March 13, 1934. E. W. KOPKE 1,950,733

CANE KNIFE

Filed Jan. 16, 1932

Fig. 1

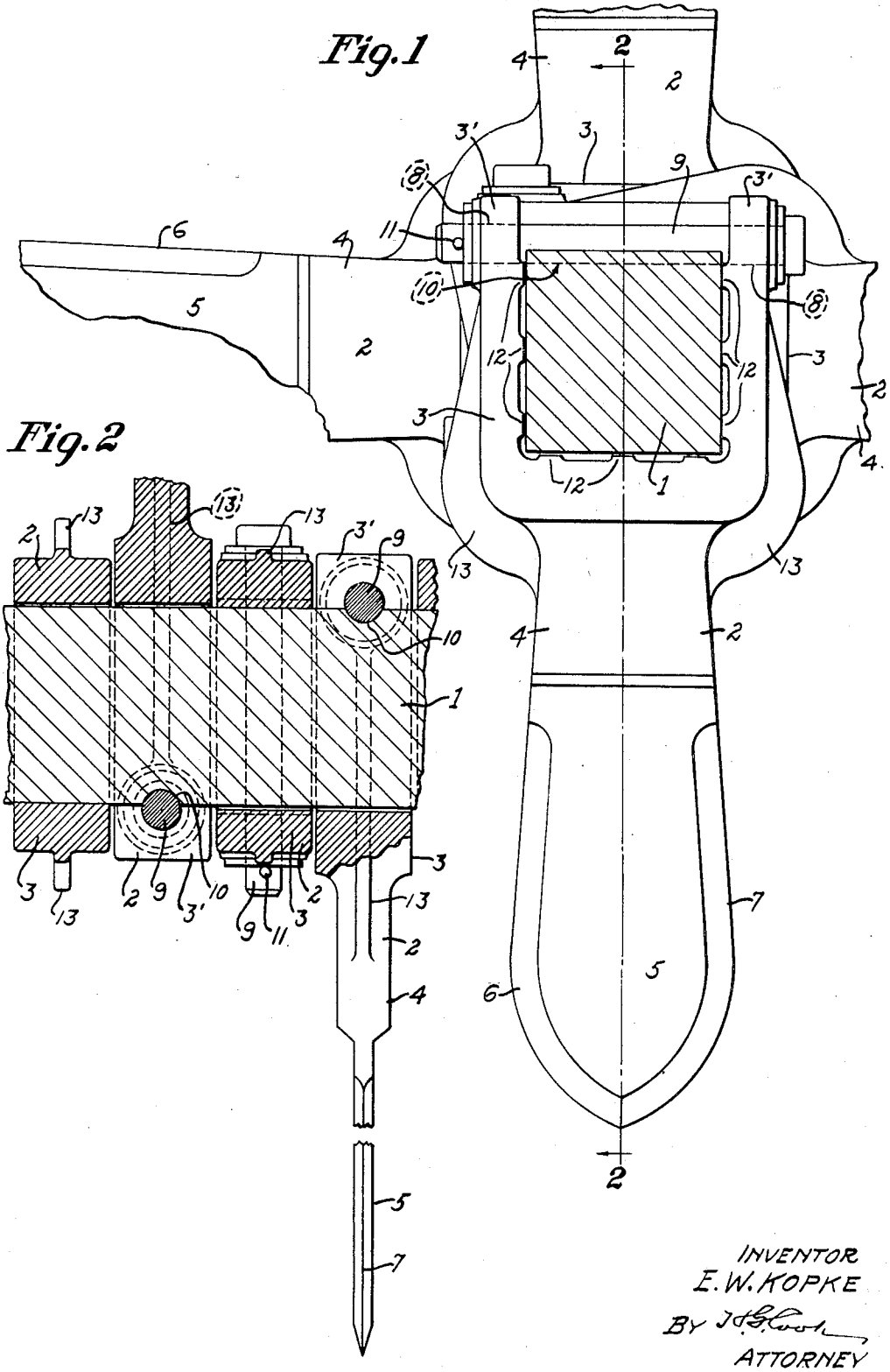


Fig. 2

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CANE KNIFE

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1 Claim. (Cl. 146—106)

This invention relates generally to knives and more specifically to knives adapted for use in the preparation of sugar cane immediately prior to the introduction of such sugar cane into cane milling units, one extremely important object of the invention being to provide a sugar cane knife with cutting edges at opposite edges thereof so that said knives may be reversed to bring a sharp cutting edge in operative position when a cutting edge previously employed has become dulled in use.

Another very important object of the invention is to provide improved means for securing cane knives to the rotatable shafts by which they are supported in use.

Fig. 1 is a fragmentary view illustrating a plurality of cane knives of the improved construction mounted on a rotatable shaft, the shaft being illustrated in section.

Fig. 2 is a section taken approximately on line 2—2 of Fig. 1.

In the drawing, where is shown for the purpose of illustration, merely, one embodiment of the invention, 1 designates a rotatable shaft on which a plurality of cane knives 2 are mounted. The shaft 1 is preferably square in cross-section, as shown in Fig. 1, and has associated therewith the usual mechanism (not shown) for subjecting same to rotary motion. The knives 2 are arranged longitudinally of the shaft 1, as shown in Fig. 2, and they extend radially with respect thereto, knives which are disposed immediately adjacent to each other on the shaft being extended outwardly from the shaft at an approximate angle of ninety degrees with respect to each other, said knives being extended in four directions from the shaft, as shown in Fig. 1.

Each knife 2 includes a yoke portion 3 which embraces the shaft 1 and has extended therefrom a shank portion 4, the yoke and shank portions preferably being of integral structure and being formed of suitable material, cast steel, for instance. The blade of the knife, which is designated by the reference character 5 and which is made of metal having qualities for prolonged wearing and cutting service, is welded or otherwise secured to the shank portion 4, and extends outwardly therefrom, said blade being elongated in form and being curved at its outer end as shown in Fig. 1. An extremely important feature of the construction of the blade 5 of the knife is that it is provided with beveled cutting edges 6 and 7 at opposite edges of said blade, said cutting edges being extended along the opposite side edges of the blade and following the curved outer end of said blade, so as to meet at the approximate center of the blade.

As shown clearly in Fig. 1, the opposed side legs of the yoke portion 3 of the improved knife extend beyond the shaft 1, as shown at 3', and said extended portions 3' are provided with alined apertures 8 through which a securing element 9, in the form of a pin or bolt, is extended. At the position of the element 9 of each knife the shaft 1 is provided with a recess 10 formed in an adjacent face thereof, and said element 9 is seated in said recess, as shown most clearly in Fig. 2, so as to prevent movement of the yoke portion of the knife longitudinally of the shaft. The element 9 is provided with suitable means for maintaining it in place; for instance, if this element be a headed pin as shown in Fig. 1, a suitable means, such as the element 11 will be employed to prevent said bolt from being displaced from its proper position. The inner faces of the yoke portion 3 are cut away as illustrated in Fig. 1 to provide raised fitting strips, or bearing zones 12, which may contact with the shaft in a manner to secure the desired degree of adaptation. However, it is important to note that the inner faces of the yoke portion 3 do not closely engage the corresponding faces of the shaft, but instead slight looseness or play is present between the inner faces of the yoke portion and the corresponding faces of the shaft. The yoke portions 3 preferably are reinforced by suitable ribs 13.

In use, the shaft 1 is subjected to rotary motion and the active cutting edges of the knives move through the cane longitudinally of its direction of travel as it moves toward the milling unit. In due time the cutting edges of the knives which are in active use will become dulled, and when this happens the knives may be quickly and easily reversed so as to place the other cutting edges of the knives in operative positions. This reversal of the knives is made by simply withdrawing the securing elements 9, detaching the knives from the shaft 1, turning the knives over, replacing the knives on the shaft, and applying the securing elements 9. As already stated, looseness or play is present between the yoke portions of the knives and the shaft 1. This arrangement permits the knives to swing laterally to a slight degree, the securing elements 9 acting as pivots for this purpose. The looseness referred to reduces very greatly the likelihood that strains on the knives will break same, as was the case heretofore when the knives were rigidly fixed

to the shaft, as said knives are capable of yielding slightly in response to such strains.

With respect to the arrangement of providing the blades of the knives with cutting edges at the leading and trailing edges thereof, it has been demonstrated in actual operation that the cutting edges at the trailing edges of the blades tend to sharpen themselves because of the nature of the material being acted on. This situation eliminates to a large extent the necessity of taking the knives out of operation for the purpose of sharpening the cutting edges thereof, and makes possible continuous use of the knives by merely reversing said knives when the cutting edges in actual use become dulled.

I claim:

In combination, a shaft having a transversely extended recess in a face thereof which is open throughout its length at said face of said shaft, a cane knife including a yoke portion which embraces said shaft and is open at one of its ends, and a securing element associated with said yoke portion, said securing element being extended across the open end of said yoke and seated in the recess in said shaft, said shaft and said yoke portion being so proportioned as to permit slight pivotal movement of the yoke portion with respect to the shaft and about said securing element.

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