Oct. 7, 1947. A. J. BRUNNER 2,428,650

SHEARING TOOL

Filed May 17, 1945

FIG. 3

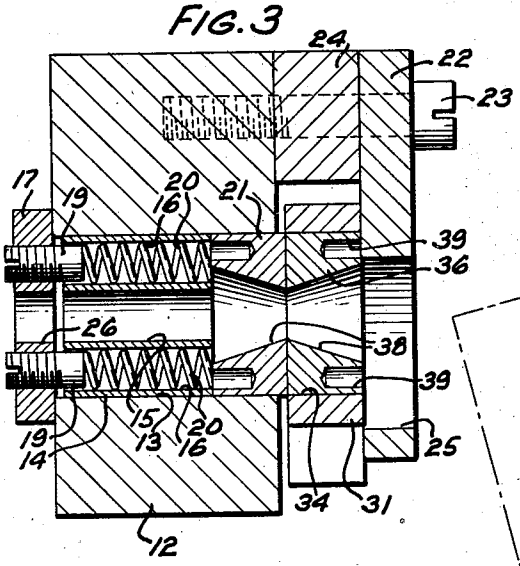


FIG. 4

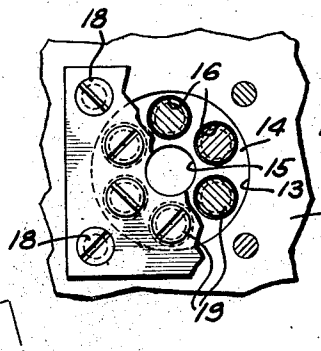


FIG. 1

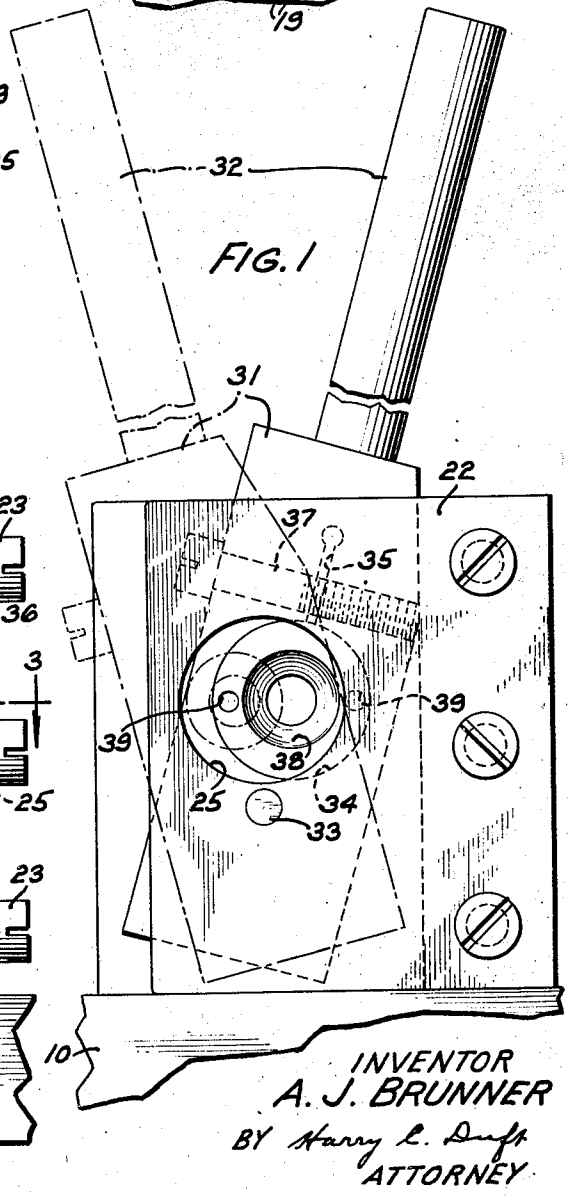
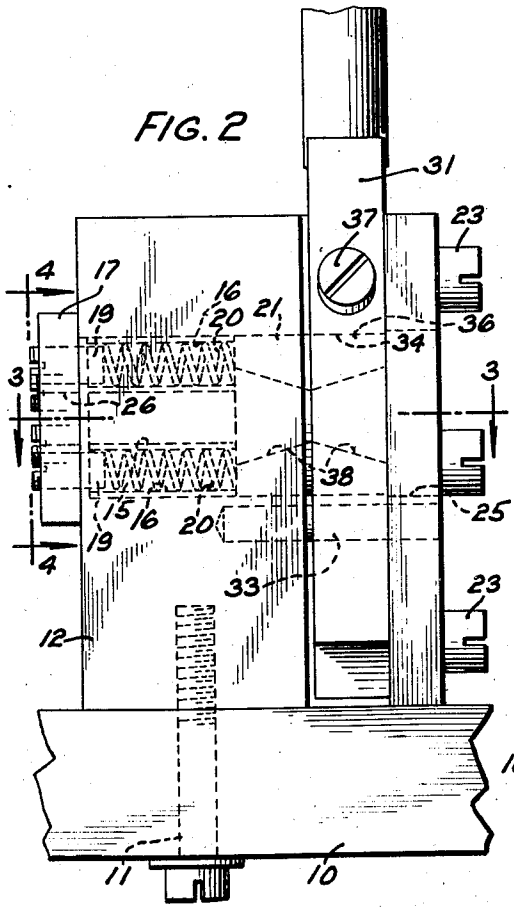


FIG. 2



INVENTOR
A. J. BRUNNER
BY Harry L. Duff
ATTORNEY

Patented Oct. 7, 1947

2,428,650

UNITED STATES PATENT OFFICE

2,428,650

SHEARING TOOL

Anton J. Brunner, Congress Park, Ill., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York

Application May 17, 1945, Serial No. 594,244

9 Claims. (Cl. 164—40)

1

This invention relates to a shearing tool and more particularly to a tool for shearing strand-like material.

In the manufacture of some electrical apparatus, sheathed and insulated conductors must be cut to predetermined lengths and, due to the fact that some of these conductors have a metallic woven sheath enclosed in a knitted or braided covering surrounding the relatively heavy layers of different density insulating material, such as rubber, through which a core extends, shearing tools for cutting these conductors must be continually sharpened due to the well-known wearing effect of rubber. Considerable difficulties have been experienced in the past in making a clean cut through these layers of different materials.

It is an object of the present invention to provide a simple and effective shearing tool having long life and relatively few parts.

In accordance with one embodiment of the invention, a cylindrical cutting element is mounted in a handle member and is held against a similar spring-pressed cutting element mounted in a block on which the handle member is pivoted. The spring-pressed cutting or shearing element is free to rotate in the block and the handle-supported cutting element is adjustable in the handle member whereby the cutting elements may rotate with respect one to another to present new shearing surfaces to the conductor being cut, whereby one sharpening operation on the elements will serve for an appreciable length of time. The means for exerting spring pressure on the spring-pressed cutting element includes a group of springs which may be adjusted so that the desired spring pressure will be exerted on the spring-pressed cutting element.

A complete understanding of the invention may be had by reference to the following detailed description when considered in conjunction with the accompanying drawings, wherein

Fig. 1 is a front elevational view of a cutting or shearing tool constituting one embodiment of the invention;

Fig. 2 is a side elevational view of the mechanism shown in Fig. 1, part of the handle being broken away to conserve space;

Fig. 3 is a horizontal sectional view taken substantially along the line 3—3 of Fig. 2 in the direction of the arrows and showing the tool in its operated position; and

Fig. 4 is a fragmentary view taken substantially along the line 4—4 of Fig. 2 in the direction of the arrows, parts being broken away to

2

more clearly illustrate the construction of those parts of the tool which are normally covered.

In the drawings, wherein like reference characters designate the same parts in the several views, the tool is shown mounted upon a base 10, through which a machine screw 11 extends to threaded engagement with a block 12. The block 12 has a cylindrical aperture 13 extending through it to receive a drum or barrel 14. The barrel 14 is provided with a central guide aperture 15, which is encircled by six spring-receiving apertures 16. Attached to the left side of the block 12 (Figs. 2 and 3) is a retainer plate 17, which is held in place on the block by machine screws 18 (Fig. 4) and is threaded to receive six adjusting screws 19, the position of which may be adjusted to regulate the pressure exerted by springs 20 in the spring-receiving apertures 16 against a spring-pressed shearing element 21. A retainer plate 22 is fixed on the block 12 by means of machine screws 23—23, being spaced from the block 12 by a spacer member 24, through which the machine screws 23 extend. The retainer plate 22 has a relatively large aperture 25 formed in it in axial alignment with the guide aperture 15 in the drum or barrel 14, which is also aligned with a guide aperture 26 formed in the retainer plate 17.

Interposed between the right hand face (Figs. 3 and 4) of the block 12 and the left-hand face of the retainer plate 22 is a handle member 31 having a handle 32 fixed therein. The handle member 31 is pivoted on a pin 33 suitably fixed in both the block 12 and the retainer plate 22. The handle member 31 has an aperture 34 formed in it, which communicates with a slot 35. The aperture 34 is adapted to receive a shearing element 36 of exactly the same construction as the shearing member 21 and the shearing element 36 is held in the handle member 31 by a machine screw 37 threaded into that portion of the handle member 31 to the right of the slot 35, as viewed in Fig. 1. This machine screw 37 may be manipulated to clamp the shearing element 36 in the handle member 31.

As pointed out hereinbefore, the shearing elements 21 and 36 are of identically the same construction, and each is provided with a central frusto-conical aperture 38, the reduced ends of which are juxtaposed to define a shearing edge in cooperation with the flat faces of the shearing elements 21 and 36. In addition to the central aperture in the shearing elements, they are provided with sockets 39 adapted to receive the ends of a suitable wrench whereby the shearing ele-

ment 36 may be set in an adjusted position and then fastened in the handle 31 by means of the machine screw 37. The shearing element 21 is free to rotate or to move axially in the aperture 13 and it has been found that the shearing element 21 will rotate in its aperture when shearing operations are performed, apparently because of the gripping of the rubber insulation of the parts being sheared against the shearing element tending to twist it. In this manner, the shearing element 21 will present different surfaces to effect the shearing operation. If necessary, the element 21 may be rotated upon disassembling the apparatus if it is desired to present a new surface of the shearing element for shearing action. Due to the fact that the springs 20 exert an appreciable amount of pressure against the shearing element 21, it will be held tightly against the shearing element 36 despite the wear between the two parts as they are moved one relative to the other.

In the operation of the tool, an insulated and shielded conductor or any other strand-like material may be inserted through the aligned central apertures in the retainer plate 17, barrel or drum 14, shearing elements 21 and 36, and the aperture 25 in the handle member 31 and the handle 32 may then be manipulated to move it from the position shown in dot and dash lines in Fig. 1 to its operated position, as shown in full lines in Fig. 1, thus to shift the shearing element 36 with respect to the shearing element 21 and shear the material between them.

What is claimed is:

1. A shearing tool comprising a pair of shearing elements having central frusto-conical apertures therein, means for supporting one of said shearing elements for oscillatory movement with respect to the other shearing element, and means for resiliently urging said other shearing element to engage the first-mentioned shearing element.

2. A shearing tool comprising a pair of cylindrical shearing elements, an oscillatable support for one of said elements, a stationary support for the other of said elements, and resilient means in said stationary support for urging the element supported thereby into shearing engagement with said one element.

3. A shearing tool comprising a base block having a bore therethrough, a tubular barrel in said bore, a cylindrical shearing element slidably and rotatably mounted in said bore, a second cylindrical shearing element, oscillatable means for supporting said second shearing element, and springs positioned in the body of the barrel for pressing said first-mentioned shearing element into operative engagement with the second shearing element.

4. A shearing tool comprising a pair of cylindrical shearing elements, an oscillatable support for one of said elements, a stationary support for the other of said elements, means in said oscillatable support for clamping the shearing element therein, and resilient means in said stationary support for pressing the element supported thereby into shearing engagement with said one element.

5. A shearing tool comprising a base block having a bore therethrough, a tubular barrel in said bore, a cylindrical shearing element slidably and rotatably mounted in said bore, a second cylindrical shearing element, oscillatable means for supporting said second shearing element, springs positioned in the body of the barrel for pressing said first-mentioned shearing element into operative engagement with the second shearing element, and means attached to said block for blocking movement of the second shearing element by the first-mentioned shearing element.

6. A shearing tool comprising a base block having a bore therethrough, a tubular barrel in said bore, a cylindrical shearing element slidably and rotatably mounted in said bore, a second cylindrical shearing element, oscillatable means for supporting said second shearing element, springs positioned in the body of the barrel for pressing said first-mentioned shearing element into operative engagement with the second shearing element, and retaining means attached to the block for holding said springs against said first-mentioned shearing element.

7. A shearing tool comprising a base block having a bore therethrough, a tubular barrel in said bore, a cylindrical shearing element slidably and rotatably mounted in said bore, a second cylindrical shearing element, oscillatable means for supporting said second shearing element, springs positioned in the body of the barrel for pressing said first-mentioned shearing element into operative engagement with the second shearing element, a retainer plate fixed to said block, and spring adjusting screws, one associated with each spring, threaded into said plate for adjusting the pressure of said first-mentioned shearing element against the second shearing element.

8. A shearing tool comprising a pair of shearing elements having central frusto-conical apertures therein, means for supporting one of said shearing elements for oscillatory movement with respect to the other shearing element, and means for resiliently urging said other shearing element to engage the first-mentioned shearing element, said shearing elements being mounted with the small ends of their apertures in abutting relation.

9. In an apparatus for cutting insulated conductors, a main support block having a bore extending therethrough, a handle member pivotally mounted on said block and having a bore therein, a backing plate attached to said block for preventing movement of the handle member away from said block, a tubular shearing element mounted in the bore of the handle member, means for fixing said shearing element in said bore, a tubular shearing element slidably and rotatably mounted in the bore in the block, a barrel shaped member also positioned in the bore in the block, a plurality of springs mounted in said barrel shaped member, a retainer plate mounted on said block, and a plurality of threaded members threaded in said plate to adjust the pressure of said springs on the second-mentioned shearing element.

ANTON J. BRUNNER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,137,093	Simsonsen	Apr. 27, 1915

FOREIGN PATENTS

Number	Country	Date
236,491	Great Britain	July 9, 1925