

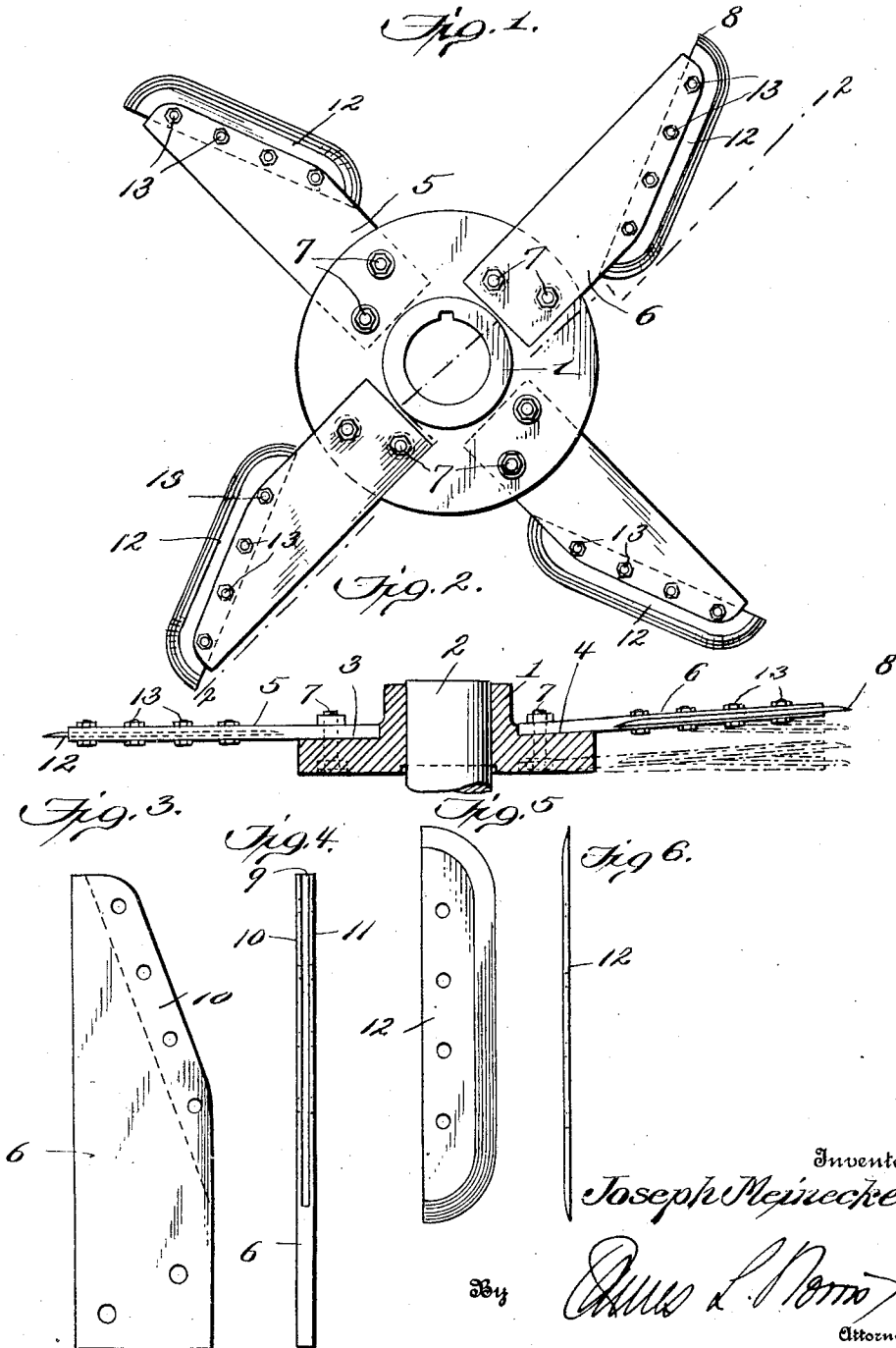
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KNIFE HOLDER FOR ROTARY CANE CUTTERS

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## UNITED STATES PATENT OFFICE.

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KNIFE HOLDER FOR ROTARY CANE CUTTERS.

Application filed July 20, 1925. Serial No. 44,926.

This invention relates to knife holders for rotary cane cutters and is designed as an improvement of the device disclosed in my Patent No. 1,217,326, granted February 27, 1917. In this patent is described a rotary cutter comprising a hub having a pair of cheeks, each provided with a pair of knife-blade seats, and a knife blade mounted on each of said seats. The knife blades are necessarily large and subject to frequent breakage due to inadvertent contact with rocks, steel, iron or other hard foreign substances fed in with the cane. Said knives, on account of their size are quite expensive, and the replacement of the same in the general operation of the sugar mill amounts to quite an item of expense. The present invention contemplates making in two parts what it was old to have in one, that is to say, in providing a knife holder securable to the hub, which may be untempered and therefore not subject to breakage, and a relatively small knife carried by said knife holder. This is an old expedient and broadly, no novelty is predicated upon the use of the same, but in its specific adaptation to a cutter of the Meinecke construction, new and inobvious results are obtained which entitle the specific improvement to patent protection. In the Meinecke cutter disclosed in said patent, one of the seats on the hub, of each pair of blades is in a plane at right angles to the hub axis, the other seat of each pair being in a plane which is inclined to the hub axis to bring the extremities of the blades into spaced relation longitudinally of the hub axis. That is to say, while one set of blades travels in a plane surface perpendicular to the axis of the cutter the other set travels in a saucer-shaped path around said axis. This causes considerably more stress on one side of the blades than on the other which renders impractical the ordinary form of knife holder when it is attempted to apply the latter to the construction shown in said Meinecke patent, but which is taken into account, in the construction of the present invention.

In the drawing:—

Figure 1 is a front elevation of a rotary cutter having the knives and knife holders of the present invention substituted for the integral knives shown in the construction of the Meinecke patent.

Figure 2 is a section taken along the line 2—2 of Figure 1.

Figures 3 and 4 are respectively front and side elevations of one of the knife holders.

Figures 5 and 6 are similar views of one of the knife blades.

Referring now in detail to the several figures, the numeral 1 represents the hub of the cane cutter which is mounted to rotate upon a driven shaft 2. Said hub has seats 3 and 4 on diametrically opposite portions of the cheek of the hub 1. Knife holders 5 and 6 are secured to said seats by suitable securing means, such as the bolts 7. One seat of each pair, namely the seat 3 is perpendicular to the axis of the shaft 2; the other seat 4 of each pair is inclined to a plane perpendicular to said axis. This construction determines that one knife holder 5 of each pair, rotates in a plane perpendicular to the axis of the shaft 2 while the other knife holder 6 of each pair travels in a saucer-shaped path so that the extremity of the knife holder 6 is spaced longitudinally of the hub with respect to the extremity of the knife holder 5, as indicated at 8 in Figure 2. Each of the knife holders 5 and 6 has its leading edge inclined toward its back, and such edge is slotted, as at 9, to form walls 10 and 11. The knife blades 12 are seated in the slots 9 between the walls 10 and 11, said walls thus serving to reinforce said knife blades against lateral deflection. The advantage of having one blade of each pair inclined or offset relatively to the other blade of such pair is that it permits the use of twice as many blades to a given length of shaft as in ordinary constructions, thereby producing a much finer cutting or shredding of the cane. The inclined disposition of the knife holders 6 causes an unbalanced stress upon said knives as they contact with the cane, the predominance of which stress is on the convex sides of said blades. This stress is so great that in the ordinary form of knife holder, the knife is apt to be broken, or, if its shank is cylindrical there is a tendency for it to rotate in its holder under the urge of the unbalanced pressure.

In the present device the walls 10 and 11 serve as a backing for the knife blades and adequately support it against bending stresses.

The knife blades 12 are of smaller size than those shown in the above patent and their cutting edges and rear edges are parallel so that, when they are seated in the holders 5

and 6, their cutting edges are parallel with the bottom of the slots 9. This preserves the proper relationship of the cutting edges of the knives to said holders. The toes of the blades preferably are rounded and preferably extend beyond the outer ends of the holders 5 and 6, and the heels of said blades, which are also rounded, meet the leading edges of the holders at or adjacent the inner ends of the slots 9. The heels of the blades, since they are nearer the axis of rotation of the hub 1 than the toes thereof, will, during the rotation of the hub, traverse a circular path of smaller radius than of that traversed by the toes and consequently rotate at a slower speed than the toes, so that the inertia blow of the blades against the cane is not as great at or adjacent the heels of the blades as at the toes thereof. Nevertheless, the rounded heels of the blades will engage and exert a shear-like action on the cane which may lie adjacent the hub and tend to wrap around the hub and will also prevent the cane from being thrown by centrifugal action in an uncut condition toward the toes of the knives. The knife blades 12 are secured in any suitable manner in the slots 9 of the knife holders as for instance by the bolts 13 passing through aligned apertures in the walls 10 and 11 of the slot 9. On account of the small size of the knife blades the expense of replacement of the same, when broken, is relatively inconsequential.

While I have, in the present description disclosed what I believe to be a preferred and practical embodiment of my invention, yet it is to be understood that experience gained by usage may suggest various changes and alterations in the configuration of the parts, such as may be adopted without de-

parting from the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. A rotary cutter comprising a hub, a knife holder secured thereto, such knife holder being arranged to carry a knife blade inclined with respect to a plane perpendicular to the axis of said cutter, said knife holder being tapered by having the leading edge thereof inclined toward the back of said holder, said inclined edge being formed with a slot, and a knife blade detachably secured in said slot, the walls of the latter embracing the sides of said knife blade and reinforcing it against lateral deflection, said knife blade being formed with a rounded heel meeting the knife holder adjacent the hub.

2. A rotary cutter comprising a hub, a knife holder secured thereto, said knife holder being arranged to carry a knife blade inclined with respect to a plane perpendicular to the axis of said cutter, said knife holder being tapered by having the leading edge thereof inclined toward the back of said holder, said inclined edge being formed with a slot, and a knife blade detachably secured in said slot, the walls of the latter embracing the sides of said knife blade and reinforcing it against lateral deflection, said knife blade being formed with a cutting edge having a portion substantially parallel to the direction of inclination of said leading edge, and a rounded heel meeting the knife holder adjacent the inner end of said slot.

In testimony whereof I have hereunto set my hand.

JOSEPH MEINECKE.