

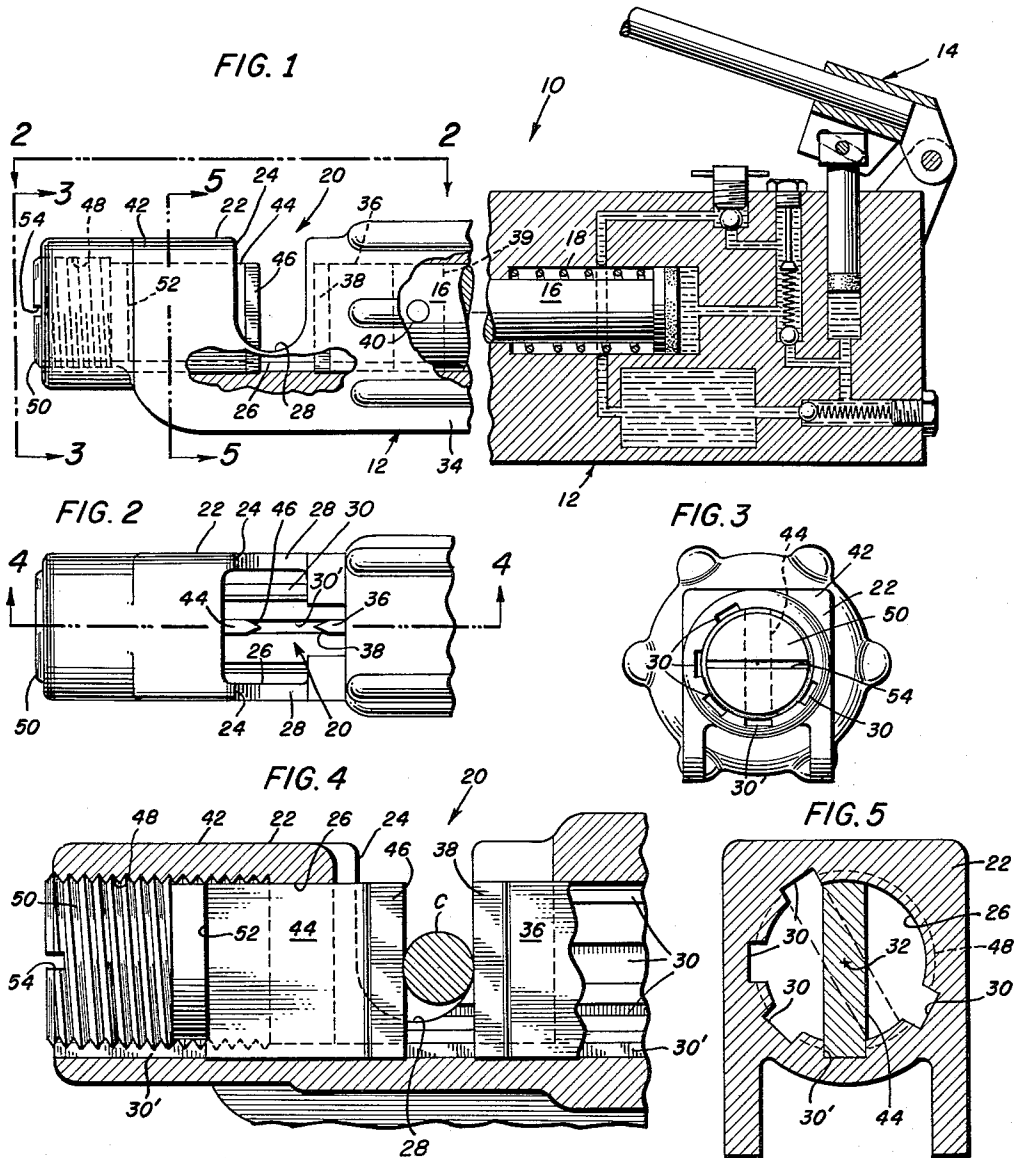
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CUTTER CONSTRUCTION FOR CUTTING CABLES, SOLID BARS AND THE LIKE

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## CUTTER CONSTRUCTION FOR CUTTING CABLES, SOLID BARS AND THE LIKE

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This invention relates generally to metal cutters or shears and is more particularly concerned with an improved cutter blade construction particularly adapted for use in power-operated portable cutters or the like which are especially adapted for cutting cables, or solid bars.

A primary object of the invention is to provide in a power-operated shear a cutter construction which assures proper orientation between cooperating cutting edges of blades which have relative axial movement with respect to each other, the cutter construction minimizing distortion, stress and breakage of the tool and attaining maximum accuracy and uniformity for the severing of cables, solid rods and the like.

Another object of the invention is to provide a cutter construction of the character mentioned which includes means whereby the cutter blades may be adjusted to bevel or angle cut a cable or a rod being worked upon.

A further object of the invention is to provide in a cutter construction of the character set forth means whereby the cooperating cutter blades may be adjustable axially with respect to each other to accommodate different sizes of stock to be severed and to assure that the cooperating cutting edges will sever but not engage each other, this expedient attaining extended intervals between sharpening of the blades and affording improved efficiency between sharpenings.

And a still further object of the invention is to provide a cutter construction of the character set forth which assures that the effective cutting edges of the cooperating blades are substantially free from metal chips or debris to further maintain and assure efficiency of operation of the tool.

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:

FIG. 1 is a side elevation of the novel cutter construction, with portions broken away for purposes of clarity, shown in relation to a fragmentary portion of typical power operating mechanism illustrated on a reduced scale and substantially diagrammatic;

FIG. 2 is a fragmentary top plan view of the novel cutter construction taken substantially from line 2-2 of FIG. 1;

FIG. 3 is an end elevation looking from line 3-3 of FIG. 1;

FIG. 4 is an enlarged longitudinal section taken substantially on line 4-4 of FIG. 2; and

FIG. 5 is an enlarged vertical section taken on line 5-5 of FIG. 1.

Referring to the drawing in detail, a portable cable or structural-shape cutter is indicated generally at 10 and includes a body 12 having mounted thereon a fluid pressure operating mechanism indicated generally at 14 for forcibly extending a piston rod 16 toward the left, as viewed in FIG. 1, against the reaction of a return spring 18.

The power-operating mechanism is conventional and is disclosed and described in detail in United States Letters Patent to Phil S. Pell et al. 2,384,130, granted September 4, 1945.

It will be noted in FIG. 1 that the left-hand portion illustrating the cutter construction is on a somewhat en-

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larged scale as compared with the right-hand portion, it being understood that the piston rod portion 16, 16 thereof would be in axial alignment.

The cutter construction is indicated generally at 20 and includes a support head 22 having a transverse upwardly opening U-shaped support notch 24 in which is received a longitudinally disposed cable, piece of bar stock C, see FIG. 4, etc., to be severed.

The support portion 22 has extending longitudinally therethrough, on opposite sides of the U-shaped notch portion 24, a cutter blade and orienting bore 26 which is formed during a single machine operation in the bore to assure proper orientation of the cooperating cutter blades as will subsequently be described in detail.

It will be noted that the lowermost portion of the U-shaped notch 24, as indicated at 28, is spaced above the lower portion of the bore 26, thus assuring that chips formed during cutting of a cable or bar will fall below this lowermost portion 28 and accordingly obviate obstruction with the effective cutting portion of the cutting blades.

Simultaneously formed in the bore 26 by means of broaching, for example, are a plurality of longitudinally extending keyways or grooves 30 which are in angularly spaced relationship with respect to the longitudinal axis 32 of the bore 26, see FIG. 5. This expedient, as will be readily apparent, permits the cutter blades to be oriented normal to the longitudinal axis of a cable or rod to be cut, i.e., disposed in angular relationship thereto in order to bevel such a rod or bar. It will be observed in FIG. 5 that a cutter is disposed in a vertical position wherein a bar or rod being cut will be severed at a plane normal to its longitudinal axis. An alternate position is shown by means of dotted lines in FIG. 5.

Disposed in groove 30' of the bore 26 at the right-hand portion 34 of the support 22 is a cutter blade 36 having a forward chisel edge 38 and having a rectangular cross section, the width of which being complementary to the width of the keyway 30'. The piston rod 16, see FIG. 1, will be bifurcated, as indicated at 39, and receives therein the cutter blade 36, the blade having a transverse aperture therethrough in aligned relationship with one extending diametrically through the piston rod 16 and receiving a locking pin 40 therein. Disposed in the bore portion 26 of the portion 42 of the support 22 is an anvil or fixed blade 44 which is received in the keyway 30' in the portion 42. The blade 44 has a chisel edge 46 and will be disposed in coplanar, axial alignment with the blade 36. Formed within the portion 42, on the inner periphery of the bore 26, is a suitably threaded portion 48 in which is received an adjustment or orienting plug 50 which will engage the cutter blade 44, as indicated at 52, for the purpose of adjusting clearances between the chisel cutting edges 38 and 46 of the respective cutter blades.

The blade 44 will be adjusted so that the blade 36 which will be moved by the power operating mechanism will have therebetween a slight clearance in order to prevent the cutting edges 38 and 46 from actually engaging each other during severing of a bar or cable. This is essential in order to prevent wedging of the blades and damage to the cutting edges, and this expedient accordingly assures efficiency and long operation of the tool. It has been found that actual contact between the cutting edges is not necessary.

It will be noted that the plug or screw 50 incorporates a diametrical slot 54 for the purpose of facilitating longitudinal adjustment of the screw or plug 50.

Still further, it will be noted that the lowermost portion 28 of the transverse rod or cable supporting notch 24 is above the lowermost portion of the cutter blades 36 and 44, and thus if any debris or chips should enter be-

tween the blades, see FIG. 4, the effective cutting edge portions of the portions of the blades which would engage the cable C would not be affected by such chips.

In order to replace or adjust the blades 36, 44, the plug 50 is removed, the piston 16 is extended to the left until 40 is exposed at notch 24, and the blades may be readily withdrawn from the left-hand end of the bore 26.

Thus, it will be observed that there has been disclosed a fixed or anvil blade which is longitudinally adjustable relative to a movable blade, and the means for mounting the blades also provides the keyway for guiding the blades into a coplanar, properly oriented relationship to thereby afford the most effective cutting. Further, the blades may be adjusted in order to prevent actual engagement between the blades during cutting, and further the means for guiding or mounting the blades are simultaneously machined, thus assuring that the coplanar, oriented relationship of the blades will be positively attained and maintained. Further, the effective cutting edge portions of the blades are not subject to interference by metal chips or debris and the longitudinal adjustment of the blade may be accomplished in an expeditious and relatively simple manner.

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 intended to be 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 cutter construction for a power operated metal cutting tool adapted for cutting solid bar stock or the like comprising a support member having a longitudinal axis including a support portion for orienting an elongated work piece to be cut normal to the longitudinal axis of said support member, a pair of co-planar cutter blades mounted in said support member for relative longitudinal movement on opposite sides of said support portion, said cutter blades including co-planar linear cutting edges,

said support member including continuous, uni-planar keyway means extending longitudinally therethrough in intersecting relationship to said support portion and receiving and orienting said cutter blades on opposite sides of said support portion, said support member including a longitudinal bore therethrough in intersecting relationship to and on opposite sides of said support portion, said keyway means including a longitudinally extending, radially disposed keyway formed on the inner surface of and extending the length of said bore, said cutter blades extending diametrically of said bore and having an edge configuration conforming to that of the keyway and having a height equal to the combined depth of said keyway and the diameter of said bore portion, and a plurality of similar, circumferentially spaced keyways opening into and extending the length of said bore portion for receiving the edge configuration of said cutter blades therein for bevel cutting a work piece disposed in the support portion.

2. The structure of claim 1 including a a longitudinally adjustable abutment element threadedly supported in said bore and in axial engagement across the entire width of one of said cutter blades exclusive of the edge portion disposed in said keyway means for providing an abutment across the entire effective cutting portion of said one cutter blades and maintaining a predetermined minimum clearance between the coplanar linear cutting edges of said blades.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

|           |               |               |
|-----------|---------------|---------------|
| 447,849   | Todd          | Mar. 10, 1891 |
| 1,419,789 | Webb          | June 13, 1922 |
| 1,780,817 | Dubois        | Nov. 4, 1930  |
| 1,963,491 | Hanson        | June 19, 1934 |
| 2,087,124 | Smith et al.  | July 13, 1937 |
| 2,227,081 | Gray          | Dec. 31, 1940 |
| 2,263,466 | McCarthy      | Nov. 18, 1941 |
| 2,898,997 | Porter et al. | Aug. 11, 1959 |