivotally connected to said die block and arranged to be looped over said pump handle so as to lock said pump handle to said body when the device is not in use, and an extension element adapted to be connected to said pump handle so as to increase its length and thereby increase the leverage which may be exerted upon said driving plunger.

PHIL S. PELL.
ARTHUR F. WALLACE.